THE IMPACT OF URBANIZATION ON THE SUSTAINABILITY OF TEA INDUSTRY IN SICHUAN PROVINCE

WANG JUE

UNIVERSITI KEBANGSAAN MALAYSIA

UNIVERSITI KEBANGSAAN MALAYSIA

THE IMPACT OF URBANIZATION ON THE SUSTAINABILITY OF TEA INDUSTRY IN SICHUAN PROVINCE

WANG JUE

UNIVERSITI KEBANGSAAN MALAYSIA

THESIS SUBMITTED IN FULFILMENT FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT (LESTARI)
UNIVERSITI KEBANGSAAN MALAYSIA
BANGI

2026

KESAN PEMBANDARAN TERHADAP KELESTARIAN INDUSTRI TEH DI WILAYAH SICHUAN

WANG JUE

UNIVERSITI KEBANGSAAN MALAYSIA

TESIS YANG DIKEMUKAKAN UNTUK MEMPEROLEH
IJAZAH DOKTOR FALSAFAH

INSTITUT ALAM SEKITAR DAN PEMBANGUNAN (LESTARI)
UNIVERSITI KEBANGSAAN MALAYSIA
BANGI

2026

DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

15 February 2026

WANG JUE
P122116

UNIVERSITI KEBANGSAAN MALAYSIA

	UKM-SPKPPP-PT(PdP)-05-AK04-BO07	No. Semakan: 02	Tarikh Kuat Kuasa: 29/01/2026
	BORANG DAN SENARAI SEMAK PENYERAHAN TESIS / DISERTASI SELEPAS PEMBETULAN ***Form and Check List of Amended Thesis Submission***		

Tandatangan: *Signature*	Tarikh: *Date* 23/2/2026
Nama dan Cap Rasmi: *Name and Official Stamp*	PROF. ChM DR. GOH CHOO TA, FMIC Pengarah Institut Alam Sekitar dan Pembangunan (LESTARI) Universiti Kebangsaan Malaysia

G. PERAKUAN TESIS SARJANA / DOKTOR FALSAFAH
(*CERTIFICATION OF MASTERS / DOCTORAL THESIS*)

Nama penuh pengarang (*Author's Full Name*)	WANG JUE		
No. Pendaftaran Pelajar (Student's Registration No.)	P122116	Sesi Akademik (*Academic Session*)	1/20252026
Tajuk Tesis (*Thesis Title*)	THE IMPACT OF URBANIZATION ON THE SUSTAINABILITY OF TEA INDUSTRY IN SICHUAN PROVINCE		

Semua tesis/disertasi dan penerbitan mengenai hasil penyelidikan pelajar adalah tertakluk kepada Dasar Harta Intelek Universiti Kebangsaan Malaysia.
All theses/ dissertations and publications relating to the research work of a student are subject to the Intellectual Property Policy of Universiti Kebangsaan Malaysia.

Saya mengaku bahawa tahap akses tesis/disertasi ini sebagai (*Tandakan ✓ dalam kotak bagi maklumat yang berkaitan; tandakan satu (1) kotak di bawah sahaja):
I hereby declare the level of access for this thesis/dissertation as follows (tick ✓ the relevant box below; tick only one option).

Pilihan Tahap Akses *Access Level Selection*		Tafsiran Tahap Akses Tesis/Disertasi *Definition of Thesis/Dissertation Access Level*
☐	**RAHSIA** ***(CONFIDENTIAL)***	Mengandungi maklumat rahsia sepertimana yang diperuntukan bawah Akta Rahsia Rasmi 1972. *Contains classified information as stipulated under the Official Secrets Act 1972.*
☐	**TERHAD** ***(RESTRICTED)***	Mengandungi maklumat yang hanya boleh diakses oleh pihak yang mempunyai kebenaran atau keperluan tertentu untuk mengetahuinya yang ditentukan oleh organisasi/ badan di mana penyelidikan dijalankan. *Contains information that may only be accessed by parties with specific authorization or a defined need to know, as determined by the organization or body where the research is conducted.*
/	**AKSES TERBUKA** ***(OPEN ACCESS)***	Tesis/disertasi versi akhir dalam format PDF yang boleh diakses secara percuma secara dalam talian dan bebas dari isu hak cipta dan pelesenan *The final version of the thesis/dissertation in PDF format that is freely accessible online and free from copyright and licensing issues.*

UNIVERSITI KEBANGSAAN MALAYSIA

	UKM-SPKPPP-PT(PdP)-05-AK04-BO07	No. Semakan: 02	Tarikh Kuat Kuasa: 29/01/2026
	BORANG DAN SENARAI SEMAK PENYERAHAN TESIS / DISERTASI SELEPAS PEMBETULAN ***Form and Check List of Amended Thesis Submission***		

		Kementerian Pendidikan Tinggi melalui surat bertarikh 27 Mac 2025 memutuskan bahawa kebenaran akses tesis / disertasi dalam borang serahan akses terbuka ditentukan oleh penyelia (bukan pelajar). *The Ministry of Higher Education, through a letter dated 27 March 2025, has decided that permission for thesis / dissertation access in the open access submission form shall be determined by the supervisor (not the student).*
☐	**EMBARGO**	Tempoh masa di mana akses kepada tesis/disertasi disekat (ditutup) selama dua (2) tahun atas sebab-sebab tertentu sebagai contoh kerahsiaan atau hak cipta. Tesis/disertasi akan berstatus akses terbuka selepas tamat tempoh *embargo.* *The period during which access to the thesis/dissertation is restricted for two (2) years due to specific reasons, such as confidentiality or copyright. The thesis/dissertation will be granted open-access status upon the expiry of the embargo period.*

PENGESAHAN PELAJAR *(STUDENT VERIFICATION)*	**PENGESAHAN PENYELIA *(SUPERVISOR VERIFICATION)***
WANG JUE **TANDATANGAN PELAJAR** **(*STUDENT'S SIGNATURE*)**	PROFESOR DR AHMAD FARIZ HJ MOHAMED FELO UTAMA Institut Alam Sekitar dan Pembangunan (LESTARI) Universiti Kebangsaan Malaysia **TANDATANGAN PENYELIA / PENGERUSI JK SISWAZAH** ***(SUPERVISOR'S / CHAIRPERSON SUPERVISION COMMITTEE SIGNATURE)***
Nama Pelajar *(Student name)*:	Nama Penyelia / Pengerusi JK Siswazah : *(Supervisor's / Chairperson Supervision Committee Name)* Prof. Dr Ahmad Fariz Bin Hj Mohamed
No. Pendaftaran Pelajar *(Student's Registration No.)* EL3859764 / P122116	
Tarikh: *(Date)* 23/2/2026	Tarikh *(Date)* 23/2/2026

UNIVERSITI KEBANGSAAN MALAYSIA

ACKNOWLEDGEMENT

As time passes by, my doctoral research life is passing by in a flash. When I look back on every step I have taken, it seems as if I just stepped into the campus of Western University yesterday. Although this period of time is a small part of my life, it has brightened my future. Whenever I fantasize about the moment of graduation, I always look forward to it with great anticipation as I imagine the moment when I put pen to paper and give my thanks. However, when I really stand at this moment, I am filled with strong gratitude and reluctance. At this moment, I would like to express my most sincere gratitude to each and every one of my honoured ones who have given me support and help along the way.

First of all, I would like to express my deepest gratitude to my Prof. Dr. Ahmad Fariz Bin Mohamed. Professor Fariz's profound knowledge, rigorous attitude and broad academic vision have deeply infected me, and have always guided me in the direction of my future. Professor Fariz has not only given me selfless guidance in academics, but also encouraged me in my research path, helping me to overcome one problem after another and break through one bottleneck after another. Especially during the revision process of my dissertation, Professor Fariz's patient guidance and meticulous advice helped me to continuously improve my research results. Without Mr. Li's teaching and support, I could not have successfully completed my doctoral dissertation. For this, I will always be grateful and respectful. I would also like to give special thanks to my co-supervisor, Dr Nuriah. She always did not hesitate to reach out to me when I needed extra guidance and help and provided me with invaluable advice and assistance. His guidance guided me when I was lost and confused.

Secondly, I would like to thank all the teachers at the Institute for Environment and Development (LESTARI) for your careful guidance in my academics. Being able to listen to your classes has broadened my academic horizons and opened up my academic dreams. Especially in the process of writing my dissertation, the advice and support of the teachers provided me with valuable help, which made me more mature academically.

Once again, I would like to thank the anonymous experts who reviewed my dissertation. Their valuable comments and corrections during the dissertation review process were like a bright light illuminating my way forward, enabling me to have a clearer understanding and a deeper understanding of my own research. Special thanks to several of my doctoral students and friends for your selfless support and help during the writing process of my dissertation. Your suggestions and guidance helped me to improve my research methodology, revise important chapters in my thesis, avoid many academic misconceptions, and stimulate many new thoughts.

I would also like to express my special thanks to Mr. Mou Yimin, the Secretary General of Sichuan Tea Industry Association, for your support and help in academics and life, helping me to introduce various experts and scholars in the tea industry, and helping me to complete the in-depth interview part of the experts, so that I am full of

warmth and motivation on this road of study, and every communication and companionship makes me more determined to move forward.

Finally, a special thank you to my dearest husband for your companionship and unconditional support throughout my academic journey. You have been by my side through thick and thin. Your understanding, love and support have been a major reason for me to overcome all the difficulties and successfully complete my research. Thank you to my parents, you are my eternal angels who always remind me of the importance of education. Your hard work and selfless support enabled me to focus on pursuing my academic dreams. Your love and teachings will always be an inexhaustible source of motivation for me.

I would like to express my heartfelt gratitude to all those who have helped, supported and encouraged me in this academic journey. Thank you for making me not alone in this journey, for providing me with valuable academic resources and life help that made me who I am today.

UNIVERSITI KEBANGSAAN MALAYSIA

ABSTRAK

Dengan proses pembandaran yang pantas, industri teh di Sichuan menghadapi pelbagai cabaran dan peluang. Kajian ini bertujuan untuk menilai kesan pembandaran terhadap kelestarian industri teh di Sichuan, dengan fokus khas terhadap bagaimana perubahan dalam permintaan pasaran, penggunaan sumber, perlindungan alam sekitar ekologi, dan faktor sosio-budaya mempengaruhi industri teh. Kajian ini menggunakan pendekatan kaedah campuran, menggabungkan analisis kuantitatif dan kualitatif. Menggunakan teori tingkah laku terancang, teori pembandaran dan teori pembangunan mampan, kajian ini meneroka peranan urbanisasi dalam mendorong pembangunan ekonomi, budaya dan ekologi industri teh. Dalam proses penyelidikan, regresi logistik binari dan model regresi berganda digunakan untuk menganalisis faktor utama yang mempengaruhi niat pembelian pengguna secara empirik, meneroka impak ciri peribadi, sikap tingkah laku, norma subjektif, dan kawalan tingkah laku yang dirasakan. Melalui temu bual separa berstruktur dengan 12 pakar industri dan perbincangan berdasarkan senario, kajian ini mendapati bahawa perubahan dalam permintaan pengguna dan tekanan ekologi yang didorong oleh proses pembandaran adalah faktor penting yang mempengaruhi kelestarian pembangunan industri teh di Sichuan. Kajian ini juga mencadangkan bahawa teknologi pengeluaran hijau dan pembangunan jenama adalah faktor utama dalam transformasi industri, manakala sokongan dasar dan pembangunan infrastruktur adalah penting untuk kelestarian industri teh. Kajian ini mencadangkan penyelesaian praktikal untuk pembangunan hijau industri teh Sichuan, menyediakan panduan yang boleh dilaksanakan untuk pembuat dasar dan pengurus industri dalam mempromosikan pembangunan mampan jangka panjang industri teh di Sichuan.

UNIVERSITI KEBANGSAAN MALAYSIA

ABSTRACT

With the acceleration of urbanization, the tea industry in Sichuan faces a series of challenges and opportunities. This study aims to assess the impact of urbanization on the sustainability of the tea industry in Sichuan, with a particular focus on how changes in market demand, resource utilization, ecological environmental protection, and sociocultural factors affect the tea industry. The study adopts a mixed-methods approach, combining both quantitative and qualitative analysis. Using theories of planned behavior, urbanization, and sustainable development, the study explores the role of urbanization in driving the economic, cultural, and ecological development of the tea industry. In the research process, binary logistic regression and multiple regression models are used to empirically analyze the key factors influencing consumers' purchase intentions, exploring the impact of personal characteristics, behavioral attitudes, subjective norms, and perceived behavioral control. Through semi-structured interviews with 12 industry experts and scenario-based discussions, the study finds that the changes in consumer demand and ecological pressures driven by urbanization are crucial factors affecting the sustainable development of Sichuan's tea industry. The study also suggests that green production technologies and brand development are key factors in the transformation of the industry, while policy support and infrastructure development are essential for the sustainability of the tea industry. The study proposes practical solutions for the green development of Sichuan's tea industry, providing actionable guidance for policymakers and industry managers to promote the long-term sustainable development of the tea industry in Sichuan.

UNIVERSITI KEBANGSAAN MALAYSIA

TABLE OF CONTENTS

		Page
DECLARATION		iii
ACKNOWLEDGEMENT		iv
ABSTRAK		vi
ABSTRACT		vii
TABLE OF CONTENTS		viii
LIST OF TABLES		xv
LIST OF ILLUSTRATIONS		xvii
LIST OF ABBREVIATIONS		xix
CHAPTER I	**INTRODUCTION**	
1.1	Introduction	1
1.2	Background and Significance of the Study	5
	1.2.1 Historical and cultural background	5
	1.2.2 Urbanization and the zeitgeist of the tea industry	6
	1.2.3 Interaction between urbanization and tea industry	9
	1.2.4 Changes in consumer tea consumption intentions and behavior in the process of urbanization	11
	1.2.5 Sustainable development and the future of China's tea industry	13
1.3	Problem Statement	15
1.4	Ten Latest Studies on the Current Tea Industry in Sichuan	19
1.5	Purpose of the Study	24
1.6	Research Objectives	26
1.7	Research Questions	26
1.8	Research Scope	27
1.9	Structure of the Thesis	29
1.10	Chapter Summary	32
CHAPTER II	**LITERATURE REVIEW**	
2.1	Operation Definition	34
	2.1.1 Urbanization process	34
	2.1.2 Sichuan tea industry	35
	2.1.3 Sustainable development	36

UNIVERSITI KEBANGSAAN MALAYSIA

2.2	Relationship between Urbanization Process and Tea Industry		38
	2.2.1	Changes in market demand and consumer behavior	38
	2.2.2	Technological innovation and transformation of production patterns	41
	2.2.3	Environmental protection and ecosystem sustainability	43
	2.2.4	Social culture and the transmission of traditional tea culture	45
2.3	The Relationship between the Tea Industry and Sustainable Development under Urbanization		48
	2.3.1	Economic dimension: Urbanization, industrial efficiency, and market restructuring	48
	2.3.2	Ecological dimension: Urbanization pressure, resource constraints, and green transformation	49
	2.3.3	Sociocultural dimension: Urbanization, consumption behavior, and cultural continuity	49
2.4	Research Theory		50
2.5	Theoretical Framework		53
	2.5.1	Theoretical modeling of sustainable development of tea industry	54
	2.5.2	Theoretical foundations of tea consumer behavior research	58
2.6	Conceptual Framework		66
2.7	Research Hypotheses		69
	2.7.1	Theoretical basis of research effects of urbanization on the sustainable development of the tea industry	69
	2.7.2	Theoretical mediating effects of sociocultural and ecological dimensions	70
	2.7.3	Theoretical effects of consumer behavior on tea consumption intention	70
2.8	Theoretical Modelling		71
	2.8.1	Theoretical basis of research on sustainable development of tea industry	71
2.9	Chapter Summary		90
CHAPTER III	**METHODOLOGY**		
3.1	Introduction		92
3.2	Research Paradigm		93
3.3	Study Design		94

UNIVERSITI KEBANGSAAN MALAYSIA

	3.3.1	Overall research design framework	94
	3.3.2	Mixed-methods design logic	94
	3.3.3	Research design corresponding to research questions	95
3.4	Research Approach		99
	3.4.1	Quantitative research approach	99
	3.4.2	Qualitative research approach	101
	3.4.3	Complementarity of quantitative and qualitative approaches	102
3.5	Data Collection		102
	3.5.1	Quantitative data collection	103
	3.5.2	Qualitative data collection	119
	3.5.3	Representativeness and scientific assurance of the sample	120
3.6	Variable Definitions and Measurement Indicators		121
	3.6.1	Variable framework and construct design	121
	3.6.2	Preliminary design of factors affecting urbanization on the sustainable development of tea industry	143
	3.6.3	Design of variables for measuring consumers' tea consumption intentions and consumption behavior	144
	3.6.4	Preliminary design of potential factors influencing consumers' tea consumption. Intention and behavior	145
	3.6.5	Determination of factors influencing urbanization on the sustainable development of the tea industry in Sichuan	153
	3.6.6	Identification of potential influences on consumers' tea consumption intention and behavior	165
3.7	Key Elements of the Questionnaire		171
	3.7.1	Questionnaire on the sustainable development of tea industry in Sichuan by urbanization	172
	3.7.2	Questionnaire on consumers' tea consumption willingness and consumption behavior	174
3.8	Research Tools		175
3.9	Application of Structural Equation Modeling (SEM) in Industrial Development Research		178
	3.9.1	SEM fundamentals and applicability	178
	3.9.2	Application of SEM in Sichuan tea industry research	179
	3.9.3	Strengths and limitations of SEM	180
	3.9.4	Specific applications of SEM in this study	181

UNIVERSITI KEBANGSAAN MALAYSIA

3.10	Reliability and Validity	181
	3.10.1 Confidence analysis of the tool	182
	3.10.2 Analysis of the validity of the tool	183
3.11	Pilot Testing	185
	3.11.1 Pilot test sample design and execution	185
	3.11.2 Internal consistency test	185
	3.11.3 Preliminary test of structural validity	186
	3.11.4 Expert interviews and qualitative support validation	187
3.12	Data Analysis Procedures	187
	3.12.1 Module 1: Impact Mechanisms of Urbanization on the Sustainable Development of the Tea Industry (industry-side analysis)	188
	3.12.2 Module 2: Driving Mechanisms of Consumer Behavior on the Sustainable Transformation of the Tea Industry (consumer-side analysis)	189
3.13	Ethical Considerations	191
	3.13.1 Informed consent	191
	3.13.2 Confidentiality and anonymity	192
	3.13.3 Data security and academic integrity	192
3.14	Chapter Summary	193
CHAPTER IV	**SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS OF URBANIZATION ON SICHUAN'S TEA INDUSTRY**	
4.1	Introduction	195
4.2	Descriptive Analysis of the Sample	196
4.3	Reliability and Validity Analysis	198
	4.3.1 Reliability analysis	198
	4.3.2 Validity analysis	200
4.4	Model Fit Tests	223
	4.4.1 Initial model construction	223
	4.4.2 Initial model construction	225
	4.4.3 Findings and discussion	228
4.5	Chapter Summary	230
CHAPTER V	**THE INFLUENCING FACTORS OF SICHUAN TEA CONSUMERS' CONSUMPTION WILLINGNESS ON THE SUSTAINABLE DEVELOPMENT OF THE TEA INDUSTRY**	
5.1	Introduction	232

UNIVERSITI KEBANGSAAN MALAYSIA

5.2	Descriptive Analysis of Tea Consumer Behavior		234
	5.2.1	Basic information about consumers	234
	5.2.2	Educational level of consumers	235
	5.2.3	Marital status of consumers	236
	5.2.4	Monthly consumer income	237
	5.2.5	Occupation of consumers	239
	5.2.6	Level of urbanization of consumers' place of residence	241
	5.2.7	Consumer awareness and evaluation of tea	243
	5.2.8	Consumer willingness to consume tea analysis	247
	5.2.9	Analysis of the frequency and cost of consumer tea	249
	5.2.10	Main places where consumers consume tea	250
5.3	Method Selection – Logistic Regression Analysis		252
5.4	Construction of Empirical Model of Factors Influencing the Willingness to Consume Tea		255
5.5	Analysis of the Results of the Identification of Factors Influencing the Willingness to Consume Tea		256
5.6	Discussion of the Results of the Identifying the Factors Influencing the Willingness to Consume Tea		264
5.7	Chapter Summary		276
CHAPTER VI	**QUALITATIVE ANALYSIS OF THE MECHANISMS INFLUENCING TEA CONSUMPTION INTENTION AND BEHAVIOR**		
6.1	Introduction		278
6.2	Coding Result		279
	6.2.1	Open coding	279
	6.2.2	Spindle type coding	282
	6.2.3	Selective coding	283
6.3	In-Depth Interview Test		284
6.4	Analysis of Impact Mechanisms		289
	6.4.1	Mechanisms of influence of basic personal characteristics of consumers on tea consumption	289
	6.4.2	Mechanisms of consumer behavioral attitudes on tea consumption	293
	6.4.3	Mechanisms of consumer subjective norms on tea consumption	295
	6.4.4	Mechanisms of consumer behavior control on tea consumption	297
6.5	Sustainable Development Pathways for Sichuan's Tea Industry		300

UNIVERSITI KEBANGSAAN MALAYSIA

	6.5.1	Building a sustainable development path for the tea industry	301
	6.5.2	Sustainable development logic diagram of Sichuan tea industry driven by urbanization	306
	6.5.3	Data support and strategy recommendations	307
6.6		Chapter Summary	312
CHAPTER VII		**CONCLUSION AND POLICY RECOMMENDATIONS**	
7.1		Main Findings	314
	7.1.1	The impact of urbanization on the sociocultural aspects of Sichuan's tea industry	314
	7.1.2	Urbanization as a catalyst for the market economy	318
	7.1.3	Ecological pressure and green production challenges	321
	7.1.4	Impact of consumer behavior on the development of the tea industry	323
7.2		Research Contribution	326
	7.2.1	Theoretical contributions	326
	7.2.2	Methodological contributions	330
	7.2.3	Practical contributions	332
7.3		Management Insights	337
	7.3.1	Recognize and value the role of sociocultural factors in the development of the tea industry	338
	7.3.2	Enhancing the perceived value of tea through multiple channels	340
	7.3.3	Promoting the implementation of eco-friendly production models	341
	7.3.4	Precise market positioning and product innovation	344
7.4		Research Limitations and Future Prospects	345
REFERENCES			**347**
APPENDICES			
Appendix A		In-Depth Interview Online	363
Appendix B		Pre-Survey Questionnaire (Factors Influencing the Sustainable Development of the Tea Industry in Urbanized Areas)	365

UNIVERSITI KEBANGSAAN MALAYSIA

Appendix C	Pre-Survey Questionnaire (The Impact of Consumer Value Choices on the Sustainable Development of Sichuan's Tea Industry	379
Appendix D	Formal Survey Questionnaire (Factors Affecting the Sustainable Development of the Tea Industry in Urbanization	384
Appendix E	Formal Survey Questionnaire (The Impact of Consumer Value Choices on the Sustainable Development of Sichuan's Tea Industry	388

UNIVERSITI KEBANGSAAN MALAYSIA

LIST OF TABLES

Table No.		Page
Table 1.1	Ten current and updated studies	19
Table 3.1	Research design based on research questions	95
Table 3.2	Summary of urbanization and consumer behavior research designs	97
Table 3.3	Annual tea production statistics 2022	106
Table 3.4	Leading tea enterprises in Sichuan Province	113
Table 3.5	Design of urbanization impact variables (based on Delphi and triple bottom line theory)	143
Table 3.6	Findings on the importance of urbanization as an influencing factor on the sustainability of the tea industry	161
Table 3.7	Basic information of the pre-survey questionnaire	163
Table 3.8	Reliability statistics	164
Table 3.9	KMO and Bartlett's test	164
Table 3.10	Findings on the importance of potential influences on tea consumption intention and behavior	168
Table 3.11	Dimensions of urbanization impact pathway measurement	177
Table 3.12	Consumer behavior pathway measurement dimensions (based on TPB)	177
Table 3.13	Pilot test scale reliability test results (reliability statistics)	186
Table 3.14	KMO and Bartlett's test	186
Table 3.15	Model fit evaluation	189
Table 4.1	Descriptive statistics of demographic variables	198
Table 4.2	Reliability statistics for the scale	199
Table 4.3	KMO and Bartlett's test	200
Table 4.4	Total variance explained	203
Table 4.5	Component matrix	203

UNIVERSITI KEBANGSAAN MALAYSIA

Table 4.6	Descriptive statistics	205
Table 4.7	Descriptive statistics of each dimension	207
Table 4.8	T-test for gender	207
Table 4.9	ANOVA for age	208
Table 4.10	ANOVA for occupation	210
Table 4.11	ANOVA for region	211
Table 4.12	Variable names and abbreviations	216
Table 4.13	Model fit tests	218
Table 4.14	Convergent validity test	219
Table 4.15	Differential validity analysis	220
Table 4.16	Path factor analysis	227
Table 5.1	Consumer awareness pathways for tea	244
Table 5.2	Analysis of the frequency and cost of tea consumption	250
Table 5.3	The chart of variables paraphrase	257
Table 5.4	Willingness to consume model test table	260
Table 5.5	Coefficients of tea consumption intention model	261
Table 5.6	Standard deviation of the significance indicator of willingness to consume	265
Table 5.7	Standardized regression coefficients of factors influencing tea consumption intention	266
Table 6.1	Chart of variables paraphrase	280
Table 6.2	Spindle type coding	283
Table 6.3	Selective coding	284
Table 6.4	Comparison of Kappa consistency coefficients	285
Table 6.5	Framework for the sustainable development of Sichuan's tea industry	302
Table 6.6	Showing the relationship between urbanization impact variables and tea industry strategy responses	308

UNIVERSITI KEBANGSAAN MALAYSIA

LIST OF ILLUSTRATIONS

Figure No.		Page
Figure 2.1	Theoretical framework for sustainable development of the tea industry	57
Figure 2.2	Theoretical framework for planned behavior	59
Figure 2.3	Theoretical framework for consumer decision making in tea consumption	64
Figure 2.4	Theoretical framework of consumer tea consumption behavior	65
Figure 2.5	Conceptual framework diagram	66
Figure 2.6	Pathways of urbanization impacts on ecological floors	75
Figure 2.7	Urbanization rate of 13 provinces in the country in 2022	79
Figure 2.8	Satellite map of earth's nighttime light distribution	84
Figure 2.9	Global distribution of PM 2.5 concentration values	85
Figure 3.1	Overall distribution of the survey sample	109
Figure 3.2	Integration of GIS workflows	110
Figure 4.1	Model assumptions	221
Figure 4.2	Validation factor analysis	223
Figure 4.3	Model results of urbanization process on sustainable development of tea culture in Sichuan Province	224
Figure 5.1	Gender distribution of consumers	234
Figure 5.2	Age distribution of consumers	235
Figure 5.3	Educational attainment of consumers	236
Figure 5.4	Marital status of consumers	237
Figure 5.5	Monthly income of consumers	239
Figure 5.6	Occupational distribution of consumers	241
Figure 5.7	Level of urbanization of consumers' place of residence	241
Figure 5.8	Statistics of tea consumption willingness	247

UNIVERSITI KEBANGSAAN MALAYSIA

Figure 5.9	Main places where consumers consume tea	251
Figure 6.1	Revised conceptual model of the impact of urbanization on the sustainable development of the Sichuan tea industry	299
Figure 6.2	Logical diagram of the impact of urbanization on the sustainable development of Sichuan's tea industry	307

UNIVERSITI KEBANGSAAN MALAYSIA

LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CR	Critical Ratio
EBL	Ecological Bottom Line
EFM	Equivalent-Forms Method
EFA	Exploratory Factor Analysis
IFI	Incremental Fit Index
NNFI	Non-normed Fit Index
PNFI	Parsimony Adjusted Normed Fit Index
PBC	Perceived Behavioral Control
RMSEA	Root Mean Square Error of approximation
SBL	Social Bottom Line
SEM	Structural Equation Modeling
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TBL	Triple Bottom Line
TBLT	Triple Bottom Line Theory
TLI	Tucker - Lewis Index
UGC	User-Generated Content

UNIVERSITI KEBANGSAAN MALAYSIA

CHAPTER I

INTRODUCTION

1.1 INTRODUCTION

Since the 1990s, the cultural industry has attracted global attention with its unique charm and amazing growth. More and more countries begin to regard cultural industry as a strategic industry and promote it systematically. Nowadays, cultural industry has become an important pillar industry in some developed countries, which not only promotes the development of national economy, but also enhances the "soft power" of the country to participate in the world competition. From the prospect point of view, cultural industry has a broad space for development, and has the reputation of "smokeless industry" and "sunrise industry". Vigorously developing cultural industry has become a global trend in the ascendant.

Since the 1990s, the cultural industry has attracted global attention due to its unique appeal and remarkable growth potential. An increasing number of countries now regard cultural industries as strategic sectors and actively promote their development. These industries not only serve as new engines for economic growth but also enhance a nation's "soft power". With the acceleration of globalization, cultural industries have become a vital manifestation of national competitiveness, particularly in facilitating cultural exchange and the dissemination of ideas (Su, Wall & Wang 2019).

The concept of sustainable cultural industry development emphasizes the balance among economic, social, and environmental dimensions to ensure the long-term, healthy growth of cultural industries. Beyond economic returns, these industries prioritize social responsibility and ecological conservation. Driven by innovation and market forces, they strive to enhance the social value and cultural diversity of cultural

UNIVERSITI KEBANGSAAN MALAYSIA

products while preserving and promoting the finest achievements of human civilization (Chen & Zhang 2020). Amidst the diversification of global cultural consumption, cultural industries are progressively shifting toward more environmentally friendly and low-carbon production processes. Simultaneously, they seek harmonious coexistence between local and global cultures within international cultural exchanges (Li & Zhang 2018).

With the advent of the digital era, the cultural industry has undergone a transformation from traditional to digital media. Advances in information technology have not only altered the production and consumption of cultural products but also presented new opportunities and challenges for the sector. The widespread dissemination of digital cultural products has liberated cultural consumption from geographical and temporal constraints, propelling the industry toward globalization and inclusive development (Zhao 2022).

The tea culture industry constitutes a vital segment of the cultural sector. Using tea as its medium, it integrates diverse cultural elements such as tea artistry, tea ceremony, teahouses, and tea tourism to create distinctive cultural products and services. This industry not only fulfills people's growing spiritual and cultural needs but also drives related industrial chains in agriculture, manufacturing, and services, thereby promoting coordinated regional economic and social development. In numerous countries and regions, the tea culture industry has evolved into a cultural brand with formidable competitiveness and influence (Su, Wall & Wang 2019). China's Sichuan tea, India's black tea, Japan's matcha, and Britain's afternoon tea are all quintessential examples within the international tea culture industry. Today, tea culture transcends time and space, serving as a cultural symbol that connects the world and embodies a nation's distinctive character and soft power.

Urbanization stands as a defining feature of contemporary global development, driving population mobility, lifestyle transformations, and diversified consumer demands. This shift has opened broader market opportunities and attracted higher-tier consumers for the tea culture industry. As urbanization advances, the sector meets the growing spiritual and cultural needs of city dwellers through diverse formats like tea

UNIVERSITI KEBANGSAAN MALAYSIA

ceremonies, teahouses, and tea tourism. Heightened health consciousness and expanding leisure demands have positioned tea culture products as integral components of fashionable and healthy lifestyles. Simultaneously, consumers increasingly demand both functional attributes (such as quality and health benefits) and emotional value (such as cultural identity and social interaction) from tea culture products, driving innovation and development within the industry (Zhao 2022).

However, rapid urbanization also poses challenges to the sustainable development of the tea culture industry. It intensifies pressure on land resources, impacting the ecological environment of tea plantations. Concurrently, urbanization fuels consumer demand for high-quality tea and cultural value-added products, compelling the tea culture industry to continuously enhance innovation and heritage preservation. Excessive urbanization may threaten the transmission of traditional culture, particularly concerning the protection and promotion of tea culture.

Sustainable development requires meeting present needs without compromising future generations' capabilities. The tea culture industry generates significant economic benefits for local economies through tea production, processing, and tea tourism integration, creating employment opportunities and boosting local fiscal revenue. This industrial growth provides the economic foundation for advancing sustainable development. The tea culture industry also plays a vital role in promoting local cultural heritage and strengthening community cohesion. Through tea cultural events, tea museums, and tea festivals, it enriches community cultural life and enhances residents' cultural identity. In advancing green development, ecological construction and management of tea gardens, along with clean, circular, and low-carbon technologies in tea production, effectively reduce environmental pollution and protect the ecological environment. Research indicates that tea plantations also function as ecological barriers in biodiversity conservation, providing buffer zones between urbanization and natural areas and promoting the protection of biodiversity, including birds (Wu, Li & Zhang 2023).

A complex interplay exists between urbanization and sustainable development. Rapid development during urbanization may sometimes lead to excessive resource

UNIVERSITI KEBANGSAAN MALAYSIA

consumption and environmental degradation. However, through scientific planning and management, urbanization can become an engine driving sustainable development (Liu & Wu 2021). Under sound planning, urbanization can both stimulate the tea industry's growth and support sustainable social and environmental development through sustainable economic growth. However, excessive urbanization may also negatively impact the tea industry, such as through land loss, environmental pollution, and the weakening of cultural traditions (Li & Zhang 2018). Therefore, while advancing urbanization, it is essential to prioritize ecological conservation and cultural preservation to ensure coordinated progress.

This study focuses on 11 key tea-producing regions in Sichuan Province, aiming to explore the impact mechanisms and pathways of factors such as market demand, population growth, and cultural inheritance on the development of Sichuan's tea cultural industry during the urbanization process. It seeks to uncover how to promote the coordinated development of the tea cultural industry and urbanization. Integrating the current state of Sichuan's tea cultural industry, this study applies urbanization theory, the triple bottom line theory, ecological modernization theory, and the theory of planned behavior to construct an evaluation framework examining urbanization's impact on the sustainable development of the tea cultural industry. Data were collected through questionnaires and statistical yearbooks, analyzed using structural equation modeling (SEM). The findings reveal that urbanization reduces tea transportation costs and enhances market efficiency by improving transportation and communication infrastructure. Concurrently, investment opportunities arising from urbanization drive the modernization of tea gardens, elevating production techniques and output. Urbanization exerts positive effects on the social dimension of tea culture, advancing its dissemination, preservation, and transmission. Furthermore, urbanization optimizes the ecological environment of tea gardens through advanced agricultural technologies and management concepts, mitigating soil and water pollution and propelling the sustainable development of the tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

1.2 BACKGROUND AND SIGNIFICANCE OF THE STUDY

1.2.1 Historical and cultural background

China is the origin of tea and the birthplace of tea culture, with rich resources of tea culture. Tea culture is an important part of the Chinese cultural system. The Divine Husbandman's Classic of the Materia Medica mentions: "The Divine Husbandman tasted a hundred herbs and encountered seventy-two poisons in a day, but he was able to cure them with tea". The Tea Classic describes in detail the history of drinking tea in the Tang Dynasty and before. Tea is the national beverage, developed by Shennong's, known in Lu Zhou Gong. From Lu Yu's Tea Classic in the Tang Dynasty to Wang Fuli's Tea Sayings in the Qing Dynasty, there are countless books, paintings and poems related to tea in China.

Tea culture in Sichuan Province is an important part of the ancient Ba Shu culture, which is famous for its long history of tea planting and tea drinking, its deep cultural heritage, and the richness of tea tree varieties, which is known as the cradle of tea and tea culture in China (Zha 2006). Tea culture in Sichuan Province is closely related to Zen Buddhism, where Zen masters developed the concepts of "Zen Tea, One Taste" and "Tea, Zen, One Taste", and influenced the spirit of the Japanese tea ceremony. Tea culture in Sichuan Province also has its origins in Taoism. Taoist priests, in their pursuit of immortality, regarded tea as an elixir and put forward the tea drinking theory of "harmony, respect, purity and silence".

Tea is essential to the daily life of the people in the daily drinking products, since ancient times, there is "firewood, rice, oil, salt, soy, vinegar and tea"; tea is an elegant cultural products, "qin, chess, calligraphy, painting, poetry, wine and tea" is the best portrayal and interpretation. At the same time, tea is a bond of communication with people, can enhance the friendship between friends and relatives, visiting friends and relatives, hospitality friends also cannot do without tea, tea has become one of the ways of emotional exchange. The long history of tea culture has resulted in a wealth of tea culture resources, including tea gardens, tea art, tea ceremonies, tea poems, tea paintings, tea songs and dances, tea relics, and tea utensils (Rahmanita, Basamah & Rudiansyah 2024). Tea culture has become one of the most important ways of

UNIVERSITI KEBANGSAAN MALAYSIA

presenting traditional Chinese culture, which is of far-reaching significance in enhancing national self-confidence and presenting Chinese culture to the world.

Regions rich in tea culture are usually characterized by beautiful environments and rich cultural resources. Tea cultivation has a long history in Sichuan, which has become one of the provinces with the largest tea production in China by virtue of its unique advantages in topography and climate conditions (Feng 2005). How to give full play to these valuable resources and transform them into productivity is an important topic for research in the field of tea culture tourism. Through the in-depth excavation and development of tea culture tourism resources, we can bring tourists a better experience while promoting the inheritance of Chinese tea culture and driving the development of regional economy.

1.2.2 Urbanization and the zeitgeist of the tea industry

Increased level of urbanization is an important foundation for the development of the tea industry. Along with the rapid development of China's economy, the level of urbanization has increased significantly, which means the agglomeration of factors such as population, industry, capital, and information, which promotes technological progress, division of labor, and specialization, and improves the total factor productivity and income level, thus leading to the growth of the residents' income (Li, Li & Strielkowski 2019). Chinese society is changing from "survival needs" to "development needs". According to the "14th Five-Year Plan for the Development of Cultural Industries", it is necessary to promote the integration of the tea industry into the construction of new urbanization, and to promote the formation of a multi-level and diversified spatial layout of the tea industry with large and medium-sized cities as the core, featured towns as a supplement, and villages as the basis.

Residents' disposable income is an important condition for the tea industry to upgrade consumption. In 2022, the national per capita disposable income of 36,883 yuan, a nominal increase of 5.0% over the previous year, after deducting the price factor, the actual growth of 2.9%. Looking at urban and rural areas, the disposable income per capita of urban residents was 49,283 yuan, an increase of 3.9%, after

UNIVERSITI KEBANGSAAN MALAYSIA

deducting the price factor, a real increase of 1.9%; the disposable income per capita of rural residents was 20,133 yuan, an increase of 6.3%, after deducting the price factor, a real increase of 4.2%. It can be seen that the income level of urban residents is significantly higher than that of rural residents. The rise in residents' disposable income reflects the continuous improvement of people's living standards, and also promotes people's higher pursuit of spiritual and cultural life, which drives the growth of urban residents' demand for the tea industry and consumption capacity (Chen et al. 2016). With the change of consumers' income level and consumption concepts, the consumption of tea industry accelerates upgrading, and the consumption demand and preference of tea products become more personalized and diversified (Chen 2013).

Tea industry has attracted much attention as an important opportunity for the development of tea industry. As an important part of the cultural industry, the tea industry has been supported and promoted by national policies in recent years. Policy documents encourage the promotion of the deep integration of tea with tourism, health, and the Internet, and the development of new tea consumption patterns and tea cultural tourism projects (Su, Wall & Wang 2019), while also highlighting the possibility of synergistic development of urban and rural industries (Zhao 2022).

The development of tea industry is an important measure to promote the quality and expansion of tea culture consumption. The tea industry covers all aspects of tea planting, processing, and sales, which not only promotes rural economic growth and rural revitalization, but also meets people's diversified needs for health, culture, and leisure (Liu, Qian & Li 2024). In this process, branding, upgrading technology, and focusing on green production are the key directions for high-quality development of the industry (Zheng 2023).

Chinese tea industry is an industry centered on tea, covering all aspects of tea planting, processing, sales, tea utensils, tea art, tea ceremony, tea books, tea paintings and tea museums. Chinese tea industry originates from the long history and rich connotation of Chinese tea culture, which carries the traditional wisdom, aesthetic taste, lifestyle and spiritual pursuit of the Chinese nation. Chinese tea industry originates from the long history and rich connotation of Chinese tea culture, and has gone through the

UNIVERSITI KEBANGSAAN MALAYSIA

evolutionary process from primitive wild to artificial cultivation, and from traditional processing to modern distribution. Historically, the tea industry has not only promoted economic trade, but also influenced culture, social structure and ecological environment. During the Tang, Song, Ming and Qing Dynasties, the tea industry gradually moved towards culturalization, commercialization and exportation, especially the rise of the Tea Horse Road, which promoted inter-regional ties and the expansion of tea culture.

During the Tang Dynasty (618-907), China's tea industry began to take shape, and tea became an important cultural phenomenon and trade commodity, facilitating economic and cultural exchanges between China and regions such as West Asia, Central Asia, and Japan, as well as increasing the country's financial revenues. At the same time, the tea industry also had an impact on China's social atmosphere and the lifestyle of the literati, with activities such as tea banquets, tea poems and tea paintings becoming a popular form of cultural expression. In addition, the tea industry has also had an impact on China's environment. Tea cultivation and production requires a large amount of water and land resources, and also produces some waste and pollutants.

During the Song Dynasty (960-1279), the Chinese tea industry entered an expansionary period in which tea production and production techniques were further developed, with the emergence of processes such as tea milling and tea kneading, which improved the quality of tea. At the same time, the tea industry gradually spread to a wider social level and became a cultural phenomenon. Activities such as tea ceremonies and tea fights had a wide range of participants among different classes such as the court, monasteries, and literati. In addition, the tea industry has had a certain impact on China's environment. Due to the increasing demand for tea, the area of tea plantations has been expanding, which may cause some damage to the original forest resources and ecosystems.

During the Ming and Qing Dynasties (1368-1911), China's tea industry reached a new peak, with tea cultivation and production techniques improving, and the art of tea and the way of tasting tea gradually becoming a form of art and learning. At the same time, the tea economy gradually rose, tea became one of China's major export

UNIVERSITI KEBANGSAAN MALAYSIA

commodities, and the Tea Horse Road prospered due to the trade in tea. In addition, the tea industry also has a certain impact on China's environment. Due to competition in the export market and changes in consumer demand, some tea producers may use some chemical fertilizers and pesticides to improve yield and quality, which may cause some harm to the soil, water sources and human health.

In the modern era (1912 to the present), China's tea industry has entered a period of tortuous development, experiencing many wars, revolutions, reforms and other social changes, as well as facing changes in domestic and international markets and consumer demand. During this period, the Chinese tea industry experienced setbacks and difficulties as well as innovation and development. During the War of Resistance Against Japan, tea production in some areas was seriously affected; after the reform and opening up, tea production in some areas was restored and developed; and in the context of the new era, tea production in some areas has realized transformation, upgrading and brand building. At the same time, the tea industry has also had an important impact on China's society and environment. The tea industry has made positive contributions to rural economic development, poverty alleviation, and the promotion of traditional culture, as well as advocating green production and consumption, and promoting ecological and environmental protection. However, it must also be seen that in the context of rapid urbanization, the tea industry faces the double pressure of changes in resource allocation and ecological protection. The study points out that upgrading infrastructure development, improving regional transportation and policy support are important factors to enhance the competitiveness of the tea industry (Chen, Li & Hatab 2020).

1.2.3 Interaction between urbanization and tea industry

Urbanization refers to the process of population migration from rural to urban areas and the continuous expansion of urban scale and functions. With the rapid development of China's economy, the process of urbanization has accelerated significantly, bringing about a high degree of agglomeration of population, industry, capital and information, and these changes have profoundly affected China's tea industry while also bringing new opportunities and challenges.

UNIVERSITI KEBANGSAAN MALAYSIA

Urbanization promotes China's tea industry. Economic growth and consumption upgrading: Urbanization has brought about an increase in the income level of residents, especially among urban residents, and the demand for cultural consumption has shown a trend of diversification and personalization. Studies have shown that income level has a significant impact on the frequency and preference of tea consumption among urban residents, driving up the demand for personalized, high-quality tea products (Chen et al. 2016). Tea not only meets the traditional needs, but also integrates into the modern lifestyle, promoting the development of new-style tea drinks and high-end tea products. Technological progress and industrial upgrading: urbanization has promoted scientific and technological progress and the deepening of the industrial division of labor, which has led to the modernization of tea planting, processing and sales. The phenomenon of "new teahouse" has become an important manifestation of urban industrial innovation, promoting the integration of the tea industry and urban life through the mode of "culture + design + industry chain integration" (Zhao 2022). Emerging channels such as Internet sales and online communication have enhanced the market penetration and industry chain innovation of the tea industry. Integration and innovation of cultural industry: With the implementation of cultural industry policies, the Chinese tea industry, as a part of it, is gradually integrating into the urban cultural space, forming a multi-level cultural dissemination platform with museums, tea culture festivals, etc. (Su, Wall & Wang 2019), which not only broadens the channels of cultural dissemination, but also strengthens the social influence of tea culture.

Challenges and impacts of urbanization on China's tea industry. Ecological and environmental pressures: The land resource constraints and increased environmental pollution that accompany urbanization pose a potential threat to tea cultivation and production. Especially in the context of increased demand for tea, the expansion of tea plantations may cause damage to local ecosystems. While expanding, the tea industry is faced with the double pressure of over-exploitation of resources and environmental protection, and how to realize the green development of the tea industry in the process of urbanization has become an urgent problem to be solved. Difficulties in the inheritance of traditional tea culture: With the advancement of urbanization, traditional tea culture customs and techniques are at risk of being weakened and forgotten

especially among the younger generation. It is a major challenge to pass on and promote tea culture through innovative means and maintain its vitality in modern society. The tea industry should not only respond to changes in market demand, but also focus on the inheritance of tea culture to avoid the loss of traditional tea arts and culture, and to maintain the uniqueness and vitality of tea culture amidst the wave of urbanization and modernization.

1.2.4 Changes in consumer tea consumption intentions and behavior in the process of urbanization

Urbanization has not only changed consumers' consumption patterns, consumer attitudes and buying habits, but also profoundly affected the overall development direction and competitiveness of the tea industry.

Changes in consumer willingness and consumption behaviours are driving the diversification of market demand. With the process of urbanization, the income level, consumption ability and consumption concepts of urban and rural residents have undergone great changes. Especially in urban areas, consumers' consumption demand for tea has gradually shifted from single functional consumption to more diversified, personalized and quality-oriented consumption demand (Chen et al. 2016). For example, with the improvement of people's health awareness, more consumers tend to choose organic tea, low-sugar, low-caffeine and other healthy tea products (Organic Tea Study 2018)

At the same time, consumers' attention to the quality, branding, packaging and cultural value of tea has been rising (Chen 2013). This shift in consumer behavior has prompted the tea industry to adjust its product mix, optimize its production processes and improve its marketing strategies, so as to meet the different needs of consumers for tea. This creates new market opportunities for the sustainable development of the tea industry and pushes the industry in the direction of higher value-added and higher quality.

Urbanization has increased the frequency and amount of tea consumption. Urbanization brings higher income levels and more convenient shopping channels

UNIVERSITI KEBANGSAAN MALAYSIA

(Chen 2014). The income level of urban residents is usually higher than that of rural residents, which directly affects their spending power and consumption frequency on tea. The increase in tea consumption is not only reflected in the number and amount of monthly consumption, but also in the choice of tea quality and brand. As tea consumption continues to grow, the tea industry is able to obtain more financial support and market demand, which further promotes industrial innovation and production upgrading, thus improving the economic efficiency and sustainable development of the tea industry.

Consumption behaviours are placing new demands on the ecological and environmental impacts of the tea industry. Accelerated urbanization has brought about a high concentration of resources and environmental pressures. As the demand for tea increases, the expansion of tea plantations may have some negative impact on the environment, especially in terms of overexploitation, fertilizer and pesticide use. Consumers' emphasis on ecology and health has prompted the tea industry to focus more on green production and sustainable development. For example, the adoption of organic farming, green packaging and the promotion of environmentally friendly processing methods are gradually becoming the new norm for the industry (Nair 2020). This means that the tea industry needs to adopt more environmentally friendly production methods, such as organic tea cultivation, reducing the use of pesticides, and promoting green packaging, in order to meet the green consumption needs of consumers, and thus realize the sustainable development of the tea industry.

Urbanization promotes the integration of the tea industry with other cultural industries. The process of urbanization has promoted the rapid development of cultural industries, and has also promoted the deep integration of the tea industry with other cultural industries. As urban residents' demand for tea culture, tea art, tea ceremony and other spiritual and cultural life increases, the tea industry not only meets the traditional demand for tea consumption, but also begins to combine with other industries such as tourism, health, art, and so on, forming a diversified consumption scene and cultural products (Mu, Chen & Liang 2019). For example, the combination of tea with tourism, health, Internet and other industries has made the product form and consumption mode of tea industry become richer. This cross-industry integration not only expands the

UNIVERSITI KEBANGSAAN MALAYSIA

market space of the tea industry, but also injects new vitality into its sustainable development.

Consumer subject norms influence the popularity of tea consumption. Urbanization has brought about closer social networks, with recommendations from family members, friends and colleagues playing an increasingly important role in tea consumption. In particular, the frequency of tea use in social settings continues to rise, prompting tea companies to pay more attention to brand communication and the design of social media marketing strategies (Zhao & Kong 2024). The tea industry needs to pay attention to this trend and focus on social influence in marketing to expand the consumer base through social platforms and recommendations from friends and family. This will help promote the spread and popularization of tea culture and further promote the sustainable development of the tea industry.

1.2.5 Sustainable development and the future of China's tea industry

In the context of global sustainable development, the sustainable development of China's tea industry is not only related to the improvement of economic benefits, but also involves the inheritance of social culture and the protection of ecological environment. Urbanization has brought new development opportunities and higher requirements for the sustainable development of China's tea industry.

Economic dimension: Urbanization promotes the economic growth of China's tea industry, which brings new development momentum to China's tea industry through modern industrial chain integration and diversified market demand. Promoting the high-quality development of China's tea industry helps to achieve the coordinated development of urban and rural economies and contributes to rural revitalization (Zhao 2022). With the changes in consumer attitudes and rising consumer incomes, the market demand for tea has continued to diversify, promoting the transformation of the tea industry towards high value-added and high quality, which not only promotes the growth of tea farmers' incomes, but also enhances the competitiveness of the industry as a whole (Zheng 2023).

UNIVERSITI KEBANGSAAN MALAYSIA

Sociocultural dimension: In the context of urbanization, tea culture, as a traditional cultural form, needs to find new ways of expression in modern society. Through innovative industrial models and cultural products, the tea industry can not only satisfy people's demand for spiritual and cultural life, but also enhance national cultural confidence (Zhang et al. 2022) and promote the global dissemination of Chinese tea culture. The innovation of tea industry is not only the innovation of technology and products, but also the innovation and dissemination of tea culture. Through tea museums, tea culture festivals, tea experience centers and other forms, tea culture can go to a wider range of consumer groups, especially among the younger generation to spread and enhance their cultural identity (Wei-ji 2013).

Environmental dimension: The pressure of urbanization on the environment requires the Chinese tea industry to focus on green production and sustainable development. Through scientific land use and environmental protection measures, the tea industry can realize a symbiosis and win-win situation with the ecological environment and promote the long-term development of the industry. For example, by promoting organic tea planting techniques, reducing the use of chemical fertilizers and pesticides, and protecting soil and water sources, the tea industry can not only guarantee the quality of its products, but also enhance the protection of the ecological environment (Mao et al. 2024). At the same time, the rational layout of tea plantations and the promotion of ecological agriculture can avoid over-exploitation and reduce the negative impacts of tea plantations on the ecosystem (Liu 2011).

There are complex and strong links between urbanization, the Chinese tea industry and sustainable development. While urbanization promotes the development of the Chinese tea industry, it also poses challenges to its sustainability. The sustainable development of the Chinese tea industry can be realized through rational policy guidance and innovative practices, thus injecting new vitality into the Chinese tea industry in the three (3) dimensions of economy, society and environment, and promoting its competitiveness and influence in the global market.

UNIVERSITI KEBANGSAAN MALAYSIA

1.3 PROBLEM STATEMENT

As an important part of China's tea industry, the Sichuan tea industry has a long history and rich cultural heritage. Tea cultivation has a history of thousands of years in Sichuan, and as early as the Tang Dynasty (618-907), tea production in Sichuan began to become one of the important economic activities (Huang Yuanxun 2014). The development of tea culture and tea industry in Sichuan is deeply influenced by the local natural environment and humanistic history, and the unique climatic conditions and rich biodiversity provide a good foundation for the production of tea in Sichuan, especially the varieties of green, black, and white teas, which occupy an important position in domestic and international markets.

In recent years, Sichuan's tea industry has made remarkable achievements in a number of economic, social and cultural fields, becoming one of the most important bases for tea production and export in China. According to a report by the China Tea Distribution Association (2018), Sichuan's annual tea production accounts for about 15% of the country's total output, and the output value of the tea industry ranks among the top in the country. The area under tea cultivation in Sichuan has also continued to expand, especially with the introduction of modern agricultural technology, which has led to an increasing level of scale and standardization of tea cultivation. The Sichuan provincial government has increased its support for the tea industry in recent years, and has formulated a number of policies to promote the development of the tea industry, covering all aspects from tea production to marketing and sales, and these policies provide a strong guarantee for the development of the tea industry (Li Jianhui 2020).

However, despite the economic success of the tea industry in Sichuan, the issue of its sustainable development is still becoming increasingly prominent. The impact of urbanization on the Sichuan tea industry, especially in terms of resource utilization, market demand and environmental protection, has become an urgent issue. With the advancement of urban-rural integration, the tea industry in Sichuan is facing many new challenges. On the one hand, the tension of land resources, the loss of labor force and the increase of environmental pressure limit the expansion space of the tea industry; on the other hand, the quality and ecological requirements of consumers for tea products

UNIVERSITI KEBANGSAAN MALAYSIA

are increasingly improving, and the production mode of the tea industry, the marketing method and its green development have become key issues (Chen Yufen 2019).

Urbanization is an important external environmental factor facing the Sichuan tea industry. With the advancement of urban-rural integration in Sichuan, population mobility, changes in consumption structure and pressure on environmental resources have made the sustainable development of the tea industry in Sichuan particularly complex and important (Zhao Jianwei 2017). The process of urbanization has not only accelerated the migration of rural population to cities, but also led to the problem of rural labor shortage. The influx of a large number of young people to the city has led to the problem of labor dependence and low production efficiency in tea planting and production processes becoming more prominent (Li Jianhui 2020). In addition, the limited nature of land resources is also a major challenge for the tea industry in Sichuan, where over-exploitation and irrational use of land have led to ecological degradation and soil erosion, which in turn affects the production and quality of tea (Junjie Wei 2018).

At the same time, urbanization has brought about an increase in the income level of urban and rural residents and changes in their lifestyles, and there has been a significant shift in consumer demand for tea. With the increased health awareness and improved quality of life of urban residents, the traditional tea consumption pattern has gradually shifted to higher quality, diversified and personalized demand. Li Yanli (2019) pointed out that urbanization has driven consumers' attention to the health value of tea, especially in the demand for green and pollution-free tea has shown a rapid growth trend. However, this change has also brought about some challenges in the Sichuan tea industry. As the tea industry relies on a large amount of chemical fertilizers and pesticides in the production process to improve the yield and quality of tea, this high-yield, low-cost production model is difficult to meet consumer demand for green, healthy tea (Chen Lihua 2020). Therefore, the Sichuan tea industry is in urgent need of transformation to improve the quality of tea and meet the market demand for high-end, organic tea, thereby realizing the high-quality development of the industry.

UNIVERSITI KEBANGSAAN MALAYSIA

In addition, the shift in consumer preferences requires the tea industry to focus not only on product quality, but also on brand building and cultural dissemination. Sichuan tea culture is rich, but in the process of urbanization, the traditional tea culture and tea arts are facing a gradual decline in the situation. The “cultural value” of tea consumption has gradually been replaced by the “functional value” of consumption, which makes it necessary for the Sichuan tea industry to re-explore the cultural connotation behind tea through innovation, marketing and branding to attract the attention of more young consumers (Hongwei Yang 2019).

The sustainable development of the tea industry in Sichuan faces multi-dimensional ecological, economic and social challenges. First, the pressure of urbanization on resource allocation also affects the sustainable development of the tea industry in Sichuan. With the concentration of population in cities, the tension of land resources, labor and water resources has become an important factor affecting tea production and ecological protection. Zhao (2017) suggested that over-exploitation of tea plantation land and deterioration of the ecological environment during urbanization may directly affect the quality of tea production and the long-term sustainable use of land. In the process of tea production, problems such as soil erosion and ecosystem degradation are becoming more and more serious, which not only negatively affects the production of tea plantations, but also creates a non-negligible pressure on the surrounding ecological environment.

In addition, the loss of rural labor force due to urbanization is also one of the important challenges facing the tea industry in Sichuan. With a large number of young people flocking to the cities, the tea farmers left behind are mostly elderly, and the lack of labor resources has exacerbated the difficulties in the production chain of the tea industry (Li Jianhui 2020). These factors work together to make the Sichuan tea industry face serious resource pressure, and there is an urgent need to improve the efficiency of resource utilization through scientific and technological innovation and the transformation of production methods to promote the sustainable development of the tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

The sustainable development of the tea industry in Sichuan is not only affected by economic and resource pressures, but environmental issues are also a key factor restricting the future development of the tea industry. With the continuous expansion of the tea industry in Sichuan, over-exploitation of land, excessive use of chemical fertilizers and pesticides, and other environmentally unfriendly production methods have led to the deterioration of the ecological environment (Junjie Wei 2018). Urbanization has brought new ecological challenges, and the environmental pressure on tea plantations has intensified, with problems such as soil erosion and ecological damage gradually appearing.

Some scholars have pointed out that it is difficult for the Sichuan tea industry to balance economic efficiency and environmental protection under the traditional production model. According to Chen Yufen (2019), the current environmental problems faced by the tea industry in Sichuan, especially the lack of effective planning in land resource utilization and water resource management, have led to the destruction of the ecological environment of tea plantations. Environmental pollution not only affects the quality of tea, but also causes long-term negative impacts on the local ecosystem, especially the soil erosion problem in some tea plantations, which seriously affects the long-term sustainable production capacity of tea.

Existing studies on the impact of urbanization on the tea industry mainly focus on the scale of the industry, economic efficiency, etc., while relatively little has been done to explore the transformation of the Sichuan tea industry in terms of the environment, resource pressure and consumer behavior. In particular, theoretical studies on how the tea industry can achieve green development and ecological protection in the context of urbanization are still insufficient. Zhao (2017) suggests that most studies ignore the importance of ecological environment and resource allocation issues in the process of urbanization, and more studies focus on economic benefits and industrial upgrading while ignoring the issues of environmental and social sustainability. Therefore, a comprehensive study on how the Sichuan tea industry can achieve environmental protection and resource conservation in the context of urbanization remains an area that has not yet been explored in depth.

UNIVERSITI KEBANGSAAN MALAYSIA

In addition, the impact of changing consumer demand on the tea industry has not received sufficient attention. Existing literature focuses more on consumers' attention to tea quality and brand, while there is a relative lack of research on consumers' changes in consumer behavior during the urbanization process and their identification with tea culture. According to Yang Hongwei (2019), with the increase in consumer demand for green and healthy tea, the traditional tea production mode and marketing methods can no longer meet market demand, so more innovative research is needed in market research and consumer behavior analysis.

1.4 TEN LATEST STUDIES ON THE CURRENT TEA INDUSTRY IN SICHUAN

In the area of sustainable development of the tea industry in Sichuan, a number of studies have been conducted in recent years to explore the impact of different factors on the tea industry. Below are five (5) recent research findings related to the urbanization process and the tea industry in Sichuan, which have been analyzed to identify the shortcomings of the existing studies.

Table 1.1 Ten current and updated studies

Representative	View
Wei, Chen, Zhang & Li (2022)	This paper analyzes trends in market transformation and sustainable innovation within China's tea industry, arguing that structural adjustments are essential to maintain competitiveness amid shifting market demands and evolving consumer preferences. The author proposes strategies to promote sustainable development in the tea sector through innovative market approaches and green products.
Li, Hong & Zhou & Zhong (2021)	This study examines the role of ecological conservation in driving the green transformation of the tea industry during urbanization. Findings indicate that as urbanization advances, ecological conservation and green transformation are crucial for achieving sustainable development in the tea industry.
Zhang, Li, Liu & Yan (2021)	This study examines consumer behavior and its evolution within the tea market, analyzing how shifting consumer preferences impact innovation in the tea industry. The paper argues that as consumer preferences for tea change, the tea industry must adapt through product innovation and brand development to drive industrial transformation.
Xu, Shuai, Sun & Tian (2020)	This study focuses on the application of ecological agricultural techniques in the sustainable development of the tea industry, particularly how environmental technologies and green production models can enhance ecological conservation within the sector. It underscores the importance of green production technologies for the long-term development of the tea industry and presents specific application examples.

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

Li Jianhui (2020)	Discusses the economic, environmental, and social challenges facing Sichuan's tea industry, pointing out the need to address issues such as resource allocation, but lacking analysis of consumer demand and other aspects.
Yang Hongwei (2019)	Analyzes the impact of changes in tea market demand on Sichuan's tea industry, but lacks analysis of consumer behavior drivers and response strategies.
Chen Yufen (2019)	Focuses on the ecological challenges facing Sichuan's tea industry, emphasizing policy measures, but lacking recommendations on technical and management measures.
Wang Qi (2019)	This paper examines the challenges faced by Sichuan's tea industry amid urbanization and explores pathways for sustainable development. It analyzes issues within the industry concerning resource allocation, shifting market demands, and ecological conservation, proposing recommendations to drive industrial transformation through green development and technological innovation.
Zhao Jianwei (2017)	Studies the comprehensive impact of urbanization on the Sichuan tea industry, with insufficient discussion on consumer behavior and ecological protection
Wei Junjie (2018)	Explores sustainable development pathways for the Sichuan tea industry, emphasizing green development, but lacks detailed implementation strategies

Analysis of the above ten studies reveals several key shortcomings in current research on sustainable development within Sichuan's tea industry:

1. Research tends to focus on economic benefits and resource allocation while neglecting shifts in consumer behavior and market demand. Most studies concentrate on production efficiency, resource distribution, and environmental protection within Sichuan's tea sector, yet analysis of evolving consumer behavior, market demand trends, and consumer motivations remains relatively weak. Li Jianhui (2020) examined the economic, environmental, and social challenges facing Sichuan's tea industry, particularly resource allocation issues, yet failed to deeply analyze the impact of consumer demand and market shifts. Similarly, Zhao Jianwei (2017), while studying the comprehensive effects of urbanization on Sichuan's tea industry, paid little attention to consumer preferences for tea, perceptions of green tea, and evolving demands for tea culture. As urbanization accelerates, consumer demands are becoming increasingly diverse, with growing demand for green tea products, health teas, and tea culture (Zhang & Liu 2021). Consequently, existing research has failed

to adequately analyze how shifts in consumer demand influence industry development, overlooking the critical role of market trends and consumer behavior in industrial transformation (Li & Zhang 2018).

2. Lack of in-depth analysis on consumer behavioral motivations and response strategies. Yang Hongwei (2019) examined the impact of shifting tea market demands on Sichuan's tea industry but lacked in-depth exploration of consumer behavioral motivations, particularly regarding strategies to address these changes. As urbanization progresses and consumer preferences for health-oriented tea products evolve, the tea industry must adapt through innovation, brand building, and targeted marketing strategies to drive industrial transformation (Zhao 2022). Consumer perceptions of tea culture, recognition of green tea's health benefits, and emotional attachment to tea traditions are all driving industrial transformation. Therefore, a thorough analysis of these factors is essential (Zhang & Liu 2021).

3. Discussions on ecological conservation focus primarily on policy levels, lacking concrete technical and management recommendations. Chen Yufen (2019) addressed ecological challenges in Sichuan's tea industry by proposing policy measures for ecological conservation. However, most research remains confined to policy frameworks and theoretical discussions, with insufficient specific technical and management recommendations (Xu & Sun 2020). Existing research predominantly centers on policy frameworks and theoretical models, failing to provide actionable studies on practical ecological agricultural technologies or green production models. Consequently, while ecological conservation is frequently mentioned, its practical application remains underdeveloped—particularly regarding the operationalization and management of green technologies, optimizing production efficiency, and balancing ecological preservation (Wei 2018).

4. Insufficient analysis exists on the comprehensive impacts of urbanization on Sichuan's tea industry, particularly regarding the relationship between consumer behavior and ecological conservation. Zhao Jianwei (2017) examined urbanization's effects on Sichuan's tea sector, analyzing shifts in resource allocation and market demand, but fell short in exploring the connection

UNIVERSITI KEBANGSAAN MALAYSIA

between evolving consumer behavior and ecological conservation. As urbanization advances, consumer preferences for eco-products, identification with tea culture, and expectations for ecological conservation are steadily increasing (Li & Zhou 2021). The tea industry must not only enhance production efficiency but also respond to consumer demands for sustainable products and green tea culture. Comprehensive analysis of these multidimensional factors remains scarce in existing research.

5. Lack of detailed implementation pathways and unclear application of green development strategies. Wei Junjie (2018) explored sustainable development pathways for Sichuan's tea industry, emphasizing the importance of green development concepts, yet lacked detailed implementation pathways and operational recommendations (Chen & Zhang 2022). Industrial transformation requires not only support from green production models and technological innovation but also joint promotion from policy, market, and consumer forces. Although green development has been proposed, specific operational pathways and implementation levels lack concrete plans and guidance, resulting in deficiencies in the research's practical application.

Compared with existing research, the innovation of this study is reflected in the following aspects:

1. Comprehensive Analysis of Consumer Behavior and Market Demand Shifts. This study integrates consumer behavior theory to conduct an in-depth analysis of evolving consumer behavior during urbanization, particularly the increasing demand for health teas, green teas, and tea culture. It explores how the tea industry can adapt to these market shifts through product innovation and brand development to drive industrial transformation. As consumer preferences evolve, the tea industry must innovate to meet these demands, thereby advancing green transformation and sustainable development (Zhang & Liu 2021; Zhao 2022).

2. Emphasizing the Practical Application of Green Production and Ecological Agricultural Technologies. This study not only focuses on environmental

UNIVERSITI KEBANGSAAN MALAYSIA

protection but also explores how green production technologies and ecological agriculture can achieve sustainable development in the tea industry. Particularly during urbanization, it addresses how to balance production efficiency with ecological conservation, ensuring the tea industry effectively protects the ecological environment while meeting market demands and promoting sustainable development. Through the application of specific ecological agricultural techniques and green production methods, the tea industry can enhance production efficiency while reducing environmental burdens (Li & Zhou 2021; Xu & Sun 2020).

3. Proposing Concrete Pathways for Industrial Transformation and Upgrading. This study outlines specific pathways for the transformation and upgrading of Sichuan's tea industry from four (4) dimensions: policy, technological innovation, market dynamics, and consumer preferences. Compared to existing research, this study fills the gap in current literature by detailing specific implementation pathways and thoroughly examining the synergistic effects among policy support, technological innovation, market orientation, and consumer demand. It highlights that industrial transformation relies not only on green production models and technological innovation but also requires policy support and market-driven coordination to drive comprehensive transformation and sustainable development (Chen & Zhang 2022; Wei 2018).

4. Promoting the Integration of Green Consumption and Ecological Culture. This study innovatively proposes that the sustainable development of the tea industry should not only rely on green production but also be driven by the promotion of green consumption combined with tea culture. Particularly amid urbanization, consumers increasingly identify with ecological tea culture and green consumption. The tea industry should align with modern consumption trends to enhance market acceptance of green products. By strengthening cultural promotion and market guidance, this study offers novel cultural and market strategies for the tea industry's green transformation (Zhao 2022).

5. An Innovative Approach of Interdisciplinary Analysis and Multidimensional Integration. This study employs an interdisciplinary analytical approach, integrating urbanization theory, sustainable development theory, and consumer

UNIVERSITI KEBANGSAAN MALAYSIA

behavior theory for multidimensional analysis. This innovative approach not only provides a theoretical framework for the sustainable development of Sichuan's tea industry but also offers systematic guidance for practical implementation. By comprehensively considering market, ecological, sociocultural, and technological innovation factors, this research delivers more holistic solutions for the tea industry to address complex urbanization challenges (Chen & Zhang 2022; Su, Wall & Wang 2019).

This section first introduces the historical background and cultural heritage of Sichuan's tea industry, the impact of urbanization on its development, and the challenges it faces in terms of economics, resources, environment, and consumer demand. It then analyzes the shortcomings of existing research, particularly the insufficient attention to multidimensional factors such as consumer behavior, market demand transformation, and ecological conservation. Finally, this study emphasizes filling the gap in current research by comprehensively analyzing consumer behavior and market demand changes, applying green production technologies, and proposing industrial transformation pathways. This approach provides a theoretical framework and practical guidance for the sustainable development of Sichuan's tea industry.

1.5 PURPOSE OF THE STUDY

This study aims to analyze in depth the impact of urbanization on the sustainable development of the tea industry in Sichuan, especially to explore how consumer behavior, changes in market demand, ecological pressures, and sociocultural factors affect the sustainability of the tea industry in Sichuan in the context of urbanization. The study will be based on a variety of theoretical frameworks, especially the sustainable development theory, the urbanization theory and the consumer behavior theory, to explore the impacts of urbanization on various dimensions of the Sichuan tea industry.

First, in the ecological dimension, the urbanization process may lead to problems such as land tension, soil erosion, and irrational fertilization structure, which put pressure on the ecosystem of tea plantations. Studies have shown that the composite

UNIVERSITI KEBANGSAAN MALAYSIA

ecosystems of ecologically-oriented tea gardens in western Sichuan Province can effectively improve the microclimate and growing environment of tea gardens by regulating temperature and humidity, thus enhancing tea quality and ecological compatibility (Shan 2004). Second, in terms of economic and land suitability, research in Cuiping District, Yibin, Sichuan Province, shows that scientific land suitability assessment methods can effectively guide the selection of tea plantation sites, and achieve rational spatial distribution and intensive development of tea plantations, which is important for the optimal allocation of land resources under urban expansion (He et al. 2013).

Third, in terms of changes in consumer behavior, with the improvement of living standards of urban residents and the enhancement of the concept of healthy consumption, consumers have a growing preference for organic tea and functional tea products, which pushes the tea industry to develop in the direction of high value-added, branding, and differentiation (Zhao 2022). Fourth, social and cultural factors should not be ignored. As a synthesis of folk culture, public politics and leisure space, Sichuan teahouses carry multiple functions of tea culture. Research points out that Chengdu teahouse is not only a consumption space, but also a symbol of the city's cultural memory and lifestyle (Howard 2010).

In addition, the optimization of tea varieties and soil environmental factors also have a profound impact on the sustainable development of the tea industry in Sichuan. Recent studies have revealed that the amino acid and polyphenol contents of Sichuan tea are controlled by specific genes through gene sequencing, which can help to improve the quality and market competitiveness of tea through varietal improvement under the pressure of urban sprawl (Wang et al. 2024) Furthermore, at the historical and policy level, traditional villages and rural teahouse culture in Southwest China have faced the impact of urbanization. Scholars have proposed that combining community teahouses with new rural construction can be a link between rural cultural education and eco-tourism, providing a path for the sustainable inheritance of tea culture (Zhang 2012). Finally, the study found that the distribution of traditional villages in Sichuan is closely related to ecology, climate and urban distance, which provides a macro perspective to

UNIVERSITI KEBANGSAAN MALAYSIA

support the understanding of the geographic suitability of the development of the tea industry (Zhou et al. 2024).

1.6 RESEARCH OBJECTIVES

This study aims to explore the impact of urbanization on the sustainable development of the tea industry in Sichuan, with a special focus on how urbanization promotes or restricts the development of the tea industry through market demand, resource allocation, ecological and environmental pressures, and sociocultural changes. Based on the multi-dimensional theoretical frameworks of sustainable development theory, urbanization theory, green production and ecological modernization theory and consumer behavior theory, the main objectives of this study are as follows:

a. To determine the impact of urbanization factors on the market economy, the sociocultural impact and the ecological environmental impact of the Sichuan tea industry.

b. To determine the impact of consumer behavior for the need of sustainable development of Sichuan's tea industry.

c. Against the backdrop of market economy impacts of urbanization on sociocultural and ecological environments, this study explores how Sichuan's tea industry can achieve green production and green consumption to promote its sustainable development.

1.7 RESEARCH QUESTIONS

a. How does urbanization affect the sustainable development of the tea industry in Sichuan through market demand, resource allocation, ecological and environmental pressures, and sociocultural changes?

b. How do changes in consumer behavior and demand affect production patterns and market demand in the Sichuan tea industry in the context of urbanization?

UNIVERSITI KEBANGSAAN MALAYSIA

c. In the course of urbanization, how can Sichuan's tea industry balance green production and green consumption to drive the transformation toward sustainable development?

1.8 RESEARCH SCOPE

This study examines the impact of urbanization on the sustainable development of the tea industry in Sichuan, with a particular focus on the role of factors such as changes in market demand, resource allocation, sociocultural changes and ecological pressures. Although this study provides a valuable theoretical framework and practical suggestions for understanding the sustainable development of the Sichuan tea industry in the context of urbanization, there are some limitations.

1. Limitations of the study scope. This study focuses on the tea industry in Sichuan Province, especially in some of the major tea-producing regions. Due to the large regional differences in urbanization and the tea industry across China, the results of the study may not be generalizable, and in particular may have limited applicability to other provinces or underdeveloped areas of the tea industry. Future studies could expand the sample to cover more major tea-producing areas or different regions to further validate the general impact of the urbanization process on the tea industry (Mao et al. 2024).
2. Limitations of data collection methods. This study collected data through methods such as questionnaires and in-depth interviews, and although the diversity and representativeness of the sample was ensured through stratified sampling, there may still be information bias. For example, as the questionnaire was distributed online, certain groups (e.g., tea farmers in rural areas or tea producers with low technology access) may not have been adequately covered (Chen et al. 2016), resulting in a sample that may not fully reflect the attitudes and behaviors of all consumers. In addition, the relatively small sample size of the in-depth interviews may have biased the views of individual interviewers, affecting the breadth of the results.
3. Limitations of the research model. A theoretical framework based on multidimensional factors such as market demand, resource allocation,

UNIVERSITI KEBANGSAAN MALAYSIA

sociocultural and ecological environment was adopted, and although this framework provides a comprehensive perspective for analyzing the sustainable development of the tea industry in Sichuan, there are still certain shortcomings in the model. In particular, the impact of urbanization process is not only limited to economic, social and environmental factors, and future research can introduce more refined variables, such as consumer behavioral psychology and policy influence (Iweala & Sun 2022), to further supplement and improve the model.

4. Limitations of cross-sectional research. This study adopts a cross-sectional research design to investigate and analyze the current situation of the tea industry in Sichuan at one point in time. However, the impact of urbanization on the tea industry is dynamic, with changes in market demand, production patterns and ecological environment occurring over time (Zhang et al. 2017). This means that the results of this study may not be able to fully capture the full impact of the urbanization process on the long-term development of the Sichuan tea industry. Future longitudinal studies can track the changes in the Sichuan tea industry, explore in depth the evolution of consumer behavior, market demand, and production patterns, and analyze the causal relationship and long-term impacts between urbanization and industry transformation.

5. The limitations of theory integration, mainly based on sustainable development theory, urbanization theory, green production and ecological modernization theory and consumer behavior theory, although these theories provide good theoretical support for the analysis, the impact of urbanization on the tea industry is multi-level and multi-dimensional, and the existing theories may not be able to fully cover all the influencing factors (Bhattacharyya et al. 2023). Future research can combine theories from more fields, especially in the fields of social behavior and ecology, to further explore the interactions and influence mechanisms at different levels.

6. Limitations of the research conclusions. The qualitative and quantitative analyses conducted in this study based on certain assumptions and theoretical frameworks, while providing useful insights into the sustainable development of the tea industry in Sichuan, the broad applicability of the conclusions may be

UNIVERSITI KEBANGSAAN MALAYSIA

limited because the findings are based on extrapolations from existing data and models (Millath & Ali 2019).

In addition, the applicability of the findings to different industries, regions, or urbanization processes still needs to be further verified, and in particular, operational research on innovation and green transformation in the tea industry is still deficient (Su, Wall & Wang 2019).

1.9 STRUCTURE OF THE THESIS

Chapter 1 introduces the background of the study, including the development trend of urbanization globally and in China, as well as the history and current situation of the tea industry in Sichuan Province. Then, the core research question of this study is clearly stated, i.e., how urbanization affects the sustainable development of the tea industry in Sichuan Province. Subsequently, the chapter describes the purpose of the study, which is to reveal the specific impacts of urbanization on the tea industry in the three (3) dimensions of market economy, sociocultural and ecological environment. The significance of the study section then discusses the academic and practical contributions of this study and points out the limitations that the study may face. Finally, this chapter outlines the overall structure of this thesis and guides the reader through the subsequent chapters.

Chapter 2 focuses on the relationship between urbanization and the sustainable development of the tea industry in Sichuan, and compiles the core concepts and related theoretical foundations, defining the connotations and interrelationships of urbanization, the tea industry and sustainable development. Through the literature review, it summarizes the multiple impacts of urbanization on the tea industry in the economic, social and ecological dimensions, and points out that both opportunities and challenges exist. Meanwhile, triple bottom line theory and structural equation model are introduced to construct the theoretical framework and analytical model of the study, which provide theoretical support and path basis for the subsequent empirical research.

Chapter 3 describes in detail the research design and methodology of this study. The study focuses on the path of urbanization's impact on the sustainable development

UNIVERSITI KEBANGSAAN MALAYSIA

of Sichuan's tea industry, constructs a multidimensional variable system integrating urbanization indicators and triple bottom line theories (market economy, social culture, and ecological environment), and combines with the theory of planned behavior (TPB) to deeply explore the mechanism of the role between consumers' tea consumption intentions and behaviors. In terms of research methodology, a mixed research strategy combining quantitative and qualitative is adopted. The qualitative aspect includes Delphi expert consultation and semi-structured interviews for constructing and refining the variable system, while the quantitative part obtains primary data through questionnaire surveys, and the relationship between the variables is rigorously examined by using statistical methods such as structural equation modeling (SEM), logistic regression, and multi-cluster SEM. The research questions cover the differences in the impact of urbanization indicators on triple bottom line dimensions, the mediating and moderating effects of consumer behavioral attitudes, and their price-paying effects on sustainable consumption intentions.

Chapter 4 explores the multidimensional impact of urbanization on the sustainable development of the tea industry in Sichuan. The study adopts the triple bottom line theory (Elkington 1997) to identify the key urbanization factors affecting the sustainable development of the tea industry, covering multiple dimensions such as social, economic and ecological environment. The study identified 16 potential influencing factors, including multiple dimensions such as policy changes, infrastructure development, labor migration, and changes in market demand. Relevant data of tea practitioners in Sichuan were collected through questionnaires for empirical analysis. This study used structural equation modeling (SEM) to validate the impact of urbanization factors on the tea industry, focusing on testing the positive effects of urbanization on the market economy, sociocultural and ecological environments. The findings were analyzed by SPSS and AMOS software and showed significant correlations between urbanization and these three (3) dimensions. It was found that urbanization positively contributes to the market economy of the tea industry by expanding consumer demand, improving production efficiency and increasing investment opportunities; it also promotes sociocultural development, improves the ecological environment and promotes the sustainable development of the tea industry through better resource management and environmental protection measures. In

UNIVERSITI KEBANGSAAN MALAYSIA

addition, the study reveals significant differences in perceptions of the dimensions by demographic characteristics such as gender, age, occupation and geography, emphasizing the need for targeted policies. The study supports that urbanization can both drive the development of the tea industry in Sichuan and may also constrain the growth of the industry if not properly managed. Therefore, how to harmonize economic, cultural and ecological relationships is key to promoting the long-term sustainable development of the Sichuan tea industry.

Chapter 5 constructs an analytical framework based on the theory of planned behavior (TPB), combines a questionnaire survey of consumers in Sichuan Province, and uses a binary logistic regression model to identify the key factors influencing the willingness to consume tea, and discusses in depth the changes in consumer behavioral patterns in the context of urbanization and their impact on the sustainable development of the tea industry in Sichuan. The study shows that consumers' personal characteristics (e.g., age, income, marital status, etc.), behavioral attitudes (e.g., health function recognition, price sensitivity, brand trust, etc.), social influence (e.g., recommendation by friends and relatives, expert advice) and perceived behavioral control (e.g., convenience of access to the channel) significantly affect their tea consumption intention.

Chapter 6 through in-depth interviews with 12 experts and field research on 25 tea enterprises in Sichuan Province, and three-level coding analysis using NVivo15, the four (4) core categories influencing tea consumption willingness and behavior are summarized: consumers' personal characteristics, behavioral attitudes, subjective norms, and behavioral control, and a theoretical model of the influencing mechanism of consumers' tea consumption behaviors in the context of urbanization is constructed. The qualitative research in this chapter deepens the understanding of the consumer consumption decision-making process, enriches the empirical support of the quantitative research, and provides a theoretical basis for the segmented market positioning, product development and cultural communication strategy of the Sichuan tea industry. The transformation of social structure and the change of information dissemination brought about by urbanization are continuously reshaping the tea

UNIVERSITI KEBANGSAAN MALAYSIA

consumption ecology, providing new opportunities and challenges for promoting the sustainable development of the tea industry.

Under the framework of the triple bottom line theory and the theory of planned behavior, Chapter 7 summarizes the comprehensive impacts of urbanization on the Sichuan tea industry in terms of market economy, social culture and ecological environment, constructs a theoretical analysis model and verifies the intrinsic mechanism between the variables by using both qualitative and quantitative methods. The study proposes feasible policy recommendations and management paths covering green production, brand optimization and tea culture dissemination, aiming to provide theoretical support and practical solutions for the sustainable development of Sichuan tea industry in the context of urbanization.

1.10 CHAPTER SUMMARY

This chapter introduces the background and significance of the study, focusing on the impact of urbanization on the sustainability of the tea industry in Sichuan. The chapter begins by highlighting the global rise of the cultural industry, specifically the tea culture sector, and its role in national economic growth and cultural soft power. It discusses the relationship between urbanization and tea production, emphasizing how urbanization affects market demand, resource utilization, ecological protection, and consumer behavior in the tea industry. The chapter establishes that urbanization presents both opportunities and challenges for the tea industry, including changes in consumer preferences, ecological pressures, and the need for sustainable production methods.

This chapter also introduced and highlighted the key issues facing Sichuan's tea industry, such as land resource tension, labor shortages, and the impact of urbanization on traditional tea culture. These challenges necessitate an innovative approach to ensure the industry's sustainable development. The chapter further introduces the thesis problem statements, and research objectives. It outlines the research questions and significance, aiming to provide practical guidance for policymakers and industry leaders to navigate the challenges posed by urbanization and promote sustainable practices.

UNIVERSITI KEBANGSAAN MALAYSIA

Thus, Chapter 1 sets the stage for the research by defining the context, objectives, and significance of studying the impact of urbanization on Sichuan's tea industry. It highlights the multidimensional challenges faced by the industry, including market, ecological, and social factors, and presents the theoretical foundations that will guide the rest of the study.

UNIVERSITI KEBANGSAAN MALAYSIA

CHAPTER II

LITERATURE REVIEW

2.1 OPERATION DEFINITION

2.1.1 Urbanization process

The process of urbanization is defined in this study as the process of population migration from rural to urban areas, accompanied by the expansion of the size of the city and the improvement of infrastructure. The process of urbanization includes not only changes in population size, but also involves the transformation of economic structure, changes in consumption patterns, sociocultural changes, and pressure on environmental resources (Chandramohan 2018). In this study, the degree of urbanization will be measured through the following dimensions:

1. Population migration rate: changes in the proportion of the urban population to the total population. With the progress of urbanization, more and more rural people are migrating to the cities, and the proportion of urban population is increasing, which has an important impact on the social structure and economic activities (Li 2017).
2. Infrastructure development: improvement and expansion of transportation, education, medical and commercial facilities. Urbanization is usually accompanied by rapid construction and improvement of infrastructure, which not only improves the quality of life of residents, but also provides the necessary support for industrial development (Wang & Zhang 2018). The improvement of infrastructure directly affects the distribution and market expansion of the tea industry, especially the investment in transportation and e-commerce platform construction.

UNIVERSITI KEBANGSAAN MALAYSIA

3. Transformation of economic structure: from an agriculture-based economic model to one based on industry and services. With the acceleration of urbanization, the economy of many regions has gradually shifted from traditional agriculture-based to industry- and service-based, and this transformation has led to more resources and capital flowing into modern industries, promoting the development of related industries (Wu & Zhang 2020).

4. Changes in consumer behavior: changes in the consumption pattern of urban residents, especially changes in the demand for tea consumption. With the improvement of income level, the consumption structure of urban residents has undergone significant changes, and the demand for healthy, green and organic tea is growing, and tea is no longer simply a daily consumer product, but has become an important part of healthy life and cultural consumption (Zhao 2019).

2.1.2 Sichuan tea industry

The Sichuan tea industry refers to all industrial activities related to tea production, processing, marketing, and tea culture in Sichuan Province, including but not limited to tea cultivation, tea processing enterprises, tea distribution, branding, and the dissemination and education of tea culture. For the purpose of this study, the Sichuan tea industry will be assessed in the following ways:

1. Tea production: The total amount of tea produced annually in Sichuan Province and its share in the national market. Sichuan Province is one of the important tea production bases in China, and its annual tea production ranks among the highest in the country (Liu 2020). According to the China Tea Distribution Association (2018), the annual production of tea in Sichuan accounts for about 15% of the total national production. This data reflects the important position of Sichuan's tea industry in the national market, influencing the supply and demand pattern of the domestic and international tea markets.

2. Tea brand influence: Market awareness, consumer recognition and market share of major tea brands in Sichuan Province. Tea branding is crucial to enhancing the market competitiveness of the Sichuan tea industry. Through brand building, Sichuan tea can increase consumer awareness and loyalty, and then increase

UNIVERSITI KEBANGSAAN MALAYSIA

market share (Zhao 2019). For example, the promotion of Sichuan tea brands has been increasing its influence in the national market, especially in the high-end segment of the domestic tea market, Sichuan tea brands are increasingly favored by consumers.

3. Inheritance and innovation of tea culture: The development of tea culture activities, such as tea art demonstrations, cultural dissemination activities and their impact on consumers. The cultural connotation of Sichuan's tea industry is not only reflected in the production and sale of tea, but also in the inheritance and innovation of tea culture (Wang & Zhang 2018). Tea culture activities in Sichuan Province, such as tea art performances, tea culture festivals and tea exhibitions, have attracted a large number of consumers' attention. These activities not only enhance consumers' identification with the Sichuan tea brand, but also promote the dissemination and innovation of traditional tea culture, which makes the Sichuan tea industry develop significantly in the cultural field as well.

2.1.3 Sustainable development

Sustainable development refers to meeting the needs of the present without jeopardizing the natural environment, social stability and economic vitality, and providing resources and opportunities for future generations. In the context of the Sichuan tea industry, sustainable development will be measured through the following three (3) dimensions.

a. Economic sustainability

The long-term economic benefits of the tea industry are mainly measured by economic indicators such as industry profits, employment opportunities and local tax revenues. The economic sustainability of the tea industry in Sichuan is reflected in its contribution to the local economy, especially in promoting employment, boosting farmers' income and boosting local tax revenue growth (Chen 2020). For example, the large-scale and industrialized development of the tea industry in Sichuan not only provides a large number of employment opportunities for farmers, but also promotes the development of the local economy. According to the *Sichuan Tea Industry Development Plan* (2019), the tea industry has become one of the important local economic pillars, especially in

UNIVERSITI KEBANGSAAN MALAYSIA

the rural areas around the tea production bases, where the tea industry provides farmers with a stable source of income.

b. Social sustainability

The contribution of the tea industry to the local community, especially in terms of boosting the income of the farmers, improving the standard of living, and promoting the cultural heritage. The social sustainability of the tea industry in Sichuan is manifested in its support and promotion of the community, especially its contribution in improving the quality of life of farmers and promoting cultural heritage. The tea industry provides farmers with a direct source of income, while enhancing the cohesion and cultural identity of local communities through the organization and dissemination of cultural activities (Wang & Zhang 2018). By guiding tea farmers to participate in tea culture education and the production of innovative products, the Sichuan tea industry not only promotes economic development, but also enhances farmers' cultural confidence and social status. Many tea farmers in Sichuan Province have enhanced their identification with tea culture by participating in tea culture festivals and tea performances, and have gained more market opportunities and income through these activities.

c. Environmental sustainability

The impact of the tea industry on the ecological environment, especially in terms of resource utilization efficiency, pollution emissions, and ecological protection, the adoption of green production technologies and sustainable agricultural practices. The environmental sustainability of the tea industry in Sichuan is reflected in the implementation of its ecological protection measures and the promotion of green production technologies. In order to achieve green and sustainable development, Sichuan Province has strengthened the protection of the ecological environment of tea plantations by implementing organic tea plantations, green production techniques and agricultural practices that reduce the use of pesticides (Li 2019). By using biopesticides, applying organic fertilizers, and reducing reliance on chemicals, the Sichuan tea industry has not only improved the quality of tea but also reduced environmental pollution. In addition, soil and water conservation and ecosystem maintenance in tea

UNIVERSITI KEBANGSAAN MALAYSIA

plantations have been incorporated into the daily management of agricultural production, promoting the development of an eco-friendly tea industry.

2.2 RELATIONSHIP BETWEEN URBANIZATION PROCESS AND TEA INDUSTRY

In the study "The Impact of Urbanization on the Sustainable Development of the Tea Industry in Sichuan", the process of urbanization, as one of the key driving forces of globalization and modernization, has had a profound impact on many dimensions of the tea industry in Sichuan. Urbanization is not only a process of population concentration from rural to urban areas, but also includes improvements in infrastructure, transformation of economic structure, and social and cultural changes. The process, in the context of the Sichuan tea industry, has brought unprecedented market opportunities as well as triggered challenges that cannot be ignored, especially in terms of resource allocation, market demand, production patterns, and environmental protection (Zhang 2015).

2.2.1 Changes in market demand and consumer behavior

The process of urbanization is not only the migration of population from rural to urban areas, but it also leads to profound changes in social structure, economic structure and lifestyle. With the acceleration of urbanization, the income level of urban residents has increased, their lifestyles have become more diversified, and the demand for the tea industry has undergone fundamental changes. Urbanization not only promotes the growth of consumers in quantity, but also promotes the change of tea consumption demand in quality.

With economic development, especially the rise of the middle class, consumer demand for spiritual and cultural consumption has gradually increased, and tea has gradually transformed from a traditional daily consumer product to a symbol representing leisure, health and cultural taste. This trend is particularly evident in the context of urbanization, especially in tea-producing regions such as Sichuan, where tea is no longer just a healthy drink, but has become a symbol of culture and status (Yang, Wu & Wu 2013).

UNIVERSITI KEBANGSAAN MALAYSIA

Consumers are beginning to be more inclined to buy tea with health, environmental and cultural added value (Wang Xiaoyan 2018). For example, with the improvement of living standards, more and more urban residents begin to tend to choose green, organic, and pollution-free high-quality teas, not only because it meets the modern people's pursuit of a healthy life, but also because these teas represent a higher social class and taste of life (Zhang 2019).

a. Changes in market demand. The process of urbanization has a far-reaching impact on the changes in market demand. First of all, urbanization accelerates the movement of population, which makes the Sichuan tea industry face a wider market, especially with the rising income level of urban residents and changes in consumer attitudes, the demand for high-end, personalized and healthy tea is gradually increasing. Consumers are no longer only concerned about the basic quality and taste of tea, but also pay more attention to its cultural connotation, brand story and health attributes (Wang et al. 2024). Under this consumer trend, the Sichuan tea industry not only needs to improve the basic quality and taste of tea, but also needs to build a unique brand and focus on the cultural value and storytelling of the brand in order to stand out in the competitive market (Pu et al. 2019).

b. Investment opportunities. The urbanization process has provided a new impetus for investment opportunities in the Sichuan tea industry. First, the improvement of infrastructure construction provides convenient conditions for tea production, processing and transportation, especially urbanization brings technological advances in transportation and logistics, which reduces the transportation cost of tea from rural to urban areas and improves the market circulation efficiency of tea (He et al. 2013). Secondly, urbanization has promoted the diversification and high-end of tea consumption demand, which allows enterprises to meet the higher requirements of urban residents for tea through innovative and differentiated products. As a result, the tea industry has ushered in new investment opportunities, especially in tea branding, marketing and e-commerce platform innovation (Yang, Wu & Wu 2013). Policy support

UNIVERSITI KEBANGSAAN MALAYSIA

from urbanization is also an important factor in promoting the development of the tea industry. For example, a series of policies introduced by the government in the process of urbanization, such as supportive policies for infrastructure construction, marketing, and industrial transformation, provide financial support and policy guarantee for the tea industry in Sichuan (Wan & Jiao 2023). Investors and tea enterprises can take advantage of these policies to accelerate the innovation and development of the tea industry.

c. Production cost. Although urbanization brings growth in market demand and increased investment opportunities, the pressure on production costs it brings cannot be ignored. Urbanization has brought about tight land resources, rising labor costs, and changes in resource allocation, which have challenged the production costs of the tea industry in Sichuan. Firstly, with the development of land resources and urbanization, the land use of tea plantations has been affected, and tea production faces the dilemma of tight land resources (Huang 2002). Secondly, with the loss of rural labor force and changes in the labor market during the urbanization process, the labor cost of the tea industry in Sichuan has gradually increased, which puts higher demands on the traditional tea production methods.

With the progress of urbanization, the consumption level and structure of urban residents have undergone significant changes. Sichuan tea industry in this process ushered in the diversification of market demand and high-end. Urban residents not only have higher requirements for the quality of tea, but also began to focus on the cultural connotation and brand value of tea. With the improvement of living standards, more and more consumers prefer green, organic, pollution-free high-quality tea, tea consumption is not only limited to daily drinks, but also become a symbol of leisure and healthy life. The social and cultural changes brought by urbanization require the Sichuan tea industry to pay attention not only to the taste and quality of the products, but also to the branding, cultural value and consumer experience of the products, so as to satisfy the market demand for personalized and differentiated products (Zhang 2012). This has prompted tea companies to strengthen brand building, innovate products and

UNIVERSITI KEBANGSAAN MALAYSIA

marketing strategies, and enhance the market influence of their brands through channels such as new e-commerce platforms, social media and tea culture experience activities.

2.2.2 Technological innovation and transformation of production patterns

The process of urbanization has accelerated the transformation of the regional economy and the adjustment of industrial structure, thus bringing new investment opportunities. With the progress of urbanization, the consumption ability and cultural needs of urban residents are rapidly increasing, and the tea industry has ushered in more investment opportunities while meeting these needs. For example, the tea industry in Sichuan Province can take advantage of urbanization to attract capital and enterprises through new sales channels such as urban market expansion, Internet + tea industry, and e-commerce platforms. Urbanization has led to the strengthening of urban infrastructure and brought about more efficient logistics and distribution systems, thus providing a good investment platform for tea production and sales (Yang 2013). Through policy support and financial investment, the Sichuan tea industry is able to access modern equipment and technology, further promoting industrial structure upgrading and technological progress (Wu, Zhao & Chen 2016).

Infrastructure development and technological innovations brought about by urbanization have had a significant impact on the production pattern of the tea industry in Sichuan. In particular, the popularization of mechanization technology has significantly improved tea production efficiency and reduced production costs. The introduction of technologies such as mechanized plucking and automated processing has led to a more standardized tea production process, reduced artificial dependence, saved labor costs, and improved production efficiency (Zhang 2011). However, urbanization has also brought about a rise in land and labor costs, especially in the context of accelerated urbanization, where land resource constraints and labor loss have become new challenges for the tea industry. For example, as a large number of rural populations migrate to the cities, the scarcity of rural labor leads to an increase in labor costs in tea plantations, which further exacerbates the rise in production costs. In order to effectively address this challenge, the tea industry in Sichuan needs to strengthen technological innovation, improve production efficiency, and further reduce production

UNIVERSITI KEBANGSAAN MALAYSIA

costs through green production methods and scientific and technological innovation (Xie 2024).

With the advancement of urbanization, the production mode of Sichuan's tea industry is undergoing a transformation from traditional hand planting to modernized mechanized production. Infrastructure construction and technological innovation in the process of urbanization have improved the production efficiency of tea. The introduction of modern mechanized and intelligent technologies has not only improved production efficiency, but also made the tea production process more standardized and less dependent on manual labor (Xiao 2011). However, while these technological advances have significantly increased productivity, the spread of mechanized production has also brought about the loss of traditional tea culture and handcraft skills. Traditional tea art, hand-picking and hand-made tea techniques are important components of Sichuan tea culture, and they carry a deep cultural heritage and historical legacy. Therefore, while transforming the production mode of Sichuan tea industry, it is necessary to strengthen the protection of traditional tea culture skills and ensure that these traditional skills are passed on in modernized production (Yang 2011).

To this end, Sichuan Province can, through policy guidance and industry support, encourage tea farmers and enterprises to ensure production efficiency while focusing on the protection and inheritance of traditional skills, and promote the dual development of culture and green production. Technological innovation is an important driving force for the transformation of Sichuan's tea industry. With the acceleration of urbanization, technological innovation provides a large number of new opportunities for the tea industry. For example, the application of modern technologies such as the Internet of Things (IoT), environmental monitoring technologies and big data analytics has made the management of tea gardens more efficient and precise, enabling real-time monitoring of the soil, climate and growth of tea leaves (Li 2021). The application of these technologies not only improves the production efficiency of tea, but also helps to reduce the negative impact on the environment and promote the development of eco-friendly tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

However, the advancement of technological innovations also faces challenges, especially in terms of capital, talents and technology landing. In order to realize green production and sustainable development, the Sichuan tea industry needs to promote technological innovation while addressing the difficulties in the implementation of these technologies, and accelerate the transformation and application of scientific and technological achievements through policy incentives and industrial support (Cao, Liu & Zhang 2019).

2.2.3 Environmental protection and ecosystem sustainability

The process of urbanization is usually accompanied by extensive land development and urban sprawl, which puts an increasing strain on land resources that would otherwise be used for agricultural production. In Sichuan, an important region for tea production, many tea plantations are at risk of being converted to residential, commercial development or industrial land. Over-exploitation of land directly affects the ecological environment of tea plantations, leading to soil degradation, reduction of water sources, and shrinkage of tea plantations, which not only limits the production capacity of tea, but also affects the quality of tea (Yang et al. 2022). The impact of land use change on the tea industry is not only in the reduction of plantation area, but also in the ecological problems caused by these changes. For example, when tea plantations are over-exploited, the original soil and water conservation function is destroyed, the soil structure deteriorates, and the soil erosion problem is aggravated, which directly affects the growing environment of tea and leads to a decline in the quality of tea (Fan 2024). Therefore, how to rationally plan land use, protect existing tea plantations and optimize the allocation of land resources has become an urgent problem for the tea industry in Sichuan. The government should restrict unreasonable land development through policies and legislation, strengthen the protection of agricultural land, and ensure the stability and sustainable development of tea plantations (Luo et al. 2024). The ecological environment of tea plantations is directly related to the growth and quality of tea leaves. Soil pollution, overuse of chemicals and overall deterioration of the ecological environment during urbanization have greatly challenged the production environment of tea plantations. For a long time, tea production has relied on the use of large quantities of chemical fertilizers and pesticides, which have improved yields but

also brought about problems such as environmental pollution, soil acidification and water pollution. These negative impacts not only adversely affect the quality of tea, but also destroy the ecological balance of tea plantations (Ding et al. 2023).

In order to improve the ecological environment of tea plantations, the tea industry needs to shift to a green production model to reduce the negative impact on the environment. By promoting eco-agricultural techniques, adopting organic fertilizers and bio-pesticides, and reducing the use of chemicals, tea farmers can reduce soil pollution and water pollution, thereby protecting the ecological environment and improving the quality of tea (Wang et al. 2023). In addition, modern technological tools, such as the Internet of Things (IoT) and environmental monitoring technologies, can monitor the environmental changes in tea plantations in real time, including soil moisture, pests and diseases, etc., and provide timely information to tea farmers, helping them to adjust their production methods according to the environmental changes and ensuring the sustainability of the tea plantation's ecosystem (Yu et al. 2021). These technologies not only help to improve production efficiency, but also reduce environmental pollution and realize eco-friendly tea production. The impact of the urbanization process on the ecological environment is not only reflected in the land use changes and the deterioration of the ecological environment of tea plantations, but also involves the overall impact of the ecosystem. For example, with the advancement of urbanization, the problem of ecological damage has become increasingly serious. Over-exploitation of land resources has led to fragmentation of ecosystems, loss of biodiversity, and soil erosion, all of which pose a threat to the long-term sustainable development of the tea industry (We 2014).

In addition, urbanization has brought about an increase in urban pollution, and industrial wastewater and exhaust emissions have had a serious impact on the tea plantation environment, further aggravating the burden on the ecosystem. To cope with these ecological problems, the Sichuan tea industry needs to work with the government and environmental protection departments to promote the application of green technologies, reduce emissions from pollutants, and protect and restore the ecological environment around tea plantations. Policy makers can encourage tea farmers and enterprises to adopt environmentally friendly production technologies through financial

UNIVERSITI KEBANGSAAN MALAYSIA

subsidies and incentives, while increasing investment in ecological protection programs for tea plantations (Gan et al. 2022). In addition, scientific water management and soil restoration techniques can help improve the natural environment of tea plantations and provide a healthy and sustainable ecological environment for tea production.

Urbanization is not only a social process, but it is also accompanied by changes in policies and regulations, infrastructure construction, and technological improvements, which directly or indirectly affect the sustainable development of the tea industry. The government's policy orientation in the urbanization process will play a crucial role in land use, ecological protection, and the transformation of the tea industry. The formulation and implementation of policies on tea plantation protection, land use, and eco-agriculture are crucial to promoting the green development of the tea industry in Sichuan. Infrastructure development, such as water resource management systems, agricultural technical services, and improved transportation networks, will also improve the tea industry's productivity and market responsiveness. Technological advances likewise play a driving role in the urbanization process. Through technological innovation, the Sichuan tea industry is better able to meet the challenges of limited resources and environmental degradation. Internet of Things (IoT) technology, environmental monitoring systems, and green agricultural technologies provide the tea industry with more efficient and environmentally friendly production methods, thereby promoting the tea industry's development in a green and sustainable direction.

2.2.4 Social culture and the transmission of traditional tea culture

The impact of urbanization on the Sichuan tea industry is not only limited to production methods, market demand and environmental protection, but is also profoundly affecting the inheritance and protection of tea culture. With the advancement of modernization, especially rapid urbanization, traditional cultural elements such as the tea ceremony, tea art and tea drinking etiquette have been gradually replaced by modernized and faster consumption patterns, and traditional tea culture is facing the risk of gradual disappearance in this process (Zhang 2012).

UNIVERSITI KEBANGSAAN MALAYSIA

Lifestyle changes brought about by urbanization, especially the accelerated pace of life of the younger generation of consumers, have led to the gradual simplification or neglect of traditional forms of tea culture, a change that poses a challenge to the transmission of tea culture (Rahmanita et al. 2024). With urbanization, consumer preferences are gradually shifting to convenient, fast, and modern consumption methods, and traditional cultural forms such as the tea ceremony, tea art, and tea drinking etiquette are gradually being weakened. Among the younger generation, the spirit and connotations of tea culture are often simplified, and tea is seen as a consumer product rather than a vehicle for cultural heritage. This trend is due to the increase in the fast pace of life and the need for convenience, and these traditional cultural forms are often considered incompatible with modern fast-paced lifestyles, especially in the context of urbanization, where the modernization and globalization of lifestyles have made the inheritance of traditional tea culture more difficult (Li 2014). The connotation of tea culture not only includes the taste of tea and drinking skills, but also includes the dimensions of long history, philosophical thinking and social etiquette. With the development of modernization, more and more consumers choose convenient drinks such as tea beverages, and the traditional tea brewing and drinking rituals are gradually neglected by the younger generation. Against this backdrop, the Sichuan tea industry is facing the great challenge of preserving the traditional tea culture and passing it on.

To address the challenges posed by urbanization, the Sichuan tea industry needs to integrate cultural heritage with innovation. While preserving the core values of traditional tea culture, cultural innovation can enhance its relevance to modern consumers through creative product development, brand storytelling, and digital dissemination. Such innovation does not imply the abandonment of tradition, but rather the reconfiguration of tea culture to align with contemporary market demand. By incorporating cultural narratives into packaging design and brand communication, tea products can gain symbolic and experiential value, thereby strengthening consumer engagement, particularly among younger generations (Howard 2010).

Urbanization-related policies, regulations, and infrastructure development play a critical role in safeguarding and transmitting traditional tea culture. Government support—through cultural protection regulations, financial incentives, and education

UNIVERSITI KEBANGSAAN MALAYSIA

initiatives—can provide institutional guarantees for the continuity of tea culture. Measures such as funding traditional tea heritage programs, supporting tea culture education, and organizing cultural events (e.g., tea festivals and trade fairs) contribute to the preservation and revitalization of tea culture under urbanization pressures (Feng 2005; Li 2008). In addition, policy interventions can help protect tea plantation landscapes and traditional production skills from being undermined by modernization.

However, urbanization and social mobility have also weakened traditional cultural identity, particularly among younger consumers. The erosion of cultural identity not only affects tea consumption behavior but also constrains the transmission of cultural value within the tea industry (Liu 2018). In response, the Sichuan tea industry should strengthen consumer–culture connections through education, experiential marketing, and localized cultural branding. Activities such as tea art training, cultural workshops, and immersive tea experiences can enhance consumers' understanding and emotional attachment to tea culture. By reinforcing cultural identity, the tea industry can simultaneously preserve cultural heritage, increase brand value, and improve market competitiveness.

Overall, the impact of urbanization on the Sichuan tea industry is multidimensional and complex. Changes in market demand, production mode, social culture and ecological environment all work together for the sustainable development of the tea industry. In order to cope with these multiple challenges, the Sichuan tea industry needs to do a good job of integrated planning in terms of policy guidance, technological innovation, cultural heritage and brand building. In this process, the government and enterprises should strengthen cooperation to promote the green development and branding of the tea industry, and focus on the inheritance and innovation of tea culture.

UNIVERSITI KEBANGSAAN MALAYSIA

2.3 THE RELATIONSHIP BETWEEN THE TEA INDUSTRY AND SUSTAINABLE DEVELOPMENT UNDER URBANIZATION

2.3.1 Economic dimension: Urbanization, industrial efficiency, and market restructuring

From an economic perspective, urbanization significantly influences the tea industry by accelerating industrial modernization, reshaping market demand, and altering competitive structures.

On the production side, urbanization promotes mechanization, industrialization, and technological upgrading in tea cultivation and processing. The introduction of mechanized harvesting, automated processing lines, and standardized quality control systems has improved production efficiency and reduced reliance on manual labor, which is particularly important in the context of rural labor outflow during urbanization (Lu 2016; Mei 2010; Zhou 2022). These changes enhance productivity and stabilize output but also raise concerns regarding the preservation of traditional production techniques that contribute to the distinctive quality of certain Sichuan teas (Quan 2016).

On the market side, urbanization has led to rising income levels and consumption upgrading among urban residents, driving demand for high-quality, branded, organic, and value-added tea products. Studies show that urban consumers increasingly prefer branded and premium tea products, which has encouraged tea enterprises to shift from bulk tea sales toward refined and brand-oriented development paths (Liu 2020; Xie 2021; Yang 2019). However, despite Sichuan being a major tea-producing region, its tea brands remain relatively weak at the national and international levels due to fragmented branding strategies and strong regionalization (Li 2020; Wang 2019).

Overall, urbanization creates both opportunities and pressures for the economic sustainability of the tea industry, requiring a balance between efficiency enhancement, market expansion, and the preservation of product differentiation.

UNIVERSITI KEBANGSAAN MALAYSIA

2.3.2 Ecological dimension: Urbanization pressure, resource constraints, and green transformation

In ecological terms, urbanization imposes significant constraints on the sustainable development of the tea industry through land use change, environmental degradation, and resource pressure.

Urban expansion often results in the conversion of agricultural land into construction land, reducing the area of high-quality tea plantations and intensifying land-use conflicts in major tea-producing regions such as Sichuan (Chen et al. 2022; Yuan 2016). In addition, industrialization and urban activities associated with urbanization can lead to soil pollution, water resource stress, and microclimatic changes, all of which negatively affect tea plant growth and tea quality (Chen et al. 2022; Li 2011; Wu 2015).

To address these ecological challenges, green production technologies and eco-agricultural practices have increasingly been adopted in the tea industry. Organic farming, ecological tea plantation construction, and advanced quality monitoring technologies help mitigate environmental impacts while improving product quality and safety (Chen Dong 2020; Li Hong 2020). These measures not only support ecological sustainability but also respond to urban consumers' growing demand for environmentally friendly and health-oriented tea products.

Thus, the ecological dimension highlights the necessity of integrating environmental protection with industrial development to ensure the long-term sustainability of the tea industry under urbanization.

2.3.3 Sociocultural dimension: Urbanization, consumption behavior, and cultural continuity

Urbanization also profoundly reshapes the sociocultural foundations of the tea industry by altering population structures, lifestyles, and cultural values.

On the one hand, rural-to-urban migration and generational change weaken the community-based transmission of traditional tea culture. The fast-paced urban lifestyle

UNIVERSITI KEBANGSAAN MALAYSIA

and modern consumption concepts have reduced younger generations' engagement with traditional tea-drinking practices and tea rituals, posing risks to cultural continuity (Lv 2018; Wang Li 2020).

On the other hand, urbanization creates new opportunities for cultural innovation and dissemination. Tea culture has increasingly integrated with tourism, cultural and creative industries, and digital media, giving rise to new forms such as tea-themed tourism, cultural experience activities, and creative tea products (Zhang Qiang 2021). These innovations enhance the visibility and social relevance of tea culture while adapting it to contemporary consumer preferences.

Moreover, cultural identity plays a critical role in shaping consumer behavior and brand loyalty. Strengthening the cultural narrative of Sichuan tea through branding, storytelling, and experiential marketing can enhance both cultural sustainability and market competitiveness (Liu Hai 2021).

Consequently, the sociocultural dimension emphasizes that sustainable development of the tea industry requires not only economic efficiency and ecological protection but also the preservation, innovation, and transmission of tea culture in the context of urbanization.

In summary, existing literature demonstrates that urbanization affects the tea industry through intertwined economic, ecological, and sociocultural pathways. Improvements in production efficiency may coexist with ecological pressures and cultural transformation, forming a complex industrial ecosystem. A comprehensive understanding of these three (3) dimensions is essential for revealing the internal mechanisms through which urbanization influences the sustainable development of the tea industry. This multidimensional analytical framework provides a solid theoretical basis for subsequent empirical analysis and policy discussion in this study.

2.4 RESEARCH THEORY

In this study, the theoretical foundation part will combine urbanization theory, sustainable development theory, ecological modernization theory and planned behavior

UNIVERSITI KEBANGSAAN MALAYSIA

theory to explore the impact of urbanization process on the sustainable development of Sichuan tea industry.

The theory of sustainable urbanization, which was first defined as "sustainable development" in *Our Common Future* (also known as the *"Brundtland Report"*), issued by the World Commission on Environment and Development in 1987, and subsequently evolved into "sustainable urbanization" in the urban policy and planning literature. It is an important theoretical perspective in modern urbanization research, emphasizing the coordination and unity of economic development, social justice and ecological environment protection in the process of urban expansion and population agglomeration (Tan & Xu 2018). The theory originates from the extension of the concept of sustainable development at the end of the 20th century, and is committed to solving the problems of resource constraints, environmental pollution and social inequality faced by cities in rapid development. Its core proposition is to simultaneously promote the coordinated development of three (3) major dimensions in the process of urbanization:

a. *Economic sustainability*: Cities should achieve high-quality economic growth by improving the efficiency of resource utilization, fostering a new type of industrial system, and promoting a green economy;

b. *Social sustainability:* Focusing on social equity, inclusion and welfare protection, emphasizing the equalization of public services, the protection of the rights and interests of vulnerable groups, and the integrated development of urban and rural areas;

c. *Environmental sustainability:* Emphasizing the protection of the ecological environment and the control of pollutant emissions in urban spatial development, and promoting the development of green infrastructure and low carbon lifestyles. carbon lifestyle (Li et al. 2019).

The theory of sustainable urbanization provides a theoretical basis for understanding and guiding the multifaceted coordination in the process of urbanization, and is particularly suitable for analyzing the dual tasks of development and conservation faced by developing countries in the process of urban expansion. Building upon this

UNIVERSITI KEBANGSAAN MALAYSIA

foundation, this study expands the role of culture as the fourth pillar of sustainable development, emphasizing its function in driving economic growth, social equity, and environmental protection. Particularly within the context of urbanization, culture assumes increasing significance by fostering social cohesion, promoting a green economy, and enhancing ecological conservation awareness (Dessein et al. 2015).

The triple bottom line (TBL) theory was developed by John Elkington in 1994 and advocates that the sustainability of business and society should take into account the impacts of three (3) dimensions: the economy (Profit), society (People) and the environment (Planet). This theory emphasizes that organizations and policies should balance the interests of all three (3) to promote sustainable development (Nie, Kiminami & Yagi 2024). The theory has been widely applied in a variety of fields such as urban sustainability, agriculture and tourism, and has been used to create a multidimensional indicator system for measuring sustainable development (Yi et al. 2024).

The theory of ecological modernization, which emerged in the early 1980s, is generally considered to have been proposed earlier by Martin Janicke and Josef Huber of Germany. Janicke pointed out that remediation compensation, end-of-pipe management, ecological modernization and structural reform are four (4) ways to improve environmental pollution and avoid ecological damage. With the development of social economy and technological progress, environmental protection and resource utilization will be gradually optimized. The theory emphasizes the win-win situation of economic development and environmental protection through modern technology and policy innovation (Venkatesh & Bala 2008). They believe that through modern technology, institutional innovation and environmental governance, economic development can be compatible with ecological protection, forming an optimization path of “technology-institution-environment” trinity (Wise 2016). In the study of sustainable development of tea industry in Sichuan, the theory provides a perspective of unification of technological innovation, industrial transformation and environmental protection (Wu et al. 2017), especially in the promotion of green planting, organic fertilizer, water-saving irrigation and other aspects of its practical significance. Especially in the process of urbanization, how to promote the green production and

UNIVERSITI KEBANGSAAN MALAYSIA

sustainable development of tea industry through ecological modernization measures is one of the core topics of this study.

The theory of planned behaviour was developed by American scholars Fishbein and Ajzen in 1975 to explore the predictors and influences on individual behaviour. The theory suggests that behavioral intentions are influenced by attitudes, subjective norms and perceived behavioral control. In the study of Sichuan tea industry, the theory helps to analyze consumers' perceptions and purchase intentions of green tea, eco-brands, and sustainable products, especially in the context of changes in consumer perceptions brought about by urbanization, which is an important reference value (Su, Wall & Wang 2019).

2.5 THEORETICAL FRAMEWORK

This study constructs a multidimensional theoretical framework integrating urbanization theory, sustainable development theory, ecological modernization theory, the theory of planned behavior, and the theory of culture as the fourth pillar. This framework reveals how various theoretical elements interact at different levels to collectively drive the transformation and upgrading of Sichuan's tea industry. Specifically, the urbanization process generates new market demands and technological innovation opportunities for the tea industry while simultaneously imposing pressures on environmental protection and resource management. Throughout this process, culture plays a pivotal role as a driving force for social, economic, and environmental sustainability. Culture not only strengthens social cohesion and identity but also enhances consumer acceptance of green tea products and eco-brands, thereby promoting green production and sustainable consumption (Dessein et al. 2015).

Specifically, the urbanization process brings new market demand and technological innovation opportunities for the tea industry, but also presents pressure on environmental protection and resource management. In this process, culture, as an important force driving social, economic, and environmental sustainability, plays a key role. Culture not only enhances social cohesion and identity but also promotes consumer

UNIVERSITI KEBANGSAAN MALAYSIA

acceptance of green tea products and eco-brands, further driving green production and sustainable consumption (Dessein et al. 2015).

In this theoretical framework, cultural identity and heritage provide deep social support for the green transformation of the Sichuan tea industry. By promoting local tea culture and integrating traditional culture with modern sustainable production techniques, the Sichuan tea industry can advance green production while enhancing cultural identity, promoting social responsibility, and fostering ecological protection. The enhancement of cultural identity and social cohesion not only boosts demand for green tea products in the market but also provides strong social impetus for ecological protection and sustainable development (Zhang & Liu 2021).

The integration of culture with ecological protection is another key aspect of this study. Ecological protection is one of the core issues facing the Sichuan tea industry. By combining traditional ecological knowledge with modern green production techniques, the tea industry can not only improve the environmental friendliness of its products but also enhance the ecological responsibility of both consumers and producers. Culture's role in driving green production, ecological protection, and sustainable consumption provides cultural and social support for the long-term sustainable development of the tea industry (Li & Zhou 2021).

By integrating the above theories, this study aims to explore how to achieve a balance between economic growth, environmental protection, social responsibility, and cultural values while promoting the sustainable development of the Sichuan tea industry. Specifically, it will focus on how to achieve green production and sustainable development through the integration of cultural innovation and green production technologies in the process of urbanization.

2.5.1 Theoretical modeling of sustainable development of tea industry

In the context of deepening urbanization, the tea industry in Sichuan is facing multiple challenges, such as the restructuring of resource factors, changes in market structure, and ecological and cultural pressures. The traditional agricultural growth model of "production for marketing" has been difficult to adapt to the systemic changes brought

UNIVERSITI KEBANGSAAN MALAYSIA

about by the urbanization process, and there is an urgent need to build a global response framework from the perspective of sustainable development. Based on this, this study combines the theory of sustainable development and the logic of urbanization development, and builds a systematic and realistic theoretical model of sustainable development of the tea industry from the four (4) dimensions of market economy, social culture, ecological environment and urbanization level, so as to provide a theoretical basis for analyzing the adaptive evolution and governance path of the tea industry in the process of urbanization.

1. Market economy dimension. Market economic factors are the most direct source of power in the development of tea industry. The dimension mainly covers three (3) aspects:
    a. Changes in market demand. The shift in the consumption concept of urban residents has promoted the development of tea product structure from traditional bulk tea to organic tea, functional tea, high-end gift tea and other diversified directions (Chen et al. 2016).
    b. Investment opportunities. The degree of capital's involvement in the tea industry chain (planting, processing, branding, cultural and tourism integration, etc.) determines the potential for industrial upgrading (Zhao 2022).
    c. Production cost. The rising cost of labor, raw materials, transportation and other factors affect the profit margin and market competitiveness of tea enterprises. The market economy dimension determines whether the tea industry has the ability to quickly respond and adapt to changes in consumption structure in the wave of urbanization (Guan 2015).
2. Sociocultural dimensions. Sociocultural variables determine the social basis and cultural continuity of the tea industry. They mainly include:
    a. Labor resources. Urbanization triggers the exodus of young adults from rural areas, resulting in a fault line in the labor force of the tea industry, which hinders the inheritance of technology and affects the sustainability of the industry (Su et al. 2019).

UNIVERSITI KEBANGSAAN MALAYSIA

b. Traditional cultural inheritance and protection. As an intangible cultural heritage, the inheritance status of tea culture directly affects the cultural added value and social identity of the industry.

c. Cultural identity. The degree of consumers' identification with local tea brands and tea culture connotations affects their purchase intention and loyalty, as well as the degree of social embeddedness of the tea industry (Tan 2022). This dimension reveals how the tea industry obtains long-term development momentum within the social structure and cultural logic.

3. Ecological environment dimension. Ecological factors are the basic guarantee for the sustainable development of agricultural industry. For the tea industry, the ecological environment dimension mainly includes:

a. The ecological environment of the tea plantation. Such as soil quality, water conditions, biodiversity, etc., determines the quality of tea and the feasibility of ecological planting (Chen et al. 2022).

b. Land use change. The squeeze of urban expansion on the space of tea gardens may trigger the reduction of arable land and fragmentation of land parcels, affecting the scale of planting and continuous benefits.

c. Ecological and environmental impacts. Including pesticide use, soil erosion, habitat destruction and other negative externalities, which need to be regulated through green planting and ecological compensation mechanisms (Wang et al. 2023). This dimension reflects the tension and reconciliation between industrial development and ecological protection.

4. Urbanization indicator dimension. The urbanization process is both an external constraint and a potential driving force. Relevant urbanization indicators are reflected in the model as follows:

a. Policies and regulations. Including land policies, agricultural subsidies, green certification and other institutional arrangements, which constitute the institutional environment for the development of the tea industry (Chunla 2011).

UNIVERSITI KEBANGSAAN MALAYSIA

b. Infrastructure development. Infrastructure, such as transportation, logistics, e-commerce, cold chain, etc., has a decisive impact on the efficiency of tea distribution and the ability to expand the market.

c. Degree of technological development. The popularization and application of mechanization, informatization and digitalization technologies determine the intelligent transformation capability and efficiency level of the tea industry (Zongmao et al. 2011). This dimension emphasizes the structural shaping role of urbanization on the development environment of tea industry. The theoretical framework of sustainable development of tea industry is shown in Figure 2.1.

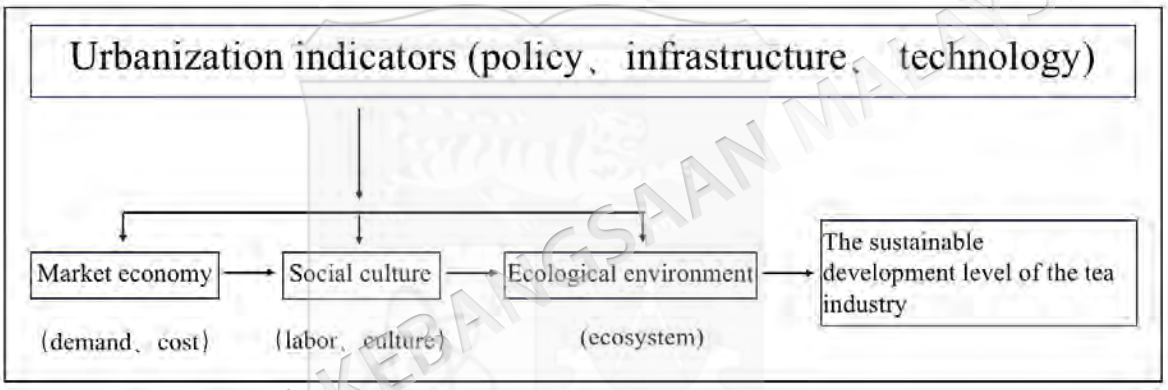

Figure 2.1 Theoretical framework for sustainable development of the tea industry

The model starts from the four (4) dimensions of "market-society-ecology-urbanization", identifies the main variable paths and logical mechanisms affecting the sustainable development of Sichuan's tea industry, and emphasizes the linkage and feedback mechanism of the elements of the dimensions in the context of urbanization. Feedback mechanism. The core logic is that urbanization is both an influencing factor and a regulating mechanism, and the development of the tea industry is a comprehensive result of the interaction of multiple variables. The theoretical model of sustainable development of tea industry constructed in this study takes into account the development momentum and development constraints, internal regulation and external adaptation, short-term benefits and long-term sustainability, which not only has a solid theoretical foundation, but also provides a systematic analytical tool for the local government, industrial organizations and scientific research institutions in the areas of policy formulation, industrial transformation and project implementation. In the future,

UNIVERSITI KEBANGSAAN MALAYSIA

structural equation modeling, path analysis or scenario simulation can be carried out based on the model to provide operable theoretical support for the green, efficient and inclusive development of Sichuan tea industry in the context of urbanization.

2.5.2 Theoretical foundations of tea consumer behavior research

a. Theory of Planned Behavior (TPB)

The theory of reasoned action (TRA) proposed by American scholars Fishbein and Ajzen in 1975 is mainly used to analyze how attitudes consciously influence individual behaviors, and it is believed that individual behaviors can be reasonably inferred from behavioral intentions to a certain extent, and behavioral intentions are determined by behavioral attitudes and subjective norms. Inferred, which in turn is determined by behavioral attitudes and subjective norms. The theory of rational behavior has an important underlying assumption: that people are rational and have full control over their behavior. However, in an organizational setting, individual behavior is constrained by external circumstances such as personal ability, situational context, cultural background, and resource scarcity. The basic assumptions of the theory of rational behavior severely limit the scope of practical application of the theory. Therefore, in order to expand the scope of application of the theory, Ajzen, Timko, and White attempted to explore the external factors that influence individual behavior other than individual will, and finally introduced the concept of "perceived behavioral control" in 1985, which expanded the theory of rational behavior and proposed the theory of rational behavior. Finally, in 1985, the concept of "perceived behavioral control" was introduced, and the "theory of rational behavior" was expanded and the "theory of planned behavior" was proposed, which was formally put forward in the "theory of planned behavior" published in 1991. The theory of planned behavior holds that individual behavioral intentions are not only influenced by behavioral attitudes and subjective norms, but also by perceived behavioral control, and attributes factors that cannot be explained by behavioral attitudes and subjective norms to cognitive factors of behavioral control. The framework of the theory of planned behavior is shown in Figure 2.2.

UNIVERSITI KEBANGSAAN MALAYSIA

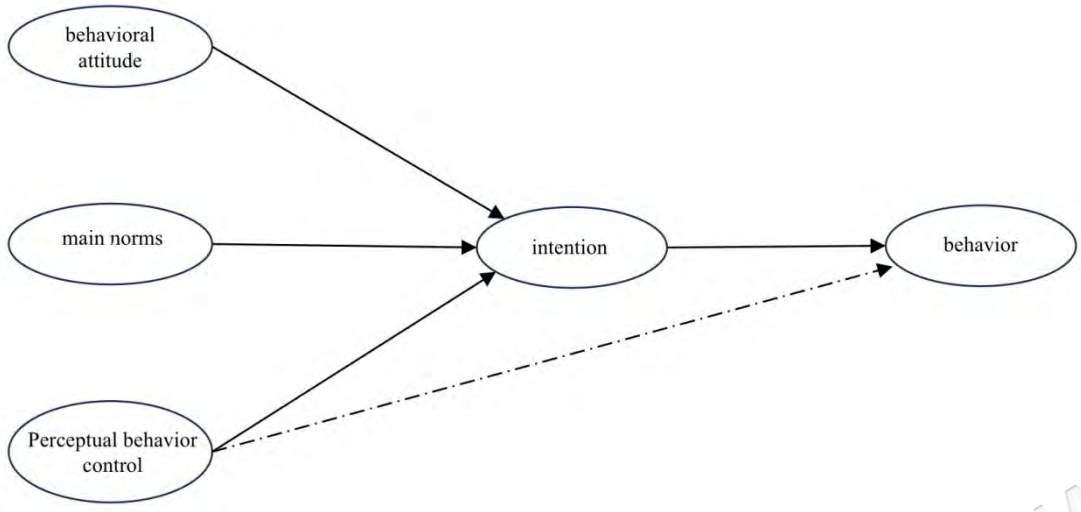

Figure 2.2 Theoretical framework for planned behavior

The theory of planned behavior (TPB) contains five (5) major elements: Attitude toward behavior, Subjective norm, Perceived behavioral control, Intention and Behavior, which systematically describes the interrelationships between the five (5) major elements, the main points are as follows:

a. Behavioral willingness is the most direct factor affecting behavior, behavioral willingness to behavioral plans have a better foresight;

b. Behavioral willingness to behavior by behavioral attitudes, subjective norms, and perceived behavioral control, these three (3) factors and behavioral willingness are positively correlated, the more positive the attitude, the greater the support of important others. The more positive the attitude, the greater the support of important others, and the stronger the perceived behavioral control, the stronger the behavioral willingness will be, and vice versa;

c. Personal basic characteristics, sociocultural characteristics, and other situational factors (e.g., age, gender, personality traits, education, experience, beliefs, attitudes toward things, product characteristics, etc.), through the influence of behavioral beliefs, normative beliefs, and control beliefs, have an impact on behavioral willingness and behavior;

UNIVERSITI KEBANGSAAN MALAYSIA

d. Personal abilities, opportunities, and resources, and other The constraints of the actual control conditions, the predicted behavior is not completely in the behavior subject will control, if the actual control conditions are sufficient, the perceived behavioral control may also have a direct impact on the behavior.

Theory of planned behavior (TPB) is a social psychological theory used to explain individual decision-making process, and is the most famous attitude-behavior relationship theory in the field of social psychological research, which has been widely used in foreign countries for research in a variety of social behavioral fields, and many studies have verified the predictive power and explanatory validity of the theory of planned behavior on people's behavioral intentions as well as behaviors.

From the results of the review of domestic and international literature, the theory of planned behavior is also widely used in the research fields of consumer purchase decision motivation, consumption behavior, product selection behavior, tourism behavior, sports consumption behavior, dining behavior, health food consumption behavior, etc. Many literatures have also verified the predictive and explanatory power of the theory of planned behavior. For example, the model of the theory of planned behavior (TPB) was modified by adding self-identification factors to the TPB model, and the predictive and explanatory power of the model on the consumption behavior of genetically modified foods was also verified (Cook 2002). The predictive reliability and explanatory validity of the TPB on consumer choice of organic foods were verified (Chen 2007). The predictive reliability and explanatory validity of the TPB in predicting consumers' online purchase of books were verified. Attitudinal beliefs, normative beliefs, and control beliefs were decomposed into multidimensional belief structures in a study to predict consumers' intention to buy books online. The study compared the pure TPB model with the decomposed TPB model, finding that the belief structures in the decomposed TPB model better explained the behavioral intention to buy books online (Lin 2007). The reliability of the theory of planned behavior (TPB) was verified in a study on Belgian young people's sustainable food consumption (Vermeir & Verbeke 2008). The usefulness of the TPB in predicting consumption intentions for organic food and organic instant pizza was verified in a study involving nationals from

UNIVERSITI KEBANGSAAN MALAYSIA

Italy, Finland, and the United Kingdom (Arvola, Lähteenmäki & Tuorila 2008). The applicability of the TPB in the study of Chinese consumers' green consumer behavior was confirmed (Liu 2008). The applicability of the TPB in Chinese consumer behavior was demonstrated (Wu 2008). The TPB was applied in the study of college students' online book-buying behavior (Wu & Chen 2006).

Applying the theory of planned behavior to the study of college students' online book-buying behavior, the study shows that: attitudes toward online book-buying, subjective norms, and perceived behavioral control significantly affect college students' behavioral intentions of online book-buying, which then affects the final consumption behavior; and so on. In view of the successful use of the theory of planned behavior (TPB) model in consumer behavior research and the applicability and reliability of its conclusions, this study also chooses the theory of planned behavior (TPB) model as the theoretical basis of the study of consumer tea consumption behavior to provide a theoretical framework for the theoretical analysis of the proposed theoretical model of consumer tea consumption behavior, and provide scientific and theoretical guidance to ensure that the variables of the measurement of consumer tea behavior and the design of their influences as well as theoretical guidance to ensure the scientific and reliability of variable design.

b. Theoretical modeling of consumer tea consumption behavior

In the traditional analytical framework of economics, the "rational economic man" hypothesis is widely used to explain the economic behavior of individuals. The assumption is that consumers always aim to maximize their own utility when making consumption decisions, and make choices based on rational trade-offs of product attributes. Using this logic, tea consumers are not randomly or emotionally driven in the purchase decision process either, but rather seek to maximize their subjectively perceived utility in consumption based on the assessment of product value (e.g., health utility, cultural value, economic cost). With the accelerated process of urbanization, residents' lifestyles, consumption concepts and health concepts continue to evolve, tea as a blend of health functions, cultural symbols and leisure experience of special

UNIVERSITI KEBANGSAAN MALAYSIA

commodities, its consumer decision-making is increasingly showing a diversified, rationalized trend. When choosing tea products, consumers usually consider:

a. Physiological utility: Including the health functions of tea, such as antioxidant, lipid-lowering, refreshing, stomach nourishing, etc.;

b. Psychological utility: Such as cultural identity, identity symbols, aesthetic experience;

c. Economic utility: That is, the cost-effective price of tea, the cost of acquiring, the ease of purchasing;

d. Time utility: Including the convenience of obtaining the channel, the investment of the time of preparation for drinking.

In this process, consumers weigh multiple tea options (e.g., green tea, black tea, black tea, flower tea, organic tea, etc.) and ultimately decide whether or not to choose local Sichuan tea products and their specific types. This behavior reflects the typical embodiment of "rational economic man" in tea consumption decision-making. Based on the above analysis, combined with the changes in consumption structure and the increase in spatial mobility brought about by urbanization, this study constructs a more psychological behavioral model of consumer behavior based on the assumption of "rational economic man" and the theory of planned behavior (TPB) proposed by Ajzen. Through the assumption of "rational economic man" and Ajzen's "theory of planned behavior" (TPB), this study constructs a more psycho-behavioral model of consumer behavior and tries to explain the consumer decision-making process of tea consumers in the context of urbanization from the four (4) dimensions of behavioral attitudes, social influences, control perceptions and individual characteristics. The core logic of the model is that consumers do not make purchasing decisions solely based on external information, but rather combine multiple factors such as internal attitudes, social norms, and their own sense of control to form the final tendency of consumption behavior.

i. Behavioral attitude (attitude toward tea consumption)

It refers to consumers' cognitive evaluation and emotional response to the act of drinking tea itself. In the process of urbanization, with the improvement of health

UNIVERSITI KEBANGSAAN MALAYSIA

consciousness and the spread of tea culture, consumers may form positive attitudes towards tea because of positive perceptions such as “drinking tea is good for health”, “reflecting the quality of life” and “environmentally sustainable”, thus increasing their willingness to buy tea. Positive perceptions of tea consumption, such as “tea is good for health”, “reflects the quality of life” and “environmentally sustainable”, which may increase consumers’ willingness to buy tea.

ii. Subjective norms (subjective norm)

Subjective norms emphasize the consumption orientation felt by individuals under social pressure or social expectations. In the case of tea consumption, such social norms may come from the influence of significant others, such as family, friends, and colleagues, on tea-drinking behavior, as well as from the mainstream culture’s advocacy of a “green and healthy lifestyle,” especially among the urban middle class.

iii. Perceived behavioral control (PBC)

It refers to the subjective judgment of consumers on whether they are able to realize their tea consumption behavior conveniently, freely and economically. This variable involves consumers’ assessment of available resources (time, money, ease of purchase). For example, urban dwellers may be less likely to purchase or consistently drink tea because of factors such as busy schedules, inconvenient access, and price sensitivity.

iv. Consumer characteristics (individual characteristics)

This variable covers general demographic and psychological characteristics at the individual level, such as gender, age, education level, income, occupation, tea-drinking habits, and tea culture perceptions. Consumer characteristics are an important basis for influencing the formation of behavioral attitudes, responding to social norms, and assessing perceptions of control, as well as for consumer stratification and market segmentation in the context of urbanization. The preliminary theoretical analysis framework of consumers’ tea consumption decisions is shown in Figure 2.3.

UNIVERSITI KEBANGSAAN MALAYSIA

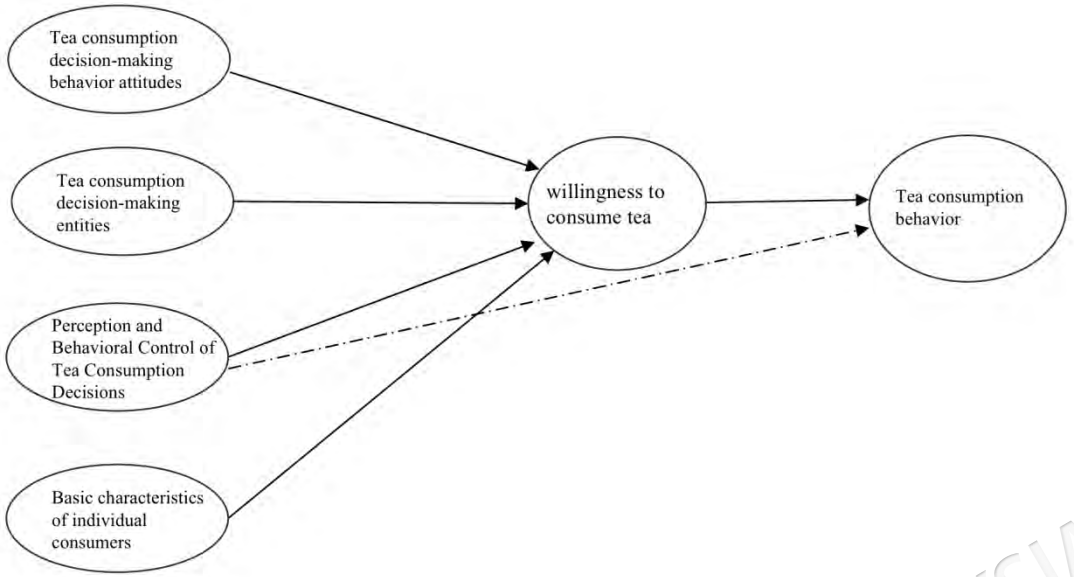

Figure 2.3 Theoretical framework for consumer decision making in tea consumption

Based on the above theoretical framework, this study will design the measurement variables of consumers' tea consumption intention and consumption behavior

Measurement, and design the potential influencing factors of consumption willingness from four (4) aspects, including behavioral attitude, subject norms, perceived behavioral control and basic personal characteristics. We collect primary data through consumers' questionnaire survey and use econometric analysis to understand the influence of behavioral attitudes, subject norms, perceived behavioral control and basic personal characteristics on the willingness to consume tea; at the same time, we identify the magnitude of the influence of the willingness to consume tea on consumption behaviors, and explore whether the consumer's willingness to consume tea is truly transformed into consumption behaviors. If the level of conversion of tea consumption intention to consumption behavior is very low or low, this study will identify the direct influence of behavioral attitudes, subject norms, perceived behavioral control and basic personal characteristics on tea consumption behavior. Therefore, this study proceeds to construct a theoretical analytical framework of consumer tea consumption behavior, as shown in Figure 2.4.

UNIVERSITI KEBANGSAAN MALAYSIA

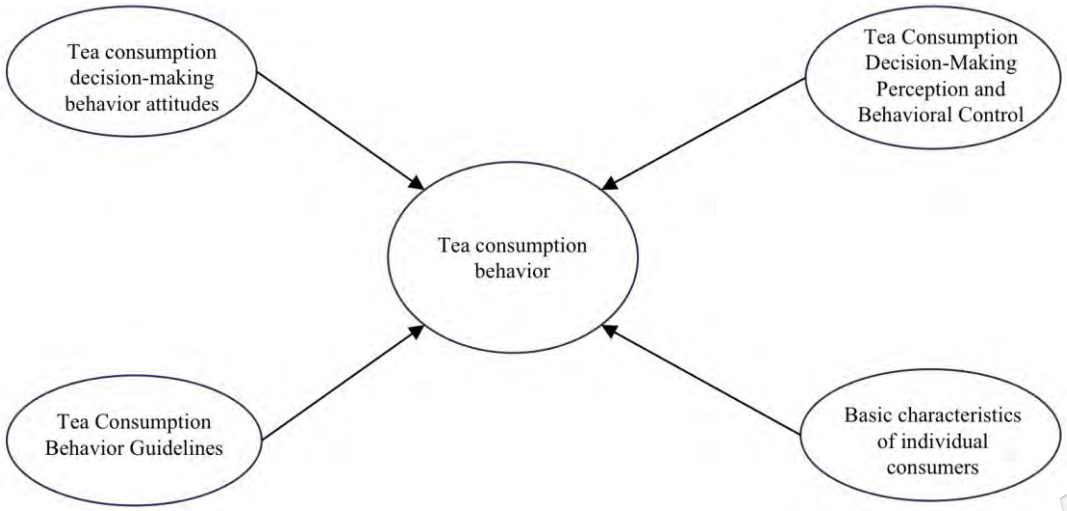

Figure 2.4 Theoretical framework of consumer tea consumption behavior

Through the empirical test of "the theoretical analysis framework of consumers' tea consumption decision-making", it can help us to understand the key influencing factors of tea consumption willingness, and understand the intensity of the transformation of consumption willingness into consumption behavior; while "the theoretical analysis framework of consumers' tea consumption behavior". The empirical test can help us understand the key influencing factors of tea consumption behavior. And comparing the key influencing factors of tea consumption willingness and the key influencing factors of tea consumption behavior, and comparing the difference of key influencing factors, we can find the root cause of the intensity of the transformation of consumption willingness to consumption behavior, and put forward the corresponding policy recommendations accordingly, which can effectively transform tea consumption willingness into consumption behavior. Applying the TPB model to the analysis of tea consumption behavior helps to break through the previous analytical thinking from the perspective of external environment or product supply only, and to understand more deeply the internal psychological mechanism and behavioral tendency of consumers in the context of urbanization. This can not only guide the Sichuan tea industry in product image shaping and market communication, but also provide a theoretical basis for the development of sub-population precision marketing strategies and the promotion of local tea culture re-dissemination.

UNIVERSITI KEBANGSAAN MALAYSIA

2.6 CONCEPTUAL FRAMEWORK

The conceptual framework of this study is based on four (4) core theories - sustainable development theory, urbanization theory, green production and ecological modernization theory, and consumer behavior theory - which are gradually constructed and refined with the aim of exploring in depth the impacts of the urbanization process on the sustainable development of the tea industry in Sichuan. The specific conceptual framework diagram can be seen in Figure 2.5.

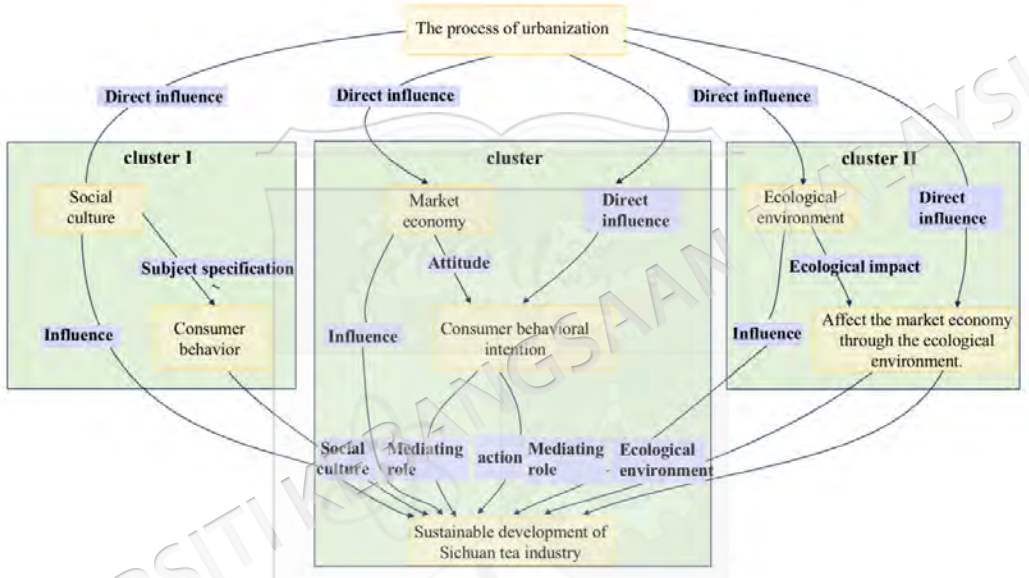

Figure 2.5 Conceptual framework diagram

First, there is the introduction of the sustainable development theory, which originated in the 1980s, especially the definition in the United Nations' *Brundtland Report*, emphasizing the coordinated development of economic growth, social progress and environmental protection (Brundtland 1987). This theory provides the foundational framework for this study to explore how to achieve sustainability in the tea industry in the context of urbanization by comprehensively measuring the economic, social and ecological dimensions of the tea industry in Sichuan (Amara et al. 2024). In the context of the Sichuan tea industry, the sustainability theory first sets the goals for the framework at the macro level, i.e., how to promote the long-term development of the tea industry in the face of the challenges of urbanization through the enhancement of green production, environmental protection, and social well-being. This theory provides an important reference for the study to compare other factors, especially how to balance

the needs of each dimension in terms of changing market demand, ecological resource protection, and labor force transformation, thus forming the first level of the framework for the study.

Second, the integration of urbanization theory. With the acceleration of global urbanization, urbanization theory has gradually become an important framework for understanding resource allocation, industrial structure transformation and social change. Urbanization theory mainly explores how urbanization triggers the reorganization and flow of production factors such as land, labor, and capital (Davis 1989). The theory provides an important perspective for the study of the tea industry in Sichuan, especially how to adjust resource allocation to cope with the pressure brought by urbanization when the tea industry is affected by urbanization. This study further refines the "market economy" and "sociocultural" dimensions of the framework through urbanization theory. The theory of urbanization draws our attention to the far-reaching impacts of population mobility, changes in consumption structure, and industrial restructuring on the tea industry. For example, urbanization has driven the flow of rural labor to cities, resulting in a labor shortage in the tea industry. At the same time, with the narrowing of the income gap between urban and rural areas, consumer demand for high-quality, green and healthy tea is also growing, prompting the tea industry to upgrade its products and make technological innovations in the face of changes in market demand due to urbanization. Research shows that new urban consumption patterns and young people's preference for the "new teahouse" culture are driving collaborative innovation between urban and rural industries and promoting the renewal of tea culture (Zhao 2022).

Then there is the combination of green production and eco-modernization theory. Eco-modernization theory emphasizes that socio-economic development should optimize resource utilization and reduce environmental pollution through technological progress and environmental policy innovation (Arhin et al. 2023). The construction of tea plantation ecosystems and the optimization of ecological service values play a positive role in the green transformation of the tea industry in Sichuan (Wang et al. 2023). Technological innovations driven by urbanization, such as water-saving planting

UNIVERSITI KEBANGSAAN MALAYSIA

and organic fertilizer substitution, are also becoming key measures in the construction of eco-tea gardens in Sichuan.

Finally, there is the incorporation of the theory of planned behavior (TPB), which was proposed by Ajzen (1991) and emphasizes that individual behavior is influenced by attitudes, subjective norms, and perceived behavioral control. In the context of urbanization, changes in consumer behavior towards the tea industry are crucial for the sustainable development of the industry. With the advancement of urbanization, significant changes have occurred in the structure of consumer demand, especially in the consumer preference for green and environmentally friendly tea, and consumer attitudes, behavioral norms, and the sense of consumer control all have an important impact on the market performance of the tea industry. By introducing the theory of consumer behavior, we further improve the dimension of "consumer behavior and demand change" in the framework, especially in the context of urbanization, how consumers' purchase intention and behavioral patterns are affected by personal characteristics, consumer attitudes, sociocultural identities, and the sense of consumer control. Social changes in the process of urbanization have led to an increase in consumer preference for green tea, and this change in preference has prompted the tea industry to adapt to the transformation of market demand from production, marketing, and branding, and the change in consumer behavior has become one of the core driving forces for the sustainable development of the tea industry (Iweala & Sun 2022). Studies have shown that consumers have a clear preference for green, sustainable certified tea products, and their consumption behavior is closely related to their education level, sustainability perceptions, and product price sensitivity (Millath & Ali 2019).

With the gradual integration of these four (4) theories, the conceptual framework of this study is gradually deepened and refined. First, the urbanization theory provides the background framework to analyze the macro impacts of urbanization on the Sichuan tea industry, including market demand, labor resources, and land use. Next, the sustainable development theory provides the goal and direction for the study from the overall economic, social and ecological dimensions, emphasizing how the Sichuan tea industry can balance the relationship between the three (3) in the urbanization process. Then, the green production and ecological modernization theory emphasizes the

UNIVERSITI KEBANGSAAN MALAYSIA

importance of eco-technology and green production in the theoretical framework, providing technical paths and innovative strategies for the green transformation of the Sichuan tea industry in the context of urbanization. Finally, the consumer behavior theory focuses on changes at the consumption level, helping the study to understand how to promote the market adaptation and sustainable development of the tea industry through changes in consumer behavior.

Through the gradual introduction and integration of these four (4) theories, the conceptual framework of this study is gradually formed and improved. The framework not only provides multi-dimensional theoretical support for analyzing the sustainable development of the Sichuan tea industry in the process of urbanization, but also provides systematic theoretical guidance for future tea industry policies, technological innovation and marketing. Through the interplay of theories, this study can more comprehensively reveal the challenges and opportunities of the Sichuan tea industry in terms of market demand, social culture, and ecological environment in the context of urbanization, and provide in-depth insights and strategic recommendations for promoting the green transformation and sustainable development of the industry.

2.7 RESEARCH HYPOTHESES

Based on the research objectives and research questions, and drawing on urbanization theory, sustainable development theory, and the theory of planned behavior (TPB), this study proposes the following research hypotheses. To enhance model parsimony and avoid redundancy, the hypotheses focus on the key structural relationships, while specific indicators are incorporated into the measurement model.

2.7.1 Theoretical basis of research effects of urbanization on the sustainable development of the tea industry

This study seeks to test the following hypotheses:

H1: Urbanization has a significant impact on the market-economic dimension of the Sichuan tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

H2: Urbanization has a significant impact on the sociocultural dimension of the Sichuan tea industry.

H3: Urbanization has a significant impact on the ecological-environmental dimension of the Sichuan tea industry.

2.7.2 Theoretical mediating effects of sociocultural and ecological dimensions

This study seeks to test the following hypotheses:

H4: The sociocultural dimension of the tea industry mediates the relationship between urbanization and the sustainable development of the Sichuan tea industry.

H5: The ecological-environmental dimension of the tea industry mediates the relationship between urbanization and the sustainable development of the Sichuan tea industry.

2.7.3 Theoretical effects of consumer behavior on tea consumption intention

This study seeks to test the following hypotheses:

H6: Consumers' behavioral attitudes toward tea consumption have a significant positive effect on their tea consumption intention.

H7: Subjective norms have a significant positive effect on consumers' tea consumption intention.

H8: Perceived behavioral control has a significant positive effect on consumers' tea consumption intention.

UNIVERSITI KEBANGSAAN MALAYSIA

2.8 THEORETICAL MODELLING

2.8.1 Theoretical basis of research on sustainable development of tea industry

a. Triple bottom line theory

With the increasing global resource and environmental constraints and the continuous evolution of social development concepts, sustainable development has become an important guideline for agricultural and rural development policies in various countries. The triple bottom line theory (TBL) of sustainable development, as one of the core theories of this concept, was firstly proposed by John Elkington, an American accountant, in 1994, aiming to break through the traditional development paradigm oriented to a single economic goal, emphasizing that while pursuing economic growth, environmental protection and social equity must be taken into account and balance environmental protection and social equity (Elkington 1997). This theory proposes that the realization of sustainable development depends on the synergistic and balanced development of the three (3) dimensions of economy, society and ecology, and its theoretical framework has been widely used in many fields, such as agriculture, corporate responsibility, regional governance, etc., which has important theoretical value and practical guidance significance.

i. Economic bottom line (EBL)

The economic bottom line emphasizes the achievement of robust growth and wealth creation in the current economic system without sacrificing the ability to utilize resources in the future. For the tea industry, economic sustainability is mainly reflected in the profitability, market competitiveness and farmers' income security of each link in the industrial chain (Van der Werf & Petit 2002). In the context of urbanization, the Sichuan tea industry is facing pressures such as upgrading consumption structure, increasing brand concentration and tight land resources, and enhancing economic resilience has become a top priority to cope with the challenges and achieve sustainable development.

Building an economic bottom line requires the industry to have the ability to supply high value-added products, the ability to dock in diversified markets, and a stable

UNIVERSITI KEBANGSAAN MALAYSIA

value distribution mechanism. For example, by promoting deep processing of tea, tea tourism integration, regional branding and other ways to enhance the product premium ability; through digitalization, e-commerce and other channels to expand market boundaries; through the order of agriculture, cooperative model and other ways to stabilize the distribution of returns to farmers, and to achieve the development of the industry chain sharing.

ii. Social bottom line (SBL)

The social bottom line focuses on the impact of development on people, emphasizing social equity, justice, well-being and cultural heritage (Harris 2000). As a typical "people-oriented" industry, the sustainable development of the tea industry cannot be separated from labor force security, community participation and intangible cultural heritage protection. In the process of urbanization, the rural population continues to migrate to the cities, and the tea areas are facing the risks of an aging workforce and cultural hollowing out, which pose serious challenges to social sustainability.

The construction of social bottom line needs to focus on the inclusiveness of industrial development. On the one hand, it is necessary to guarantee the return of migrant workers to their hometowns to start their own businesses and the return of young people to their hometowns for employment through industrial policies, so as to alleviate the "talent shortage" in the countryside; on the other hand, it is important to pay attention to the revitalization and dissemination of tea cultural resources, so as to strengthen the cultural identity and sense of participation of the local residents. In addition, the enhancement of rural community governance capacity and the establishment of stakeholder consultation mechanisms are also important guarantees for the realization of the sustainable development of the tea industry (Pretty 2003).

iii. Ecological bottom line (EBL)

The ecological bottom line emphasizes that economic activities must operate within the ecological carrying capacity and maintain the integrity and regenerative capacity of the ecosystem. As an agricultural industry dependent on natural resources, the development of the tea industry is highly dependent on the homeostasis and sustainability of the

UNIVERSITI KEBANGSAAN MALAYSIA

ecological environment, such as soil fertility, water supply, and biodiversity (Tilman et al. 2002). However, under the pressure of urbanization and expansion, the land encroachment and ecological space of tea plantations have been squeezed, and the abuse of pesticides and fertilizers, soil erosion and other phenomena have also aggravated the ecological burden.

Ecological sustainability requires both source control and systematic management. Promoting the application of green production technologies, such as pollution-free planting, organic certification, and the construction of ecological tea gardens, is a key path to improve ecological performance (Zhou et al. 2017). At the same time, an ecological responsibility system covering the whole chain of planting, processing and marketing should be established to promote the joint responsibility of ecological protection between enterprises and farmers, so as to realize the benign cycle of "promoting quality with ecology and enhancing value with quality".

iv. Triple bottom line synergy and the path to sustainable development of the tea industry

TBL theory emphasizes that the economic, social and ecological triple bottom line does not exist in isolation, but is a unity of mutual constraints and mutual promotion. In the development process of Sichuan tea industry, it is necessary to take into account the relationship between the three (3), to achieve the following synergistic goals: economic growth cannot be sacrificed at the expense of ecology, should be shifted to green, intensive growth path; social equity is a guarantee mechanism for economic development, should be through the institutional design of the industry to achieve the sharing of dividends.

Environmental protection needs to be embedded in the market mechanism and social behavior, to realize the ecological value of manifestation and industrialization. In actual governance, the triple bottom line can be promoted in the tea industry through the construction of a multi-principal co-management mechanism, the development of ecological industry model, and guide the consumer side of the green cognition and other ways to implement.

UNIVERSITI KEBANGSAAN MALAYSIA

v. Analysis of the coupled relationship between the triple bottom line and urbanization

Urbanization is not only an important symbol of the social development process, but also profoundly reshapes the resource allocation, market structure, ecosystem and human-land relationship of the agricultural industry. In this context, the coupled analysis of the triple bottom line theory and the urbanization process can help to reveal the multidimensional impacts and regulatory mechanisms of urbanization on agricultural sustainability.

1. The interactive mechanism of urbanization and economic bottom line. Urbanization promotes the upgrading of regional economic structure and changes in consumption patterns, bringing broad market space and investment opportunities for the tea industry. On the one hand, the high-end consumption structure drives the development of branding and functionalization of the tea industry, and promotes the supply of high value-added products; on the other hand, the improvement of policies and regulations, infrastructure and technological development level provides institutional safeguards and technical support for the tea production, processing and logistics circulation, which reduces the transaction costs and improves the efficiency of the industry (Zhao 2023). However, urbanization has also brought challenges such as accelerated land turnover and rising operating costs, placing higher demands on the operational capacity of small and medium-sized tea enterprises and small farmers (Li et al. 2016).

2. The interaction between urbanization and the social bottom line. In the process of urbanization, population migration and labor force transfer make the main tea producing areas face the structural problem of “people leaving the tea is not ripe”. The massive exodus of young and middle-aged laborers has led to the sloppy management of tea gardens, the risk of losing the traditional tea-making techniques, and the deconstruction of social organization structure, which also poses a threat to the inheritance of tea culture (Zhu 2024). At the same time, urbanization has raised the education level and health awareness of the population, making consumers pay more attention to the cultural connotation and social responsibility of tea products, and forcing tea enterprises to

UNIVERSITI KEBANGSAAN MALAYSIA

strengthen cultural construction and social communication (Ji 2024). Therefore, the impact of urbanization on the social bottom line has both negative pressures and provides opportunities for positive guidance.

3. The path of urbanization's impact on the ecological bottom line. Urban expansion inevitably impacts the land use structure and ecological spatial pattern, and the ecological environment of tea plantations faces the risk of erosion and fragmentation. At the same time, intensive cultivation and market-oriented production can easily lead to pesticide and chemical fertilizer dependence, ecological imbalance and other problems, challenging the ecological bottom line (Han et al. 2007). On the other hand, with the tightening of policies and regulations, the popularization of green consumption concepts, urbanization has also led to an increase in the demand for green, organic and ecological products, which provides an external driving force for the tea industry to implement green cultivation and sustainable certification (Zhong et al. 2024). Therefore, a coupled feedback mechanism of pressure-response-regulation is formed between the ecological bottom line and urbanization, as shown in Figure 2.6, in which the urbanization factor acts on the economic, social, and ecological triple bottom line through a multidimensional driving mechanism, and each bottom line regulates each other, which jointly shapes the performance of the tea industry's sustainable development.

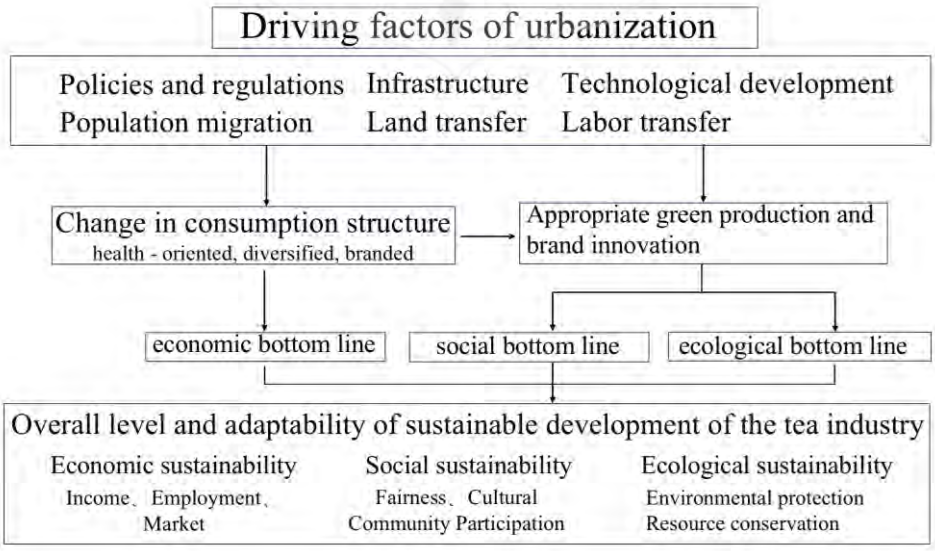

Figure 2.6 Pathways of urbanization impacts on ecological floors

UNIVERSITI KEBANGSAAN MALAYSIA

The triple bottom line theory provides this study with evaluation dimensions and governance logic for the sustainable development of the tea industry, which not only clarifies the three (3) core criteria for measuring sustainability, but also provides a systematic perspective for analyzing the impact of urbanization on the tea industry. Under the guidance of this theory, this study can start from the three (3) dimensions of economy, society and ecology in the context of urbanization, explore how the pressure of urbanization is transmitted to the tea industry system, and the formation path of the response mechanism of each dimension, so as to lay a solid theoretical foundation for the construction of a sustainable tea industry development model with Sichuan characteristics.

b. Theories of urbanization

Urbanization, as a socio-economic process, generally refers to the phenomenon of population migration from rural to urban areas, accompanied by the expansion of urban areas, the development of infrastructure, and the transformation of social structures. According to the *Brundtland Report* (1987), urbanization is not just the aggregation of people, but also the coordinated development of economic, environmental, and social aspects. During urbanization, agricultural transformation, industrial upgrading, and lifestyle changes have profound effects on society and the environment.

1. Economic urbanization. This concept focuses on the role of economic development in driving urbanization. Economic urbanization promotes urban expansion through the concentration of resources, development of modern industries, and increased productivity. The sustainable development of Sichuan's tea industry is a typical example where urbanization has brought about changes in market demand, opportunities for technological innovation, and the expansion of industrial chains.

2. Social urbanization. Social urbanization refers to the migration of population from rural to urban areas, primarily manifested in the gradual reduction of urban-rural disparities and the transformation of social structures. As social urbanization progresses, cultural identity and lifestyle in rural areas are affected, promoting cultural exchange and integration. For instance, in the context of

UNIVERSITI KEBANGSAAN MALAYSIA

urbanization, Sichuan's tea industry faces not only production model transformation but also the need to focus on protecting and passing down tea culture.

3. Environmental urbanization. Environmental urbanization focuses on the impact of urban expansion on the natural environment. Urbanization often leads to changes in land use, resource depletion, and ecological pressures. In the tea industry, as urbanization progresses, the ecological environment of tea gardens faces challenges like land loss and pollution. Therefore, balancing economic growth with environmental protection has become an important issue for the sustainable development of the industry.

4. Cultural urbanization. Cultural urbanization focuses on the role of culture in the urbanization process, emphasizing how cultural inheritance and innovation are reinforced in the process. In the tea industry, cultural identity and the inheritance of local tea culture are key factors in driving industry upgrading and market expansion. As urbanization accelerates, tea culture is not only spread domestically but is also gaining international recognition, enhancing the global influence of tea culture.

i. China's urbanization development

As China's economy develops and its national power grows stronger, the realization of China's traditional dualistic social structure to a monistic modernization structure becomes a major historical task. Urbanization, on the other hand, is a necessary way to break down the dualistic social structure to achieve a fair and just one-dimensional social structure. In recent years, the CPC Central Committee and the State Council have attached great importance to the issue of urbanization. For example, the National New Urbanization Plan (2014-2020) emphasizes the new path of people-oriented, urban-rural integration and green ecology, and the equalization of public services and farmers' citizenship, which is an important transition of urbanization policy from "quantity-oriented" to "quality-oriented" (Rohland et al. 2014). In the process of urbanization, policies such as land reform, infrastructure investment and industrial development have continued to promote urban agglomeration and facilitate the orderly transfer of rural populations. For example, since 2000, urban agglomerations and county cities have

UNIVERSITI KEBANGSAAN MALAYSIA

become the main carriers of agricultural migrants through national key strategies such as the “urban agglomeration development strategy” and the “small and medium-sized city-led development strategy” (Choi et al. 2013). In addition, China’s urbanization has been accompanied by large-scale population migration and institutional changes, including the reform of the household registration system and the equalization of basic services in cities and towns, which are widely regarded as the key institutional support for the realization of “fair and shared urbanization” at the current stage (Zhang 2008). From the perspective of spatial structure, China’s urbanization is not only limited to the expansion of first-tier cities, but also actively promotes the development of towns and cities in the central and western regions to achieve the goal of spatial equilibrium on a nationwide scale, and this “urbanization path with county towns as the important carrier” is also receiving increasing policy encouragement and academic attention (Brakman et al. 2016). In order to ensure the coordinated development of urbanization with ecological environment and social equity, the state has also put forward the three (3) policy pillars of “green, inclusive and intensive” in the process of new-type urbanization, and explicitly proposed in the 14th Five-Year Plan that it should “... improve the modernization level of urban construction and governance” (2021: 62). In the 14th Five-Year Plan, it is explicitly stated that “the level of modernization of urban construction and governance should be improved”, laying the institutional foundation for high-quality urbanization (Li & Piachaud 2006).

Finally, under the strong support of the state, the development of urbanization in China has made great progress, the urbanization rate has exceeded 65% by the end of 2022, and the urbanization rate of 13 provinces in the country has exceeded the national average, detailed data are shown in Figure 2.7.

UNIVERSITI KEBANGSAAN MALAYSIA

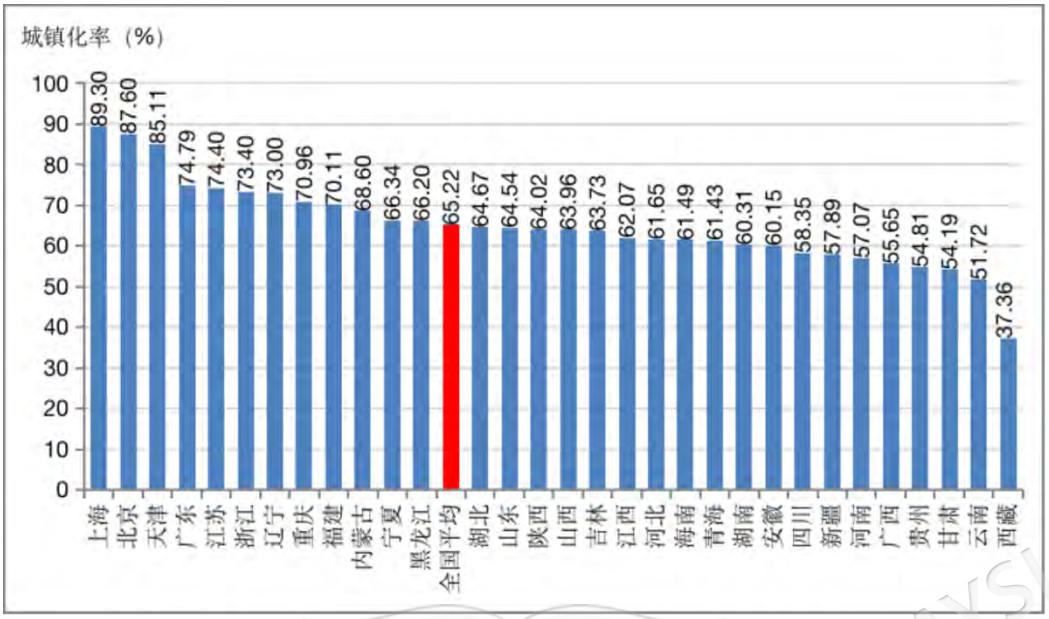

Figure 2.7 Urbanization rate of 13 provinces in the country in 2022

Although there is still a gap between China's urbanization rate and that of developed countries in Europe and the United States, China's urbanization has great potential and its development rate is among the highest in the world. According to the data of 2022, 92.7% of China's GDP was created by non-agricultural industries, i.e. secondary and tertiary industries, but the proportion of the employed population in secondary and tertiary industries only accounted for 62.6%, which illustrates that China's non-agricultural industries have increased their proportion of GDP, but the rate of urbanization is still lower than that of the level of industrialization and economic urbanization. This situation is closely related to the historical process of China's development, especially after the reform and development, this situation is getting better and better, and China's urbanization rate is still advancing at a faster rate. The problems facing China's urbanization are no longer the traditional problems such as slow speed and low level, but the quality of urbanization that has emerged after a high degree of economic development. It can be seen from the overview of the above problems that China's urbanization is developing relatively fast at the present stage, but the development of population, economy, society and spatial urbanization is uncoordinated, all kinds of urban diseases occur frequently, the quality of urbanization needs to be improved urgently, and taking the road of high-quality, connotative development of urbanization has become an important problem facing the development of China's urbanization.

UNIVERSITI KEBANGSAAN MALAYSIA

ii. Development of urbanization abroad

Throughout the history of urbanization in the world, developed countries such as Europe and the United States were the first regions to begin industrialization and urbanization, and the first to realize the transition from an agricultural society to a modern society. Although these regions in the process of urbanization.

Numerous problems have also arisen, but they have made notable achievements in industrialization and urbanization.

There are a number of valuable lessons to be learned from our country's experience. The starting stage of urbanization in developed countries began in the middle of the 17th century to the middle of the 18th century, and although cities appeared at an early stage, they appeared in the true sense of the word during this period. Because the industrial revolution began in Britain in 1760, and by the end of the industrial revolution in 1850, the urbanization rate of Britain had exceeded 50%, Britain was one of the first countries to realize industrialization and urbanization, and its urbanization rate had exceeded 80% in the mid-19th century, setting a model of urbanization for other countries (Okamoto 2019).

With the advance of the Industrial Revolution, the number of towns and cities in the United Kingdom surged, and it was the first country to realize the transition from an agrarian society to an industrial society. However, the United Kingdom was the only country that achieved urbanization during this period, while urbanization in other countries was still in its infancy. After the middle of the 18th century, urbanization began to spread in developed countries. Inspired by the miracle of the industrial revolution in Britain, other countries in the world followed suit and began the process of large-scale functional industrialization. The Second Industrial Revolution was carried out on a large scale in the developed countries of Europe and America, such as Britain, France, the United States, Germany and other regions, where new types of industries, such as the electrical industry, the petroleum industry, and the iron and steel industry, prospered rapidly and greatly enhanced the speed and scale of the urbanization process. In the middle of the 19th century, the urbanization rate of the United Kingdom

UNIVERSITI KEBANGSAAN MALAYSIA

was close to 80%, the United States reached 64%, France also reached 55%, and the urbanization rate of Japan was close to 50%. From the middle of the 19th century to the present, it is the mature development period of urbanization in developed countries. The Third Scientific and Technological Revolution started from the United States of America and set off a new round of urbanization centered on high technology such as computers etc. The developed countries have all entered into the mature stage of urbanization rate after the 1980s, and the urbanization rate in these countries is still advancing with a relatively small rate of increase. At the same time, these regions have continued to improve the quality of urbanization, and have coordinated the integrated development of urban and rural areas through innovations in urban governance models, re-urbanization and other measures, so that the structure of urbanization has continued to improve, and the quality of urbanization has continued to rise.

In 2022, the global urbanization rate reaches 57.1%, with North America's rate at 82.4% and Europe's at 75.3%, both higher than the global average. In 2022, the UK and Japan's urbanization rates are 83.8% and 92.1%, respectively, and remain two (2) of the highest in the world. China's urbanization rate is 65.2%, up from 2015 by 6.7 percentage points, making it one of the fastest-growing countries in the world in terms of urbanization. In 2022, India's urbanization rate was 35.7%, 1.6 percentage points higher than in 2015, but still lower than the global average. While the urbanization rate is rising, these regions are focusing on high-quality development of urbanization, and are continually improving their urbanization development model through new initiatives such as industrial upgrading, spatial planning, and social governance, making it possible to achieve the highest urbanization rate in the world. Through industrial upgrading, spatial planning, social governance and other new initiatives, these regions have improved their urbanization development mode, effectively alleviated urbanization problems, and achieved sustainable development of urbanization. At present, the urbanization of developed countries has basically achieved high-quality urbanization in harmony with developed economies, networked spatial patterns and livable and friendly living environments.

UNIVERSITI KEBANGSAAN MALAYSIA

Developed economy

The urbanization process in developed countries is highly dependent on the transformation of the service industry structure, and productive services and high-end knowledge-based services have become the key factors driving urban development (Jähnke 2002). In developed countries, cities and towns have prosperous economies, rational industrial organizations, and tertiary industries such as high-tech and service industries dominate, and these regions have basically realized the transformation of industrial structure from "two, three, one" to "three, two, one". According to the *World Development Indicators 2010 Report* issued by the World Bank, the value-added of the service industry in developed countries in Europe and America, such as the United States, the United Kingdom, France, etc., accounted for 78.90%, 80.40% and 79.60% of the GDP, respectively. From the viewpoint of the internal structural composition of the service industry, such industries as finance, insurance, securities, law, counseling and entertainment occupy a dominant position, and the productive service industry has become a pillar industry in these countries. Developed countries have formed an urbanization system dominated by service industries and high-end manufacturing industries, which are characterized by high value creation, high quality requirements for employees, strong dependence on science and technology, and low energy consumption. It is these characteristics that make the urbanization of these regions form a benign interactive cycle, with industrial characteristics continuously gathering high-level talents, and high-level talents enhancing the creativity and vitality of cities.

Through the adjustment of industrial structure, cities in developed countries have formed a more developed economic and industrial structure, developed strong urban competitiveness, occupied a strong voice, and generally have higher per capita income. According to the statistics of the *Global Competitiveness Report*, the top ten cities in the global ranking of national industrial competitiveness in 2022 are Singapore, Switzerland, Denmark, the Netherlands, Sweden, Germany, Hong Kong, Japan, Finland and the United States. There are four (4) cities in the United States (New York, San Francisco, Boston and Los Angeles), while major cities in Europe and Asia also occupy a share, such as London, Paris, Tokyo and Seoul.

UNIVERSITI KEBANGSAAN MALAYSIA

Networked spatial patterns

In terms of spatial structure, developed countries have experienced the evolution from urban centers to polycentric network structure, forming a networked pattern of suburbanization and city clusters (Sohn, Hewings & Kim 2004). Through continuous development and upgrading, urbanization in developed countries has completed the evolutionary development of the spatial structure and pattern system of urbanization, forming a certain scale of national or regional large-scale urban clusters or large-scale spatial structure of urban clusters. After experiencing the centralized development of urban cores, these areas began the process of suburbanization. With the improvement of urban policies, these large-scale urban clusters have gradually formed a spatial networked structure of multi-centers and multi-poles that are interconnected and influenced by each other through continuous evolution and development. The evolution of urban spatial structure is not only a spatial projection of economic behavior, but also reflects the fundamental transformation of governance mechanism and production mode (Sun 2014). The "Satellite Map of Earth's Nighttime Light Distribution" produced by NASA's Earth Observatory based on the Suomi National Polar-orbiting Partner Satellite can be used to better analyze the current status of large-scale urban development and economic prosperity around the world. On the one hand, the shining lights of the Earth at night directly reflect the level of local industrialization and urbanization; on the other hand, it also partly reflects the concentration and distribution of the world's population. On this basis, the spatial structure of cities and urban clusters as well as the evolution of network patterns are analyzed, so as to find out the development and spatial layout gaps of global urban development clusters. The night lighting map of the relevant areas is shown in Figure 2.8.

UNIVERSITI KEBANGSAAN MALAYSIA

Figure 2.8 Satellite map of earth's nighttime light distribution

As can be seen in Figure 2.8, North America, Europe, and northeastern Asia are the regions with the brightest and most balanced distribution of lights at night, which shows that these regions have indeed developed an evolution of urban spatial patterns.

Livable and friendly living environment

Spatial governance has played a key role in the urbanization process in developed countries, emphasizing the promotion of high-quality urban development through cross-sectoral synergies (Özogul 2019). In 2022, the distribution of PM2.5 concentration values globally is shown in Figure 2.9. It can be seen that air quality in developed countries in Europe and the United States is still relatively good, while the air quality of a number of countries and regions in Asia, Africa, and South America is still poorer, which is inextricably linked to the environmental governance of regional urbanization. The environmental problem of global urbanization is a complex and urgent challenge, which involves many aspects such as climate change, energy consumption, pollution emission, resource utilization and ecological protection. According to United Nations' report, the global urbanization rate has reached 57.1% and is expected to reach 68% by 2050. Cities consume 78% of the world's energy and emit more than 60% of greenhouse gases. Urban dwellers also face a variety of environmental problems such as air pollution, water pollution, waste disposal, traffic congestion, etc., which affect people's health and quality of life. In order to address the environmental problems of global urbanization, it is necessary for governments, social organizations, businesses and citizens to work together to take a series of policy measures and actions to promote green and low-carbon development, improve the adaptive capacity and resilience of cities and achieve the goal of sustainable development.

UNIVERSITI KEBANGSAAN MALAYSIA

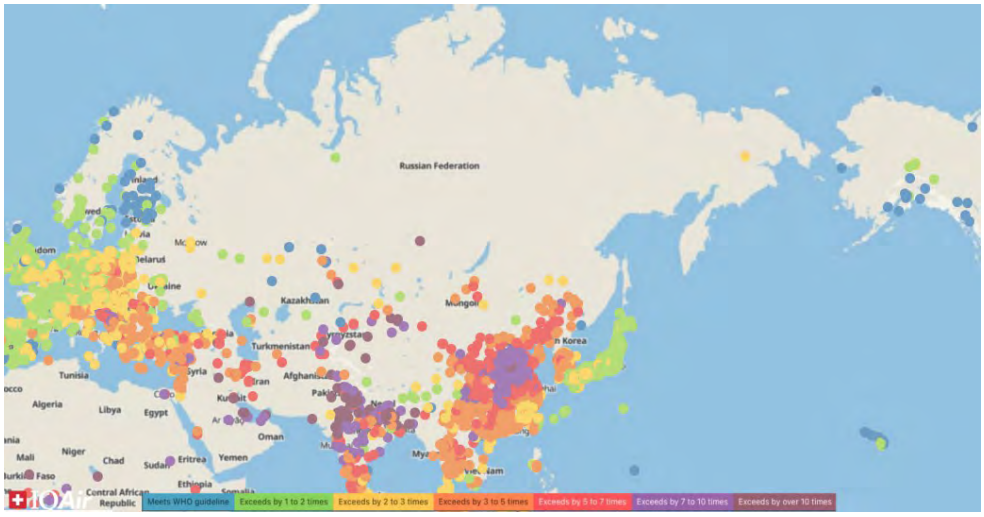

Figure 2.9 Global distribution of PM 2.5 concentration values

c. Foreign urbanization patterns

i. Western European urbanization model

The urbanization of Western Europe, primarily exemplified by Germany, France, and the United Kingdom, represents a large-scale, government-led process of rural-to-urban population concentration. The fundamental driving force behind Western European urbanization was the Industrial Revolution. Under government organization, this process involved systematic and planned arrangements that gradually relocated rural populations to urban areas. The gradual transfer of rural populations to live in cities under organized and planned planning. The Western European model of urbanization emphasizes government leadership, a process that began with the Industrial Revolution, and guides rural-urban migration through the government's organized promotion of infrastructure and policy planning. This development model has been widely practiced in Europe, which has brought about orderly urban expansion and reshaping of social structure (Nilsson 2011), but at the same time, it has also exposed problems such as aging population and increasing fiscal pressure (Hudson & Pinder 1991). Under this urbanization model, urbanization in Western Europe mainly has the following characteristics: the government is the main driving force of urbanization and the maker of urbanization planning, and the government's decision determines the scale and speed of urbanization; a large number of urbanization bills have been enacted during the process of urbanization, which effectively promotes the development of regional urbanization; under the guidance of the government, the infrastructure of towns and

UNIVERSITI KEBANGSAAN MALAYSIA

cities has been constructed in a good and orderly way, and medical care, education, and industry have been developed in a coordinated manner. However, this government-led urbanization model also has some drawbacks, such as the lack of market economic development, the lack of vitality of domestic demand, the aging of the population, and the heavy burden on the government, which hinder the development of regional urbanization.

ii. American urbanization model

In contrast, the urbanization model of the United States is dominated by market mechanisms. The "westward movement" and the Industrial Revolution in the United States have promoted the rapid development of its urban system, and urbanization has been deeply coupled with industrial development, forming an urban pattern with complementary industries and diverse functions (Sloan 2012). However, in recent years, urbanization in the United States has shown a trend of "counter-urbanization", which manifests the problems of weak government regulation, widening social gap and waste of resources, etc. (Brenner 2004).

Since the development of the United States, 51 states have formed more distinctive industrial characteristics, and the economic and industrial complementarity between regions is strong. Driven by the development of industries, distinctive and functionally complementary types of urbanization have been formed. Driven by economic and industrial development, the urbanization of each region has been strongly promoted, with urban infrastructure continuously improved and more high-tech industrial bases with reasonable layout and larger scale formed. Inter-regional factor flow is convenient, resource allocation is efficient, and inter-regional cooperation and exchange capacity is strong. However, this development model also has certain drawbacks, that is, the urbanization development planning is not coordinated with the actual demand, and the development of regional urbanization is more obviously affected by the economy and industry, which leads to the close correlation between regional urbanization and economic development. Especially in the 21st century, the United States has shown a more obvious tendency of reverse urbanization. In the economy-led urbanization development mode, the government's insufficient ability to guide the

UNIVERSITI KEBANGSAAN MALAYSIA

development has caused many problems such as excessive suburbanization, increasing gap between the rich and the poor, and waste of resources.

iii. Japanese urbanization model

Japan's urbanization is characterized by a "concentric circle" model in which the development of small and medium-sized cities is driven by the radiation of large cities. This model has realized the optimal allocation of population and resources between urban and rural areas (Adam & Fritzsche 2012), but it has also brought about side effects such as "big city disease", excessive concentration of resources and environmental pollution (Mokyr 2003). Japan's urbanization began in the 1960s and has developed into three (3) major urban agglomerations with Tokyo, Nagoya and Osaka as the core, forming the most densely populated areas in Japan. Japan's urbanization pattern is based on the concentric circle development pattern with big cities as the core and small and medium-sized cities as the periphery, and the density of population is gradually dispersed from big cities to peripheral cities, spreading the radiation effect of the central city through the layers of big cities, small and medium-sized cities, small towns and villages, and driving the development of peripheral urbanization. This model better solves the problem of urban-rural integration, realizes the efficient allocation of human resources and improves the intensive utilization of land. However, this model has also aggravated the development of many "urban diseases" in large cities, increased the living standards of urban residents, over-concentration of urban resources, severe urban environmental problems, and many restrictions on regional economic development, hindering the healthy development of urbanization.

iv. Differences in urbanization at home and abroad

1. Similarities between Chinese and foreign urbanization. Urbanization is an important symbol for measuring the level of national development and an important means for integrating resources to realize the rapid development of regional economy. Although there are differences in the specific process of urbanization, the basic understanding and concepts of urbanization are common to all countries, therefore, China's urbanization development has some common features with that of other countries. Firstly, both China and other countries pay

UNIVERSITI KEBANGSAAN MALAYSIA

attention to the high-quality development of urbanization and the role of urbanization in promoting the regional economy and industries, and strive to realize the efficient development of urbanization in a scientific and reasonable way, giving full play to the central role of urbanization (Maimaitiming & Cao 2010). Secondly, both China's urbanization and that of other countries emphasize the coordinated development of economy, government, technology, talents, capital and other factors, and the integration and intensification of resources to ultimately achieve the effect of efficient utilization. Finally, both China and other countries emphasize the role of government regulation and guidance in the process of urbanization, and achieve the development goals of regional urbanization through effective government policies, planning, constraints and guidance (Deng et al. 2013).

2. Differences between Chinese and foreign urbanization. Although the ultimate goal of urbanization is the same in all countries, the development of urbanization in different countries has typical and unique characteristics due to the fact that the actual development situation of each country is very different, and urbanization is a complex systematic project involving various aspects such as politics, law, environment, economy and humanities. Firstly, China's urbanization process is guided by the theory of socialism with Chinese characteristics, and the Chinese government's policy making has long-term planning and continuity, which makes China's urbanization-related policies more coordinated and continuous, and can effectively integrate resources to promote the coordinated development of urbanization (Zhang 2002). Secondly, China has a profound history and culture of 5,000 years, forming unique cultural traditions, which makes urbanization in China culturally different from that in other countries. In addition, there are also differences in the driving mechanism of urbanization: urbanization in Europe and the United States started earlier with the development of the industrial revolution, while urbanization in China is more driven by the transfer of surplus rural labor to the cities (Han & Qin 2005). Against this background, urbanization is more likely to advocate new age concepts such as modernity, harmony, sharing, and greenness, and at the same time pay more attention to the sense of identity with traditional Chinese culture.

UNIVERSITI KEBANGSAAN MALAYSIA

Finally, the basic driving force of urbanization is different between China and foreign countries. In Europe and America, urbanization was initiated by the Industrial Revolution, and economic development and urbanization are basically synchronized. The urbanization in China is mainly due to the transfer of rural surplus labor force, which directly drives the development of urbanization in China, which also leads to a series of problems such as excessive population density and over-concentration of resources in some of China's cities, and needs to further promote the urbanization process to meet the needs of social development.

d. Global tea industry and development prospects

The global tea industry has shown steady growth and broad development prospects. According to industry reports, the global tea market was valued at approximately USD 17.4 billion in 2024 and is projected to reach around USD 24.6 billion by 2030, expanding at a compound annual growth rate (CAGR) of about 6.0% from 2025 to 2030, driven by increasing consumption of both traditional and specialty teas worldwide (Grand View Research 2025). Furthermore, global tea production continues to rise year-on-year, with significant contributions from key producing countries such as China, India, and Sri Lanka — together determining global supply and trade dynamics (FAO 2021).

Within this broader context, Sri Lanka's tea industry plays a strategic role in the global tea trade, historically known for its high-quality black tea exports and recognized brands such as Dilmah and Akbar Tea. Despite facing structural challenges such as declining export share, labor shortages, climate variability, and fluctuating prices, several analyses suggest that with strategic innovation, diversification, and export market development, Sri Lanka's tea sector can maintain competitiveness and aspire to global leadership by 2030. For example, combining industry analysis with stronger value chain management and sustainability practices may help the Sri Lankan tea industry sustain its global position, even amid external pressures such as international competition and climate challenges (Ceylon Today 2025).

UNIVERSITI KEBANGSAAN MALAYSIA

Overall, the global tea industry including both traditional tea-exporting countries like Sri Lanka and emerging markets is expected to continue offering growth opportunities, particularly in segments such as specialty and green teas, supported by rising health consciousness, evolving consumer preferences, and digital marketing innovations (Grand View Research 2025; QY Research 2025). These trends not only underline the importance of global context in understanding tea industry sustainability, but also highlight potential lessons and comparative insights for studies on regional tea sectors, such as Sichuan's, under processes like urbanization and market transformation.

2.9 CHAPTER SUMMARY

This chapter provides a solid theoretical foundation and analytical framework for this study by systematically combing domestic and international research results related to urbanization, tea industry and sustainable development. First, in terms of urbanization research, the far-reaching impacts of urbanization on multiple dimensions such as agriculture, culture and economic structure are reviewed, and it is made clear that the urbanization process is not only a shift in population migration and spatial structure, but also a process of deep-level reconstruction of economic forms, social behaviors and environmental systems. Second, the study on Sichuan tea industry reveals the opportunities and challenges faced by the tea industry in the context of urbanization from the perspectives of tea production, brand building, and tea culture dissemination. Third, based on the triple bottom line theory, this chapter divides sustainable development into three (3) dimensions: economic, social and ecological. Taking into account the actual situation of the tea industry in Sichuan, this chapter explores in detail the coupling between economic sustainability (e.g., industrial profit and market competitiveness), social sustainability (e.g., cultural heritage and community well-being) and ecological sustainability (e.g., green production and ecological protection).

In addition, this chapter constructs the theoretical framework of structural equation modeling (SEM), which is closely related to this study, and explicitly proposes nine (9) sets of research questions and their corresponding research hypotheses to provide logical support for the subsequent empirical research. Urbanization is

UNIVERSITI KEBANGSAAN MALAYSIA

introduced as an exogenous variable in the theoretical model to explore its direct and indirect impacts on the sustainable development of the tea industry through the triple path of market economy, social culture and ecological environment.

In summary, Chapter 2 not only lays a comprehensive theoretical support and logical path for this study, but also reveals the gaps in the current research on the interaction mechanism between tea industry and urbanization, which provides a strong basis for the research design and model construction in Chapter 3.

UNIVERSITI KEBANGSAAN MALAYSIA

CHAPTER III

METHODOLOGY

3.1 INTRODUCTION

This chapter presents the methodological framework adopted in this study to investigate the impact of urbanization on the sustainable development of the tea industry in Sichuan Province. In line with the research objectives and research questions outlined in Chapter 1, the chapter explains how the study is designed to systematically examine the economic, sociocultural, ecological, and consumer-behavioral dimensions of sustainability within the context of rapid urbanization.

To address the complexity and multidimensional nature of the research problem, this study adopts a mixed-methods research approach, integrating quantitative and qualitative methods. Quantitative techniques are employed to test hypothesized relationships among key variables derived from the conceptual framework, while qualitative methods are used to explore underlying mechanisms, contextual dynamics, and stakeholder perspectives that cannot be fully captured through numerical data alone. This methodological integration enables both empirical validation and in-depth interpretation of the research findings.

Specifically, this chapter introduces the research paradigm, research design, and research approach, followed by a detailed description of the data collection procedures, including questionnaire surveys and semi-structured interviews. The chapter then explains the measurement instruments, variable operationalization, and data analysis techniques, with particular emphasis on structural equation modeling (SEM) and qualitative thematic analysis. Issues of reliability, validity, and data verification are

UNIVERSITI KEBANGSAAN MALAYSIA

subsequently addressed to ensure the rigor and credibility of the research. Ethical considerations and methodological limitations are also discussed.

3.2 RESEARCH PARADIGM

This study adopts a mixed research paradigm, integrating elements of positivism and interpretivism, to comprehensively examine the impact of urbanization on the sustainable development of the tea industry in Sichuan Province. The complexity of the research problem—spanning economic transformation, sociocultural change, ecological sustainability, and consumer behavior—necessitates a pluralistic epistemological stance that allows both empirical testing and contextual interpretation.

From a positivist perspective, the study employs quantitative methods to examine structured relationships among key variables, including urbanization indicators, market economy factors, sociocultural dimensions, ecological conditions, and consumer behavioral intentions. Statistical techniques such as structural equation modeling (SEM) and regression analysis are used to test hypothesized relationships and mediating effects, enabling objective measurement and generalization of findings.

At the same time, the study is informed by an interpretivist paradigm, recognizing that consumer behavior, cultural identity, and industrial transformation are embedded in specific social and cultural contexts. Qualitative methods, including semi-structured expert interviews and enterprise-level investigations, are therefore employed to explore underlying mechanisms, contextual dynamics, and actor perceptions that cannot be fully captured through quantitative data alone.

By integrating these two (2) paradigmatic perspectives, the study follows a mixed-methods research paradigm that emphasizes methodological complementarity and triangulation. Quantitative analysis provides empirical validation of structural relationships, while qualitative inquiry deepens theoretical understanding by revealing the mechanisms through which urbanization reshapes consumption behavior and sustainability pathways in the tea industry. This paradigm is particularly suitable for research on sustainable cultural industries, where economic, ecological, and cultural dimensions intersect and mutually influence one another.

UNIVERSITI KEBANGSAAN MALAYSIA

3.3 STUDY DESIGN

This study adopts a mixed-methods research design to systematically examine the multidimensional impact mechanisms of urbanization on the sustainable development of the tea industry in Sichuan Province. Given the complexity of the research problem—spanning economic, sociocultural, ecological, and consumer-behavioral dimensions—a single methodological approach would be insufficient to capture both structural relationships and contextual mechanisms. Therefore, this study integrates quantitative and qualitative methods to enhance analytical rigor, explanatory depth, and empirical validity.

3.3.1 Overall research design framework

The overall research design is organized around the research questions (RQs) proposed in Chapter 2 and structured into two (2) interrelated analytical modules:

a. Module 1: Urbanization and Sustainable Development of the Tea Industry, focusing on how urbanization factors influence the economic, sociocultural, and ecological dimensions of sustainability.

b. Module 2: Consumer Behavior and Sustainable Development, examining how consumer attitudes, subjective norms, and perceived behavioral control influence tea consumption behavior and, in turn, industrial sustainability.

The research process follows a sequential mixed-methods design (QUAL → QUAN), supplemented by partial concurrent validation. Qualitative methods are primarily employed in the exploratory and variable refinement stages, while quantitative methods are used in the hypothesis testing and structural modeling stages.

3.3.2 Mixed-methods design logic

1. Sequential exploratory design. This study mainly adopts a sequential exploratory mixed-methods approach, consisting of the following stages:

UNIVERSITI KEBANGSAAN MALAYSIA

a. Stage 1: Qualitative exploration and variable identification. Expert interviews, Delphi surveys, and practitioner pre-surveys are conducted to identify key urbanization indicators, sustainability dimensions, and consumer-behavior variables relevant to the Sichuan tea industry context.

b. Stage 2: Quantitative measurement and hypothesis testing. Based on the refined variables, structured questionnaires are designed and administered to industry practitioners, consumers, and local stakeholders. Quantitative techniques such as factor analysis, regression analysis, and structural equation modeling (SEM) are then applied to empirically test the proposed hypotheses and causal pathways. This sequential design ensures that quantitative models are theoretically grounded and context-sensitive, rather than purely data-driven.

2. Complementarity between qualitative and quantitative methods. Qualitative and quantitative methods in this study are complementary rather than parallel: qualitative data support conceptual clarification, indicator refinement, and mechanism interpretation; quantitative data provide statistical validation, effect size estimation, and generalizability of findings. Together, they form an integrated analytical framework that links theoretical constructs, empirical evidence, and real-world practices.

3.3.3 Research design corresponding to research questions

To ensure methodological coherence, each research question is explicitly matched with appropriate research tools and analytical techniques (as summarized in Table 3.1 and Table 3.2.).

Table 3.1 Research design based on research questions

Serial Number	Research Question (RQ)	Research Design Tools Used	Data Analysis Methods
RQ1 RQ2 RQ3	▪ Do urbanization factors significantly affect the level of sustainable development of the tea	▪ Delphi expert survey method ▪ Questionnaires	▪ Descriptive statistical analysis ▪ Factor analysis

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

	industry in Sichuan? ▪ (Urbanization indicators → market economy, sociocultural, ecological environment)	▪ (practitioners, local government officials)	▪ Structural equation modeling (SEM) path analysis
RQ4 RQ5	▪ How do different urbanization variables (e.g., policies and regulations, infrastructure, technological development, population migration, etc.) differ in their impacts on the triple-bottom-line (economic, social, and ecological) dimensions of the tea industry during the urbanization process?	▪ Semi-structured interviews ▪ Questionnaires (distributed on a zonal basis)	▪ Multi-cohort validation factor analysis (MCFA) ▪ Comparison of structural equation paths
RQ6	▪ Do consumers' behavioral attitudes have a significant positive effect on their tea consumption behavior?	▪ Questionnaire (consumer) ▪ Reference to TPB model scale	▪ Regression analysis ▪ Structural equation modeling (SEM)
RQ7	▪ Do behavioral attitudes mediate the relationship between the following variables and tea consumption behavior? I. Level of tea awareness II. Perceived quality of tea III. Social influence IV. Evaluation of tea safety V. Perceived behavioral control	▪ Questionnaires (consumers) ▪ Expert interviews to aid refinement of variables	▪ Mediation effects test (Bootstrap) ▪ SEM path analysis
RQ8	▪ Do gender, age, and level of urbanization moderate the relationship between the following variables and consumption attitudes? I. Social influence → consumption attitude II. Perceived safety of tea → consumption attitude III. Perceived behavioral control → consumption attitude)	▪ Questionnaire surveys (stratification of consumer samples)	▪ Multi-group SEM modeling analysis (Multi-group SEM) ▪ Moderating effect analysis
RQ9	▪ Are consumers willing to pay higher prices for a sustainable tea industry? What are the factors influencing this?	▪ In-depth interviews (qualitative exploration) ▪ Questionnaires (quantitative validation)	▪ Descriptive Statistical Analysis ▪ Logistic regression analysis

UNIVERSITI KEBANGSAAN MALAYSIA

Table 3.2 Summary of urbanization and consumer behavior research designs

Module (In Software)	Research Objective	Tools and Methodologies	Data Analysis Strategy
Module 1: Analysis of the impact mechanism of urbanization on the sustainable development of the tea industry	Identifying and refining the main factors affecting the economic, social and ecological triple bottom line of the Sichuan tea industry in the context of urbanization	▪ Delphi method: Invite experts in the fields of agricultural economics, regional planning, and ecological governance to conduct more than two (2) rounds of surveys to identify key urbanization impact indicators ▪ Practitioner pre-survey: Survey tea farmers, tea enterprises, local administrators and other groups through questionnaires to obtain first-hand perception data	▪ Descriptive statistical analysis ▪ Reliability test ▪ Structural equation modeling (SEM): Analyzing the paths and strengths of the effects of multidimensional variables of urbanization on the triple bottom line (economic, social, and ecological)
Module 2: Study on the driving path of consumer behavior on the sustainable development of tea industry	Based on the theory of planned behavior (TPB), exploring the mechanisms of consumer attitudes, subjective norms, and perceived behavioral control on tea consumption intentions and behaviors	▪ Expert interviews: Explore the trend of consumers' concern and preference for tea quality, green label, and origin in the context of urbanization ▪ Consumer questionnaire survey: Design structured scales around the TPB model to quantify behavioral attitudes, subjective norms, perceived control and external environmental variables	▪ Binary logistic regression model ▪ Multiple linear regression modeling ▪ Semi-structured in-depth interviews with a three-tier coding system via NVivo15 software

The scientific and rational nature of the questionnaire directly affects the accuracy of the findings and the extent to which the objectives of the study are achieved. Therefore, the questionnaire of this study was designed in accordance with the following principles:

UNIVERSITI PERANGSAAN MALAYSIA

1. Urbanization and sustainability (RQ1–RQ5)

    a. Qualitative tools: Delphi expert surveys, semi-structured interviews with scholars, industry managers, and policymakers.

    b. Quantitative tools: Practitioner questionnaires distributed across major tea-producing regions.

    c. Analytical methods: Descriptive statistics, exploratory and confirmatory factor analysis, structural equation modeling (SEM), multi-group SEM, and mediation effect testing.

These methods are used to examine: The direct effects of urbanization on market economy, sociocultural structure, and ecological environment; the differential impacts of specific urbanization variables (e.g., infrastructure, policy, technological development); the mediating roles of sociocultural and ecological factors in the urbanization–market relationship.

2. Consumer behavior and sustainable development (RQ6–RQ9)

    a. Drawing on the theory of planned behavior (TPB), this module focuses on consumers' behavioral attitudes, subjective norms, and perceived behavioral control.

    b. Qualitative tools: Expert interviews and open-ended consumer interviews to refine TPB-related variables.

    c. Quantitative tools: Consumer questionnaires using TPB-based measurement scales.

    d. Analytical methods: Regression analysis, SEM, mediation and moderation analysis, logistic regression, and NVivo-assisted thematic coding.

This design allows the study to explore both: Psychological mechanisms driving tea consumption behavior; feedback effects of consumer behavior on the sustainable transformation of the tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

3.4 RESEARCH APPROACH

This study is guided by a problem-oriented and mechanism-driven research approach, focusing on how the process of urbanization influences the sustainable development of the tea industry in Sichuan Province. Given that the research subject spans macro-level structural changes (urbanization), meso-level industrial systems (sustainable development of the tea industry), and micro-level decision-making processes (consumer behavior), the relationships among variables are inherently complex and multidimensional. Relying on a single methodological approach would therefore be insufficient to capture these interactions comprehensively.

Accordingly, this study adopts a mixed research approach that integrates quantitative and qualitative methods, enabling the systematic identification of influence mechanisms, empirical testing of causal pathways, and contextual interpretation of findings. The overall research approach is designed to achieve coherence between theoretical exploration and empirical validation.

3.4.1 Quantitative research approach

a. Structural equation modeling (SEM)

Structural equation modeling (SEM) constitutes the core quantitative method employed in this study. SEM is primarily used to examine the causal relationships and interaction mechanisms among urbanization factors, the multidimensional sustainability of the tea industry, and consumer behavior variables. The main research questions addressed in this study (RQ1–RQ5 and RQ6–RQ9) involve complex relationships among multiple latent variables, such as: the direct effects of urbanization on the economic, sociocultural, and ecological dimensions of the tea industry; the mediating roles of sociocultural and ecological factors in the relationship between urbanization and the market economy of the tea industry; the effects of consumers' behavioral attitudes, subjective norms, and perceived behavioral control on tea consumption intentions and behaviors.

UNIVERSITI KEBANGSAAN MALAYSIA

SEM is particularly suitable for this research for several reasons. First, it allows for the simultaneous estimation of multiple dependent relationships among latent constructs, which aligns well with the multi-level analytical framework of this study. Second, SEM enables the testing of direct effects, indirect effects, and mediating mechanisms within a single integrated model, thereby facilitating a deeper understanding of the pathways through which urbanization affects the sustainable development of the tea industry. Third, by combining measurement models and structural models, SEM enhances the reliability and validity of latent variable measurement and strengthens theoretical interpretation.

In this study, SEM is applied to test the influence paths of urbanization variables on the economic, social, and ecological dimensions of tea industry sustainability; examine the mediating effects of sociocultural and ecological factors; and analyze the role of consumer behavior mechanisms in promoting or constraining sustainable industrial transformation.

b. Logistic regression analysis

To complement SEM analysis, logistic regression models are employed in the consumer behavior module of this study. Logistic regression is particularly appropriate for analyzing binary or categorical decision outcomes, such as consumers' willingness to pay a price premium for green, organic, or sustainably produced tea; consumers' likelihood of engaging in sustained tea consumption behavior.

Through logistic regression analysis, this study quantitatively estimates the direction and magnitude of the effects of demographic characteristics, behavioral attitudes, and perceived behavioral control on consumers' decision probabilities. The use of logistic regression provides a decision-level perspective that complements the structural insights generated by SEM, allowing for a more comprehensive explanation of consumer behavior in the context of urbanization.

UNIVERSITI KEBANGSAAN MALAYSIA

3.4.2 Qualitative research approach

a. Semi-structured interviews

Qualitative research plays a critical supporting role in this study, particularly in the early-stage identification of variables, model refinement, and interpretation of quantitative findings. Semi-structured interviews were conducted with key stakeholders, including academic experts and scholars in tea economics, regional development, and sustainability; managers and technical staff from tea enterprises; and policy-related practitioners involved in agricultural and rural development.

Semi-structured interviews allow for consistency in research themes while providing flexibility for respondents to elaborate based on their professional experience. This approach facilitates the exploration of practical constraints and opportunities faced by the tea industry under urbanization; institutional, cultural, and behavioral factors that are difficult to capture through standardized questionnaires; underlying motivations and contextual dynamics behind consumer behavior.

b. Scenario-based discussion and mechanism exploration

Building on interview findings, this study further incorporates scenario-based discussion methods, in which experts are guided to reflect on possible development pathways of the tea industry under different urbanization scenarios (e.g., rapid urban expansion, heightened ecological constraints, or consumption upgrading). This method helps to embed abstract variables within concrete development contexts; identify key mechanisms driving industrial transformation; and support the formulation of sustainable development pathways in later chapters.

c. NVivo-based qualitative coding and analysis

All interview transcripts were systematically analyzed using NVivo qualitative analysis software, following a three-stage coding strategy: open coding to identify initial concepts related to urbanization, industrial development, and consumer behavior; axial coding to integrate concepts into core categories such as policy mechanisms, cultural identity, and ecological constraints; selective coding to construct an explanatory

UNIVERSITI KEBANGSAAN MALAYSIA

mechanism framework that complements quantitative findings. The use of NVivo enhances the rigor, transparency, and traceability of qualitative analysis, reducing subjectivity and strengthening analytical validity.

3.4.3 Complementarity of quantitative and qualitative approaches

In this study, quantitative and qualitative research approaches are not applied independently but are mutually reinforcing. Qualitative research provides theoretical grounding and contextual understanding for variable selection and hypothesis formulation, while quantitative analysis empirically tests the proposed relationships and mechanisms. Qualitative findings further serve to interpret and contextualize quantitative results, particularly in explaining institutional, cultural, and behavioral dynamics that cannot be fully captured through numerical data alone.

This integrative approach enables the study to move beyond identifying whether effects exist, toward explaining how and why urbanization influences the sustainable development of the tea industry.

3.5 DATA COLLECTION

This study adopts a mixed-methods design to address two (2) core research foci; the mechanisms through which urbanization influences the sustainable development of the Sichuan tea industry; and the driving pathways through which consumer behavior promotes the industry's green transformation. Accordingly, data collection covers both the industry-side perspective and the consumer-side perspective, while ensuring regional representativeness, industrial-chain completeness, and variation in levels of urbanization, so as to support subsequent quantitative modeling and qualitative mechanism interpretation.

The study population consists of two (2) groups. The first group includes tea-industry practitioners, such as tea farmers/plantation households, enterprise managers and representatives of leading firms, cooperative and family-farm operators, as well as local government officials responsible for tea-industry administration. The second group includes tea consumers, drawn from areas with different levels of urbanization

UNIVERSITI KEBANGSAAN MALAYSIA

(core metropolitan areas, prefecture-level cities, and county-level areas, including both urban and rural residents). Particular attention is paid to consumers' purchasing preferences, green cognition, and behavioral intentions.

3.5.1 Quantitative data collection

a. Sampling regions and sampling framework

Basis for selecting sample regions and enterprises: According to the distribution of the main tea-producing areas in Sichuan Province and the economic weighting of the tea industry, the study samples mainly come from 11 key tea-producing cities in Sichuan Province, including Yibin, Leshan, Ya'an, Meishan, Guangyuan, Dazhou, Luzhou, Mianyang, Chengdu, Bazhong, and Zigong. These 11 regions account for 98% of the total area of tea plantations in the province, 98% of the production, and more than 96% of the comprehensive output value (see Table 3.9), making them highly representative.

To further ensure the completeness of the industrial structure of the sample and the coverage of the urbanization level, this study includes 12 national tea leading enterprises (see Table 3.10) as the sample of industrial subjects, and also focuses on small and medium-sized enterprises (SMEs), tea cooperatives, and family farms in different urban areas, to achieve a broad coverage of the business model of the tea industry in Sichuan.

Consumer surveys, on the other hand, stratified sampling according to different levels of urbanization (large and medium-sized cities, county urban areas, and villages) to ensure coverage of differences in consumer behavior in different regions.

b. Sampling method and sample distribution

This study adopts a combination of multistage cluster sampling (MCS) and Stratified random sampling (SRS), using a combination of online questionnaires + social platforms + industry forums to push, taking into account the tea e-commerce platform consumers and physical store consumer groups, combined with the Tea Expo. The

UNIVERSITI KEBANGSAAN MALAYSIA

questionnaires were distributed in the field in combination with the Tea Expo and the publicity activities in the production areas.

i. Stage I: Regional cluster division

Sichuan Province is divided into 11 key tea-producing regions as a first-level clustering unit, with each urban area as a cluster, taking into account its urbanization development level and tea industry output value.

ii. Stage 2: Industry structure stratification

Within each tea-producing region, survey respondents were categorized into four (4) groups based on the structure of the industry chain; tea farmers/growers, tea processing enterprises, sales and distribution enterprises, and government managers or industry experts.

iii. Stage 3: Sampling of enterprise types

Priority is given to the inclusion of samples of national and provincial leading enterprises in each region, while an appropriate amount of samples of local SMEs and cooperatives are taken to ensure sample diversity and data stability.

iv. Stage 4: Structural stratification of the consumer sample

Urbanization level groupings: core cities (e.g., Chengdu), prefecture-level cities (e.g., Ya'an, Leshan), and counties; stratification of demographic characteristics: gender, age, occupation, income level, education.

c. Method of questionnaire distribution and response rate

i. Practitioner survey: Sampling framework and data collection

The practitioner survey focuses on the industry-side mechanisms through which urbanization influences the sustainable development of the tea industry in Sichuan Province. The target population includes tea farmers and plantation households, managers and representatives of tea enterprises (including leading firms), operators of

UNIVERSITI KEBANGSAAN MALAYSIA

cooperatives and family farms, as well as local government officials responsible for tea-industry administration.

Based on the spatial distribution of major tea-producing areas and the economic importance of the tea industry in Sichuan Province, the practitioner sample was drawn from 11 key tea-producing cities, namely Yibin, Leshan, Ya'an, Meishan, Guangyuan, Dazhou, Luzhou, Mianyang, Chengdu, Bazhong, and Zigong. These regions account for approximately 98% of the province's tea plantation area and output, and over 96% of its total output value, indicating a high level of representativeness.

To ensure industrial-chain completeness, the sampling framework incorporated enterprises at different stages of the tea value chain, with priority given to national and provincial leading enterprises, while also including small and medium-sized enterprises, cooperatives, and family farms.

A total of 250 practitioner questionnaires were distributed, of which 240 valid questionnaires were recovered, yielding an effective response rate of 96%. The practitioner survey data were used to analyze the impacts of urbanization on the sustainable development of the tea industry from the production and management perspective.

ii. Consumer survey: Sampling framework and data collection

The consumer survey aims to examine the driving pathways through which consumer behavior promotes the green transformation of the tea industry. The target population consists of tea consumers residing in areas with different levels of urbanization, including core metropolitan areas, prefecture-level cities, and county-level areas, covering both urban and rural residents.

A stratified sampling strategy was adopted based on urbanization level and demographic characteristics such as gender, age, occupation, income, and education. Given that tea sales venues represent the primary context in which consumers interact with tea products, approximately 80% of the questionnaires were distributed at major tea sales locations in Sichuan Province, including professional tea markets in major

UNIVERSITI KEBANGSAAN MALAYSIA

producing areas (e.g., Chengdu and Yibin) and tea sections in large supermarkets. The remaining questionnaires were collected at tea culture events, tea expos, and tea houses, capturing leisure-oriented consumers and tea enthusiasts.

In total, 520 consumer questionnaires were distributed, and 508 valid questionnaires were recovered, yielding an effective response rate of 97.7%. The consumer survey sample size meets the recommended requirements for structural equation modeling (SEM), as suggested in the relevant methodological literature.

Data collection was supported by trained students from Sichuan Agricultural University. Prior to the survey, standardized training was provided to ensure consistency in questionnaire administration. Small tea samples were offered as incentives to enhance respondent cooperation. The consumer survey data serve as the primary empirical basis for subsequent quantitative modeling and hypothesis testing.

Table 3.3 Annual tea production statistics 2022

Region	Area (10,000 ha)	Production area (10,000)	Yield (ton)	Out value of raw tea (billion)
Yibin City	8.67	7.49	97200	46.92
Leshan City	9.33	8.13	52300	20
Ya'an City	6.58	5.42	114800	74.24
Meishan City	2.83	2.67	25300	-
Guangyuan City	3.29	2.58	17000	25
Dazhou City	2.65	1.87	14500	29
Luzhou City	2.93	1.6	21000	-
Mianyang City	1.3	1.08	3700	2.16
Chengdu City	1.77	-	23000	-
Bazhong City	3.82	1.88	13600	27.5
Zigong City	1.33	1.26	57414	-

As shown in Table 3.3, regional representativeness is the key to ensure the extrapolation of the study results. In this study, 11 tea-producing regions with typical representativeness in Sichuan Province were selected, covering different geographical environments and tea culture characteristics. The selection of these regions not only

UNIVERSITI KEBANGSAAN MALAYSIA

represents the overall situation of the tea industry in Sichuan Province, but also reflects the differentiated impact of urbanization on the tea industry and culture in each different region. The specific bases for regional selection include:

1. Yibin City: An important tea export base within Sichuan Province, known for its early tea production. The impact of urbanization on the local tea economy and ecological environment is significant and has research value. The production and export of morning tea in Yibin has experienced multiple changes in the context of urbanization, and the study of its economic benefits and environmental protection measures can reveal the impacts of urbanization on tea export bases.
2. Leshan City: It is an important tea-producing area in Sichuan Province, and its tea culture is closely related to tourism. The social and cultural impacts of urbanization on Leshan City are particularly obvious, and studying this area helps to understand how the tea industry integrates with the tourism industry.
3. Ya'an City: It is a traditional tea production area in Sichuan Province, famous for its Mengdingshan tea. Its long history of tea culture and gradually accelerating urbanization provide a typical case for the study. The urbanization process of Ya'an City has had a significant impact on the inheritance and innovation of traditional tea culture, and it is an important sample for the study of the development of tea industry under the intersection of tradition and modernity.
4. Meishan City: It is an emerging tea production area in Sichuan Province, and in recent years, the urbanization process has been rapidly advancing, and the area of tea cultivation has been increasing year by year. The rapid urbanization of Meishan City provides rich materials for the study of the development of tea industry in the emerging production areas, especially the application of new technologies and the promotion of modern agriculture.
5. Guangyuan City: Guangyuan City is located in the northern part of the Sichuan Basin, and the accelerated urbanization process in recent years has had a far-reaching impact on the local ecological environment and the structure of the tea industry, which makes it an important area for the study of how urbanization has

UNIVERSITI KEBANGSAAN MALAYSIA

remodeled the structure of the tea industry and the ecological environment, helping to reveal the relationship between ecological environment protection and ecological environment. It is an important area to study how urbanization reshapes the structure of tea industry and ecological environment, and helps to reveal the balanced relationship between ecological environmental protection and industrial development.

6. Dazhou City: Located in the eastern part of Sichuan Province, with black tea production as its main focus, the accelerated process of urbanization and industrialization in recent years has brought about impacts on tea cultivation. Studying Dazhou can provide insights into the impacts of urbanization on the black tea industry, especially in terms of changes in resource allocation, production costs and market competitiveness.

7. Luzhou City: Famous for its high-quality green tea production area, Luzhou City is also an important tea processing and trading center in Sichuan Province. Tea processing and trade in Luzhou has undergone profound changes in the context of urbanization, and studying this region helps to reveal the impact of urbanization on the upstream and downstream of the tea industry chain.

8. Mianyang City: It is a science and technology city in Sichuan Province, where the tea industry is closely integrated with science and technology and innovation. The study focuses on how science and technology innovation can integrate with the traditional tea industry, and explores the development path of tea culture in the context of urbanization and technologization.

9. Chengdu: As the capital city of Sichuan Province, it is the economic and cultural center of the province, as well as an important dissemination site of tea culture. The study of Chengdu City will focus on the changes in tea culture dissemination and consumption patterns in the context of urbanization, and explore the role of urbanization in promoting the modernization of tea culture.

10. Bazhong City: An ecologically excellent tea-producing area in Sichuan Province, which has maintained a good ecological environment during the process of urbanization, which is helpful for understanding the coordinated relationship between ecological protection and the development of the tea

UNIVERSITI KEBANGSAAN MALAYSIA

industry, in particular, how to achieve sustainable development in the context of the pressure of urbanization.

11. Zigong: Famous for its salt culture, but tea cultivation and consumption are also important in the region. With significant urbanization in recent years, a study in Zigong could reveal the impact of multiculturalism on the tea industry in the process of urbanization, and explore the interaction and integration between tea culture and other local cultures.

The selection of the above regions is based on a comprehensive examination of the current situation of the tea industry in Sichuan Province, as well as full consideration of the differences in the urbanization process in different regions, with reference to Lenth's (2001) relevant theories on sample selection, as shown in Figure 3.3.

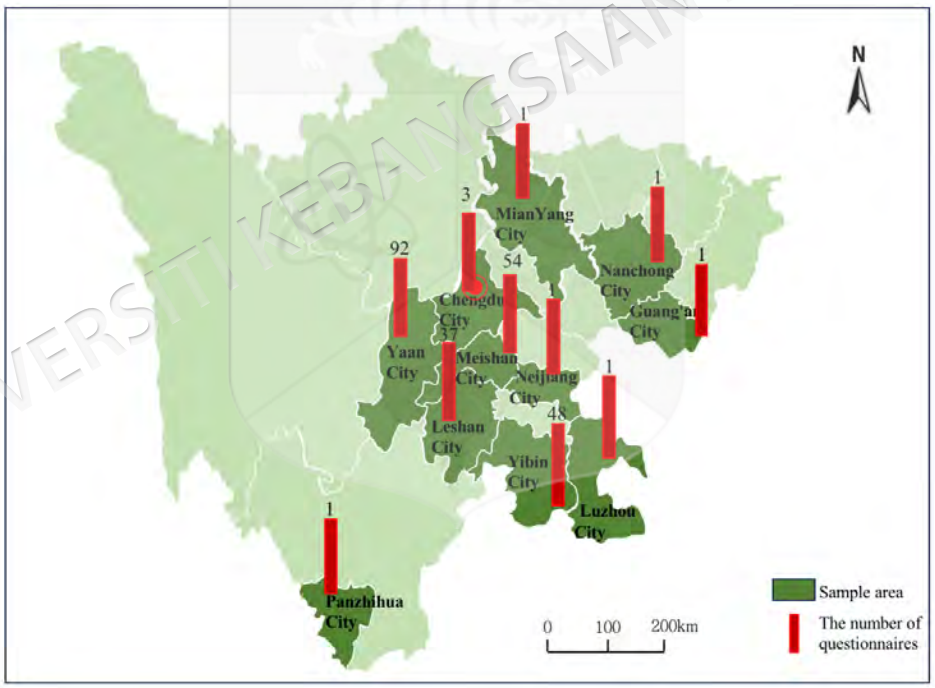

Figure 3.1 Overall distribution of the survey sample

UNIVERSITI KEBANGSAAN MALAYSIA

Figure 3.2 Integration of GIS workflows

In recent years, Sichuan Province has intensified efforts to cultivate and develop new types of tea business entities, gradually forming a tea operation system anchored by leading enterprises, specialized tea cooperatives, family farms, and large-scale growers. This system has not only promoted the centralization and scaling of tea production but also driven the efficient operation of the tea industry and the refinement of its industrial chain. Transitioning from traditional tea production methods to modern, intensive production, Sichuan's tea industry has continuously enhanced production efficiency while also prioritizing brand building and market expansion.

The production and processing workflows of Sichuan's tea industry have progressively shifted from extensive to intensive models, while tea processing and sales have transitioned from raw material sales to branded product sales. Throughout this process, every stage of green tea production—including fresh leaf picking, withering, fixation, rolling, and drying—has been efficiently integrated and technically supported within the new industrial structure. Leading enterprises like Sichuan Tea Group and Emeishan Snow Bud Tea Company leverage modern production technologies to continuously enhance tea production efficiency. Simultaneously, they strengthen ecological conservation and the application of green production techniques, propelling the tea industry toward greener, more sustainable development.

UNIVERSITI KEBANGSAAN MALAYSIA

1. Fresh leaf picking: Tea production in Sichuan typically begins with harvesting in tea gardens, particularly in regions like Yibin and Ya'an, where the process prioritizes leaf freshness and quality.
2. Wilting and fixation: After picking, leaves undergo wilting and fixation to rapidly remove moisture and prevent oxidation, preserving their original flavor and nutritional value.
3. Rolling and drying: During processing, rolling not only releases the tea's aroma but also involves drying using modern equipment to guarantee proper moisture content and shelf life. In Luzhou City, innovative mechanized techniques have been adopted, significantly boosting production efficiency.
4. Branding and marketization: With modernized production processes, Sichuan's tea industry is transitioning toward branded sales. Major tea enterprises strengthen brand development, promoting market acceptance of green tea through the preservation and innovation of tea culture. For instance, companies like Sichuan Tea Co. Ltd. expand markets for high-value-added tea products through production-sales alliances. For details, refer to Figure 3.2.

Sichuan's tea industry is advancing toward intensive and large-scale development. Under the influence of urbanization, production and processing models are increasingly modernized. In Leshan City, integrating tea culture with tourism has not only upgraded the local tea industry but also elevated the market profile of its teas. In Guangyuan City, combining green production techniques with ecological conservation has enabled the tea industry to achieve both environmental protection and coordinated industrial development.

There are 5.5 million tea farmers in the province, 78 specialized tea cooperatives, 549 wholesale tea markets with an annual turnover of 366 million yuan, 11 specialized tea trade markets, and more than 1,750 processing enterprises with more than 1 million yuan, including 377 enterprises with a sales income of more than 5 million yuan, 157 enterprises with an output value of more than 10 million yuan, 80 enterprises with an output value of more than 50 million yuan, and more than 20 enterprises with more than 100 million yuan. There are more than 1,750 processing

UNIVERSITI KEBANGSAAN MALAYSIA

enterprises with more than 1 million yuan, including 377 enterprises with sales revenue of more than 5 million yuan, 157 enterprises with production value of more than 10 million yuan, 80 enterprises with production value of more than 50 million yuan and more than 20 enterprises with more than 100 million yuan. In addition, there are 147 leading enterprises above the municipal level, 62 key leading enterprises at the provincial level, 77 model cooperatives at the provincial level, 12 leading enterprises at the national level, and 16 Chinese well-known trademarks. As well as 16 Chinese well-known trademarks and 28 Chinese geographical protected marks.

UNIVERSITI KEBANGSAAN MALAYSIA

Table 3.4 Leading tea enterprises in Sichuan Province

Name	Registered Capital (in millions of dollars)	National Standard Industry	Enterprise Size	Workers	Company Products	Pollution-Free Certification/ There Are No QS Certification/ With or Without International Quality System Certification
Sichuan Wenjun Tea Co/1980	4000	Refined tea processing	mega	49	Green tea and flower tea	there are/ there are/ there are
Sichuan Emeishan Bamboo Leaf Green Tea Co/ 1998	8000	Cultivation and management of tea plantations, primary production, refined processing, sales and import/export trade	mega	385	Bamboo leaf green series of famous green tea and export green tea refining	there are/ there are/ there are
Sichuan Tea Group Co/ 2000	35680	Mixed ownership enterprises	mega	200	Tianfu dragon buds	there are/ there are/ there are
Sichuan Bashan Bird's Tongue Famous Tea Co/ 2006	10000	Bags or loose tea, skincare combo packs	medium-sized	330	Bashan bird's tongue, Bashan Mao Jian, Bashan Mao Feng, Bashan selenium green tea	there are/ there are/ there are
Sichuan Huaqiu Tea Co/ 1997	1000	Alcohol, beverages and refined tea manufacturing	medium-sized	167	Tea, tea machines, tea sets, tea seedlings, tea plantation inputs, tea packaging supplies;	there are/ there are/ there are
Sichuan Micangshan Tea Industry Group Co/ 2000	3300	Tea in bags or bulk, sweetened bakery products	medium-sized	32	Sale of tea and tea sets; cultivation of edible mushrooms; wholesale of aquatic products; retail of aquatic products; production of seeds of non-major crops	there are/ there are/ there are
Sichuan Mengding	1000	Savory bakery	medium-	42	Tribute grade specialty	there are/ there are/ there are

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

Mountain Yuehua Tea Group Co/ 2010		products, kernel fruits, sweet bakery products, skin care assortments	sized		tea, famous green tea, jasmine tea series	
Sichuan Early White Tip Tea Co/ 2002	4900	Leisurely food, skin care products	medium-sized	450	Black tea, green tea, industrial tea, liquid tea	there are/ there are/ there are
Sichuan Shanghao Tea Co/ 2007	5500	Bulk bagged tea, fruit and herb tea blends, drinkable tea beverages	medium-sized	More than 1,000 people	Spring mulberry tea, frost mulberry tea, medicinal mulberry, compound mulberry tea	not have/ there are/ not have
Sichuan Baiyue Tea Co/ 2018	3500	Alcohol, beverages and refined tea manufacturing	medium-sized	52	Eyebrow tea, famous tea	there are/ there are/ there are
Zigong Chunlan Tea Co/ 2010	860	Alcohol, beverages and refined tea manufacturing	medium-sized	Less than 50	Green tea, black tea, flower tea, gift boxes	there are/ there are/ not have
Yibin Chuanhong Tea Group Co/ 2000	500	Wholesale of alcoholic beverages and tea, bitter tea, tea planting	minor works	Less than 50	Black tea series, bitter tea series	there are/ there are/ there are

UNIVERSITI KEBANGSAAN MALAYSIA

The study takes tea factories or tea enterprises as the unit of analysis and examines the challenges and opportunities faced by these organizations in the process of urbanization, including technological upgrading, market expansion and ecological protection measures.

a. Sichuan Wenjun Tea Co. Ltd. is an enterprise with a deep history, famous for its Wenjun tea, focusing on the production and sales of high-end tea, and has high brand awareness in Sichuan province and the national market. By choosing Wenjun tea as a sample, we can study how high-end tea brands respond to the changes in market demand in the process of urbanization as well as how to strike a balance between brand positioning and cultural inheritance. Especially in the modern marketing means and changes in the urban consumer groups on the impact of the business model has research value;

b. Sichuan Emei Mountain Bamboo Leaf Green Co. Ltd. is a famous tea company in Sichuan Province, the main products of bamboo leaf green tea in the domestic and international markets have enjoyed a good reputation, located in the scenic area of Mount Emei, combining the development of the tea culture and tourism, the focus of the study of the Bamboo Leaf Green Co. The study focuses on analyzing the integration of the tea industry and tourism, and the impact of urbanization on tea plantation tourism, eco-tourism and brand promotion. At the same time, this case also helps to understand how enterprises can maintain an eco-friendly production model in the context of urbanization to meet modern consumer demand for green products;

c. Sichuan Tea Group Co. Ltd. is one of the largest tea enterprises in Sichuan Province, with a number of tea brands and products covering a wide range of categories, such as green tea and black tea, which are sold all over the country and in the international market; as a large-scale tea enterprise, the study of Sichuan Ltd. focuses on the impact of urbanization on the integration of the tea industry chain, large-scale production and market

UNIVERSITI KEBANGSAAN MALAYSIA

expansion. The study of this enterprise can reveal how to enhance the competitiveness of the enterprise through modern management mode and technological innovation in the market expansion and industrial integration opportunities brought about by urbanization;

d. Sichuan Bashan Bird's Tongue Co. Ltd. is famous for its specialty product Bashan bird's tongue tea, which is produced in the high mountain tea plantations around Bazhong City in Sichuan Province, and it has a unique geographic iconography, and it was chosen as a sample to explore the impact of urbanization on GI products, especially the coordinated development between the protection of traditional tea-making techniques and modern production requirements. At the same time, the study analyzes how to use geographical indications to enhance the added value and market competitiveness of products in the process of urbanization.

e. Sichuan Huaqiu Tea Co. Ltd. focuses on the production and sale of medium- and high-end teas, and is famous for its high-quality green and black tea products, which are mainly oriented to the high-end market in China, especially the role of the change of consumers' preference in the process of urbanization in the drive of high-end tea market, which can help to understand how high-end tea companies can make use of geographical indications through market fine-tuning in the context of urbanization. It helps to understand how high-end tea enterprises can increase market share through market segmentation and brand management in the context of urbanization;

f. Sichuan Mengding Mountain Yuehua Tea Co. Ltd. is a well-known enterprise with Mengding Mountain tea as its core product, and the tea plantation is located in Ya'an City, Sichuan Province, which has a long history of tea cultivation, and it focuses on the impacts of urbanization on ecological environmental protection and sustainable development of traditional tea areas. How to balance the relationship between tea production and ecological protection in the process of urbanization and how to enhance the ecological benefits of the tea plantation through innovative management is an important part of the study.

UNIVERSITI KEBANGSAAN MALAYSIA

g. Sichuan Early White Tip Tea Co. Ltd. focuses on the production of Early White Tip Tea, which is a unique local tea with distinctive regional characteristics, and concentrates on the impacts of urbanization on the market positioning and brand shaping of local specialties, especially on how to take advantage of the market positioning and brand shaping of local specialty tea products. In particular, it focuses on how to take advantage of the market expansion opportunities brought about by urbanization to enhance the market visibility of Early White Tip Tea.

h. Sichuan Shanghao Tea Co. Ltd. produces high-quality green and black teas, focusing on ecological cultivation and product quality, and exploring the role of urbanization in promoting ecological cultivation patterns, especially how to maintain a balance between eco-friendly production and market competitiveness in the process of urbanization. Sichuan Shanghao Tea Co. Ltd. focuses on the production of high-quality tea, covering a wide range of categories for both domestic and international markets, focusing on the impact of urbanization on the diversification of tea products and the expansion of the international market, in particular how to enhance competitiveness through innovative products and marketing strategies in new market environments;

i. Zigong Chunlan Tea Co. Ltd. is an important tea producer in Zigong region, mainly producing green tea and black tea, exploring the impact of urbanization on the structural transformation of the tea industry in Zigong region, especially how to maintain the stability and sustainable development of traditional tea production in the process of urban expansion and population mobility;

j. Yibin Chuanhong Tea Group Co. Ltd. is a famous black tea producer in Sichuan Province, with strong export capacity, through the study of the Chuanhong Tea Group, analysis exploring the impact of urbanization on the tea exporters, especially how to capitalize on policy and market opportunities in the process of urbanization to expand international market share was conducted.

UNIVERSITI KEBANGSAAN MALAYSIA

The selection of these representative tea enterprises as a sample enables an in-depth analysis of the multiple impacts of urbanization on the tea industry in Sichuan Province at the organizational level. These enterprises cover a wide range of important tea-producing areas in Sichuan Province, and cover a diverse range of enterprise types from high-end brands to geographical indications, and from large-scale enterprises to eco-friendly production. The study of these enterprises can comprehensively reveal the opportunities and challenges faced by the tea industry in the process of urbanization, and provide a basis for the formulation of more scientific industrial development policies, as shown in Table 3.4.

d. Sample size estimation and theoretical basis

Since an exact and operationally definable population size corresponding to the target respondents of this study could not be reliably identified from existing census data or industry statistics, the sample size was estimated using Cochran's (1977) formula. Although population census reports and industry yearbooks provide aggregate figures for tea industry employment and general population size, these data do not precisely correspond to the specific survey populations considered in this study, such as active tea industry practitioners involved in production and management decisions, or consumers with actual tea purchasing experience across different sales channels.

Under such circumstances, Cochran's formula is widely applied in social science research to estimate the minimum required sample size for populations that are unknown, highly heterogeneous, or effectively large (Sarndah & Choudhury 2013). The formula is expressed as follows:

$$n_0 = \frac{Z^2.p.q}{e^2} \quad \ldots(3.1)$$

where Z represents the standard normal value corresponding to the desired confidence level, *ppp* is the estimated proportion of the population possessing a given attribute (set conservatively at 0.5 to maximize variance), $q=1-p$, and e denotes the acceptable margin of error.

UNIVERSITI KEBANGSAAN MALAYSIA

In this study, a confidence level of 95% was adopted (Z=1.96), with p=0.5 and a margin of error of 10% (e=0.1). Substituting these values into the formula yields a minimum theoretical sample size of 166 valid questionnaires.

Furthermore, considering that structural equation modeling (SEM) was employed for path analysis, the number of projects was determined with reference to established methodological recommendations, which suggest a minimum of 200 observations to ensure model stability and statistical robustness (Hair et al. 2006).

In practice, 240 valid questionnaires were collected from tea industry practitioners, and 508 valid consumer questionnaires were gathered. These sample sizes not only exceeded the theoretical minimum estimated by Cochran's formula but also surpassed the recommended threshold for structural equation modeling analysis, thereby providing a reliable empirical foundation for subsequent modeling and analysis.

3.5.2 Qualitative data collection

Qualitative data are collected to complement the quantitative findings and to provide deeper interpretive evidence for mechanisms and pathways that may not be fully captured through statistical models. The main qualitative sources include expert interviews, enterprise interviews, and Delphi consultation.

Experts and Delphi participants: A total of 15 experts were invited for factor identification and weight assessment through Delphi-style consultation. Among them, 12 industry experts participated in semi-structured, in-depth interviews, including university scholars, leaders of industry associations, and technical/market managers from leading tea companies. Interview topics covered consumer behavior change, market trend assessment, and key bottlenecks in industrial transformation.

Enterprise cases: 25 representative production and sales enterprises from eight (8) core tea-producing regions were selected for in-depth investigation. These cases cover planting bases, processing chains, and brand retail terminals, forming a structured industrial-chain case sample to explore how firms respond to urbanization pressures and opportunities.

UNIVERSITI KEBANGSAAN MALAYSIA

To strengthen systematicity and theoretical depth, scenario-based discussion was incorporated into expert interviews. Experts were guided to evaluate industrial transformation choices and green development pathways under different urbanization contexts, which in turn supported variable refinement, indicator revision, and the interpretation of empirical results.

3.5.3 Representativeness and scientific assurance of the sample

In order to ensure the representativeness of the sample and the generalizability of the conclusions, this study adopts the following measures in the process of sample sampling and data collection. By covering the core production areas, key enterprises and diversified consumer groups of the tea industry in Sichuan, the sample of this study has the following characteristics:

a. Strong geographical representation. Covering more than 96% of the tea production areas in Sichuan Province;

b. Complete industrial structure. It includes the whole chain of planting, processing, distribution and branding enterprises, and covers national leading enterprises, cooperatives, processing bases, family farms and other types of business entities;

c. Diverse levels of urbanization. The samples cover core cities, prefecture-level cities and counties, distinguishing the differences in consumption habits under different urbanization levels;

d. Flexible data collection methods. Combine online and offline methods to improve recovery efficiency and data quality;

e. Meet structural modelling needs. The sample size meets the needs of SEM, CFA and other analytical models, and has a good basis for reliability and validity;

f. Questionnaire reliability and validity control. The questionnaire design combines Delphi method expert feedback, and Cronbach's α, KMO and other reliability and validity tests will be carried out subsequently.

UNIVERSITI KEBANGSAAN MALAYSIA

g. Data cleaning strategy is clear. Uniformly screen out missing rate >20%, logical skip answer error or duplicate IP samples to ensure data quality.

3.6 VARIABLE DEFINITIONS AND MEASUREMENT INDICATORS

This section describes the measurement framework, variable design, and research instruments employed in this study. Guided by the conceptual framework and research hypotheses, the measurement system is constructed to capture the multidimensional impacts of urbanization on the sustainable development of the Sichuan tea industry, as well as the behavioral mechanisms through which consumers influence the industry's green transformation. The instruments include structured questionnaires for quantitative analysis and interview guides for qualitative inquiry, ensuring consistency between theoretical constructs and empirical observation.

3.6.1 Variable framework and construct design

a. Indicator measurement and characterization of urbanization

i. Indicator measurement and characterization of policies and regulations in urbanization

In studying the impact of urbanization development on the sustainable development of tea industry in Sichuan Province, policies and regulations, infrastructure construction and technological progress are the three (3) key policy guidance factors. These factors have an important impact on the economic benefits, ecological environmental protection and cultural inheritance of tea industry. Therefore, it is crucial to measure the impact of these factors by constructing a scientific indicator system. Policies and regulations play a key role in promoting the sustainable development of tea industry. With the acceleration of urbanization, the tea industry faces multiple challenges such as resource utilization, environmental protection, and cultural inheritance, etc. Policies and regulations guide and regulate the development direction of the industry by setting up clear rules and guidelines, thus promoting its healthy and sustainable growth. The following is a detailed analysis of the specific measurement indicators of policies and regulations and their importance:

UNIVERSITI KEBANGSAAN MALAYSIA

1. Degree of policy publicity: Policy publicity is an important part of the implementation of government policies, which is not only the conveyance of policy information, but also a key means of influencing the public's behavior and enhancing the perception of policies. The extent and depth of policy publicity is directly related to the understanding and acceptance of the policy by farmers and enterprises. Through a variety of channels, such as government-led activities, media dissemination, and community outreach, policy publicity can enhance the policy perceptions of practitioners in the tea industry, prompting them to follow urbanization-related policies in their actual operations. This enhanced perception can effectively reduce behaviors that do not meet policy requirements, such as environmental damage and resource waste, while prompting more enterprises and farmers to participate in the green development of the industry. It has been shown that the effectiveness of policy publicity has a significant impact on the outcome of policy implementation. For example, Yan Li (2017) pointed out that through enhanced policy advocacy, farmers are more inclined to follow the environmental standards set out in the policy, thereby enhancing the sustainability of agricultural production. Other studies have shown that publicity can significantly enhance the technology perception and environmental awareness of farmers and enterprises, including through public opinion pressure (Gaihao et al. 2021).

2. Policy satisfaction: Policy satisfaction reflects the degree to which farmers and enterprises recognize existing policies. The effectiveness and fairness of the policy as well as the protection of the interests of farmers and enterprises in the process of policy implementation directly affect the acceptance of the policy and its actual implementation. If the policy can be implemented fairly and equitably in practice and can really help practitioners to improve production efficiency, reduce costs or enhance market competitiveness, then the policy satisfaction of farmers and enterprises will increase, and then they will be more willing to cooperate with the implementation of the policy. The study by Jian Zhang et al. (2015) shows that the fairness of the policy and the transparency of its implementation are important factors in increasing policy satisfaction. Only when the beneficiaries are satisfied with the policy, they will be more proactive

UNIVERSITI KEBANGSAAN MALAYSIA

in complying with the policy provisions and actively cooperate with the government's policy direction in actual operation.

3. Policy constraints: Policy constraints ensure that the tea industry follows environmental protection requirements and avoids over-exploitation or resource wastage in the process of urbanization through mandatory measures in laws and regulations. Such policies include land use norms, environmental protection regulations, etc., aiming to ensure the sustainable development of the tea industry. Strong policy constraints can effectively prevent blind development and overuse of resources, thereby protecting the ecological environment and safeguarding the long-term interests of the tea industry. Studies have shown that policy constraints play an unignorable role in promoting the sustainable development of the industry. Gao Fuxiong et al. (2020) pointed out that the mandatory measures of policies and regulations can effectively regulate the behavior of enterprises and farmers to avoid the occurrence of behaviors that do not comply with the goal of sustainable development. At the same time, strong constraints can also guide the industry in the direction of more environmental protection and energy saving, thus promoting sustainable development.

4. Policy incentives: Policy incentives refer to the government's efforts to provide incentives to enterprises and farmers that follow policy requirements, which may include environmental subsidies, tax incentives and other forms. Through the establishment of incentives, the government can encourage more enterprises and farmers to actively participate in the practice of sustainable development. The incentive policy can not only reduce the operating costs of practitioners, but also motivate them to give more consideration to environmental protection and resource conservation in their industrial development by means of economic incentives. Li Wenhuan et al. (2021) pointed out that the policy incentive mechanism is an important means to guide the sustainable development of the industry. The implementation of incentive policies can significantly increase the environmental protection motivation of practitioners and drive them to more actively adopt environmentally friendly technologies and sustainable production methods by means of economic benefits, thus promoting the development of the whole industry in the direction of greening.

UNIVERSITI KEBANGSAAN MALAYSIA

5. Degree of policy training: The degree of policy training involves the breadth and depth of technical training and knowledge dissemination provided by the government and relevant organizations. Through policy training, farmers and enterprises can better understand the specific requirements of the policy and obtain the necessary technical support to implement the policy. Such training not only includes the application of environmental protection technologies, but also covers the acquisition of market information and the promotion of modern management concepts. The study by Xia Cuizhen et al. (2022) shows that policy training plays an important role in enhancing the policy implementation capacity of farmers and enterprises. Effective training can significantly improve practitioners' acceptance of new technologies and their ability to apply them, thus promoting the modernization and sustainable development of the industry.

6. Effectiveness of policy services: The effectiveness of policy services measures the effectiveness of related services provided by the government (such as technical support, market information, etc.), which directly affects the implementation and coverage of policies. Effective policy services can help practitioners better cope with market changes and technological challenges, and enhance their competitiveness and sustainability in the industry. Related studies show that the effectiveness of government services is closely related to the effectiveness of policy implementation. Zhao et al. (2008) point out that efficient government services can significantly improve the actual implementation of policies and promote the sustainable development of industries. This finding further emphasizes that in the process of urbanization, governments not only need to formulate policies, but also need to provide strong service support to ensure policy implementation.

In summary, policies and regulations play a central guiding role in the sustainable development of tea industry. Through the comprehensive effects of policy publicity, policy satisfaction, policy constraints, policy incentives, policy training and policy service effects, policies and regulations provide a strong institutional guarantee and direction guidance for the development of tea industry. These policy guiding factors work together to ensure that under the background of urbanization, the tea industry can

UNIVERSITI KEBANGSAAN MALAYSIA

strike a balance between economic benefits, environmental protection and cultural inheritance to achieve sustainable development.

ii. Indicator measurement and characterization of infrastructure in urbanization

Infrastructure construction is an important material foundation for the development of tea industry, which not only directly affects the production, processing, transportation and sales of tea, but also determines the development potential and sustainability of tea industry in the process of urbanization. Good infrastructure can improve industrial efficiency, reduce operating costs and enhance market competitiveness. The following is a detailed analysis of the specific measurement indicators for infrastructure development and their importance.

1. Infrastructure coverage: Infrastructure coverage refers to the coverage of infrastructure in the tea area in the process of urbanization, including basic facilities such as roads, electricity, water conservancy and communications. Comprehensive infrastructure coverage can ensure the smooth operation of all aspects of the tea industry, thus avoiding production interruptions or cost increases due to the lack of infrastructure. Especially in tea production areas, a comprehensive infrastructure network can effectively support the management and production activities of tea gardens, and improve production efficiency by optimizing resource allocation. Studies have shown that comprehensive coverage of infrastructure has a positive effect on the development of the agricultural industry. The study of Li Yanyan et al. (2017) found that in areas with high infrastructure coverage, the output value and economic efficiency of the agricultural industry are significantly increased, especially in areas with perfect transportation, electricity and water conservancy facilities, and the production motivation and economic income of farmers are increased.

2. Infrastructure quality: Infrastructure quality includes the accessibility and durability of transportation roads, the efficiency of water supply and irrigation systems, the stability of power supply, and the modernization of information and communication facilities. High-quality infrastructure not only ensures the smooth running of daily production activities, but also effectively responds to

UNIVERSITI KEBANGSAAN MALAYSIA

emergencies such as natural disasters and reduces economic losses due to infrastructure damage or aging. Gao Fuxiong et al. (2020) pointed out that the quality of infrastructure has a direct impact on the productivity and product quality of the agricultural industry. For example, the accessibility and durability of roads can reduce losses during the transportation of tea, while a stable supply of electricity is a key guarantee during tea processing. In addition, the modernization level of information and communication facilities also determines the degree of informatization of tea industry, which in turn affects the market competitiveness and product innovation ability.

3. Convenience of transportation: Convenience of transportation refers to the impact of road construction and the convenience of transportation facilities on the logistics and market access of tea industry. The perfection of transportation facilities directly affects the transportation cost and market coverage of tea. An efficient transportation network can not only shorten transportation time and reduce logistics costs, but also expand market accessibility and promote the circulation and sale of tea products. Zhang Jian et al. (2015) showed that transportation accessibility is closely related to the degree of marketization of the agricultural industry. Good transportation conditions can enable the tea industry to respond quickly to market demand and increase the market competitiveness of products, while also providing more space for the diversified development of the industry.

4. Level of information and communication facilities: The level of information and communication facilities reflects the popularization and application of modern communication facilities in the tea area. This indicator is crucial for improving the informatization level of tea industry. The improvement of information and communication facilities can promote farmers and enterprises to obtain market information, technical support and policies and regulations in a timely manner, so as to make more reasonable and scientific production decisions. According to the research of Xia Cuizhen et al. (2022), the application of information and communication technology significantly improves the modernization level and production efficiency of the agricultural industry. Information and communication facilities are not only an important part of modern agriculture,

UNIVERSITI KEBANGSAAN MALAYSIA

but also provide technical support for the innovative development of the tea industry, especially in the areas of e-commerce, intelligent agriculture and market information acquisition.

iii. Indicator measurement and characterization of technological progress in urbanization

Technological progress is a key driving force for the modernization and sustainable development of the tea industry, which directly promotes the long-term development of the tea industry by enhancing production efficiency, optimizing resource utilization and improving product quality. In the context of urbanization and globalization faced by the tea industry, technological progress is not only an effective means to cope with environmental challenges, but also an important way to enhance market competitiveness. The following are the specific measurement indicators of technological progress and their importance to the tea industry are analyzed.

Technological promotion: Technological promotion refers to the frequency and effect of technological promotion activities of the government and scientific research institutions in the tea industry, especially the promotion of new planting technologies, environmentally friendly production technologies and pest control technologies. These technology promotion activities are a bridge for the transformation of technological progress into industrial practice, and through the effective promotion of the government and scientific research institutions, the new technologies can quickly cover all the production links in the tea area and improve the technology application level of tea farmers and enterprises. Gao Fuxiong et al. (2020) pointed out that the strength of technology promotion directly affects the acceptance and practical application of new technologies by tea farmers. Positive technology promotion can significantly enhance the production capacity of farmers, reduce the negative impact of traditional planting techniques on the environment, and promote the green transformation of the tea industry. In addition, the strength of technology promotion also reflects the degree of attention paid by the government and research institutions to the development of tea industry, which is an important indicator of policy implementation.

UNIVERSITI KEBANGSAAN MALAYSIA

Application rate of technological innovation: The application rate of technological innovation measures the acceptance and practical application level of new technologies by tea farmers and enterprises. The modernization process of tea industry cannot be separated from technological innovation, especially in planting, processing, packaging and marketing. New technologies with high application rate can not only improve production efficiency, but also increase the added value of products and enhance market competitiveness. Xia Cuizhen et al. (2022) pointed out that the application rate of technological innovation is closely related to the degree of modernization of the industry. A high level of technology application can effectively reduce labor costs, increase production, and enhance product quality. In addition, the wide application of technological innovation can also enhance the resilience of the tea industry, so that it can occupy a favourable position in the global market competition.

Mechanization level: Mechanization level refers to the degree of mechanization in the process of tea production, including the mechanization level of tea plucking, processing and packaging. Mechanization is one of the important symbols of the modernization of the tea industry, through mechanized production, it can not only improve the production efficiency, but also reduce labor costs and improve the consistency and quality of products. The research of Zhang Jian et al. (2015) shows that the increase in the level of mechanization significantly reduces the time cost and labor intensity of tea production, which enables the tea industry to carry out large-scale production at a lower cost and higher efficiency. In addition, mechanization can also reduce the dependence on labor and alleviate the labor shortage problem caused by urbanization.

Information technology application level: Information technology application level assesses the application of information technology means in the tea industry, such as e-commerce, intelligent agriculture, blockchain traceability and other technologies in terms of popularity and application effect. The application of information technology in the tea industry can not only optimize production management, but also expand market channels and improve the transparency of the industry and consumer trust. Li Yanyan et al. (2017) pointed out that the wide application of information technology can significantly improve the informatization level of the tea industry, and then promote

UNIVERSITI KEBANGSAAN MALAYSIA

the digital transformation of the industry. The application of information technology not only improves the production process, but also provides new avenues for marketing, consumer interaction and branding, enhancing the overall competitiveness of the tea industry.

Coverage rate of agronomic technology training: The coverage rate of agronomic technology training refers to the proportion and frequency of farm households covered by technology training. Wide coverage and high frequency of training can ensure that tea farmers can master new technologies and production management methods in time, and then improve their technical level and production capacity. Effective agronomic technology training can not only improve the technical quality of tea farmers, but also enhance their trust and reliance on modern agricultural technology. The study of Li Wenhuan et al. (2021) shows that agronomic technology training plays an important role in the modernization of the tea industry. Through regular technical training, tea farmers are able to update their knowledge and master the latest production techniques, thus improving the yield and quality of tea and reducing production risks. In addition, technical training can also improve farmers' awareness of sustainable development and promote the application of green production and environmental protection technology.

Transformation rate of scientific research results: The transformation rate of scientific research results refers to the application of scientific research results in actual production, including the popularization of new varieties and the application of new techniques. High conversion rate of scientific research results can promote the technological innovation and industrial upgrading of tea industry, and enhance the overall competitiveness and sustainable development of the industry. Zhao Yong et al. (2008) pointed out that the effective transformation of scientific research results can provide continuous technical support and innovation power for the tea industry. Through the popularization of new varieties and the application of new technology, the tea industry can continuously improve production efficiency, product quality and adapt to the constant changes of the market. In addition, the transformation of scientific research results can also promote the extension of the industrial chain and the

UNIVERSITI KEBANGSAAN MALAYSIA

enhancement of the value chain, providing a solid technical guarantee for the sustainable development of the tea industry.

Technological progress is the key driving force for the modernization and sustainable development of the tea industry. By strengthening technology promotion, increasing the application rate of technological innovation, upgrading mechanization, applying information technology extensively, expanding the coverage of agronomic technology training and accelerating the transformation of scientific research results, the tea industry is able to achieve efficient, green and sustainable development in the context of urbanization and globalization. These measures of technological progress interact with each other to promote the tea industry to continuously adapt to market demand, enhance its competitiveness, and provide strong technical support for its long-term sustainable development.

b. Indicator measurement and characterization of economic benefits of sustainable development

In the context of urbanization, the sustainable development of the tea industry is not only dependent on policies and regulations, infrastructure and technological advances, but is also closely related to economic benefits such as market demand, investment opportunities and production costs. The following are the indicator measurements of these economic efficiency aspects and their characterization.

Consumer preference: Consumer preference is an important indicator reflecting changes in market demand. With the acceleration of urbanization, the concentration of population in cities and the accelerated pace of life, the demand for high-quality, branded and functional tea has increased significantly. This is not only reflected in the increased demand for traditional teas such as green tea and black tea, but also includes the expansion of demand for specific functional teas such as health tea and organic tea. Through questionnaires, consumer interviews and market research, it is possible to assess urban consumers' preferences, purchase frequency and consumption habits for different types of tea. Consumption upgrading in the context of urbanization has prompted people to pay more attention to the quality and brand of tea, which provides the tea industry with opportunities for branding and high-end development. For

UNIVERSITI KEBANGSAAN MALAYSIA

example, Chen Liang's (2019) study shows that high-income groups are more inclined to choose tea products with high brand awareness, which prompts tea companies to increase investment in product research and development and branding to meet the diversified needs of consumers.

Market size: Market size refers to the total sales volume of tea products in the market and its growth potential. The increase in urban population due to urbanization, as well as the improvement of living standards, directly promotes the expansion of tea market size. By analyzing data such as tea sales, market share, and market penetration, the trend of market size can be quantified and reflect the expansion of the tea industry in different regions and markets. In the process of urbanization, the expansion of the tea market is not only reflected in the domestic market, but also in the international market. Jian Zhang (2018) pointed out that with the increase of China's urbanization rate, the average annual growth rate of the domestic tea market size has reached 5.7%, and in the international market, China's tea exports have steadily increased, which indicates that the expansion of the market size has provided the tea industry with the impetus for sustained development.

Export demand: With the advancement of urbanization, the growth of demand in the domestic market has also promoted the expansion of the international market for tea. Tea products are favored by the international market because of their cultural value and health attributes. By analyzing indicators such as tea export volume, export market distribution, and export product types, the change in demand for tea in the international market can be assessed. The growth in export demand not only reflects the potential of the international market for tea, but also indicates the expanding influence of tea culture worldwide. Wang Fang (2020) showed that with the promotion of the "Belt and Road" initiative, the export volume of Chinese tea in the countries along the route has increased significantly, which not only enhances the international status of Chinese tea, but also promotes the global dissemination of tea culture.

Investment opportunities are an important indicator of the attractiveness of capital in the tea industry in the context of urbanization. With the advancement of urbanization, the market scale of tea industry is expanding and the consumption

UNIVERSITI KEBANGSAAN MALAYSIA

structure is upgrading, which provides a broad space for the entry of capital. The measurement of investment opportunities helps to understand the trend of capital flow and industry development, and provides a scientific basis for policy formulation and market strategy. The following are the main measurement indicators of investment opportunities and their detailed analysis.

Capital input: Capital input is the core indicator for assessing investment opportunities. The scale, source and flow of capital reflect the attractiveness and development potential of the tea industry. In the context of urbanization, capital input in tea planting, processing and marketing is an important aspect of measuring investment opportunities in the industry. The input of domestic and foreign capital can be analyzed through data from financial markets, annual reports of enterprises, and investor research. Urbanization has led to an increase in the demand for production factors such as land, labor, and technology in the tea industry, and the growth of capital investment has not only promoted the expansion of the industry, but also the upgrading of tea production and processing technology. As Wang Ming (2019) pointed out, capital flows in the context of urbanization accelerated the structural adjustment of the tea industry, and the influx of capital not only brought capital, but also introduced advanced management concepts and technological innovation, which promoted the modernization of the tea industry.

Government support: Government support is an important part of measuring investment opportunities. Through financial subsidies, infrastructure construction, tax incentives and other policy measures, the government has provided a solid guarantee and support for the tea industry. The government's capital investment not only directly promotes the development of the tea industry, but also attracts the extensive participation of social capital through policy guidance, further expanding the investment opportunities. Government support is an important driver of capital investment. Zhang's (2018) study shows that the government's policy support and financial investment in the tea industry significantly improves the capital's investment confidence and the industry's risk resistance. Especially in the process of urbanization, the government has effectively attracted more social capital into the tea industry through

UNIVERSITI KEBANGSAAN MALAYSIA

the guidance of infrastructure construction and industrial policies, thus promoting the sustainable development of the industry.

Innovation and entrepreneurship: Urbanization not only brings population concentration and increased consumption demand, but also creates a large number of innovation and entrepreneurship opportunities, especially in the tea industry, emerging entrepreneurial projects around tea production, processing, sales, as well as tea culture experience, tea tourism and other related industries are endless. By analyzing the number of new start-ups, investment in innovative projects and investment and financing, we can understand the vitality of innovation and entrepreneurship in the industry. Innovation and entrepreneurship is the new driving force for the development of tea industry. In the context of urbanization, the increase of innovation and entrepreneurship opportunities promotes the diversification of the tea industry. Li (2020) points out that in the process of urbanization, emerging startups are active in the creative design, branding, and marketing of tea products, attracting a large amount of venture capital attention, which provides new opportunities for the modernization and international development of the tea industry. As an important indicator of economic efficiency, investment opportunities play a crucial role in guiding the sustainable development of the tea industry. The process of urbanization not only increases the market demand for the tea industry, but also provides diversified investment opportunities for the entry of capital. These investment opportunities promote the modernization, technological innovation and marketization of the industry, and facilitate the expansion and upgrading of the tea industry. Firstly, the inflow of capital has increased the capital supply of tea industry, promoted the technological upgrading and equipment renewal of tea production, processing and sales, and improved the productivity and product quality of the industry. Secondly, the government's policy support and capital investment for the development of tea industry provides a policy guarantee and financial basis, which not only directly promotes the development of tea industry, but also by guiding the flow of capital, activates the extensive participation of social capital, expanding the opportunities for industrial investment. Finally, the rise of innovation and entrepreneurship has injected new vitality into the tea industry and promoted the optimization of the industrial structure and the diversification of the market. This innovation and entrepreneurship opportunity not only attracts a large

amount of venture capital and capital into the industry, but also promotes the globalization layout and brand building of the tea industry.

With rapid urbanization, growing demand in the domestic market has further contributed to the expansion of Chinese tea products in the international market. As a product with rich cultural connotations and significant health benefits, tea is becoming increasingly popular worldwide. Export demand is not only a key indicator of the international influence of the tea industry, but also reflects the competitiveness of tea in the global market.

1. Export volume: Export volume is an important indicator of tea demand in the international market. With the advancement of urbanization, the demand for tea in the domestic market increases, and this demand extends to the international market. The increase in export volume reflects the competitiveness and market acceptance of Chinese tea on a global scale. By analyzing the export volume of tea in different time periods, we can assess the growth trend of the international market demand for tea.
2. Export market distribution: The geographical distribution of export market can reflect the market expansion of tea in the global scale. Different countries or regions have different demands for tea, and by analyzing the distribution of export markets, we can better understand which markets have the strongest demand for tea and which markets are still to be developed.
3. Types of export products: Different types of tea have different demands in the international market. For example, green tea, black tea, oolong tea and other products may have different popularity in different markets. By analyzing the types and quantities of exported products, it is possible to assess which types of tea are most competitive in the international market and to predict future changes in market demand. The increase in export demand not only shows the potential of tea in the international market, but also indicates that the influence of tea culture is expanding globally. For example, Wang Fang's (2020) study shows that with the advancement of the Belt and Road Initiative, the export volume of Chinese tea in countries along the route has increased significantly.

UNIVERSITI KEBANGSAAN MALAYSIA

This not only enhances the international status of Chinese tea, but also promotes the global dissemination of tea culture and the sustainable development of China's tea industry. Further, the increased demand for exports has helped to improve the profitability of the tea industry, thereby attracting more capital and technological investment and promoting the modernization and internationalization of the entire industry chain.

Production cost is one of the core factors affecting the economic efficiency of the tea industry, especially in the highly competitive international market, controlling production cost is crucial to maintain competitiveness.

1. Raw material cost: The raw material cost of tea production mainly includes the cost of planting, fertilizers, pesticides and other inputs. With the advancement of urbanization and the increase in the scarcity of land resources, the rent and purchase cost of tea plantation land may rise accordingly, which constitutes an important impact on the production cost of tea. By analyzing the cost changes of raw materials, the economic pressure on tea production can be assessed.
2. Labor cost: The loss of rural labor in the process of urbanization makes the labor cost in tea planting and processing increase. Especially in tea plucking and other aspects that require a lot of manual operation, the impact of labor costs on production costs is particularly significant. The study of labor market trends can help predict the future trend of tea production costs.
3. Mechanization level: With the advancement of technology and the increase of mechanization, the application of mechanical equipment can reduce the production cost to a certain extent, especially in the context of labor shortage or rising cost. The contribution of mechanization to reducing production costs can be assessed by analyzing the use of mechanized equipment and its impact on production efficiency.
4. Energy and water costs: Energy and water resources are indispensable inputs in the tea production process. Urbanization may lead to an increase in the price of energy and water resources, which poses a challenge for cost control in tea production. By analyzing the cost of energy and water use, it is possible to

UNIVERSITI KEBANGSAAN MALAYSIA

understand the impact of changes in these costs on tea production. The control of production costs is directly related to the economic efficiency and market competitiveness of the tea industry. The lower the cost of production, the more competitive the price of the product, which in turn helps to expand the market share and improve the profitability of the enterprise. At the same time, the control of production costs also affects the survival and development ability of tea farmers and tea enterprises, which in turn affects the sustainability of the whole industry. For example, Gao Fuxiong et al. (2020) pointed out that by improving the level of mechanization and controlling labor costs, tea production costs can be significantly reduced, enhancing the competitiveness of enterprises and promoting the sustainable development of the industry. Controlling production costs is not only a necessary condition to maintain market competitiveness, but also an important means to modernize and internationalize the industry.

Market demand is the basic driving force for the development of tea industry. With the advancement of urbanization, the change of market demand directly affects the development direction and structural adjustment of tea industry. Consumption upgrading brought by urbanization makes the market demand show a diversified and high-end trend, which pushes the tea industry towards branding and quality development. At the same time, the internationalization of market demand also provides new opportunities for the global layout of tea industry. Market demand determines the market capacity and development potential of tea industry, which is the driving force of industrial development. Without demand, the industry cannot survive and expand. Investment opportunities are the key to promote industrial upgrading and technological progress. In the process of urbanization, the gathering and flow of capital provides financial support for the innovation and development of tea industry, and promotes the modernization of tea planting, processing and brand building. Production costs affect the market competitiveness of tea products. In the context of urbanization, changes in the cost of production factors such as land, manpower and resources directly affect the production cost and profit margin of tea. Effective control of costs is the key to maintaining competitiveness and sustainable development of the industry.

UNIVERSITI KEBANGSAAN MALAYSIA

c. Indicator measurement and characterization of environmental benefits of sustainable development

i. Number of tea plantation laborers

Urbanization is often accompanied by the transfer of rural populations to cities, resulting in a shortage of laborers in tea plantations. The number of tea garden laborers can be measured by surveying the total number of tea garden employees, which directly reflects the current situation of labor supply.

ii. The aging rate of tea garden labor force

With the large influx of young labor force to the city, the structure of the labor force engaged in tea production in rural areas tends to be aging. The aging rate of the tea garden labor force can be measured by the proportion of the elderly in the statistical tea garden labor force, which reflects the intergenerational inheritance of the tea garden labor force.

iii. Mechanization level of tea plantations

In order to cope with labor shortage, tea plantations usually increase mechanization inputs. The level of mechanization can be measured by counting the number and application degree of mechanical equipment in tea gardens, so as to understand the response of tea gardens to labor shortage. Labor shortage has a significant impact on the sustainable development of tea industry. With the advancement of urbanization, a large number of rural laborers flow into cities, the labor supply in tea gardens gradually decreases, and the remaining laborers are older, resulting in lower efficiency and higher cost of tea planting and picking. Studies have shown that labor shortage not only affects the productivity of tea plantations, but also threatens the heritage and development of tea culture (Li Qiang 2020). To cope with this challenge, tea gardens need to increase the investment in mechanization and make up for the shortage of labor through technological means (Liu Hong 2021). However, the increase in mechanization requires a large amount of capital investment, which further increases the production cost of tea plantations.

UNIVERSITI KEBANGSAAN MALAYSIA

iv. Frequency of traditional tea culture activities

Tea culture activities are an important carrier for the protection and inheritance of tea culture. By investigating and counting the frequency of traditional tea culture activities (e.g. tea ceremony, tea culture festival) in the tea hometown area, it can reflect the inheritance status of local tea culture.

v. Coverage of tea culture education

The inheritance of tea culture cannot be separated from education, especially for the younger generation. The education coverage rate can be measured by the proportion of tea culture courses offered by schools in tea villages and the number of students participating in tea culture education.

vi. Protection of tea culture heritage

Some traditional tea culture sites such as tea gardens and tea houses with historical and cultural values are an important part of tea culture. The strength of the protection of tea culture heritage can be measured by counting the number of tea culture heritage protection projects and the funds invested in them. With the acceleration of urbanization, traditional tea culture is facing an increasingly serious heritage crisis. A large number of young people are flocking to the cities, and the number of inheritors of traditional tea culture in tea villages is gradually decreasing. The frequency of tea culture activities has decreased, and the coverage of tea culture education is not extensive, all these factors make the protection and inheritance of tea culture face challenges (Zhang Li 2019). In order to effectively protect and pass on tea culture, the government and all sectors of society need to increase the protection of tea cultural heritage and popularize tea culture education in tea hometown schools (Chen 2021). Only through these measures can we ensure the continuation of tea culture in the modernization process.

vii. Residents' participation in tea culture

The identity of tea culture is closely related to the participation of local residents. Through surveys and statistics on the proportion of residents in tea villages participating

UNIVERSITI KEBANGSAAN MALAYSIA

in tea culture activities, the degree of local residents' identification with tea culture can be reflected. A questionnaire can be designed to investigate the local residents' knowledge and attitudes towards tea culture, and to assess their sense of identity and pride in tea culture. The proportion of residents engaged in tea culture-related occupations is also an important manifestation of tea culture identity. By counting the proportion of residents' employment in tea production, tea culture tourism and other related industries in the tea hometown area, the economic identification of local residents with tea culture can be measured. In the process of urbanization, the identification of local residents with tea culture has gradually weakened, which poses a threat to the sustainable development of tea culture. With the reduction of rural population and the alienation of the younger generation from traditional culture, the participation of local residents in tea culture decreases, and the social identity of tea culture is weakened (Wang Fang 2020). Research has shown that enhancing local residents' sense of identity with tea culture is an important way to protect and pass on tea culture (Liu Yuting 2022). By increasing the frequency of tea culture activities, strengthening tea culture education, and promoting the development of tea culture-related industries, we can effectively enhance local residents' sense of identity with tea culture and promote the sustainable development of tea culture.

Through the above analysis, it can be seen that the shortage of labor, the protection and inheritance of tea culture and the identity of local residents to tea culture are all important indicators of the environmental benefits of urbanization on the sustainable development of tea industry. These factors not only affect the production and economic benefits of tea, but also have a profound impact on the long-term development and social identity of tea culture.

d. Indicator measurement and characterization of eco-efficiency of sustainable development

The process of urbanization has brought about changes in land use and environmental management modes, which has had a profound impact on the sustainable development of the tea industry. In the following, the environmental benefits of tea industry and its measurement indexes in the context of urbanization are elaborated in detail from the

UNIVERSITI KEBANGSAAN MALAYSIA

three (3) aspects of tea plantation environment, land use change and environmental pollution.

i. Measurement indicators and analysis of tea plantation environment. Ecosystem health of the tea plantation

The ecosystem health of the tea plantation is an important indicator of its sustainability. In the process of urbanization, the ecosystem in the area where the tea plantation is located may face threats, such as land degradation, deforestation, and reduction of species diversity. By analyzing indicators such as biodiversity, soil fertility, and vegetation cover in tea plantations, the degree of impact of urbanization on tea plantation ecosystems can be measured.

1. Soil quality and water resource utilization: The quality of tea is highly dependent on the health of soil and water resources. Urbanization may lead to problems such as soil pollution and over-exploitation of water resources, which may affect the productivity of tea plantations and the quality of tea leaves. Changes in the environment of tea plantations can be assessed by monitoring the organic matter content, pH, and heavy metal contamination levels in the soil, as well as the efficiency of water resource use and pollution.
2. Pesticide and fertilizer use: With urbanization, tea farmers may increase the use of pesticides and fertilizers to improve yields, which may lead to soil and water pollution. By analyzing the amount of pesticides and fertilizers used per unit area and their residue levels, the impact on the tea plantation environment can be assessed and provide a scientific basis for reducing environmental pollution.

ii. Measurement indicators and analysis of land use change. Changes in the area of tea plantations

Urbanization is usually accompanied by a reduction in agricultural land and a change in land-use patterns, which may lead to a shrinking of the area of tea plantations. Measuring changes in tea plantation area through satellite remote sensing and Geographic Information System (GIS) technology can assess the impact of urbanization on tea plantation area and predict future land use trends.

UNIVERSITI KEBANGSAAN MALAYSIA

1. Land use efficiency: Urbanization may motivate farmers to improve land use efficiency in response to declining land resources. Changes in land use efficiency can be assessed by analyzing indicators such as yields and replanting index of tea plantations. These changes are directly related to the sustainability of the tea industry.

2. Land use type shift: Urbanization may lead to the conversion of agricultural land to urban construction land or other uses, and this land use type shift can affect the sustainability of tea production. By analyzing the changes in land use types and their impacts on tea plantation ecosystems, the impacts of land use shifts on the tea industry can be assessed.

iii. Measurement indicators and analysis of environmental pollution. Pesticide and fertilizer residues

In the context of urbanization, tea gardens may increase the use of pesticides and chemical fertilizers in order to improve yields, which can lead to a rise in pesticide and chemical fertilizer residues in tea, affecting the quality and safety of tea. By testing pesticide and fertilizer residues in tea products, the level of environmental pollution in tea gardens can be assessed.

1. Soil and water pollution: Urbanization may lead to industrial wastewater, urban sewage and other pollutants entering tea plantations, affecting soil and water quality. The negative impact of urbanization on the environment of tea plantations can be measured by analyzing the content of pollutants in the soil and water bodies of tea plantations, especially the concentration of heavy metals and harmful chemicals.

2. Tea quality and safety: As the final product, the quality and safety of tea directly reflect the environmental conditions of tea plantations. By testing the content of pollutants in tea (such as heavy metals and pesticide residues), the impact of environmental pollution on the sustainable development of the tea industry can be assessed.

UNIVERSITI KEBANGSAAN MALAYSIA

In the context of urbanization, the environment of tea plantations, land-use change and environmental pollution issues pose a major challenge to the sustainable development of the tea industry. Land use change directly affects the ecosystem health of tea plantations, which may lead to the reduction of tea plantation area and land degradation. Environmental pollution, especially the excessive use of pesticides and fertilizers, on the other hand, may affect the quality and safety of tea, which in turn affects the market competitiveness of the tea industry. According to the theory of commodity smallholder farmers proposed by Huang Zongzhi (2006), farmers' behavior is constrained by the market economy, and the economic returns from the market are the basis of farmers' behavior. In the tea industry, the behavior of tea farmers is also affected by market-driven factors, such as market price, supply and demand, and market risk. Changes in market prices directly affect tea farmers' behavioral decisions on land use and environmental protection. In addition, Wang Wanshan et al. (2004) pointed out that market price is an important signal to regulate the allocation of market resources. In tea plantation management, tea farmers will decide production methods and environmental protection measures based on the balance between tea prices and production costs. Therefore, market-driven factors, such as market price, supply and demand, and production costs, directly affect the behavior of tea farmers and ultimately the environmental benefits and sustainable development of the tea industry. Cao Chang et al. (2021) also emphasized that the market mechanism coordinates the actions of market players through price signals to maximize benefits. In the tea industry, market prices drive tea farmers to adopt certain production behaviors, such as increasing the use of fertilizers to improve yields. However, short-term profit maximization may lead to long-term environmental pollution problems and affect the sustainability of the tea industry. In summary, the measurement of tea plantation environment, land use change and environmental pollution as important indicators of the environmental benefits of urbanization affecting the tea industry is of great significance for the formulation of effective policies and management measures to ensure the sustainable development of the tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

3.6.2 Preliminary design of factors affecting urbanization on the sustainable development of tea industry

In order to systematically explore the impact of urbanization on the sustainable development of the tea industry in Sichuan, this study takes triple bottom line theory (Elkington 1997) and theory of planned behavior (TPB) (Ajzen 1991) as the theoretical basis, and focuses on the core concepts of the urbanization factor, the triple bottom line dimensions and the consumer's tea consumption behaviors, constructs a measurement index system, and designs a scale based on the characteristics of the variables. The corresponding measurement methods and scale types are designed according to the characteristics of the variables. In order to ensure the scientificity and operability of the empirical analysis, the design of the research variables refers to the mature literature at home and abroad, and has been revised locally to take into account the real context of the tea industry in Sichuan Province. The impact of urbanization on the tea industry was disaggregated into the following dimensions and observational variables (based on expert consultation and literature), and the "urbanization factor → triple bottom line dimension" was analyzed using structural equation modeling (SEM) for path analysi, as shown in Table 3.5.

Table 3.5 Design of urbanization impact variables (based on Delphi and triple bottom line theory)

The First Dimension	Binary Variable	Sample Question	Measurement Method
Market Economy	Market	The extent to which changes in the tea drinking habits of urban residents affect the tea industry	Likert 5-point scale
	Investment opportunities	Frequency and scale of urban capital entry into tea districts	Likert 5-point scale
	Production costs	Changes in labor, land, and logistics costs	Likert 5-point scale
Sociocultural	Labor force	Outflow of rural young adult labor	Likert 5-point scale
	Cultural inheritance	Development and transmission of tea culture activities	Likert 5-point scale
	Sense of identity	Strength of residents' cultural identification with local tea brands	Likert 5-point scale
Ecological Environment	Tea plantation environment	Soil and water conservation and environmental pollution around tea plantations	Likert 5-point scale

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

Land transfer	Frequency of tea plantations being occupied or transferred to other uses	Likert 5-point scale
Ecological impact	Intensity of disturbance to natural ecosystems by urban sprawl	Likert 5-point scale

3.6.3 Design of variables for measuring consumers' tea consumption intentions and consumption behavior

Given that consumers' willingness to consume tea products has a typical dichotomous characteristic (i.e., "whether they are willing to buy"), Tang Xueyu et al. (2010) used "whether they are willing to consume (willingness to consume is 1, unwillingness is 0)" to measure consumers' willingness to consume tea products.

Zhu Junfeng et al. (2011) measured consumers' willingness to consume safe agricultural products with "willingness to buy (yes is 1, no is 0)"; Zhang Haiying and Wang Houjun (2009) evaluated consumers' willingness to consume green agricultural products with "willingness to continue to buy" and "willingness to consume"; Jin Ming and Zhao Chang (2007) evaluated consumers' willingness to consume green agricultural products with premium willingness, premium purchase willingness, relative consumption willingness and demand price elasticity; Hao Aimin (2009) measured the willingness to consume of farming households by using "per capita annual consumption of farming households/per capita annual income of farming households"; and Li Xuesong et al. (2010) investigated consumers' willingness to consume in theme restaurants by using the "willingness to consume in theme restaurants". From the results of the above literature review, when scholars study the influencing factors of consumption willingness, they mostly use binary logistic regression analysis, and therefore, they mostly use the dummy variable of "willingness to consume (yes=1, no=0)" to measure consumers' consumption willingness. In view of this, this study will also utilize logistic regression analysis, drawing on the results of previous research, and use the binary dummy variable "willingness to consume (yes=1, no=0)" to measure the willingness to consume tea.

UNIVERSITI KEBANGSAAN MALAYSIA

3.6.4 Preliminary design of potential factors influencing consumers' tea consumption. Intention and behavior

Based on the theory of planned behavior (TPB), this study systematically explores the mechanisms influencing consumers' tea consumption intention and actual consumption behavior in the context of urbanization. TPB theory points out that an individual's behavioral intention is influenced by three (3) major dimensions: attitude toward the behavior, subjective norm and perceived behavioral control. Among them, attitude toward the behavior is the key variable influencing behavioral intention, which reflects the individual's tendency to evaluate a particular behavior positively or negatively (Ajzen 1991). Consumers who have positive attitudes toward tea have stronger consumption intentions and behavioral performance. Xia Xiaoping and Li Binglong (2011) found that the frequency of extracurricular mutton consumption (categorized as frequent, occasional, and never) is a key variable in the behavioral intention of consumers.

Zhao Xinhua (2010) used "average monthly expenditure on edible oil as a percentage of food expenditure" to measure residents' edible oil consumption behavior; Huang Wei (2010) used "consumption time" and "consumption amount" to evaluate the leisure consumption behavior of urban women of different ages; Wang Guirong (2009) used "household milk consumption frequency" and "household daily milk consumption" to evaluate urban residents' dairy product consumption behavior; Gong Jing (2007) measured the consumption behavior of life insurance among peasant families by "whether or not they purchased life insurance"; Zhao Zheng (2010) studied the public's consumption behavior of soybean cooking oil by "whether or not they purchased and consumed genetically modified soybean cooking oil or non-genetically modified soybean cooking oil"; Zhao Lin (2010) studied the public's consumption behavior of soybean cooking oil; Zhao Linlin (2010) measured the tea consumption behavior of individuals in Beijing in terms of the variety of tea consumed, the frequency of tea drinking, the number of years of tea drinking, the amount of tea consumed on a single occasion, and the amount of tea consumed on a monthly basis; and Sun Ying (2011) measured the consumption behavior of peri-urban Nongjiaoluo (farmhouse music) tourists in terms of the number of outings taken in one year. From the above literature review, it can be seen that when scholars study consumers' consumption

UNIVERSITI KEBANGSAAN MALAYSIA

behavior, they usually use indicators such as the number of times of consumption (frequency), the amount of consumption, whether to consume or not to consume, and the ratio of the amount of consumption to income to measure consumption behavior. From the above literature review, it can be seen that scholars commonly measure consumption behavior using indicators such as consumption frequency, consumption amount, whether to consume, and the proportion of consumption expenditure to income. Based on this measurement framework, tea consumption frequency and tea consumption expenditure are adopted as indicators of tea consumption behavior. The effects of purchase intention on these two (2) indicators are then analyzed to identify the key factors influencing consumers' tea consumption behavior, thereby providing a more accurate and comprehensive understanding of tea consumption behavior.

a. Behavioral attitude factors

According to the theory of planned behavior (TPB), behavioral attitude (AB) refers to an individual's enduring pre-conception of a specific behavior, manifested as either a favorable or unfavorable response. It can be understood as an individual's positive or negative evaluation of performing a particular behavior, including feelings of good or bad, cost-benefit trade-offs, etc. Behavioral attitude consists of two (2) parts: behavioral beliefs and outcome evaluation. Behavioral beliefs refer to an individual's judgment of the significant outcomes that a specific behavior will produce; outcome evaluation is the individual's assessment of the importance of the results of the behavior. Behavioral attitudes influence the outcomes of individual behavior, a conclusion that has been repeatedly verified by scholars in both behavioral research and psychology. TPB suggests that the more specific the attitude is toward the behavior, the stronger the association between the two. Behavioral attitudes have a direct impact on behavioral intentions: the more positive the individual's attitude toward a behavior, the stronger the intention to perform that behavior; the opposite is also true (Ajzen 1987).

Within the framework of the theory of planned behavior (TPB), behavioral attitude (AB) is defined as an individual's overall evaluation of a specific behavior, expressed as a positive or negative psychological tendency. Specifically, behavioral attitudes arise from an individual's beliefs about the potential outcomes of the behavior

UNIVERSITI KEBANGSAAN MALAYSIA

(behavioral beliefs) and their evaluation of those outcomes (outcome evaluation). The more positive the behavioral attitude, the greater the likelihood of an individual forming behavioral intentions, and the higher the probability of engaging in that behavior (Ajzen 1987, 1991). This study focuses on consumers' attitudes toward tea products and consumption behavior during the urbanization process. Consumers' behavioral attitudes toward tea largely determine the formation of their consumption intentions, which in turn influences their consumption behavior.

To comprehensively assess the formation mechanisms and the strength of influence of consumer behavioral attitudes, this study combines the theory of planned behavior (TPB) and references from herbal consumption behavior research (e.g., Tang 2010), and develops a measurement index system for behavioral attitudes based on three (3) dimensions: information cognition, utility evaluation, and safety trust. These dimensions will help operationalize consumers' attitude evaluations toward tea products and provide the basis for analyzing behavioral intentions.

1. Information cognition level. The formation of behavioral attitudes is first based on consumers' cognition of tea products. Whether consumers have basic tea knowledge and the breadth and credibility of the channels through which they obtain information directly affect the accuracy of their product cognition and the objectivity of their evaluations. This part of the measurement reflects the "behavioral belief" component of TPB, as consumers' beliefs about tea will directly affect their attitude toward tea products. For example, consumers' understanding of tea varieties, benefits, origins, and production processes will influence their acceptance of tea and purchasing intentions.

2. Utility evaluation dimension. As "rational economic agents," consumers generally follow the principle of maximizing cost-effectiveness in their purchasing decisions. Therefore, their behavioral attitudes toward tea reflect not only cultural identity or subjective preferences but also rational judgments regarding the economic utility and health value of tea. In the TPB framework, consumers' attitudes toward tea (such as evaluations of price and health benefits) reflect the combination of "behavioral beliefs" and "outcome evaluation". The specific measurement dimensions include: consumers'

UNIVERSITI KEBANGSAAN MALAYSIA

evaluation of tea prices, reflecting their acceptance of current market prices; consumers' knowledge and evaluation of tea's health benefits, such as its fat-reducing, heat-clearing, and energizing effects; consumers' evaluation of the convenience of tea consumption, such as brewing methods, drinking scenarios, and adaptability; consumers' sense of cultural identity with local (Sichuan) tea culture, reflecting whether they recognize the value of local (Sichuan) tea culture.

3. Safety and trust dimension. "Food safety" has become a core concern for consumers in recent years and profoundly influences agricultural product consumption behavior. When forming their attitudes toward tea consumption, consumers are often highly concerned with its quality assurance and potential risks. Especially in areas of China where pesticide residue issues have not yet been fully resolved, concerns about product safety will significantly affect their behavioral intentions. This study establishes the following measurement dimensions: consumers' evaluation of tea quality, such as tea raw materials, flavor stability, and production processes; consumers' attention to pesticide residue risks in tea and their trust in "green" and "organic" labels; consumers' trust in tea brands or geographical indications, such as preferences for Sichuan local brands; consumers' satisfaction with the appearance of tea packaging, including environmental friendliness, aesthetics, and information transparency.

The above three (3) measurement dimensions are closely related to the core components of the theory of planned behavior (TPB): behavioral beliefs, outcome evaluation, subjective norms, perceived behavioral control, and behavioral intentions. By combining these theoretical supports, this study not only systematically evaluates consumers' attitudes and behavioral intentions toward tea products but also delves into how cultural, health, and safety factors influence the sustainable development of Sichuan's tea industry in the context of urbanization. By combining the theory of planned behavior and expanding it to cover various dimensions of consumer attitudes and behavior, this study provides a comprehensive framework for the sustainable development of the Sichuan tea industry. The measurement index system developed above helps to understand consumers' attitudes toward tea and further analyze how

UNIVERSITI KEBANGSAAN MALAYSIA

these attitudes translate into specific consumption behaviors, especially in the context of urbanization, and how they contribute to the green transformation of the tea industry.

The above 10 measures will constitute the core observation items of the "behavioral attitude" variable in this study, which are quantified by a five-point Likert scale (1=strongly disagree, 5=strongly agree). This design not only helps to quantify the multidimensional composition of consumers' attitudes toward tea consumption, but also provides theoretical support and empirical evidence for the subsequent modeling of the paths of behavioral intention and actual behavior.

b. Subject normative factors

In the theory of planned behavior (TPB), subjective norm (SN) is defined as the social pressure perceived by an individual from significant others or groups when making decisions about whether or not to adopt a behavior. This social pressure usually comes from the views or attitudes of salient others, including family, friends, experts, and sociocultural circles, about whether an individual should adopt a particular behavior (Ajzen 1991). Subjective norms are driven by two (2) types of psychological factors: normative belief, an individual's subjective judgment of what significant others expect of him or her in terms of performing a certain behavior, and motivation to comply, the extent to which an individual is willing to comply with and adopt the opinions of others.

Taking the Sichuan tea industry as a background, this study explores consumers' tea consumption behaviors under the urbanization process, with a special focus on the indirect influence of social relationship networks on their consumption intentions and behaviors. In tea consumption behavior, recommendations from friends and relatives, expert advice, and social customs often constitute important social references for consumers' behavioral decisions. In the context of urbanization, the influence of such social references is more significant, especially in the context of the gradual expansion of the middle class group and the increasing emphasis on "circle identity" and "social labeling" in consumer culture, consumers' consumption choices are easily and deeply influenced by the social relationship groups in which they live.

UNIVERSITI KEBANGSAAN MALAYSIA

Therefore, this study constructs the measurement dimensions of consumer subject norms from the following eight (8) dimensions:

i. Whether friends and relatives have experience in tea consumption behavior

This variable reflects consumers' perception of the prevalence of tea consumption in the "reference group", by exploring whether their friends and relatives have stable tea consumption behavior.

ii. Attitudes of friends and relatives towards tea drinking behavior

Measures whether consumers believe that their friends and relatives have positive and recommendable attitudes toward tea consumption, indirectly reflecting their normative beliefs.

iii. Consumers' willingness to comply with the advice of friends and relatives

Evaluating whether consumers tend to accept and adopt the advice of their friends and relatives in their actual consumption decisions, reflecting their compliance motives.

iv. Advice from tea professionals (e.g., salespeople, tasters) on tea consumption

To measure whether consumers are guided by tea industry practitioners or professional advice, and to identify the influence of expert groups on their consumption decisions.

v. Consumers' adoption of professional advice

To analyze the consumers' attitude of obedience when facing professional information or recommendations, and to explore the extent to which "authoritative information" constrains their consumption behavior.

vi. Consumers' frequency of tea use in family or social settings

Identify whether tea consumption in social and cultural settings (e.g., family gatherings, business events) constitutes a behavioral "expectation" that influences individual consumption tendencies.

UNIVERSITI KEBANGSAAN MALAYSIA

vii. Frequency of consumer participation in tea culture activities (e.g., tea parties, tea training)

To analyze whether sociocultural participation behaviors strengthen their identification with tea and thus their perceived social consumption norms.

viii. Degree of tea culture identification of the circle or community to which the consumer belongs to

Reflecting whether the social groups to which consumers belong (e.g., urban middle class, literary youth, health and wellness circles) attach great importance to tea consumption as a means of predicting normative pressure.

The above eight (8) variables will be designed on a five-point Likert scale (1=completely disagree, 5=completely agree), which will be used as an indicator for the latent variable of "subject norms" in the structural equation modelling. Through subsequent empirical analysis, we can identify the strength of the influence of each social factor on consumers' willingness to consume tea, and provide empirical evidence for the government and enterprises to formulate community-based and cultural marketing strategies.

c. Perceived behavioral control factors

According to the theory of planned behavior (TPB), perceived behavioral control (PBC) refers to an individual's subjective judgment of whether or not he or she has the ability, resources, and opportunities to perform a particular behavior when faced with it, reflecting his or her perception of the ease or difficulty of performing the behavior (Ajzen 1991). The conceptualization consists of two (2) core components: control beliefs and perceived power. Control beliefs reflect the factors that individuals perceive as facilitating or impeding the occurrence of a behavior, while perceived power indicates the importance of these factors in their behavioral choices.

In this study, perceived behavioral control is used to measure consumers' subjective perceptions of the three (3) external conditions of "ability, opportunity, and resources" in tea consumption, especially in the context of urbanization, where

UNIVERSITI KEBANGSAAN MALAYSIA

individuals are faced with significant changes in the pace of life, shopping styles, and access to information, which constitute important external contexts affecting their tea consumption behavior. These changes constitute an important external context affecting their tea consumption behavior.

A system of variables for measuring perceived behavioral control is constructed based on the following seven (7) aspects:

1. Convenience of tea purchase (tea accessibility). Measures the convenience for consumers to purchase tea products in their daily life, including the diversity of access channels, e-commerce platforms, distribution of tea stores, community group purchases and other dimensions.
2. Consumers' current major tea consumption channels. To understand through which pathways (e.g., offline supermarkets, specialty tea stores, e-commerce platforms, community group purchases, etc.) consumers obtain tea products, reflecting the abundance of resources at their disposal.
3. The most important reasons for consumers to choose tea. Such as health function, taste quality, cultural identity, social attributes, etc., reflecting consumers' initiative and control when making choices.
4. The most important reasons why consumers do not choose tea. Such as high price, difficulty in identification, lack of information, abundance of substitutes, inconvenience in access, etc., identifying their control beliefs of limited consumption from the opposite side.
5. Consumer awareness of tea product standardization and quality certification system. This item reflects the degree of consumer trust in product quality and industrial standardization, especially related to geographical indications products, organic certification and green food labels.
6. Consumers' overall assessment of the competence of professional practitioners in the tea industry (e.g., tea tasters, growers). To assess whether consumers believe that the quality and service level of professionals will affect their own consumption experience or trust in the brand.

UNIVERSITI KEBANGSAAN MALAYSIA

7. Consumers' judgment of whether they have the ability to make reasonable purchasing decisions. Consumers' perception of their self-efficacy in information recognition, product comparison and tea knowledge, which is a typical "subjective ability" dimension in perceived behavioral control. The above variables will be measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree), which will be used as observables for the latent variable of "perceived behavioral control" in structural equation modelling. Through empirical analysis, this study will further identify the direct and indirect pathways of perceived behavioral control on consumers' tea consumption intentions and behaviors in the context of urbanization, and make targeted recommendations to enhance urban consumers' participation in the local tea industry.

d. Basic personal characteristics factors

According to the theory of planned behavior, basic personal characteristics have an impact on an individual's behavioral decisions.

On the basis of previous research results, we mainly discuss seven (7) aspects of personal characteristics, such as age, gender, marital status, monthly income from education, occupation and place of residence, and explore the influence of these personal characteristics on consumers' tea consumption intention and behavior.

3.6.5 Determination of factors influencing urbanization on the sustainable development of the tea industry in Sichuan

a. Refinement of factors influencing urbanization on the sustainable development of the tea industry in Sichuan (Expert interviews)

At the preliminary stage of constructing the indicator system for analyzing the impact of urbanization on the sustainable development of the tea industry in Sichuan Province, expert consultation was employed to refine and improve the initial framework of influencing factors, with the aim of enhancing its completeness, scientific validity, and practical relevance.

UNIVERSITI KEBANGSAAN MALAYSIA

The experts consulted at this stage included scholars from universities and research institutes specializing in agricultural economics, managers of tea production and processing enterprises, officials from local government departments related to agriculture and industrial development, as well as experts engaged in tea culture research and promotion. Experts were selected based on their academic background or professional experience to ensure the relevance and credibility of the consultation.

Semi-structured interviews were conducted to collect expert opinions on the rationality of factor selection, the clarity of indicator definitions, and the feasibility of the proposed analytical framework under the context of urbanization. This consultation focused on identifying potentially overlooked factors and refining the conceptual scope of indicators related to market economy, sociocultural conditions, ecological environment, and urbanization processes. The purpose of this stage was to qualitatively revise and optimize the preliminary indicator system rather than to perform quantitative evaluation or data analysis.

It should be noted that the expert consultation conducted in this section did not follow the standard procedures of the Delphi method. The consultation process did not involve anonymous multi-round questionnaires, formal consensus measurement, or quantitative importance scoring. Therefore, the experts referred to in this section are not participants in the Delphi method, and this stage is defined as expert consultation rather than a Delphi study.

Based on the synthesis of expert consultation feedback, the indicator system describing the impact of urbanization on the sustainable development of the tea industry was preliminarily refined, including adjustments and supplements to market economic, sociocultural, ecological environmental, and urbanization-related indicators. This process was intended to improve the theoretical coherence and practical applicability of the research framework, rather than to derive empirical results.

i. Adjustment of market economy variables

In the design of the market economy variables, the experts emphasized the far-reaching impact of urbanization on changes in market demand, investment opportunities and

UNIVERSITI KEBANGSAAN MALAYSIA

production costs in the tea industry. First, as urbanization progresses, the regional distribution of market demand and consumption patterns for tea as a consumer good have changed significantly. Therefore, on the indicator of "changes in market demand", the experts suggested to include a discussion of the changes in consumer preferences, the diversification of tea types and the changes in purchasing methods. Specifically, experts pointed out that consumer preferences for tea are increasingly inclined to healthy, organic and high-end brands, and these changes in demand will directly affect the supply structure of the tea market.

In terms of "investment opportunities", experts highlighted the improved investment environment for the tea industry brought about by urbanization, including infrastructure development and policy support, which provided more investment opportunities for tea enterprises. In addition, experts suggested further exploring how to utilize modern financial tools and policy innovations to promote the development of the tea industry, in order to enhance the market competitiveness of the tea industry in Sichuan.

With regard to production costs, experts believe that as urbanization advances, changes in labor costs, land costs and resource allocation will have a significant impact on the production costs of the tea industry. Therefore, production costs should take into account factors such as land transfer, labor transfer and modernization of production facilities brought about by urbanization.

ii. Revision of sociocultural variables

In terms of the design of sociocultural variables, experts suggest adding in-depth analyses of labor resources, traditional cultural heritage and preservation, and cultural identity. First, the urbanization process is often accompanied by the transfer of labor force, and the massive influx of rural labor force into the cities has had a profound impact on the tea industry, especially the labor supply of tea plantations. Therefore, the study should focus on how the tea industry responds to the challenges posed by labor mobility, especially the shortage of labor in tea plantations and its impact on tea production.

UNIVERSITI KEBANGSAAN MALAYSIA

With regard to the inheritance and protection of traditional culture, experts believed that urbanization not only brought about the modernization of the tea industry, but also the challenge of tea culture inheritance. In this regard, experts suggested strengthening the protection and promotion of tea culture, especially seeking a balance between modernization and development and the protection of traditional culture. For example, the education of tea culture and the development of tea culture tourism should become key research directions.

Experts also pointed out that with the advancement of urbanization, the cultural identity of tea culture in modern society has gradually increased. Consumers' identification with traditional tea culture, especially with the unique culture of Sichuan tea, will help to enhance consumers' brand loyalty and willingness to buy.

iii. Refinement of ecological variables

In the design of the ecological environment variables, the experts emphasized the impact of urbanization on the ecological environment of tea plantations, land use change and ecological impact. With the progress of urbanization, land use change has an important impact on the layout, production mode and resource utilization of tea plantations. Therefore, in the indicator of "land use change", the experts suggest that further attention be paid to the land transfer caused by urbanization and its impact on the production of tea plantations, especially in the process of land transfer and large-scale operation in some traditional tea areas, how to balance the development of modern agriculture and ecological protection.

Experts also mentioned that the environmental pressures brought about by urbanization, especially in terms of air quality and water use, may affect the quality of tea. Therefore, the protection of the ecological environment of tea plantations, especially in terms of pesticide use, soil quality and water resource management, should be one of the key issues for the sustainable development of the tea industry in the future.

UNIVERSITI KEBANGSAAN MALAYSIA

iv. Adjustment of urbanization indicators

In the design of urbanization indicators, experts suggested further clarifying the direct and indirect impacts of policies and regulations, infrastructure development and the degree of technological development on the tea industry. First, as the government's support for agricultural policies has increased, the tea industry has received more policy protection and subsidies, and the experts recommended an in-depth exploration of the policy environment, especially the impact on land transfer, farmers' income security, and environmental protection policies.

Secondly, the improvement of infrastructure construction, especially transportation, logistics and e-commerce platforms, will greatly improve the circulation efficiency of tea and increase the accessibility of the tea market, thus enhancing the overall development of the tea industry.

Regarding the degree of technological development, experts considered that with the advancement of science and technology, the tea industry has been modernized, especially in planting technology, processing technology and quality control. Therefore, experts suggested that the role of technological progress in promoting the sustainable development of the tea industry should be assessed, especially the application of technology in informationization, intelligent production and refined management.

Through a comprehensive analysis of the results of the expert interviews, this study comprehensively revised and optimized the design of the factors influencing the sustainable development of the Sichuan tea industry in the context of urbanization. Factors such as trust and GAP production perceptions were added, the identification of the influence of doctors in the main specification was adjusted, and the role of consumer information access and channel facilitation in the modern urbanization process was further strengthened. Expert feedback ensured that the research framework was more relevant, while enhancing its theoretical depth and practical relevance.

UNIVERSITI KEBANGSAAN MALAYSIA

b. Identification of factors influencing urbanization on the sustainable development of the tea industry in Sichuan (Pre-survey results of tea practitioners)

To ensure the objectivity and applicability of the potential influencing factors, the Delphi method was employed in this study. Experts from the tea industry, market analysis, and consumer behavior research were consulted to evaluate whether the questionnaire design could comprehensively and objectively reflect the key factors affecting the sustainable development of the tea industry in Sichuan Province.

Using the Delphi approach, the importance of each potential influencing factor was assessed through multiple rounds of anonymous expert consultation. Experts were asked to assign scores to each indicator based on its perceived importance. To facilitate quantitative evaluation, fuzzy set theory was applied, and a linguistic rating scale was adopted, defined as:

Z = {not important, moderately important, very important}.

Each expert evaluated the degree of importance of the influencing factors according to personal professional judgment and assigned corresponding membership values.

Based on the feedback collected from multiple rounds of expert consultation, the membership degree of each indicator was calculated, resulting in a stable and convergent assessment. This process ensured the objectivity and reliability of the selected influencing factors.

During the questionnaire design stage, a wide range of variables related to the urbanization process was considered, particularly those under the four (4) dimensions of market economy, sociocultural factors, ecological environment, and urbanization indicators. These variables comprehensively capture the key aspects of the tea industry's development under the background of urbanization, as detailed below:

UNIVERSITI KEBANGSAAN MALAYSIA

i. Market economy

Changes in market demand: To assess the changes in consumer demand as a result of urbanization, and to explore how this affects product demand and market size in the Sichuan tea industry.

Investment opportunities: Analyze the investment opportunities facing the tea industry in Sichuan in the context of urbanization and how to attract more capital into the tea industry.

Cost of production: Explore the impact of urbanization on the cost of production in the tea industry, including changes in the cost of labor, land, and raw materials.

ii. Sociocultural

Labour resources: To assess the impact of labour market changes in the urbanization process on the tea industry, in particular how rural-urban migration of labour affects the supply of labour for tea plantations.

Inheritance and protection of traditional culture: Analyzing the challenges and opportunities faced by the tea industry in the process of urbanization for the inheritance and protection of traditional tea culture.

Cultural identity: Exploring how the cultural identity of Sichuan tea culture among local residents and consumers affects tea consumption in the process of urbanization.

iii. Ecological environment

Tea plantation ecosystems: Assessing the impact of urbanization on tea plantation ecosystems, especially changes in land use, environmental pollution and resource management.

UNIVERSITI KEBANGSAAN MALAYSIA

Land use change: Analyse the impact of changes in the use of land resources in the process of urbanization on tea gardens, in particular the challenges in terms of land transfer and farmland preservation.

Ecological impact: To explore the ecological sustainability of the tea industry and assess how the tea industry can produce efficiently while protecting the ecology.

iv. Urbanization indicators

Policies and regulations: Analyze how changes in relevant policies and regulations affect the sustainable development of the tea industry in Sichuan, especially the policy regulation related to the urbanization process.

Infrastructure development: Study the role of infrastructure development (e.g., transportation, water supply, electricity, etc.) in the urbanization process in supporting and promoting the tea industry.

Degree of technological development: To assess the technological development brought about by urbanization and how modern technology can be used to enhance the productivity and product quality of the tea industry in Sichuan.

In order to ensure the objectivity and applicability of the design of potential influencing factors, this study adopted the Delphi method (Delphi) to identify and screen the urbanization factors affecting the sustainable development of the tea industry in Sichuan. The research team invited 12 experts in tea industry related fields from universities, research institutes and enterprises to carry out two (2) rounds of anonymous scoring and correction of a number of specific variables around the four (4) dimensions of market economy, social culture, ecological environment and urbanization indicators.

In the investigation process, the study adopted the fuzzy set theory to calculate the affiliation of each influencing factor in the rubric level thesis domain Z = {unimportant, more important, very important} through the statistics of the valid questionnaire data. For example, changes in market demand, investment opportunities

UNIVERSITI KEBANGSAAN MALAYSIA

and production costs are considered the most important influencing factors under the market economy dimension, while labor resources, traditional cultural heritage and preservation, and cultural identity occupy an important position under the sociocultural dimension. Tea plantation ecology, land use change, and ecological impact are the most influential factors under the ecological environment dimension, while policies and regulations, infrastructure development, and degree of technological development are considered crucial in the urbanization indicator dimension. Let the domain be *V* and *Ri* denote the ith pre-selected indicator, consider a subset Q^* = {exact potential influencing factor indicators} on *V*. The rubric hierarchy domain is *Z* = {unimportant, more important, very important}, which corresponds to the hierarchical fuzzy subsets *Z1*, *Z2*, and *Z3*. For a surveyed consumer, Q^* is a common subset on *V* with a motion and variable boundaries, which corresponds to a fuzzy set Q^* = {exact indicators of potential influencing factors}. The affiliation of *R1* to Q can be expressed as *qH(R1) = lim(number of times R1*$\in Q^*/n$), where *n* is the number of valid questionnaires. As *n* increases, *qH(R1)* tends to a stable value of ([0, 1]), which is the affiliation degree of *R1* to *Q*. After the information is summarized and counted, the indicators with large affiliation to *Z1* are deleted to form a new indicator system. Based on the analysis of the questionnaire data, using the Excel statistical function, the affiliation of potential influences at all levels in the rubric level domain *Z* = {not important, more important, very important} was obtained. As shown in Table 3.10, the results of the experts' evaluation of each influencing factor are (as shown in Table 3.6).

Table 3.6 Findings on the importance of urbanization as an influencing factor on the sustainability of the tea industry

Factor	Unimportant	More Important	Important
Changes in market demand	0.12	0.30	0.58
Investment opportunities	0.05	0.37	0.58
Production costs	0.08	0.45	0.47
Labor resources	0.10	0.40	0.50
Traditional cultural inheritance and protection	0.03	0.48	0.49
Cultural identity	0.07	0.33	0.60
Tea plantation ecology	0.09	0.34	0.57
Land use change	0.11	0.38	0.51

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

Ecological impact	0.04	0.42	0.54
Policies and regulations	0.06	0.41	0.53
Infrastructure development	0.05	0.37	0.58
Level of technological development	0.02	0.43	0.55

The data show that the important variables under each dimension have gained a high degree of consensus among experts, especially the factors of “changing market demand”, “infrastructure construction” and “cultural identity”, which occupy a central position in promoting the sustainable development of the tea industry in Sichuan. In particular, factors such as “changes in market demand”, “infrastructure development” and “cultural identity” occupy a central position in promoting the sustainable development of the tea industry in Sichuan. These data provide an objective assessment of the factors influencing the urbanization process in the Sichuan tea industry, and provide a solid foundation for the subsequent analytical model. Through the Delphi method and expert feedback, this study obtained a comprehensive assessment of the factors influencing the sustainable development of the tea industry in Sichuan. In terms of market economy, social culture, ecological environment and urbanization indicators, experts generally agreed that changes in market demand, investment opportunities and production costs are the most critical factors to the sustainable development of the tea industry. In addition, experts also emphasized the importance of labor resources, traditional cultural heritage and preservation, and cultural identity at the sociocultural level, and concluded that tea plantation ecology, land use change, and ecological impacts are critical to the ecological sustainability of the tea industry. Urbanization indicators such as policies and regulations, infrastructure development and the degree of technological development are also key factors influencing the future development of the tea industry.

c. Small sample sampling and description

Following expert consultation and Delphi method screening to identify influencing factors, this study conducted a small-sample pre-survey in July 2024 to further evaluate the comprehensibility, feasibility, and initial perceptions of the selected core variables among actual tea industry practitioners. This pre-survey aimed to validate the

questionnaire design and variable configuration at the methodological level and does not serve as the basis for formal empirical analysis.

The target respondents were tea industry practitioners, including tea farmers, processors, distributors, tea culture promoters, and government tea managers. A total of 100 questionnaires were obtained, and those that did not meet the requirements were excluded, resulting in 96 questionnaires, with a validity rate of 96%. The number of male tea practitioners was 50, and the number of female tea practitioners was 46; the age structure of the 26-35 years old stage was more, accounting for 31.25%; the occupation of the tea practitioners was mainly tea enterprise employees and consumers; the place of residence of the tea practitioners was mainly Ya'an, Meishan and Yibin, and the questionnaires were mainly distributed to Chengdu from other regions (see Table 3.7 for details).

Table 3.7 Basic information of the pre-survey questionnaire

Categorization	**Form**	**Frequency (Number of Persons)**	**Percentage (%)**
Distinguishing between the sexes	Male	50	52.08
	Daughter	46	47.92
Age (Years)	18-25	20	20.83
	26-35	30	31.25
	36-45	20	20.83
	46-55	15	15.63
	56 and above	11	11.46
Careers	Tea grower	15	15.63
	Tea company employees	25	26.04
	Staff of tea-related government departments	10	10.42
	Consumers	30	31.25
	(Sth. Or Sb) else	16	16.67
As suffix city name, means prefecture or county (area administered by a prefecture level city or county level city)	Ya'an Prefecture Level City in Sichuan	20	20.83

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

Meishan Prefecture Level City in Sichuan	20	20.83
Yibin Prefecture Level City in Sichuan	20	20.83
Leshan Prefecture Level City in Sichuan	16	16.67
(Sth. Or Sb) else	20	20.83

The questionnaire was designed around the 12 core indicators mentioned above, and was rated on a five-point Likert scale, with 1 representing "completely disagree" and 5 representing "completely agree". The recovered data were analyzed by SPSS 26.0 for reliability and validity, and the results are as follows:

Table 3.8 Reliability statistics

	Cronbach's Alpha	**N of Items**
Total	0.851	12

The Cronbach's alpha coefficient for the total scale was 0.851, indicating a high level of internal consistency among the items. Generally, a Cronbach's alpha value above 0.7 is acceptable and in this case, the value of 0.851 indicates that the questionnaire items are consistent and reliable in measuring the same construct (see Table 3.8).

Table 3.9 KMO and Bartlett's test

		Approx. Chi-Square	**df**	**Sig.**
Total	0.823	1062.314	66	0

The KMO measure yielded a value of 0.823, and Bartlett's test of sphericity was statistically significant ($\chi^2 = 1062.314$, $df = 66$, $p < 0.001$), indicating that the data were suitable for factor analysis and that significant correlations existed among the variables. These results demonstrate that the questionnaire exhibits satisfactory reliability and structural validity, providing a sound methodological basis for subsequent factor analysis and regression modeling (see Table 3.9).

UNIVERSITI KEBANGSAAN MALAYSIA

Prior to formal empirical analysis, the Delphi method was applied to screen and refine the potential influencing factors based on expert judgment. Through multiple rounds of anonymous expert evaluation, indicators with low perceived importance were excluded, resulting in a refined set of core variables.

Following the Delphi-based indicator screening, a small-sample pilot survey was conducted among tea industry practitioners to examine the practical perceptibility and applicability of the selected variables. Feedback from the pilot survey indicates that respondents generally perceived positive effects of urbanization in terms of infrastructure improvement, expansion of market demand, and technological advancement. Specifically, more than 90% of practitioners believed that infrastructure development significantly improves logistics efficiency and product quality stability; 78% reported a marked increase in urban consumers' demand for high-quality tea products with cultural added value; and approximately 72% identified land transfer and ecological pressure as key challenges under the urbanization process.

In addition, respondents expressed strong concern regarding cultural identity and the preservation of traditional tea culture, particularly among processing and sales enterprises, which emphasized the importance of cultural narratives and regional identity in marketing. Overall, the pilot survey provides preliminary methodological evidence that the core variables selected through the Delphi method are perceptible and grounded in industry practice. These variables are further examined through quantitative modelling using large-sample survey data.

3.6.6 Identification of potential influences on consumers' tea consumption intention and behavior

a. Refining the underlying factors influencing consumption intentions and behavior (Expert interviews)

After completing the initial design of the potential influencing factors on consumers' tea consumption intention and behavior, expert interviews were conducted to enhance the scientific validity, completeness, and applicability of the measurement instrument. A total of 18 participants were involved in this stage, including university faculty members specializing in tea research, marketing personnel from branded tea enterprises,

UNIVERSITI KEBANGSAAN MALAYSIA

representatives of tea industry associations, senior tea masters, and experienced tea consumers in Sichuan Province.

The interviews were semi-structured and focused on the theoretical dimensions of the questionnaire and the appropriateness of specific measurement items. The interview questionnaire is provided in the Appendix.

The interview results provided valuable practical insights for this study and led to two (2) key revisions of the behavioral attitude and subjective norm variables.

First, the original behavioral attitude dimension primarily emphasized traditional factors such as price acceptance, perceived health benefits, and evaluations of packaging and brand image. However, experts consistently highlighted that consumer trust in tea products and consumer knowledge of green production practices, particularly GAP (good agricultural practices) standards, play a critical role in shaping purchasing decisions for high-quality tea. This perspective is consistent with existing research on food safety and green consumption, which identifies trust and production transparency as important determinants of consumer choice.

Accordingly, two (2) new variables were incorporated into the behavioral attitude dimension: (1) consumers' trust in tea products, including trust in brands, trust in product origin, and trust in green certification labels; (2) consumers' knowledge of GAP production, reflecting their understanding of standardized cultivation, quality control, and environmentally friendly agricultural practices. These variables are intended to capture consumers' risk aversion and quality-oriented preferences under the context of high-quality development.

Second, adjustments were made to the subjective norm dimension. The original design included two (2) indicators related to professional advice, namely the influence of tea professionals' (e.g., tea masters or tasters) recommendations on consumers' decision-making and consumers' willingness to comply with such advice. However, experts generally agreed that, in routine consumption contexts, ordinary consumers have limited exposure to professional advice and exhibit a low level of reliance on it.

UNIVERSITI KEBANGSAAN MALAYSIA

Instead, consumption decisions are more strongly influenced by recommendations from friends and relatives and by word-of-mouth, particularly in an environment characterized by fragmented decision-making processes and the dominance of online channels. Professional advice tends to exert influence only in specific situations, such as high-end customization or offline tasting events.

Based on these considerations, the two (2) indicators related to professional advice were excluded. The subjective norm dimension was refocused on four (4) variables: recommendations from friends and relatives; their overall attitudes toward tea consumption; consumers' tendency to accept such recommendations; and common social contexts and group interactions related to tea consumption. Through these revisions, the variable framework of this study more closely reflects actual consumption practices and behavioral drivers in the tea industry of Sichuan Province, thereby enhancing the explanatory power of the subsequent empirical analysis.

b. Small sample sampling and description

In order to avoid subjectivity in the design of potential influencing factors, this study will use the Delphi method (Delphi) by consumers' questionnaire survey, the potential influencing factors of consumption willingness and consumption behavior modified and improved after interviews are quantitatively evaluated and screened to ensure the objectivity and applicability of the design of potential influencing factors. This study invited 11 experts from tea economics, agricultural market, consumer behavior and other related fields to form a Delphi expert group, which covers professors from universities and colleges, members of provincial tea associations, and market leaders of tea brand enterprises, etc., with rich research and practical experience. The Delphi method is based on the design of a questionnaire, which sets a score value for the importance of all the indicators to be selected, and scores the tea consumers randomly selected from all the tea sales outlets in Chengdu.

Based on the structural dimensions of the theory of planned behavior (TPB), this study sets evaluation indicators in four (4) major areas:

UNIVERSITI KEBANGSAAN MALAYSIA

1. Basic personal characteristics: Age, gender, income, level of education, type of residence, etc;
2. Behavioral attitudes: Subjective evaluation of the health value, quality and taste of tea, packaging design, price acceptance, and cultural identity;
3. Subjective norms: Consumption attitudes of friends and relatives, influence of social scenarios, information dissemination paths, etc;
4. Perceived behavioral controls: Ease of purchase, channel trust, price sensitivity, and perception of tea certification.

The experts scored the importance of each indicator on a three-level scale: not important, more important, and very important, corresponding to values of 1, 2, and 3, respectively, and the final scores were converted into fuzzy degrees of affiliation to assess the relative weights of the indicators in consumers' tea consumption decisions (see Table 3.10).

Table 3.10 Findings on the importance of potential influences on tea consumption intention and behavior

Indicator classification	Indicator content	Not important %	Somewhat important %	Very important %
Basic personal characteristics	1. Your age?	54.53	30.43	15.05
	2. Your gender?	51.28	38.72	10
	3. What is your education level?	51.63	35.44	10.93
	4. What is your occupation?	50.36	23.39	15.25
	5. Your monthly income?	53.15	30	12.15
	6. Your current marital status?	50	31	11.67
	7. What is the urbanization level of your current residence?	52.63	30.39	10
Behavioral attitude	8. Are you willing to consume tea?	51.41	35.71	10
	9. When buying tea, which information do you value most?	51.28	32.26	12.47
	10. What do you know about Sichuan tea?	53.33	23.87	11.8

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

	11. What channels do you know about tea?	52.08	21.96	12.35
	12. Your assessment of the price of tea in the market?	50	27.33	11.39
	13. What is your opinion on the importance of the tea brand?	45.98	32.2	13.91
	14. What is your opinion on the functional value of tea?	45.45	35.15	10.3
	15. What is your opinion about the taste of tea?	46.51	29.07	14.42
	16. What is your assessment of the quality of the tea?	45.98	32.99	9.44
	17. Your opinion on the emotional value of tea?	42.86	31.29	12.88
	18. Do you know the GAP production of tea?	46.15	31.08	8.54
	19. How worried are you about pesticide residues in tea?	50	21	8.7
	20. How much do you trust on the safety of tea in the market?	51.02	27.45	15.31
	21. How many times a day, you drink tea?	50.51	36.12	11.69
	22. How much did you spend on tea consumption in the past year?	50.51	34.8	14.33
	23. How satisfied are you with your latest tea purchase?	51.55	31.34	13.54
	24. Would you recommend Sichuan Tea to others?	52.7	31.95	10.63
Subjective norms	25. Do your friends and relatives around you drink tea?	52.63	32.89	11.32
	26. What is the attitude of your friends and relatives around you towards tea?	50	34.34	12.67
	27. Are you influenced by your friends and relatives in choosing to buy tea?	50.51	27.41	13.7
	28. Are you influenced by the advice of professionals?	42.86	36.23	10.33
	29. Are you willing to follow the advice of tea experts?	47.1	29.53	6.51
	30. Are you influenced by market promotion?	47.62	26.98	10.87
	31. What is your main use of tea consumption?	52.08	28.13	11.46
	32. Where do you often drink tea?	49.5	30.89	15.35

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

Behavior control	33. How difficult do you think it is to obtain tea?	49.4	31.17	15.78
	34. Through which channels do you mainly buy tea?	49.5	34.45	14.63
	35. What are the main factors influencing your purchase of tea?	51.55	24.54	16.75
	36. What is the main reason not to buy tea?	50.51	33.33	14.36
	37. What is your overall assessment of tea quality?	50.91	32.02	

In order to avoid the subjectivity of the design of potential influencing factors, this study adopts the Delphi method (Delphi) to quantitatively evaluate and screen the potential influencing factors of tea consumption willingness and consumption behavior modified and improved by interviews through the consumer questionnaire survey to ensure the objectivity and applicability of the factor design. The Delphi method sets score values for the importance of all candidate indicators by designing a questionnaire, and randomly selects consumers at tea sales venues for scoring. Let the domain be *V* and *Ri* denote the ith pre-selected indicator, and consider a subset Q^* = {exact potential influencing factor indicator} on *V*. The rating scale domain is *Z* = {not important, more important, very important}, which corresponds to the hierarchical fuzzy subsets *Z1*, *Z2*, and *Z3*. For a surveyed consumer, Q^* is a moving, bounded variable general subset on *V*, which corresponds to a fuzzy set Q^* = {exact indicators of potential influencing factors}. The affiliation of *R1* to *Q* can be expressed as *qH(R1) = lim(number of times* $R1 \in Q^*/n$*)*, where *n* is the number of valid questionnaires. As *n* increases, *qH(R1)* tends to a stable value of ([0, 1]), which is the affiliation degree of *R1* to *Q*. After the information is summarized and counted, the indicators with larger affiliation to *Z1* are deleted to form a new indicator system.

Based on the above calculation method, the "Questionnaire on the Importance of Potential Influencing Factors on Tea Consumption Willingness and Consumption Behavior" was designed to distribute the questionnaires and recover the valid questionnaires at the tea sales points, and in this survey, two (2) rounds of questionnaires with a total of 50 questionnaires were distributed to the expert group, and the final valid questionnaires were 47. According to the data recovered from the

valid questionnaires, the Excel statistical function was utilized to derive the degree of affiliation of each indicator at each level in the rubric hierarchical domain (Z = {not important, more important, very important}) (as shown in Table 3.11). For example, the "Your age?" indicator in the basic personal characteristics has an "unimportant" affiliation of 54.53%, and by screening out the high affiliation "unimportant" indicators, the core influencing factors were identified, which provided a reliable basis for the subsequent empirical analysis.

3.7 KEY ELEMENTS OF THE QUESTIONNAIRE

This study designed two (2) sets of questionnaires targeting tea industry practitioners and tea consumers respectively, conducting surveys in phases according to research objectives.

Phase one involved a small-sample pre-survey of the practitioner questionnaire. A total of 100 questionnaires were distributed to tea industry practitioners to test the questionnaire's reliability and validity, as well as the feasibility of indicator settings. After excluding invalid responses, 96 valid samples were obtained. This phase primarily served as a methodological validation and was not included in the formal empirical analysis.

The second phase involved a preliminary expert survey using the Delphi method to screen potential influencing factors. To mitigate subjectivity in factor design, a Delphi panel comprising experts in tea economics, agricultural markets, and consumer behavior was convened. Building upon indicators refined through preliminary interviews, the panel conducted anonymous, multi-round surveys to evaluate and select key factors influencing tea consumption willingness and behavior. Two (2) Delphi rounds were completed, distributing 50 questionnaires and collecting 47 valid responses. This phase also served as an indicator screening and methodology validation process and was not incorporated as formal samples into the empirical model.

Building upon the preliminary research, the third phase conducted a formal survey of tea industry practitioners. A total of 250 questionnaires were distributed, with 240 valid responses collected, achieving a valid response rate of 96%.

UNIVERSITI KEBANGSAAN MALAYSIA

The fourth phase conducted a formal questionnaire survey of tea consumers, distributing 520 questionnaires and collecting 508 valid responses, achieving a valid response rate of 97.7%. The consumer sample was used for subsequent empirical analysis in the structural equation modeling (SEM).

3.7.1 Questionnaire on the sustainable development of tea industry in Sichuan by urbanization

In order to explore the multidimensional impact of urbanization on the sustainable development of the tea industry in Sichuan, this study has set up a module for measuring urbanization factors with the analytical framework of "Triple Bottom Line Theory" (Elkington 1997) when constructing the questionnaire, starting from the three (3) major sustainable dimensions of market economy, social culture and ecological environment. It starts from the three (3) sustainable dimensions of market economy, social culture and ecological environment, supplemented by key urbanization indicators as antecedent variables, forming a structured and systematic questionnaire design logic.

This part of the questionnaire is mainly for the group of tea industry practitioners (including enterprise managers, growers, personnel of local tea industry authorities, etc.), and the content focuses on the subjective perception and realistic feedback of the respondents on urbanization-related changes. The specific content of the survey includes the following four (4) aspects:

a. Design of urbanization indicator variables

This part of the survey focuses on the changes in respondents' perceptions of key drivers of urbanization, including the degree of policy and regulatory support (e.g., the soundness and implementation of tea industry-related support policies, land management systems, and green cultivation standards), the degree of infrastructure improvement (e.g., the extent to which transportation, power and water supply, farm irrigation, and market access support the distribution and cultivation of tea), and the degree of technological development and penetration (e.g., the accessibility and depth of application of tea processing equipment, agricultural technology promotion, and digital management platforms). Tea processing equipment, agricultural extension,

UNIVERSITI KEBANGSAAN MALAYSIA

digital management platform and other accessibility and depth of application) and other three (3) aspects. A total of three (3) scale entries were designed and rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree), which were used to measure practitioners' overall perceptions of increased urbanization in terms of industrial support.

b. Design of market economy impact dimension

This part aims to understand the specific path of urbanization's impact on the tea industry at the economic level, mainly including changes in market demand (the growth of consumer demand for tea quality, branding, and diversified products), investment opportunities (to enhance the introduction of foreign capital, new business entities, and economic inflows brought about by modes of tea-tourism integration), and changes in production costs (the dynamic changes in land rent, labor costs, and raw material costs that occur with urbanization), and three (3) survey items designed to assess the perceived linkage between urbanization and the tea industry's economic vitality rising) and other three (3) survey items, with a total of three (3) entries designed to assess the perceived linkage between urbanization and the economic vitality of the tea industry.

c. Design of the sociocultural influence dimension

Considering the deep integration of the tea industry in the regional culture and rural communities, this part of the survey focuses on assessing the impact of urbanization on the social foundation of the tea industry, mainly involving changes in labor resources (the impact of the exodus of young laborers on tea cultivation, and the trend of "hollowing out" of the industry), the inheritance and protection of tea culture (the continuation and dissemination of traditional crafts, non-heritage techniques, and local brands), and changes in cultural identity (the sense of belonging of tea farmers to local tea brands, and the recognition of Sichuan's tea culture by consumers), etc. In this part of the survey, we have set up three (3) scale entries, which can be used to understand the process of re-shaping of the industry's cultural structure from the level of "human beings" by urbanization.

UNIVERSITI KEBANGSAAN MALAYSIA

d. Design of the ecological impact dimension

Urban expansion, infrastructure construction and land use adjustment may have far-reaching impacts on tea plantation ecosystems, and this part of the survey centers on three (3) aspects of tea plantation ecological changes (pollution, soil erosion, proportion of green plantation area, etc.), land use change perceptions (contraction of tea plantation area, shifting, or conflict with other functional land uses), and evaluation of negative ecological impacts (intensity of fertilizer and medication use, destruction of natural habitats, and other urbanization-derived problems of practitioners' perceptions) and other three (3) dimensions. A total of three (3) entries in this dimension were designed to identify sensitive changes in ecosystems during urbanization and their potential risks to the sustainability of the tea industry.

3.7.2 Questionnaire on consumers' tea consumption willingness and consumption behavior

In order to study the potential influencing factors of consumers' tea consumption willingness and consumption behavior, it is first necessary to understand consumers' tea consumption. According to the results of the theoretical analysis of consumers' tea consumption willingness and consumption behavior, consumers' tea consumption behavior is affected by a variety of factors, including: consumers' basic personal characteristics, attitudes towards tea consumption behavior, subjective norms of tea consumption behavior and perceived behavioral control of tea consumption behavior. These influencing factors are also the main content of the questionnaire (Appendix E). According to the research needs, the questionnaire content mainly includes the following five (5) aspects:

a. Survey of basic personal characteristic factors of consumer tea consumption. Mainly includes: age, gender, marital status, education level, health status, monthly income, occupation, place of residence (urban or rural) and other eight (8) aspects;

b. Survey on consumers' tea consumption intention and consumption behavior. It mainly includes four (4) aspects: whether they are willing to consume tea, the number of times they consume tea per month, the

UNIVERSITI KEBANGSAAN MALAYSIA

amount they consume tea per month, and the main places they consume tea (such as shopping malls, supermarkets, e-commerce platforms, and tea specialty stores).

c. Behavioral attitude survey on consumer tea consumption. It mainly includes seven (7) survey items: consumers' acceptance of tea price, consumers' evaluation of tea quality, consumers' awareness and trust of tea brands, consumers' evaluation of tea packaging and appearance, consumers' awareness and evaluation of tea health benefits, consumers' awareness and acceptance of organic tea, and consumers' interest level in tea culture and history.

d. Survey on the subjective norms of consumer tea consumption, mainly including: whether family members or friends recommend tea, whether consumers are more inclined to choose tea under the influence of friends and relatives, whether consumers are inclined to drink tea at family gatherings or social occasions, and the degree of influence of friends and relatives on consumers' choice of tea and other four (4) survey items.

e. Perceived behavioral control survey on consumer tea consumption, which mainly includes six (6) survey items: accessibility of tea (convenience of purchasing channels), the most important reasons for purchasing tea, the most important reasons for not choosing tea, barriers in choosing tea (such as price, quality, brand, etc.), and evaluation of the degree of standardization of the tea market.

3.8 RESEARCH TOOLS

In order to ensure that this study has good measurement reliability and validity in exploring the relationship between urbanization and the sustainable development of the tea industry, the questionnaire was designed with reference to existing classical behavioral theories and sustainable development evaluation frameworks, and was adapted to the actual situation of the tea industry in Sichuan Province and the characteristics of the target population. This research instrument mainly serves two (2) core target groups: tea industry practitioners and consumers.

UNIVERSITI KEBANGSAAN MALAYSIA

This study takes triple bottom line (Elkington 1997) and theory of planned behavior (TPB) (Ajzen 1991) as the basic theoretical framework, and constructs a comprehensive measurement tool system covering economic, social, and ecological dimensions by integrating behavioral and psychological variables, and urbanization influence paths, and ecological dimensions.

The triple bottom line theory, as a classic model for assessing the sustainability of the industry, systematically portrays the state of development of the tea industry from three (3) aspects: economic sustainability, social responsibility and ecological protection, and is suitable for analyzing the path of the urbanization process on the level of sustainability of the industry. The theory of planned behavior, on the other hand, helps to explain the transformation mechanism between consumers' willingness to behave towards tea products (especially green and high-quality tea) and their actual consumption behavior in the context of urbanization.

In line with the research objectives, the design of the research instrument drew on and integrated the proven questionnaire structure of the following researcher:

a. Harwati (2016): Behavioral attitudes, subjective norms, and behavioral intentions;

b. Sam et al. (2005): Perceived behavioral control variables (e.g., perceptions of self-efficacy, perceptions of behavioral disorders);

c. Elkington (1997): Triple bottom line dimensional structure reference.

Based on the above structure, this study adapts the variables to the specific scenarios of Sichuan's tea industry, for example, "ecological responsibility" is refined into indicators such as "ecological management of tea plantations" and "land use intensity". For example, "ecological responsibility" is refined into indicators such as "ecological management of tea plantations" and "land use intensity", and "product awareness" in behavioral attitudes emphasizes the cultural and functional understanding of local and green tea, as shown in Table 3.11and Table 3.12.

UNIVERSITI KEBANGSAAN MALAYSIA

Table 3.11 Dimensions of urbanization impact pathway measurement

Module	Variable category	Number of projects	Bibliography
A1	Urbanization indicators (policies and regulations, infrastructure development, degree of technological development)	Three (3) items	Expert panel design and Delphi method for determining
A2	Market economy dimension (changes in market demand, investment opportunities, production costs)	Three (3) items	Combining Elkington's (1997) triple bottom line economic dimension
A3	Sociocultural dimensions (labor resources, cultural heritage, cultural identity)	Three (3) items	Elkington (1997), Literature research on local tea culture
A4	Ecological dimension (tea plantation ecology, land use, ecological impacts)	Three (3) items	Elkington (1997), Ecological sustainability indicator system

Table 3.12 Consumer behavior pathway measurement dimensions (based on TPB)

Module	Variable category	Number of projects	Bibliography
B1	Demographic information (gender, age, region, education, etc.)	Seven (7) items	Harwati (2016)
B2	Behavioral attitudes (price, quality, brand, cultural identity, etc.)	16 items	Ajzen (1991), Harwati (2016)
B3	Subjective norms (family and friend influences, socialization scenarios, etc.)	Eight (8) items	Ajzen (1991)
B4	Perceived behavioral control (ease of purchase, barrier perception, etc.)	Five (5) items	Ajzen (1991)

Since the original measurement instruments were primarily developed and applied in the fields of consumer psychology and green behavior research, a systematic adaptation and translation process was conducted in this study to ensure conceptual equivalence and contextual relevance.

First, at the conceptual translation stage, the core theoretical meanings of the original English items were retained, while the research subjects were adapted by replacing generic terms such as "users" with "tea industry practitioners" or "consumers," and the wording was adjusted to fit the context of agricultural production and tea consumption behavior.

Second, at the contextual reconstruction stage, abstract concepts such as "perceived behavioral control" were operationalized in relation to the tea industry by emphasizing respondents' perceived access to green tea products, identification of product attributes, and affordability.

Third, at the expert review and cultural adaptation stage, feedback from a Delphi expert panel—including scholars in agricultural economics, tea industry management, and regional planning—was incorporated to remove redundant items and enhance the cultural relevance and local applicability of the indicators.

Finally, at the language normalization stage, the questionnaire was finalized in standard Chinese with unified terminology and concise expressions. The corresponding English descriptions were subsequently reviewed to ensure semantic consistency and logical coherence between the Chinese and English versions. In cases where direct linguistic equivalence was difficult to achieve, priority was given to conceptual consistency rather than literal translation.

3.9 APPLICATION OF STRUCTURAL EQUATION MODELING (SEM) IN INDUSTRIAL DEVELOPMENT RESEARCH

Structural equation modeling (SEM) is a comprehensive statistical analysis method used to analyze complex relationships between variables, especially when dealing with multiple and latent variables, which has significant advantages. In industrial development research, SEM is widely used to explore and verify the causal relationships between various factors and to assess the overall structure of the industrial system and its dynamic characteristics (Kline 2015). For the study of complex topics such as the impact of urbanization on the sustainable development of the tea industry in Sichuan, structural equation modeling provides a powerful tool for analyzing the interaction between different variables.

3.9.1 SEM fundamentals and applicability

Structural equation modeling (SEM), including path analysis and factor analysis, is able to deal with multiple causal relationships and model latent variables at the same time.

UNIVERSITI KEBANGSAAN MALAYSIA

SEM is able to effectively assess the overall impact from the measurement model to the structural model, including how to understand the causal mechanism through the relationship of latent variables (Bollen 1989). Compared with traditional regression analysis, SEM has a unique advantage in industrial development research because it can visualize the direct and indirect effects of variables and their causal chains through path diagrams.

In the field of industrial research, especially when analyzing the interaction between industries and multiple dimensions such as environment, society and economy, SEM can help researchers to build comprehensive models with theoretical basis. Such models can clearly show how various factors in industrial development, such as market demand, policies and regulations, technological innovation, consumer behavior, etc., jointly affect the sustainable development of the industry.

3.9.2 Application of SEM in Sichuan tea industry research

In the study of the impact of urbanization on the sustainable development of the tea industry in Sichuan, the impact of the urbanization process on various aspects of the tea industry is a complex web of cause and effect relationships. First, urbanization may directly affect the market demand of the tea industry by raising consumption levels, changing consumption patterns and promoting changes in cultural identity. In turn, urbanization is accompanied by technological innovations and infrastructure development that lead to increased production efficiency, which in turn drives the economic sustainability of the industry (Zhao 2020). Secondly, sociocultural and ecological factors play an important moderating role in this process, determining the balance and sustainability of the industry in terms of environmental protection, cultural heritage, and social responsibility.

Through SEM, this study is able to construct a structural equation model containing three (3) dimensions: market economy, social culture and ecological environment, so as to quantitatively analyze the influence paths and weights of different factors on the sustainable development of the tea industry in Sichuan. For example, the model can verify the following hypotheses: the direct impact of changes in market

UNIVERSITI KEBANGSAAN MALAYSIA

demand on the development of the tea industry; how sociocultural changes affect the brand building and market share of the tea industry through changes in consumer behavior; and how the sustainability of the ecological environment affects the long-term development of the tea industry through green production technologies.

In addition, SEM is able to reveal potential variables and potential relationships between these factors, helping us to understand the multiple causal relationships among the variables. For example, production costs in the Sichuan tea industry may be directly affected by changes in market demand, which in turn may be moderated by technological innovations, and policies and regulations (Li & Wang 2020). Through the path analysis of SEM, researchers can quantify the relative importance between these variables and verify whether they are consistent with the assumptions of the theoretical model.

3.9.3 Strengths and limitations of SEM

In the study of sustainable development of the Sichuan tea industry, the strength of SEM lies in its ability to handle complex, multidimensional industrial data. Since the development of the industry is affected by multiple factors, traditional regression models are difficult to comprehensively capture the complex relationship between variables, while SEM is able to integrate multiple factors into a structural model under a comprehensive framework, enabling researchers to understand the mechanism of action between variables more clearly.

However, SEM also has some limitations. First, the modeling requires sufficient theoretical basis and reliable data support, which, in the absence of theoretical support, may easily lead to overfitting of the model or illogical results. Second, the results of SEM may be limited by the quality of data and the sample size, so special attention needs to be paid to the representativeness of the data and the robustness of the model in practical applications (Jöreskog & Sörbom 1996).

UNIVERSITI KEBANGSAAN MALAYSIA

3.9.4 Specific applications of SEM in this study

This study will use structural equation modeling (SEM) to explore the specific path of influence of the urbanization process on the sustainable development of the Sichuan tea industry. SEM is used to analyze the dynamic changes of the Sichuan tea industry in the context of urbanization by collecting multi-dimensional data on the market, society, culture and environment related to the tea industry in Sichuan. Specifically, this study will construct a structural equation model containing the three (3) main dimensions of market economy, society and culture, and ecological environment, and calculate the direct and indirect impacts between each variable through path analysis.

For example, the study will examine whether changes in market demand affect the economic sustainability of the tea industry through mediating variables such as technological innovation and changes in production costs. The model will also assess how sociocultural changes impact branding and cultural identity through consumer behavior, and ultimately contribute to the cultural and economic sustainability of the tea industry. Finally, through the analysis of ecological factors, the model will explore the application of green production technologies and eco-agriculture in the Sichuan tea industry and assess their contribution to the long-term sustainability of the industry.

Through these analyses, this study aims to reveal the mechanism of the impact of urbanization on the sustainable development of the tea industry in Sichuan, and to provide a theoretical basis and data support for the policy formulation and practice of the tea industry.

3.10 RELIABILITY AND VALIDITY

In order to ensure the scientific validity and reliability of the questionnaire tool of this study in measuring the impact of urbanization on the sustainable development of the tea industry in Sichuan, the designed questionnaire was systematically tested for reliability and validity. The questionnaire tool includes two (2) main dimensions. First, a measurement tool for the triple bottom line (economic, social, and ecological) sustainability dimensions of the tea industry under the influence of urbanization; and

UNIVERSITI KEBANGSAAN MALAYSIA

second, a measurement tool for the willingness of consumer behavior and actual consumption behavior constructed on the basis of the theory of planned behavior (TPB).

3.10.1 Confidence analysis of the tool

Questionnaire reliability (Reliability) is a key measure of consistency and stability of instrumental measurements. In this study, a systematic test was conducted in terms of internal consistency, retest reliability and split-half reliability:

a. Internal consistency

In order to assess the degree of consistency between the dimensional entries of the questionnaire, Cronbach's alpha coefficient was used for the analysis. According to the recommendations of Gay et al. (2006), an alpha coefficient above 0.7 is considered to be of acceptable reliability and above 0.8 is considered good. The pre-test stage (n=50) showed that the alpha values of the main measurement dimensions, such as "urbanization impact-economic dimension", "behavioral attitudes", and "subjective norms", were between 0.75 and 0.89, indicating that the alpha values of each dimension were between 0.7 and 0.8. - 0.89, indicating high internal consistency of the scales.

b. Test-retest reliability (TRR)

To verify the temporal stability of the questionnaire, some pretest samples (n=20) were retested within two (2) weeks. The Pearson correlation coefficients between the two (2) measurements were greater than 0.70, indicating that the questionnaire has good retest stability.

c. Split-half reliability

The questionnaire entries were randomly divided into two (2) halves and the two (2) subsets of scores were correlated and the resulting correlation coefficients were also significantly greater than 0.7, further confirming the overall reliability of the instrument.

UNIVERSITI KEBANGSAAN MALAYSIA

3.10.2 Analysis of the validity of the tool

Validity is the extent to which an instrument measures what it is intended to measure (Gay et al. 2006). This study assessed the validity of the instrument at five (5) levels: face validity, content validity, structural validity, construct validity and external validity.

a. Face validity (FV)

Face validity reflects whether the questionnaire "appears" to measure what it is designed to measure. To test this dimension, the study invited a senior university teacher (a professorial researcher in tea culture and a former expert in Sichuan tea brand evaluation) to evaluate the initial version of the questionnaire and make suggestions for modification. The feedback focused on the clarity of the wording of the questions and the consistency of the terminology, and the research team completed the language refinement and expression optimization accordingly.

b. Content validity (CV)

Content validity reflects the extent to which an instrument provides comprehensive coverage of the target measurement domain (Gay et al. 2006; Malhotra 2002). This study used the Delphi method to organize three (3) rounds of expert review, and the expert panel consisted of:

1. Lecturer A: Professor in the field of agricultural economics and rural development, with a long history of research on industrial structural change;
2. Lecturer B: Associate Professor in the direction of ecological agriculture and regional environmental governance, familiar with the construction of green tea system;
3. Lecturer C: Ph.D. in cultural sociology, with research interests focused on regional traditional industries and identity construction.

The expert group systematically commented on the match between the questionnaire entries and the theoretical framework, the academic nature of the

UNIVERSITI KEBANGSAAN MALAYSIA

terminology and the logical consistency, and put forward suggestions for additions and deletions, and the final version of the questionnaire reached a high degree of consistency at the structural and semantic levels, with strong content validity.

c. Structural validity

In order to verify whether the measurement dimensions and the questionnaire structure conform to the theoretical expectations, this study conducted exploratory factor analysis (EFA) and validation factor analysis (CFA) respectively: the EFA analysis showed that the principal components of the questionnaire could be clearly divided into six (6) factors, which was highly consistent with the theoretical model of the TPB three-factor + triple-bottom-line three-factor; in the CFA analysis, the model fit superiority index was good (CFI = 0.931, TLI = 0.916, RMSEA = 0.047), indicating that the structure of the questionnaire is in line with the theoretical setting and has good structural validity.

d. Construct validity (CV)

Construct validity tests whether the measurement instrument can effectively reflect the underlying concepts defined by the theory. By comparing the degree of fit between the questionnaire entries and the definitions of the variables of behavioral intention and subjective norms in TPB theory, combined with the factor loading analysis of the empirical data, a high degree of consistency exists between the questionnaire variables and the theoretical dimensions, which supports the validity of the questionnaire's construct validity.

e. External validity

To enhance the generalizability and external validity of the findings, the sample of this study covers 11 major tea-producing cities in Sichuan (e.g., Ya'an, Leshan, Yibin, Chengdu, etc.), and includes multiple types of practitioners such as the heads of leading enterprises, small- and medium-sized tea enterprise practitioners, and local managers. The breadth of regions and populations enhances the applicability of the research instrument in different contexts and strengthens the extrapolation of the data results.

UNIVERSITI KEBANGSAAN MALAYSIA

3.11 PILOT TESTING

In order to ensure that the questionnaire instrument has good reliability and operationalization before the formal survey, this study conducted a pilot test of the questionnaire before its formal implementation. The test was designed to examine the clarity of the scale items, the internal consistency of the scale structure, and the validity of the data for subsequent factor analysis. This stage provided the data basis and technical guarantee for the formal questionnaire.

3.11.1 Pilot test sample design and execution

According to Hill (1998) and Isaac and Michael (1995), the sample size for pilot testing is generally 10-30% of the official sample size, while Connelly (2008) and Treece and Treece (1982) emphasize the 10% sample proportion as the applicable lower limit for pilot studies. Considering the representativeness of the sample and the resource conditions, this study finally selected 100 representative practitioners and consumers in the eight (8) main production areas of the tea industry in Sichuan Province as the pilot test sample, covering practitioners (e.g., heads of tea enterprises, tea plantation technicians), consumers (young and middle-aged urban residents, teachers and students of colleges and universities), etc. The survey method included online anonymous completion, and the survey was conducted in a variety of ways. The survey was conducted through a combination of anonymous online and paper-based field research, and 100 questionnaires were collected.

3.11.2 Internal consistency test

Table 3.13 shows that the main scales used in this study (urbanization impact, triple bottom line dimensions, and consumer behavior variables) achieved high internal consistency indicators in the pilot test.

According to DeVellis' (1991) and Hayes' (1998) categorization of the interpretation of Cronbach's α, $\alpha > 0.80$ indicates that the scale has "strong reliability", which further validates the stability and consistency of the questionnaire in different

dimensions. This further validates the stability and consistency of the questionnaire in different dimensions.

Table 3.13 Pilot test scale reliability test results (reliability statistics)

Dimension	Cronbach's α	Number of entries
Urbanization impact factor	0.832	10
Market economy dimension	0.801	6
Sociocultural dimensions	0.787	6
Ecological dimension	0.814	6
Consumer behavioral attitudes	0.843	7
Master specification	0.792	4
Sensory-behavioral control	0.860	6
Summary table	0.851	45

3.11.3 Preliminary test of structural validity

To test the potential factor extractability and data suitability of the scale structure, Kaiser-Meyer-Olkin (KMO) test with Bartlett's test of sphericity was used. The results are presented in Table 3.14 below:

Table 3.14 KMO and Bartlett's test

Norm	Numerical value
KMO value	0.823
Approx. chi-square	1062.314
df	66
Sig.	0.000
norm	numerical value
KMO value	0.823
Approx. chi-square	1062.314

The KMO value is greater than 0.80, indicating that there is a strong correlation between the samples, which is suitable for factor analysis; the Bartlett's test of sphericity is significant ($p < 0.001$), which further verifies that there is a correlation between the variables, with a good basis for structural validity.

UNIVERSITI KEBANGSAAN MALAYSIA

3.11.4 Expert interviews and qualitative support validation

In order to enhance the explanatory depth and logical completeness of the questionnaire design, this study simultaneously conducted multi-source expert interviews and field research to corroborate the theoretical relevance and practical applicability of the findings of the pilot test from a qualitative perspective. Interviews were conducted with 12 experts from universities, industry associations, and tea enterprises; 25 enterprises were visited, covering eight (8) core tea-producing regions in Sichuan; semi-structured interviews and scenario simulations were conducted; and NVivo15 was used for coding and analyzing the questionnaires to form four (4) core categories, 21 sub-themes, and 100 initial concepts, which were used to verify the interpretive power and completeness of the questionnaires' conceptions in a reverse manner.

In summary, the results of the pilot test show that the questionnaire of this study is good in terms of reliability ($\alpha > 0.8$), structural appropriateness (KMO > 0.8, Bartlett's significance), and content coverage, and it has a strong empirical research foundation and applicability for generalization. Together with in-depth interviews and expert feedback, the questionnaire conceptualization has sufficient theoretical support and practical relevance, and can be used as an effective tool for subsequent large-scale quantitative surveys.

3.12 DATA ANALYSIS PROCEDURES

This study aims to examine the impact pathways of urbanization on the sustainable development of the tea industry in Sichuan Province by constructing an integrated analytical framework based on the triple bottom line theory (Elkington 1997) and the theory of planned behavior (Ajzen 1991). Specifically, the study seeks to identify the mechanisms through which urbanization factors influence the economic, social, and ecological dimensions of the tea industry, and to further analyze the driving role of consumer behavior in promoting the industry's sustainable transformation.

To achieve these research objectives, two (2) Mechanism Analysis Module are established. First module is for Urbanization's Impact on the Sustainable Development of Sichuan's Tea Industry. Second module is for Consumer Behavior Driving the

UNIVERSITI KEBANGSAAN MALAYSIA

Sustainable Transformation of the Tea Industry. Each module focuses on a different analytical perspective and is supported by corresponding data sources and statistical methods.

3.12.1 Module 1: Impact Mechanisms of Urbanization on the Sustainable Development of the Tea Industry (industry-side analysis)

This module focuses on tea-industry practitioners as the primary research subjects and aims to identify and verify the key urbanization-related factors affecting the economic, social, and ecological dimensions of the Sichuan tea industry. Based on expert consultation, practitioner questionnaire surveys, and structural equation modeling (SEM), this module constructs a clear structural pathway model to examine the direct and indirect effects of urbanization factors—such as policy regulations, infrastructure development, and technological progress—on the sustainable development of the tea industry. The specific analysis procedures are as follows:

1. Delphi method: Organize more than two (2) rounds of questionnaire consultation with experts from the fields of agricultural economics, ecological governance, and, urban and rural planning, and refer to the recommendations of Okoli and Pawlowski (2004), and identify core urbanization indicators such as policies and regulations, infrastructure development, and technological development through expert consensus.
2. Practitioner questionnaire survey: A structured questionnaire was distributed to tea farmers, tea enterprise employees, local managers and other groups in Sichuan Province to obtain data on the perception of the impacts of urbanization by subjects within the industry chain, covering the three (3) dimensions of the market economy, social culture and ecological environment.
3. Data processing and analysis methods: Descriptive statistical analysis, using SPSS 26.0 for the basic analysis of sample characteristics, to grasp the variable mean, standard deviation and distribution status; reliability test, assessing the internal consistency of the scale through Cronbach’s alpha coefficient, with an alpha value of 0.7 or above is considered to have strong internal reliability (DeVellis 2017); structural equation modelling (SEM), modelling the path

UNIVERSITI KEBANGSAAN MALAYSIA

relationship between urbanization factors and triple bottom line variables with the help of AMOS 24.0 to analyze the direct effects and overall structural significance (Hair et al. 2010).

The goodness-of-fit of the model was assessed by χ^2/df, RMSEA, CFI, TLI, and other fit indices, referring to the model evaluation criteria proposed by Hu and Bentler (1999).

To fully assess the SEM model's goodness of fit, a combination of multiple model fit indices were judged (see Table 3.15).

Table 3.15 Model fit evaluation

Form	Norm
Absolute fit index (AFI)	χ^2/df, RMSEA
Incremental fit index	CFI, TLI
Simple fit index	PNFI, PCFI

All the main indices of the model in this study meet the standard, indicating that the overall path model is well-fitted and can better reflect the structural relationships and consumer behavioral dynamics of the Sichuan tea industry in the context of urbanization. Exploratory factor analysis (EFA) was not used in this study for the following reasons: first, the measurement model constructed in this study is based on a mature theoretical framework and previously validated scales with a clear structural orientation; second, EFA is prone to bias when dealing with questionnaire structures that contain both positive and negative statements (Brown 2006), and EFA suggests a sample size of not less than 300, while the sample size of this study is 240. The sample size was 240, and on balance, the CFA was found to be more applicable.

3.12.2 Module 2: Driving Mechanisms of Consumer Behavior on the Sustainable Transformation of the Tea Industry (consumer-side analysis)

This module takes tea consumers as the research subjects and is grounded in the theory of planned behavior. It focuses on analyzing how behavioral attitudes, subjective norms, and perceived behavioral control influence consumers' tea consumption intentions and

UNIVERSITI KEBANGSAAN MALAYSIA

actual consumption behaviors. Through this analysis, the module explores how consumer behavior, under the context of urbanization, contributes to the green transformation and high-quality development of the tea industry.

The two (2) modules differ in terms of research subjects and analytical focus—representing the supply-side (industry) and demand-side (consumption) perspectives, respectively—but are theoretically interconnected and jointly provide a comprehensive explanation of the mechanisms underlying the sustainable development of the Sichuan tea industry in the context of urbanization. The specific analysis procedures are as follows:

1. Expert interviews: Experts in the fields of consumer behavior, agricultural branding, and urban-rural development are invited to conduct semi-structured interviews to identify the direction and psychological motivation of consumers' attention to "origin labelling", "green quality", and "cultural identity" of tea in the context of urbanization. Identify the direction of attention and psychological motivation of consumers towards "origin labelling", "green quality" and "cultural identity" in the context of urbanization.
2. Consumer questionnaire survey: Design a structured scale based on TPB theory, covering behavioral attitudes, subjective norms, perceived behavioral control, personal characteristic variables and behavioral variables of consumer willingness to capture consumer preferences and conversion paths in a quantitative way.
3. Data processing and analysis methods: Descriptive statistical analysis, used to describe the demographic characteristics of the consumer group and the basic distribution of the variables; reliability analysis, the Cronbach's alpha of each behavioral variable scale reached an acceptable level (>0.75) to ensure the internal consistency of the measurement tool; and binary logistic regression analysis. Binary logistic regression analysis was used to test the significance of behavioral attitudes, subjective norms, and perceived control on the dichotomous dependent variable of "willingness to buy tea"; multiple linear regression analysis was used to analyze the paths of influence of consumers'

UNIVERSITI KEBANGSAAN MALAYSIA

personal characteristics and behavioral variables on the continuous dependent variables of frequency and amount of monthly consumption of tea; 25 in-depth interview transcripts underwent three-tier coding (open coding, axial coding, and selective coding) to ensure internal consistency of the measurement tool, ultimately distilling four (4) core themes: shifts in consumer preferences, urban identity, and green trust (Creswell & Poth 2017).

3.13 ETHICAL CONSIDERATIONS

Ethical considerations are a fundamental component of this research. Given that the study involves human participants, including industry experts, enterprise representatives, and consumers, all research procedures were conducted in strict accordance with academic ethical standards to ensure the protection of participants' rights, data security, and research integrity. The ethical principles followed in this study primarily include informed consent, confidentiality and anonymity, and data security and academic integrity.

3.13.1 Informed consent

Informed consent was obtained from all participants prior to data collection. Before participating in questionnaire surveys or interviews, respondents were clearly informed of the purpose of the study, the research procedures, the voluntary nature of participation, and their right to withdraw from the study at any time without any negative consequences.

For questionnaire-based surveys, an informed consent statement was provided at the beginning of the questionnaire, explaining the academic purpose of the research and confirming that responses would be used solely for research analysis. Only respondents who agreed to participate proceeded to complete the questionnaire.

For semi-structured interviews and expert consultations, participants were informed in advance of the interview topics, data usage, and recording arrangements. Verbal consent was obtained before interviews commenced, and interviewees were given the opportunity to decline any questions they were uncomfortable answering. This

UNIVERSITI KEBANGSAAN MALAYSIA

approach ensured that participation was fully voluntary and based on an adequate understanding of the research.

3.13.2 Confidentiality and anonymity

The confidentiality and anonymity of all participants were strictly protected throughout the research process. Personal identifying information, such as names, contact details, and organizational affiliations, was not disclosed in any research outputs.

In the questionnaire survey, no personally identifiable information was collected beyond basic demographic variables required for statistical analysis. All questionnaire responses were anonymized and coded numerically before data analysis.

For interview data, participants were assigned pseudonyms or identification codes to ensure anonymity. When reporting qualitative findings, quotations were carefully selected and edited to avoid revealing identifiable information about individuals or organizations. Enterprise-level information was presented in an aggregated or descriptive manner to prevent potential reputational or commercial risks.

3.13.3 Data security and academic integrity

Data security was maintained at all stages of the research. All electronic data, including questionnaire datasets and interview transcripts, were stored on password-protected computers and encrypted storage devices accessible only to the researcher. Backup files were securely maintained to prevent data loss.

Qualitative data processed using NVivo software and quantitative data analyzed through statistical software were handled exclusively for academic purposes. No data were shared with third parties or used for commercial purposes.

In addition, this study strictly adheres to the principles of academic integrity. All data were collected and analyzed honestly and transparently, without fabrication, falsification, or selective reporting. All sources, theories, and empirical findings drawn from existing literature were properly cited in accordance with academic referencing

UNIVERSITI KEBANGSAAN MALAYSIA

standards. The research design, data analysis procedures, and results interpretation were conducted independently to ensure objectivity and reliability.

By following these ethical principles, this study ensures the protection of participants' rights, the credibility of research findings, and the overall integrity of the research process, thereby providing a solid ethical foundation for the analysis of urbanization and the sustainable development of the tea industry in Sichuan Province.

3.14 CHAPTER SUMMARY

This chapter systematically describes the research design, data collection and analysis strategy of this study in the theoretical framework and empirical analysis. The study focuses on the impact of urbanization on the sustainable development of the tea industry in Sichuan, constructs a multidimensional variable system integrating urbanization indicators and triple-bottom-line theory (market economy, social culture, and ecological environment), and combines the theory of planned behavior (TPB) to deeply explore the role of the mechanism between consumers' tea consumption willingness and behavior.

In terms of research methodology, a mixed research strategy combining quantitative and qualitative was adopted. The qualitative aspect included Delphi expert consultation and semi-structured interviews, which were used to construct and improve the variable system; while the quantitative part obtained primary data through questionnaire surveys, and rigorously examined the relationship between variables using statistical methods such as structural equation modeling (SEM), logistic regression, and multi-cluster SEM. The research questions cover the differences in the impact of urbanization indicators on triple bottom line dimensions, the mediating and moderating effects of consumer behavioral attitudes, and their price-paying effects on sustainable consumption intentions.

The data collection is divided into two (2) parts: first, practitioner questionnaires and expert interviews for tea enterprises, managers and local governments to identify the core variables of urbanization; second, structured questionnaires for consumers to quantify the potential variables of behavioral attitudes, subjective norms, and perceived

UNIVERSITI KEBANGSAAN MALAYSIA

behavioral control, to further validate the mechanism of consumer behavior in the process of urbanization. In summary, this chapter provides a solid theoretical and methodological foundation for the subsequent empirical analysis of the mechanism of urbanization's impact on the sustainable development of Sichuan's tea industry through rigorous variable design and scientific research procedures.

UNIVERSITI KEBANGSAAN MALAYSIA

CHAPTER IV

SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS OF URBANIZATION ON SICHUAN'S TEA INDUSTRY

4.1 INTRODUCTION

Building upon the identification and refinement of potential factors influencing the sustainable development of the Sichuan tea industry under urbanization, this chapter conducts an empirical analysis to determine the key factors affecting the social, economic, and environmental dimensions of the industry. Based on the triple bottom line theory (Elkington 1997), the sustainable development of the tea industry is conceptualized across three (3) core dimensions: market economy, social culture, and ecological environment.

Urbanization may influence the tea industry through multiple channels, including institutional arrangements, infrastructure development, technological progress, and the reallocation of production factors. However, not all potential urbanization-related factors exert significant effects on industry sustainability. Therefore, it is necessary to identify the key influencing factors through structural modeling in order to enhance the explanatory power and policy relevance of the research findings.

Accordingly, this chapter employs a structural equation modeling framework to examine the relationships between urbanization factors and the three (3) sustainability dimensions of the tea industry. Both direct and indirect effects are analyzed to reveal the mechanisms through which urbanization shapes the sustainable development of the Sichuan tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

Based on the research framework, the following hypotheses are proposed and tested in this chapter:

H1: Urbanization factors have a positive effect on the market-economic dimension of the Sichuan tea industry.

H2: Urbanization factors positively influence the social-cultural dimension of the Sichuan tea industry.

H3: Urbanization factors exert a positive impact on the ecological-environmental dimension of the Sichuan tea industry.

H4: Urbanization factors indirectly promote the market-economic performance of the tea industry through their influence on social-cultural development.

H5: Urbanization factors indirectly enhance the market-economic performance of the tea industry through their influence on the ecological environment.

Through empirical testing of these hypotheses, this chapter aims to clarify the key pathways through which urbanization affects the sustainable development of the Sichuan tea industry and to provide empirical evidence to support future policy formulation and industrial planning.

4.2 DESCRIPTIVE ANALYSIS OF THE SAMPLE

A total of 250 questionnaires were distributed and 240 valid questionnaires were collected. The recovery rate was 96%. Data collection was done through an online survey. The online questionnaire was disseminated through social media platforms and forums related to the tea industry. This method ensured a wide coverage and diversity of samples, obtaining more comprehensive and representative data for the study of the impact of urbanization on the sustainable development of tea culture in Sichuan Province. To ensure the representativeness and breadth of the research data, the questionnaire was widely distributed in the key tea industry production areas in Sichuan Province (including Ya'an, Meishan, Yibin and Leshan). The samples cover multiple dimensions such as gender, age, occupation and region, which can reflect the structural

UNIVERSITI KEBANGSAAN MALAYSIA

distribution characteristics of tea practitioners and related groups in Sichuan under the background of urbanization in a more comprehensive way.

In terms of gender distribution, there were 123 male respondents, accounting for 51.2%, and 117 female respondents, accounting for 48.8%, both of which are basically equal, indicating that this survey is more balanced in terms of gender structure, which helps to reveal the difference of gender factors in the perception of sustainable development of the industry.

In terms of age distribution, the sample is concentrated in the youth and junior high school age groups of 26-35 (33.3%) and 18-25 (28.3%), followed by 36-45 (20.4%), with a relatively small proportion of those aged 46 and above. This structure is consistent with the trend of youth returning to their hometowns to start their own businesses and the participation of young technicians in standardized tea production in Sichuan tea industry in recent years, and it also provides a database for exploring the differences in perceptions of the impact of urbanization between generations.

In terms of occupational structure, tea consumers (40.8%) accounted for the highest proportion, reflecting the prominence of end-market feedback. In addition, employees from tea companies (20.8%) and government administrators (23.3%) also constituted the main force of the survey, showing that the data source is multi-dimensional and representative, taking into account the comprehensive feedback from the frontline production, management and policy making levels.

In terms of regional distribution, respondents mainly came from Ya'an (38.3%), Meishan (22.5%) and Yibin (20.0%), which are the core tea producing areas in Sichuan. Leshan and other regions together accounted for 19.2%, constituting a spatially representative sample network that can reflect the multidimensional impact of regional differences on the sustainable development of the tea industry (see Table 4.1).

UNIVERSITI KEBANGSAAN MALAYSIA

Table 4.1 Descriptive statistics of demographic variables

		Frequency	Percent
Gender	Male	123	51.2
	Female	117	48.8
Age	18-25	68	28.3
	26-35	80	33.3
	36-45	49	20.4
	46-55	27	11.3
	56 and above	16	6.7
Occupation	Tea farmer	25	10.4
	Employee of tea enterprises	50	20.8
	Tea industry related government department staff	56	23.3
	Consumer	98	40.8
	Others	11	4.6
Region	Yaan	92	38.3
	Meishan	54	22.5
	Yibin	48	20
	Leshan	37	15.4
	Other	9	3.8
	Total	240	100

4.3 RELIABILITY AND VALIDITY ANALYSIS

In the following, the reliability test and validity test will be conducted on the collected large sample data. The reliability of the questionnaire was first analyzed by the Cronbach's alpha coefficient values of the measurement items, and then the structural validity of the questionnaire was measured by validated factor analysis using AMOS 26.0 software. The specific analysis methods and indicators are the same as those described in the previous section and will not be repeated here.

4.3.1 Reliability analysis

To assess the stability and internal consistency of a scale, it is necessary to evaluate the reliability of the questionnaire. In social science research, common reliability

UNIVERSITI KEBANGSAAN MALAYSIA

assessment methods include test-retest reliability, copy reliability, and internal consistency reliability.

Among these, test-retest reliability involves administering the same questionnaire to the same research subjects twice within a short time interval, then calculating the correlation coefficient between the two (2) sets of results to assess the scale's temporal stability. Parallels reliability entails administering two (2) content-equivalent but formally distinct questionnaires to the same subjects within a similar time frame, evaluating scale consistency through the correlation of results.

It should be noted that since this study employed a one-time cross-sectional questionnaire survey without repeated measurements or parallel questionnaire designs, retest reliability and duplicate reliability methods were not actually applied. Considering the research design characteristics and data conditions, Cronbach's alpha coefficient was used to test the internal consistency of each scale. This method demonstrates high applicability and feasibility in one-time large-sample survey research.

This study employed Cronbach's α coefficient to assess the internal consistency of the scales. Correlation analysis was conducted using SPSS 21.0 software, with results presented in Table 4.2.

Table 4.2 Reliability statistics for the scale

Dimension Names	Cronbach's Alpha	N of Items
Market Economy	0.797	3
Social Culture	0.793	3
Ecological Environment	0.804	3
Urbanization Factors	0.811	3
Total	0.844	12

As shown in Table 4.2, the Cronbach's α coefficients for the market economy dimension, sociocultural dimension, ecological environment dimension, and urbanization factors dimension were 0.797, 0.793, 0.804, and 0.811, respectively, all

UNIVERSITI KEBANGSAAN MALAYSIA

exceeding the commonly used criterion of 0.7. The overall Cronbach's α coefficient for the entire scale was 0.844.

These results indicate that each dimension and the overall scale demonstrate good internal consistency. The scale's reliability meets empirical research requirements and is suitable for subsequent analysis.

Further assessment of data suitability for factor analysis was conducted using the KMO test and Bartlett's sphericity test, with results presented in Table 4.3. KMO values for all dimensions exceeded 0.70, and Bartlett's tests reached statistical significance ($p < 0.001$). This indicates that the sample data is suitable for factor analysis, with strong correlations existing among variables.

Table 4.3 KMO and Bartlett's test

		Approx. Chi-Square	**df**	**Sig.**
Market Economy	0.71	218.374	3	0
Social Culture	0.705	213.934	3	0
Ecological Environment	0.709	228.543	3	0
Urbanization Factors	0.715	241.243	3	0
Total	0.78	1164.703	66	0

4.3.2 Validity analysis

Validity analysis is generally categorized into content validity, construct validity, and is a measure of the quality of a questionnaire when the test is;

a. The higher the similarity between the results of the measure and the desired measure, the better the validity of the questionnaire is represented.

b. Content validity is primarily a measure of the extent to which the measurement items adequately cover and represent the content domain of the construct being measured.

c. The suitability of the measurement content to the measurement items is a propositional logic analysis. Since the measurement scales in this paper

UNIVERSITI KEBANGSAAN MALAYSIA

are obtained on the basis of combining domestic and international related literature and in-depth interviews, and then through multiple meetings with various experts and scholars.

d. The scales developed from this exploration and amended with reference to the more mature scales at home and abroad were obtained through the rigorous scale development process, which has inherently good content validity, and therefore this is not being tested for content validity.

The main construct validity analysis was conducted.

Methodology for validity analysis. The test of construct validity is derived from factor analysis, which consists of two (2) main components, exploratory factor analysis (EFA analysis) and confirmatory factor analysis (CFA analysis). Among them, exploratory factor analysis mainly measures the factor structure of the scale and clarifies how many factors the variable is composed of. Exploratory factor analysis is usually conducted in the pre-survey stage of a dissertation to determine the structure of the factors and thus the construct validity of the questionnaire (Kang 2013). Whereas, validation factor analysis occurs after exploratory factor analysis to confirm that the scale contains factors that are consistent with the initial constructs after it is clear that the variables have multiple dimensions (Lu 2007). In this study, the questionnaire has been subjected to exploratory factor analysis in the pre-survey stage of Chapter 3, where a factor analysis was conducted on each measurement question item, thus determining that the measurement variables have good construct validity. Therefore, in this section, the collected data were firstly put on AMOS 26.0 for computing to test the fitness of construct validity using validated factor analysis (Huang 2007).

Exploratory factor analysis is to carry out KMO and Bartlett's sphere test, so as to further speculate whether the scale is suitable for factor analysis, if it is suitable for factor analysis, we will use principal component analysis to extract the common factors, and then rotate it by using the method of forward rotation with maximum variance. Generally, the KMO value will be between 0 and 1, the larger the KMO value, the more common factors between the scales, the more suitable for factor analysis, and the KMO value of 0.7 will be used as the lowest standard of measurement, and we also need to

UNIVERSITI KEBANGSAAN MALAYSIA

see whether the Bartlett's sphere test reaches the level of significance, and in general, the significance of the Bartlett's sphere test should be less than 0.05 (Machado et al. 2021). Factor loading value, which measures the extent to which the variable is explained by the latent variable, the value generally needs to be greater than 0.5, the greater the value, the more representative the indicator is of the factor (Pedrosa et al. 2016).

Validation factor analysis is a sub-model of structural equations that tests whether the factor structural model of a scale matches the actual data collected (Syahfitri et al. 2020). Validated factor analysis utilizes the fitted indicators to measure the fit of the indicators, and then the factors of each item are tested to determine the factor loadings of each item, and then the composite reliability (CR) and average variance extracted (AVE) values are calculated, and the CR and AVE values are used to measure the scale's fit (Syahfitri et al. 2020). The CR and AVE values measure the convergent and discriminant validity of the scale to determine the accuracy of the construct validity of the scale (Baharum et al. 2023).

Construct validity indicators. Construct validity measures mainly include discriminant validity and convergent validity, both of which measure how well the measure responds to the theoretical construct. Distinguishing validity is a measure of the degree of difference between items under the same construct, while convergent validity is a measure of the correlation between items under the same construct.

The main measures of construct validity include factor loading value, which is a measure of the extent to which the variable is explained by the latent variable. The value generally needs to be greater than 0.5, the larger the value, the more representative the indicator is of the factor. The absolute value of critical ratio (CR) needs to be greater than 1.96. The average variance extracted (AVE) value, AVE is a measure of the average explanatory power of the observed variables of the potential variable on behalf of the potential variable, when the AVE value is greater than 0.5, it means that the aggregation validity of the scale is ideal, and when the AVE value is greater than the square of the other correlation coefficients, it means that the scale has a very good discriminant validity (Wu 2010).

UNIVERSITI KEBANGSAAN MALAYSIA

Table 4.4 Total variance explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	4.451	37.092	37.092	2.186	18.215	18.215
2	1.627	13.557	50.649	2.181	18.178	36.393
3	1.451	12.092	62.74	2.177	18.139	54.532
4	1.174	9.78	72.521	2.159	17.989	72.521
5	0.648	5.403	77.924			
6	0.535	4.459	82.383			
7	0.469	3.912	86.295			
8	0.397	3.309	89.604			
9	0.395	3.29	92.894			
10	0.344	2.865	95.759			
11	0.284	2.364	98.123			
12	0.225	1.877	100			

Extraction Method: Principal Component Analysis

The total variance explained table provides crucial insights into the data structure. In the initial eigenvalues section, Component 1 accounts for 37.092% of the variance, with a cumulative percentage of 37.092%. Component 2 contributes 13.557% of the variance, bringing the cumulative percentage to 50.649%. After rotation, the distribution of variance changes. Component 1 still holds a significant portion with 18.215% of the variance and a cumulative percentage of 18.215%. Component 2 follows with 18.178%, increasing the cumulative percentage to 36.393%, see table 4.5 for details.

Table 4.5 Component matrix

	1	**2**	**3**	**4**
What do you think is the impact of urbanization on the market demand for tea industry?	0.827			
What do you think is the impact of investment opportunities brought about by urbanization on the tea industry?	0.794			
To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs) in the tea industry?				

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

Does urbanization have an impact on the shortage of labour for the tea industry?	0.842		
Do you see that urbanization have an impact on the protection and inheritance of tea culture?	0.817		
Does urbanization have an impact on the identity of local residents in tea culture?	0.817		
What is the impact of urbanization on the ecology of tea gardens?		0.836	
What is the impact of urbanization on land use change in tea plantations?		0.798	
What is the impact of environmental pollution caused by urbanization on the tea industry?		0.782	
What do you think is the strength of the influence of the Sichuan government's policies and regulations on the tea industry?			0.842
What do you think is the impact of infrastructure construction on the tea industry in the process of urbanization?			0.801
What is the impact of technological progress on tea production efficiency and product quality in the process of urbanization?			0.773

Rotation Method: Varimax with Kaiser Normalization

The component matrix presented in Table 4.6 offers valuable insights into the structure of the data related to the influence of urbanization on the sustainable development of tea culture in Sichuan Province. The component matrix presented in Table 4.6 offers valuable insights into the structure of the data related to the influence of urbanization on the sustainable development of tea culture in Sichuan Province. The key findings based on the Components were described as follows:

1. Component 1 appears to be strongly associated with economic aspects of the tea industry, as indicated by high loadings such as 0.827 for "The Impact of Urbanization on the Tea Industry-What do you think is the strong impact of urbanization on the tea industry" and 0.836 for "Dimension 1: The Impact of Urbanization on the Economy of the Tea Industry-What do you think".
2. Component 2 seems to capture different elements, although the specific nature is not immediately clear from the given loadings.
3. Component 3 is significantly related to the ecological environment of the cultural industries, as reflected by loadings like 0.842 for "Dimension Three:

UNIVERSITI KEBANGSAAN MALAYSIA

The Impact of Urbanization on the Ecological Environment of Cultural Industries".

4. Component 4 seems to pertain to the sociocultural impact of urbanization on the tea industry, with loadings such as 0.842 for "The Socio-cultural Impact of Urbanization on the Tea Industry-Does urbanization".

The Varimax with Kaiser Normalization rotation method, which converged in five (5) iterations, ensures a more distinct and interpretable factor structure, facilitating a better understanding of the complex relationships between urbanization and the various dimensions of the tea culture's sustainable development. The descriptive statistics presented in Table 4.7 provide valuable information regarding the various aspects related to the influence of urbanization on the sustainable development of tea culture in Sichuan Province. The descriptive statistics presented in Table 4.6 provide valuable information regarding the various aspects related to the influence of urbanization on the sustainable development of tea culture in Sichuan Province. On a 5-point scale ranging from minimal to maximal, the means and standard deviations for each variable are as follows.

Table 4.6 Descriptive statistics

	Mean	**Std. Deviation**
What do you think is the impact of urbanization on the market demand for tea industry?	3.79	1.16
What do you think is the impact of investment opportunities brought about by urbanization on the tea industry?	3.6	1.175
To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs) in the tea industry?	3.7	1.262
Does urbanization have an impact on the shortage of labour for the tea industry?	3.77	1.19
Do you see that urbanization have an impact on the protection and inheritance of tea culture?	3.88	1.16
Does urbanization have an impact on the identity of local residents in tea culture?	3.87	1.166
What is the impact of urbanization on the ecology of tea gardens?	3.92	1.081

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

What is the impact of urbanization on land use change in tea plantations?	3.91	1.13
What is the impact of environmental pollution caused by urbanization on the tea industry?	3.83	1.151
What do you think is the strength of the influence of the Sichuan government's policies and regulations on the tea industry?	3.42	1.176
What do you think is the impact of infrastructure construction on the tea industry in the process of urbanization?	3.54	1.257
What is the impact of technological progress on tea production efficiency and product quality in the process of urbanization?	3.6	1.344

The mean value for "The Impact of Urbanization on the Economy of the Tea Industry - What do you think" is 3.79 with a standard deviation of 1.16. For "What do you think is the impact of investment opportunities brought about by urbanization on the tea", the mean value is 3.6 and the standard deviation of 1.16. For "What do you think is the impact of investment opportunities brought about by urbanization on the tea", the mean value is 3.6 and the standard deviation is 1.175. "To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs)" has a mean value of 3.7 and a standard deviation of 1.262. The mean value for "The sociocultural impact of urbanization on the tea industry - Does urbanization" is 3.77 and the standard deviation is 1.19. "Do you see that urbanization have an impact on the protection and inheritance of tea culture?" has a mean value of 3.88 and a standard deviation of 1.16. "Does urbanization have an impact on the identity of local residents in tea culture?" has a mean value of 3.87 and a standard deviation of 1.166. The mean value for "The Impact of Urbanization on the Ecological Environment of Cultural Industries" is 3.92 and the standard deviation is 1.081. "What is the impact of urbanization on land use change in tea plantations?" has a mean value of 3.91 and a standard deviation of 1.13. "What is the impact of environmental pollution caused by urbanization on the tea industry?" has a mean value of 3.83 and a standard deviation of 1.151. The mean value for "The Impact of Urbanization on the Tea Industry - What do you think is the strength" is 3.42 and the standard deviation is 1.176. "What do you think is the impact of infrastructure construction on the tea industry? The impact of infrastructure construction on the tea industry in the process of urbanization?" has a mean value of 3.54 and a standard deviation of 1.257. Finally, "What is the impact of technological progress on tea production? Impact of technological progress on tea

UNIVERSITI KEBANGSAAN MALAYSIA

production efficiency and product quality in the process of urbanization?" has a mean value of 3.6 and a standard deviation of 1.344. These statistics help in understanding the central tendencies and variabilities of the respondents' perceptions on the different dimensions of urbanization's influence on tea culture, see table 4.6 for details.

Table 4.7 Descriptive statistics of each dimension

	Minimum	Maximum	Mean	Std. Deviation
Market Economy	1	5	3.69	1.01
Social-Culture	1.33	5	3.84	0.99
Ecological Environment	1	5	3.89	0.95
Urbanization Factors	1	5	3.52	1.07

The descriptive statistics of each dimension presented in Table 4.7 provide valuable insights. For Dimension 1: Market Economy, the minimum value is 1, the maximum is 5, with a mean value of 3.69 and a standard deviation of 1.01. Dimension 2: Social-Culture has a minimum of 1.33, a maximum of 5, a mean value of 3.84 and a standard deviation of 0.99. Dimension 3: Ecological Environment has a minimum of 1, a maximum of 5, a mean value of 3.89 and a standard deviation of 0.95. Dimension 4: Urbanization Factors has a minimum of 1, a maximum of 5, a mean value of 3.52 and a standard deviation of 1.07. These statistics help in understanding the distribution and variability of the responses for each dimension, offering a basis for further analysis of the influence of urbanization on the sustainable development of tea culture in Sichuan Province.

Table 4.8 T-test for gender

	Your gender	N	Mean	Std. Deviation	t	p
Market Economy	Male	123	3.772	0.95	1.224	0.222
	Female	117	3.613	1.071		
Social-Culture	Male	123	3.978	0.814	2.243	0.026
	Female	117	3.695	1.124		
Ecological Environment	Male	123	4.049	0.712	2.757	0.006
	Female	117	3.715	1.126		
Urbanization Factors	Male	123	3.485	1.077	-0.507	0.612
	Female	117	3.556	1.074		

UNIVERSITI KEBANGSAAN MALAYSIA

The t-test results presented in Table 4.8 for gender differences in various dimensions provide interesting insights. For the Market Economy dimension, the mean value for males is 3.772 with a standard deviation of 0.95, and for females it is 3.613 with a standard deviation of 1.071. The t-value is 1.224 and the p-value is 0.222, indicating no significant gender difference.

In the Social-Culture dimension, the mean for males is 3.978 with a standard deviation of 0.814, and for females it is 3.695 with a standard deviation of 1.124. The t-value is 2.243 and the p-value is 0.026, suggesting a significant gender difference. 1.124.

For the Ecological Environment dimension, the mean for males is 4.049 with a standard deviation of 0.712, and for females it is 3.715 with a standard deviation of 1.126. The t-value is 2.757 and the p-value is 0.006, indicating a significant gender difference. In the Urbanization Factors dimension, the mean for males is 3.485 with a standard deviation of 1.077, and for females it is 3.556 with a standard deviation of 1.074. The t-value is -0.507 and the p-value is 0.612, showing no significant gender difference.

Table 4.9 ANOVA for age

		N	Mean	Std. Deviation	F	Sig.
Market Economy	18-25	68	3.779	0.999	2.117	0.079
	26-35	80	3.783	0.98		
	36-45	49	3.367	1.074		
	46-55	27	3.605	1.07		
	56 and above	16	4.042	0.749		
	Total	240	3.694	1.012	2.47	0.045
Social-Culture	18-25	68	3.794	0.969		
	26-35	80	3.938	0.991		
	36-45	49	3.51	1.106		
	46-55	27	4.086	0.788		
	56 and above	16	4.146	0.709		

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

	Total	240	3.84	0.986		
Ecological Environment	18-25	68	3.892	0.861	1.05	0.382
	26-35	80	3.963	1.043		
	36-45	49	3.653	0.91		
	46-55	27	4.037	0.859		
	56 and above	16	3.938	1.076		
	Total	240	3.886	0.95		
Urbanization Factors	18-25	68	3.407	1.173	7.284	0
	26-35	80	3.933	0.76		
	36-45	49	3.095	1.076		
	46-55	27	3.111	1.294		
	56 and above	16	3.917	0.745		
	Total	240	3.519	1.074		

In the Market Economy dimension, the mean scores range from 3.367 to 4.042 across the age groups. The F-value is 2.47 and the significance level is 0.045. This indicates that there is a statistically significant difference in the perception of the Market Economy among different age groups. However, the sig. value of 0.045 is not significant. The sig. value of 0.079 for the 18-25 age group comparison suggests that this specific age group does not significantly differ from the others.

In the Social-Culture dimension, although the mean scores vary, the overall sig. value is not significant (0.382), suggesting no substantial age - related differences in the perception of the Social-Culture aspect.

For the Ecological Environment dimension, the F-value is 1.05 and the sig. value is 0.382, indicating that age does not have a significant impact on the perception of the Ecological Environment.

In the Urbanization Factors dimension, the F-value is 7.284 and the sig. value is 0, which is highly significant. This implies that there are significant differences in the perception of Urbanization Factors among the age groups. The younger age groups (18-25, 36-45) seem to have lower mean scores compared to the older age groups (26-35,

UNIVERSITI KEBANGSAAN MALAYSIA

56-45), suggesting that older individuals may have different views on the impact of urbanization factors on the tea culture, see table 4.9 for details.

Table 4.10 ANOVA for occupation

		N	Mean	Std. Deviation	F	Sig.
Market Economy	Tea farmer	25	3.827	0.828	2.034	0.09
	Employee of tea enterprises	50	3.68	0.952		
	Tea industry related government department staff	56	3.851	0.845		
	Consumer	98	3.663	1.078		
	Others	11	2.939	1.533		
	Total	240	3.694	1.012		
Social-Culture	Tea farmer	25	3.56	0.994	3.187	0.014
	Employee of tea enterprises	50	3.687	1.022		
	Tea industry related government department staff	56	3.881	1.032		
	Consumer	98	4.041	0.858		
	Others	11	3.182	1.242		
	Total	240	3.84	0.986		
Ecological Environment	Tea farmer	25	3.56	0.886	1.569	0.183
	Employee of tea enterprises	50	4.073	0.72		
	Tea industry related government department staff	56	3.958	0.966		
	Consumer	98	3.864	0.995		
	Others	11	3.606	1.365		
	Total	240	3.886	0.95		
Urbanization Factors	Tea farmer	25	3.267	1.009	0.962	0.429
	Employee of tea enterprises	50	3.4	1.139		
	Tea industry related government department staff	56	3.613	1.023		
	Consumer	98	3.619	1.072		
	Others	11	3.273	1.191		
	Total	240	3.519	1.074		

The ANOVA results presented in Table 4.10 for different occupations provide insightful information. In the Market Economy dimension, the mean scores vary among

UNIVERSITI KEBANGSAAN MALAYSIA

the different occupations. The F-value is 2.034 and the sig. value is 0.09. This indicates that there is a tendency towards a significant difference in the perception of the Market Economy based on occupation, but it is not highly significant. Tea farmers have a mean score of 3.827, while consumers have a relatively lower mean score of 3.663.

For the Social-Culture dimension, the F-value is 3.187 and the sig. value is 0.014, suggesting a significant difference based on occupation. Consumers have the highest mean score of 4.041, while others have a relatively lower mean score of 3.182.

In the Ecological Environment dimension, the F-value is 1.569 and the sig. value is 0.183, indicating that occupation does not have a significant impact on the perception of the Ecological Environment.

In the Urbanization Factors dimension, the F-value is 0.962 and the sig. value is 0.429, suggesting no significant difference in the perception of Urbanization Factors among the different occupations.

Overall, these results show that occupation has varying degrees of influence on the perception of different aspects related to the sustainable development of tea culture in the context of urbanization in Sichuan Province. The significant differences in the Social-Culture dimension imply that different occupational groups may have distinct perspectives on this aspect. These findings can be useful for tailoring strategies and initiatives based on the specific needs and viewpoints of tea culture and different occupational groups involved in the tea industry.

Table 4.11 ANOVA for region

		N	Mean	Std. Deviation	F	Sig.
Market Economy	Yaan	92	3.982	0.769	6.521	0
	Meishan	54	3.222	1.21		
	Yibin	48	3.465	1.127		
	Leshan	37	3.892	0.868		
	Other	9	4	0.5		

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

	Total	240	3.694	1.012		
Social-Culture	Yaan	92	3.982	0.969	1.677	0.156
	Meishan	54	3.821	0.887		
	Yibin	48	3.889	0.879		
	Leshan	37	3.523	1.196		
	Other	9	3.556	1.167		
	Total	240	3.84	0.986	3.218	0.014
Ecological Environment	Yaan	92	4.018	0.861		
	Meishan	54	3.889	0.715		
	Yibin	48	3.563	1.236		
	Leshan	37	4.108	0.843		
	Other	9	3.333	1.258		
	Total	240	3.886	0.95		
Urbanization Factors	Yaan	92	3.551	1.151	2.321	0.058
	Meishan	54	3.426	1		
	Yibin	48	3.493	1.047		
	Leshan	37	3.82	0.807		
	Other	9	2.667	1.443		
	Total	240	3.519	1.074		

The ANOVA results presented in Table 4.11 for different regions offer significant insights. In the Market Economy dimension: Yaan has 92 samples with a mean score of 3.982 and a relatively low standard deviation of 0.769. Meishan has 54 samples and a mean score of 3.222, indicating a lower perception compared to Yaan. Yibin has 48 samples with a mean of 3.465. Leshan, with 37 samples, has a mean value of 3.892. The other region has nine (9) samples and a mean of 4. The F-value is 6.521 and the F-value of the other region is 6.521. Sig. value is 0, which indicates a highly significant difference among the regions.

For the Social-Culture dimension: Yaan again has 92 samples with a mean value of 3.982. Meishan has 54 samples and a mean of 3.821. Yibin has 48 samples and a mean of 3.889. Leshan has 37 samples and a mean of 3.523. The other region has nine (9) samples and a mean of 3.556. The F-value is 1.677 and the Sig. value is 0.156,

UNIVERSITI KEBANGSAAN MALAYSIA

suggesting no significant difference among the regions. The F-value is 1.677 and the sig. value is 0.156, suggesting no significant difference among the regions in terms of the perception of the Social-Culture aspect.

In the Ecological Environment dimension: Yaan has 92 samples with a mean value of 4.018. Meishan has 54 samples and a mean value of 3.889. Yibin has 48 samples and a mean value of 3.563. Leshan has 37 samples and a mean value of 4.108. Yibin has 48 samples and a mean value of 3.563. The other region has nine (9) samples and a mean value of 3.333. Although there are variations in the means, the sig. value does not suggest a significant difference. Although there are variations in the means, the sig. value does not suggest a significant difference.

For the Urbanization Factors dimension: Yaan has 92 samples with a mean of 3.551. Meishan has 54 samples and a mean of 3.426. Yibin has 48 samples and a mean of 3.493. Leshan has 37 samples and a mean of 3.82. The other region has nine (9) samples and a mean of 2.667. The F-value is 2.321 and the sig. value is 0.058, showing a tendency towards a significant difference among the regions.

Overall, the regional differences are not statistically significant. The Urbanization Factors dimension shows a potential for significance, requiring further examination. These results can help in understanding the variations in perceptions based on the region and formulating region-specific strategies for the sustainable development of tea culture in Sichuan Province.

Research results situation. This study aims to explore the impact of urbanization on the sustainable development of tea industry in Sichuan Province. In terms of demographic characteristics, gender distribution is relatively balanced. Most of the respondents were between 26-35 years old. Consumers were the largest occupational group, with the highest representation in Ya’an. Reliability and validity tests showed that the questionnaire had high internal consistency and was suitable for factor analysis.

Factor analysis revealed the structure and composition of the data related to the different dimensions of the study. The t-test for gender revealed significant differences

UNIVERSITI KEBANGSAAN MALAYSIA

in the sociocultural and ecological environment dimensions, but not in the market economy and urbanization factors dimensions. ANOVA for age revealed significant differences in the market economy and urbanization factors dimensions but not in the sociocultural and ecological environment dimensions. For occupation, there was a significant difference in the sociocultural dimension, while for region, there was a significant difference in the market economy dimension. Correlation analysis showed that sociocultural and ecological environment were significantly negatively correlated with gender. The urbanization factor showed a relatively strong positive correlation with market economy and sociocultural.

This study comprehensively examines the impact of urbanization on the sustainable development of the tea industry in Sichuan Province. The results of the study show that different factors such as gender, age, occupation and geography have different degrees of influence on different aspects of tea culture in the context of urbanization. Significant differences based on some aspects of these factors highlight the need for targeted strategies and policies. For example, in sociocultural and ecological aspects, gender-specific approaches may be needed. In the case of the market economy, region-specific strategies may be developed. The interrelationships between different variables provide the basis for integrated and coordinated development. Further research could delve into the specific mechanisms and implications of these findings to better promote the sustainable development of tea culture in Sichuan Province.

Indicator of model fit. Usually measure the overall model fit will be used to test the index of the chi-square value, but the chi-square value is easily affected by the size of the sample size, especially when the sample size is greater than 200. Therefore, the scientific nature of the chi-square value will not be so accurate. At this time it is necessary to consider the other fit statistics indicators including the following indicators to measure the overall model fit goodness of fit:

The ratio of chi-square degrees of freedom (χ^2/df). The chi-square/degrees of freedom ratio is also known as the canonical chi-square, and smaller values mean that the model's covariance matrix matches the observed data better. A ratio between the

UNIVERSITI KEBANGSAAN MALAYSIA

chi-square and the degrees of freedom of less than three is standardized, but some scholars have argued that the chi-square degrees of freedom ratio can also be relaxed to 5 to determine whether the measurement model fit is good (Tseng et al. 2021).

The Comparative Fit Index (CFI), proposed by Bentler (1990), is a value-added fitness statistic that measures the improvement in the non-concentration parameter as one moves from the most restrictive model to the most saturated model. The CFI index is stable even with small sample sizes, and its value will be between 0 and 1, with larger values indicating a better fit; a CFI value greater than 0.9 indicates that the model path diagram has a good fit with the actual data (Sathyanarayana & Mohanasundaram 2024).

Root Mean Square Error Approximation (RMSEA for short), the closer the RMSEA is to 0, the better the model fit is. 0.08<RMSEA<0.10, indicates that the model is fair, with ordinary fitness; if 0.05<RMSEA<0.08, it indicates that the model is good with proper fit; RMSEA<0.05, indicates that the model fit is very good. Compared to the chi-square value, the RMSEA value is more suitable than other metrics when measuring the model path because it is not easily affected by the size of the sample size (Martins et al. 2023).

The Tucker Lewis Index (TLI), which can also be referred to as the Non-Normed Fit Index (NNFI), is used to compare the fit between the proposed model and the null model, with a value size between 0-1. Typically a TLI value greater than 0.9 indicates a better fit of the model to the data (Ansari et al. 2020).

Parsimony Adjusted Normed Fit Index (PNFI), is a parsimony-adjusted normed fit index, because the PNFI index will take the number of degrees of freedom into account in the degree of fitness, so it is more suitable for judging the degree of model streamlining than the NFI, and it will generally be used as the index that the value of NFI is greater than 0.5. NFI value greater than 0.5 is generally used as a criterion.

Parsimony Goodness of Fit Index (PGFI), which is similar in nature to PNFI, is also a parsimony fitness index. The larger its value, the better, indicating that the model is more parsimonious, with a PGFI value greater than 0.5 as a measure.

UNIVERSITI KEBANGSAAN MALAYSIA

In addition to the above measures, there are two (2) other measures of convergent validity, composite reliability (CR) and average variance extracted (AVE). Composite reliability of latent variables is to test the reliability of latent variables, which is mainly judged by the CR value. Generally, the CR value needs to be greater than 0.6 as a criterion, and when it is greater than 0.6, it indicates that there is a high correlation between the latent variables of the model (Baldisserotto et al. 2022).The AVE value indicates that the observed variables are able to explain the latent variables, and the larger the AVE value is, the higher the reliability and validity of the latent variables are. Generally, the value of AVE should be greater than or equal to 0.5, and the factor loadings of the measurement items should not be lower than 0.5 to represent good convergent validity (Li-Yu Tseng et al. 2021). Whereas, discriminant validity is measured by looking at the square root of the mean variance extracted from the AVE of the latent variable and comparing it with the correlation coefficients between this latent variable and the other latent variables, when the coefficient of this latent variable is greater than the latter, it indicates that there is a significant difference in the variance between each latent variable and its own measurement items, representing a significant discriminant validity (Campos et al. 2014).

This thesis uses structural equations AMOS version 26.0 for validation factor analysis and assessment of overall model fit. Fit metrics measure the fit between the theoretical model and the data model, and their metrics cannot be used as the sole criterion for determining whether the model is valid or not, but also require a discussion of the model's soundness with respect to the problem under study (Konold & Sanders 2023). Below are the names and abbreviations of the individual variables targeted by the later study, as shown in Table 4.12.

Table 4.12 Variable names and abbreviations

Latent Variable	Observed Variable	Abbreviation
Urbanization Factors	What do you think is the impact of urbanization on the market demand for tea industry?	A1
	What do you think is the impact of investment opportunities brought about by urbanization on the tea industry?	A2

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

	To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs) in the tea industry?	A3
Market Economy	Does urbanization have an impact on the shortage of labour for the tea industry?	B1
	Do you see that urbanization have an impact on the protection and inheritance of tea culture?	B2
	Does urbanization have an impact on the identity of local residents in tea culture?	B3
Social-Culture	What is the impact of urbanization on the ecology of tea gardens?	C1
	What is the impact of urbanization on land use change in tea plantations?	C2
	What is the impact of environmental pollution caused by urbanization on the tea industry?	C3
Ecological Environment	What do you think is the strength of the influence of the Sichuan government's policies and regulations on the tea industry?	D1
	What do you think is the impact of infrastructure construction on the tea industry in the process of urbanization?	D2
	What is the impact of technological progress on tea production efficiency and product quality in the process of urbanization?	D3

The basic formulas of structural equation modelling (SEM) include the measurement equation and the structural equation. The measurement equation formulas are as follows:

$$x = \lambda_x \varepsilon + \delta \quad \ldots(4.1)$$

$$y = \lambda_y \eta + \varepsilon \quad \ldots(4.2)$$

where x is the vector of exogenously observed variables, λ_x is the relationship matrix between exogenously observed variables and exogenous latent variables, ε is the vector of exogenous latent variables, and δ is the measurement error of exogenously observed variables; and y is the vector of endogenously observed variables, λ_y is the relationship matrix between endogenously observed variables and endogenous latent variables, η is the vector of endogenous latent variables, and ε is the measurement error of endogenously observed variables (Bollen 1989; Hair et al. 2010).

UNIVERSITI KEBANGSAAN MALAYSIA

The structural equations are formulated as follows:

$$\eta = B\eta + \Gamma\xi + \zeta \quad \ldots(4.3)$$

where η is a vector of endogenous latent variables, ξ is a vector of exogenous latent variables, B is a matrix of relationships between endogenous latent variables, Γ is a matrix of impacts of exogenous latent variables on endogenous latent variables, and ζ is a vector of error terms in the structural equation (Kline 2015). "Urbanization Factors" can be used as exogenous latent variables, such as one of the observed variables "A1 - What do you think is the impact of urbanization on the market demand for tea industry?" (What do you think is the impact of urbanization on the market demand for tea industry?), whose observations can be obtained through surveys or data collection, reflecting the latent variable of the urbanization factor through a measurement equation (Byrne 2016). "Market Economy" can also be considered as an exogenous latent variable with observations such as "B1 - Does urbanization have an impact on the shortage of labor for the tea industry?" (Does urbanization have an impact on the shortage of labor for the tea industry?), observations were used to measure this latent variable (Hair et al. 2010). There may be interactions between these latent variables, described by structural equations, for example, there may be an effect of "Urbanization Factors" on "Social-Culture", which can be described in structural equations (Hair et al. 2010), and there may be an effect of "Urbanization Factors" on tea industry? For example, there may be an influence of "Urbanization Factors" on "Social-Culture", which can be captured by the corresponding coefficients in the structural equations (Kline 2015). SEM can quantitatively estimate the paths of these relationships and test for significance, making it an effective tool for exploring the causal relationships between variables in industrial research.

Table 4.13 Model fit tests

Norm	Reference Standard	Actual Results	Fitting Result
CMIN/DF	1-3 excellent, 3-5 good	2.730	talented
RMSEA	<0.05 Excellent	0.075	talented
GFI	>0.9 excellent, >0.8 good	0.918	talented

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

AGFI	>0.9 excellent, >0.8 good	0.869	favorable
IFI	>0.9 excellent, >0.8 good	0.926	talented
TLI	>0.9 excellent, >0.8 good	0.898	favorable
CFI	>0.9 excellent, >0.8 good	0.924	talented

As shown in Table 4.13, the chi-square to degrees of freedom ratio (CMIN/DF) is 2.730, which falls within the acceptable range, indicating a good overall model fit.

The Goodness-of-Fit Index (GFI) is 0.918, exceeding the recommended threshold of 0.90, suggesting that the proposed model fits the observed data well.

In addition, RMSEA equals 0.075, which is within the acceptable range, while IFI (0.926), TLI (0.898), and CFI (0.924) all meet recommended criteria. Overall, the model demonstrates satisfactory goodness of fit.

Table 4.14 Convergent validity test

	Observed Variable	**Estimate**	**CR**	**AVE**
A: Market_Economy	A1	0.736	0.797	0.567
	A2	0.777		
	A3	0.746		
B: Social_Culture	B1	0.786	0.794	0.562
	B2	0.754		
	B3	0.707		
C: Ecological_Enviroment	C1	0.710	0.803	0.578
	C2	0.836		
	C3	0.728		
D: Urbanization_Factors	D1	0.773	0.812	0.590
	D2	0.797		
	D3	0.733		

As shown in Table 4.14, for A (Market_Economy), which covers the three (3) observed variables A1, A2, and A3, the estimate is 0.736, 0.777, and 0.746 respectively, the CR is 0.797, and the AVE is 0.567.

UNIVERSITI KEBANGSAAN MALAYSIA

B: (Social_Culture) covers the three (3) observed variables B1, B2, and B3, the estimate is 0.786, 0.754, and 0.707 respectively, the CR is 0.794, and the AVE is 0.562.

C: (Ecological_Environment) consists of C1, C2, and C3 variables, estimate is 0.710, 0.836, and 0.728 respectively, CR is 0.803, and AVE is 0.567.

D: (Urbanization_Factors) consists of three (3) variables, D1, D2 and D3, with estimate 0.773, 0.797 and 0.733, CR 0.812 and AVE 0.590. Taken together, the CR of each potential variable is higher than 0.7 and the AVE is 0.590. The CR value of each potential variable is higher than 0.7 and the AVE value is higher than 0.5, which fully indicates that the model has good convergence effect.

Table 4.15 Differential validity analysis

	Urbanization_ Factors	**Ecological_ Enviroment**	**Social_ Culture**	**Market_ Economy**
Urbanization_Factors	0.768			
Ecological_Enviroment	0.43	0.76		
Social_Culture	0.545	0.234	0.75	
Market_Economy	0.559	0.365	0.411	0.753

As can be seen in Table 4.15, the numbers on the diagonal are the arithmetic square roots of the average variance extracted (AVE). The diagonal numbers corresponding to “Urbanization_Factors” are 0.768; “Ecological_Enviroment” is 0.76; “Social_Culture” is 0.75; and “Market_Economy” is 0.753. In this table, since the diagonal elements are larger than the non-diagonal elements in the rows and columns where they are located, it can be determined that the model has a good discriminant validity.

Modelling assumptions. The use of structural equation modelling is of great significance when studying the impact of urbanization process on the sustainable development of tea culture in Sichuan Province. Structural equation modelling has the ability to deal with complex relationships among multiple variables at the same time. This study covers the direct and indirect relationships between urbanization factors (D) and the market economy (A), sociocultural (B), and ecological environment (C) of the

UNIVERSITI KEBANGSAAN MALAYSIA

tea industry, and the model is able to clearly present the paths and strengths of the interactions between these factors. The model assumptions are shown in Figure 4.1.

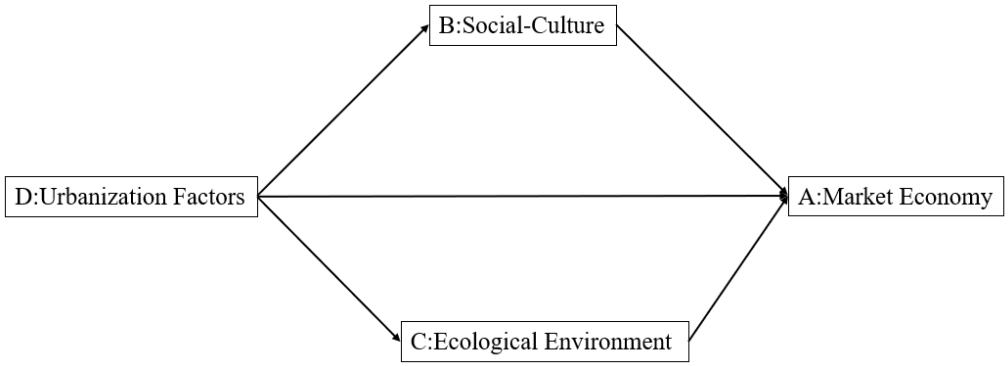

Figure 4.1 Model assumptions

a. H1: D - A positive

Hypothesis 1 indicates that the urbanization factor (D) has a positive effect on the market economy (A) of the tea industry in Sichuan Province. That is to say, with the development of urbanization, it will bring positive impetus to the market economy of the tea industry in Sichuan Province. For example, the urbanization process makes the urban population increase, the consumption demand for tea increases, which in turn leads to the expansion of the production scale of tea, the broadening of sales channels, and promotes the prosperity of the market economy of the tea industry.

b. H2: D - B positive

Hypothesis 2 states that the urbanization factor (D) presents a positive effect on the social culture (B) of the tea industry in Sichuan Province. This means that urbanization will enrich and develop the social culture of the tea industry in Sichuan Province. For example, the mobility of people and cultural exchanges brought about by urbanization may introduce new elements of tea culture and forms of activities, making the social culture of the tea industry more diverse and active.

c. H3: D - C positive

Hypothesis 3 shows that urbanization factor (D) positively affects the ecological environment (C) of the tea industry in Sichuan Province. Urbanization may promote the

UNIVERSITI KEBANGSAAN MALAYSIA

improvement of the ecological environment of the tea industry under certain conditions. For example, the technological progress and capital investment brought about by urbanization may be used to promote ecological cultivation and strengthen environmental protection measures, thus optimizing the ecological environment of the tea industry.

d. H4: D - B - A positive

Hypothesis 4 explanation: The urbanization factor (D) has a positive indirect effect on the tea industry's market economy (A) through its impact on the tea industry's social culture (B) in Sichuan Province. It may be because urbanization promotes the prosperity of the tea industry's society and culture, attracts more consumers to pay attention to and participate in tea culture, which stimulates the consumption of tea and promotes the development of the tea industry's market economy.

e. H5: D - C - A positive

Hypothesis 5 suggests that the urbanization factor (D) indirectly positively affects the market economy of the tea industry (A) through its effect on the ecological environment of the tea industry (C) in Sichuan Province. For example, a good ecological environment of the tea industry can improve the quality and brand image of tea, attract more consumers and investors, and thus drive the growth of the market economy of the tea industry.

Validation factor analysis. Conducting a validation factor analysis has multiple key implications for assessing the reasonableness and validity of the measurement model constructed. It can clarify whether the observational indicators used to measure the latent variables such as urbanization factor (D), market economy of the tea industry (A), sociocultural (B), and ecological environment (C) accurately and reliably reflect their true meaning. It is possible to verify whether the relationship between the observed variables and the latent variables fits the theoretical expectations. For example, it is expected that some specific economic indicators can effectively measure the market economy of the tea industry, and the validation factor analysis can verify the reasonableness of this expectation, which can enhance the reliability and validity of the

UNIVERSITI KEBANGSAAN MALAYSIA

results of the subsequent structural equation modelling, and make the conclusions of the study on the relationship between the urbanization process and the sustainable development of the tea culture in Sichuan Province more persuasive (see Figure 4.2 for details).

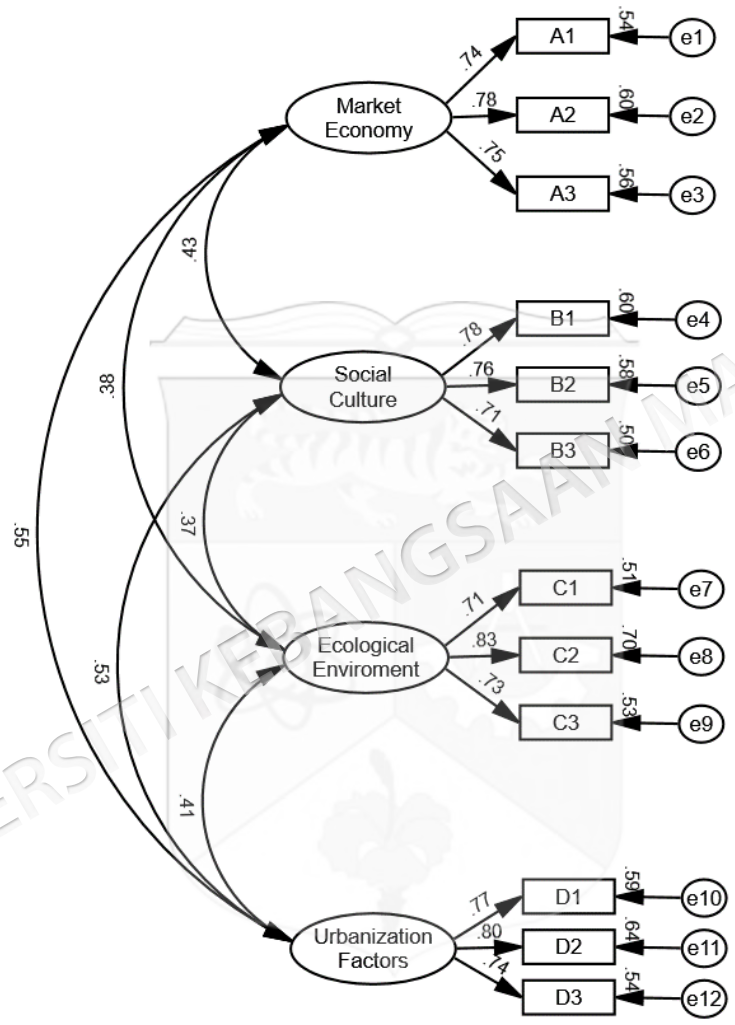

Figure 4.2 Validation factor analysis

4.4 MODEL FIT TESTS

4.4.1 Initial model construction

Based on the relevant theories and research experiences in this thesis, we constructed a relationship model between each latent variable, and used AMOS 26.0 software to carry out validation factor analysis to confirm the relationship between latent variables and explicit variables, and based on this, we used AMOS 26.0 data processing software for

structural equation modeling (SEM) to test the path relationship between the variables, and compared with multiple regression. SEM software has more stringent data requirements and can handle multiple sets of regression equations simultaneously to judge the significance and predictive ability of the theoretical model. Based on this, the path relationship between the variables is examined using the AMOS 26.0 data processing software of structural equation modelling (SEM), which has more stringent data requirements and can handle multiple sets of regression equations at the same time to judge the significance and predictive ability of the theoretical model. SEM can use the latent variables for the estimation of the residuals of the observations, and also allow the relationship between the residuals and the variables, whereas in the case of multiple regression, the residuals and the independent variables are independent of each other. The main model includes four (4) variables, including one independent variable, urbanization indicator, 32 mediating variables, sociocultural and ecological environment, and one market economy dependent variable, which add up to a total of 12 measurement items, and the complete structural equation model is plotted using AMOS 26.0 software as shown in the figure below:

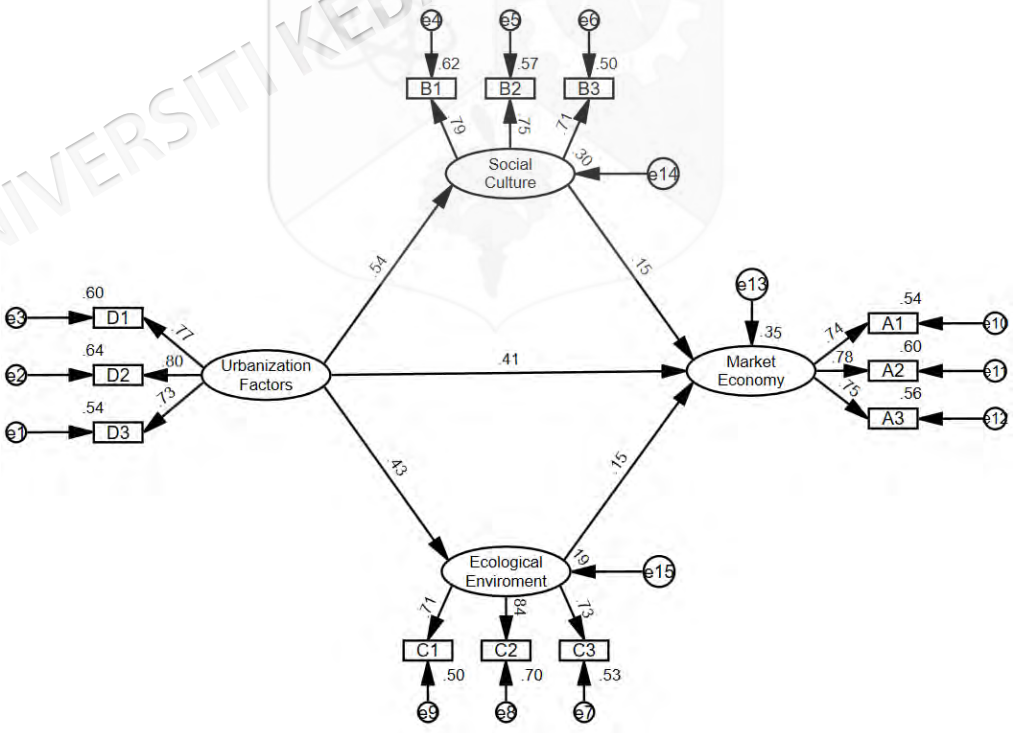

Figure 4.3 Model results of urbanization process on sustainable development of tea culture in Sichuan Province

UNIVERSITI KEBANGSAAN MALAYSIA

As can be seen in Figure 4.3, the urbanization factor (D) has a significant impact on the market economy (A), social culture (B) and ecological environment (C) of the tea industry. Specifically, urbanization has shown a significant driving effect on the market economy, which may bring more opportunities and development space for the production, sales and trade of the tea industry by promoting population agglomeration, increasing consumer demand and optimizing the allocation of resources.

4.4.2 Initial model construction

As can be seen from Table 4.16, the following is a test analysis for each hypothesis:

Validation of H1: The standardized total effect between Urbanization_Factors and Market_Economy is 0.559, direct effect is 0.412, and indirect effect is 0.147, which significantly indicates that urbanization has a positive impact on the market economy of the tea industry. From the analysis of observed variables, the estimate of A1 is 0.736, with “Dimension 1: The impact of urbanization on the economy of the tea industry - What do you think…” as an example. “Dimension 1: The impact of urbanization on the economy of the tea industry - What do you think…”, for example, implies that urbanization affects the economy of the tea industry to a certain extent. For example, urbanization brings more convenient transportation and communication facilities, which reduces the cost of transporting and trading tea, and thus improves market efficiency. From the analysis of observed variables, the estimate of A2 is 0.777, “What do you think is the impact of investment opportunities brought about by urbanization on the tea”, suggests that urbanization affects the economy of the tea industry to a certain extent. “By urbanization on the tea”, reflecting that the investment opportunities brought about by urbanization are significant for the tea industry. More capital investment promotes the modernization of tea plantations and improves the technical level and output of tea production. The estimate of A3 is 0.746, “To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs)” reflects that investment opportunities brought about by urbanization are significant for the tea industry. It suggests that although urbanization may lead to an increase in some production costs, the overall positive impact prevails and strongly contributes to the economic prosperity of the tea industry market.

UNIVERSITI KEBANGSAAN MALAYSIA

Validation of H2: The coefficient between Urbanization_Factors and Social_Culture is 0.545, which shows that urbanization has a significant positive effect on the sociocultural aspects of the tea industry. The estimate of B1 is 0.786, e.g., “6. Dimension 2: The sociocultural impact of urbanization on the tea industry - Does urbanization …”, which shows that people are aware of the impact of urbanization on the social aspects of the tea industry. “Sociocultural impact of urbanization on the tea industry - Does urbanization …”, which indicates that people are aware of the impact of urbanization on the social aspects of tea culture. Urbanization brings about mobility and concentration of population, and people from different regions interact with each other, which may contribute to the wider dissemination and enrichment of tea culture. The estimate of B2 is 0.754, e.g., “Do you see that urbanization have an impact on the protection and inheritance of tea culture?”, urbanization plays a positive role in promoting the protection and inheritance of tea culture. Perhaps it is because urbanization raises people’s cultural awareness, thus prompting more resources to be devoted to the preservation of tea culture. The estimate of B3 is 0.707, like “Does urbanization have an impact on the identity of local residents in tea culture?”, suggests that urbanization may have enhanced the identity of local residents in tea culture, making it part of community cohesion.

Validation of H3: The coefficient of Urbanization_Factors and Ecological_Enviroment is 0.430, which clearly indicates that there is a positive impact of urbanization on the ecological environment of the tea industry. The estimate of C1 is 0.71, as in “7. Dimension Three. The impact of urbanization on the ecological environment of cultural industries”, which may reflect that the technology and management concepts brought by urbanization are conducive to improving the ecological environment of the tea industry. For example, more advanced agricultural technology can reduce the use of pesticides and fertilizers, and reduce the pollution of soil and water. The estimate of C2 is 0.836, such as “What is the impact of urbanization on land use change in tea plantations?” suggests that the impact of urbanization on land use change in tea plantations is not entirely negative. It may lead to more rational planning and layout of tea plantations to improve the efficiency of land use. The estimate of C3 is 0.728 like “What is the impact of environmental pollution caused by urbanization on the tea culture? The estimate of C3 of 0.728, like “What is the impact

of environmental pollution caused by urbanization on the tea industry?", suggests that even though urbanization brings certain environmental pollution, its negative impact on the ecological environment of the tea industry can be mitigated through effective management measures, and may even prompt the tea industry to pay more attention to ecological protection and promote sustainable development.

Validation of H4: The indirect effect of Urbanization_Factors on Market_Economy through Social_Culture is 0.545 * 0.151 = 0.083. This implies that the positive effect of urbanization on Social_Culture in the tea industry can indirectly promote the development of Market_Economy. The enrichment and development of social culture can enhance the attractiveness and influence of tea culture, which in turn attracts more consumers and investors. For example, special tea culture activities can attract tourists and drive the sales of tea and the development of related industries; the inheritance and protection of tea culture can enhance consumers' sense of identity and loyalty to the tea brand and promote the expansion of market share.

Validation of H5: The indirect effect of Urbanization_Factors on Market_Economy through Ecological_Enviroment is 0.430 * 0.152 = 0.064. This indicates that the positive impact of urbanization on the ecological environment of the tea industry can indirectly promote the market economy to a certain extent. A good ecological environment helps to improve the quality and yield of tea, thus enhancing the market competitiveness of the product. Moreover, eco-friendly tea gardens can be used as tourist attractions to promote the integrated development of tea tourism and create new economic growth points for the tea industry. Meanwhile, consumers' preference for green and environmentally friendly products also gives tea from good ecological environments a greater advantage in the market.

Table 4.16 Path factor analysis

Suppose that...	**Pathway Relationship**	**Standardized Coefficient**
H1	Urbanization_Factors - Market_Economy	Standardized total effects: 0.559 Standardized direct effects: 0.412 Standardized indirect effects:

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

		0.147
H2	Urbanization_Factors - Social_Culture	0.545
H3	Urbanization_Factors - Ecological_Enviroment	0.430
H4	Urbanization_Factors - Social_Culture - Market_Economy	0.545*0.151=0.083
H5	Urbanization_Factors -Ecological_Enviroment - Market_Economy	0.430*0.152=0.064

Taken together, the coefficients in each of the above hypotheses are all positive, and the values of the observed variables reflect a positive relationship, which fully demonstrates that the urbanization factor has a significant positive impact on the market economy, social culture and ecological environment of the tea industry, and that this impact interacts with each other through both direct and indirect pathways, which jointly promotes the sustainable development of the tea culture in Sichuan Province.

4.4.3 Findings and discussion

This chapter is the cognition and impact analysis of urbanization on the sustainable development of tea industry in Sichuan Province, which integrates the changes of market demand, the transformation of consumption pattern, the upgrading of industrial structure, and the guidance and support of government policies into the theoretical logical framework of "the impact of urbanization on the sustainable development of tea industry", combines the research data, and analyzes the impact of urbanization on the economic benefits, environmental benefits and social benefits with the help of structural equation model. Combined with the research data, with the help of structural equation modelling, analysis was conducted on the impact of urbanization on the economic, environmental and social benefits of the tea industry, empirically test the theory of "urbanization and sustainable development of the tea industry" established in this thesis, explain the reasons for the differences between theory and practice, and provide a multi-perspective empirical basis for the construction of the mechanism of urbanization on the sustainable development of the tea industry later. Provide multi-perspective empirical evidence, which specific on:

UNIVERSITI KEBANGSAAN MALAYSIA

1. The impact of urbanization on the sustainable development of the economic benefits of tea industry in Sichuan Province exists in two (2) paths:

    a. Population growth → market demand → consumer consumption patterns → industrial structure → sustainable development of the tea industry economy in Sichuan Province. With the acceleration of urbanization, population growth has pushed the tea market demand up. The transformation of the consumption pattern prompts the upgrading of the industrial structure of the tea industry, thus promoting the sustainable development of the tea industry's economy.

    b. Policy guidance → modernization of the tea industry → sustainable development of the tea industry's economy in Sichuan Province. The government promotes the modernization of the tea industry through policy guidance, which in turn enhances the competitiveness and sustainability of the industry, and ultimately promotes the enhancement of economic benefits.

2. The impact of urbanization on the sustainable development of tea industry in Sichuan Province, there is a path of social and cultural impact: population mobility → residents' cultural cognition → lifestyle and cultural consumption → tea culture dissemination and exchange → sustainable development of tea industry in Sichuan Province. Urbanization brings a large number of population mobility to promote the intermingling of different cultures, residents of the tea culture gradually deepen the cognition, the formation of new lifestyles and cultural consumption habits, thus promoting the dissemination and exchange of tea culture.

3. There exists a path for the impact of urbanization on the sustainable development of the ecological environment of the tea industry in Sichuan Province: land use mode → area and location of tea plantations → construction of ecological tea gardens → production technology → sustainable development of the environment of the tea industry in Sichuan Province.

4. There is a linkage between urbanization and sociocultural influences on the market economy: urbanization ← → sociocultural → market economy. There is a close linkage between the urbanization process and the development of

UNIVERSITI KEBANGSAAN MALAYSIA

social culture. The richness and prosperity of social culture attracts more consumers, but also promotes the growth of the market economy of the tea industry.

5. There is a linkage between urbanization and the ecological environment that affects the market economy: urbanization ← → ecological environment → market economy. The improvement of the ecological environment by urbanization in turn affects the development of the market economy. Good ecological environment improves the quality and brand image of tea products, thus attracting more consumers and investors and promoting the further development of the market economy.

4.5 CHAPTER SUMMARY

This chapter presents a systematic analysis of the social, economic and ecological dimensions of the sustainable development of the Sichuan tea industry in the context of urbanization. Through the analytical framework constructed based on the triple bottom line theory, 16 potential influencing factors covering urbanization indicators, market economy, sociocultural and ecological environments are identified, and the paths and significant differences of these factors on the sustainable development of the Sichuan tea industry are discussed in depth through the methods of questionnaire surveys, structural equation modelling and multivariate analysis.

The results of the study show that, firstly, urbanization has a direct and significant positive impact on the market economic development of the tea industry in Sichuan, which is mainly manifested in the enhancement of consumer demand, investment opportunities and resource allocation efficiency; secondly, at the sociocultural level, urbanization has facilitated the dissemination of tea culture and the enhancement of the sense of identity, especially in the context of the intensification of population mobility and the frequency of cultural exchanges, which has further highlighted. Third, in terms of the ecological environment, although urbanization brings certain pressure, it also creates conditions for the introduction of eco-technology and green planting patterns, and creates potential positive incentives for the ecosystem as a whole.

UNIVERSITI KEBANGSAAN MALAYSIA

In addition, the structural equation modelling analysis further reveals that urbanization factors not only have a direct impact on the market economy, but also have an indirect effect through the two (2) intermediary variables of sociocultural and ecological environment, verifying the "urbanization-sociocultural/ecological environment-market economy" influence mechanism. The influence mechanism of "urbanization-social culture/ecological environment-market economy" is verified.

The reliability and validity analysis verifies the scientific validity and stability of the scale, and the regression path and model fitting indexes are above the good level, which enhances the rigor and explanatory power of the empirical research in this chapter. The findings of this chapter not only deepen the understanding of the interrelationship between urbanization and the tea industry, but also provide theoretical support and variable padding for the further exploration of the consumer behavior driving mechanism in Chapter 5.

UNIVERSITI KEBANGSAAN MALAYSIA

CHAPTER V

THE INFLUENCING FACTORS OF SICHUAN TEA CONSUMERS' CONSUMPTION WILLINGNESS ON THE SUSTAINABLE DEVELOPMENT OF THE TEA INDUSTRY

5.1 INTRODUCTION

In identifying factors influencing consumers' willingness to purchase tea, this study does not merely list variables but follows a systematic construction logic. First, using the theory of planned behavior (TPB) as the fundamental analytical framework, potential influencing factors are categorized into four (4) core dimensions: individual basic characteristics, behavioral attitudes, subjective norms, and perceived behavioral control. Second, through a systematic review of domestic and international research on tea consumption, green consumption, and agricultural product consumption behavior, we integrated and screened key variables repeatedly validated in existing literature. Building on this foundation, we contextualized and localized certain variables to align with the characteristics of Sichuan Province's tea industry development and its urbanization context.

Finally, through expert consultation and questionnaire pre-testing, the formulation and applicability of variables were refined. Indicators exhibiting high overlap or limited explanatory power were eliminated, resulting in an initial analytical framework encompassing 37 potential influencing factors. This variable system provides a systematic and robust foundation for subsequent identification of key influencing factors using a binary logistic regression model.

Binary logistic regression analysis is a statistical method commonly used to analyze the relationship between a dichotomous dependent variable (e.g., willingness to consume) and multiple independent variables (e.g., age, income, cultural identity,

UNIVERSITI KEBANGSAAN MALAYSIA

etc.). Through this method, the key factors affecting consumers' willingness to consume tea can be effectively identified and provide data support for subsequent research and industrial development strategies.

In this study, the binary logistic regression model was tested by the following hypotheses:

H6: Consumers' basic personal characteristics (e.g., age, gender, income, etc.) have a significant effect on willingness to consume tea.

H7: Consumers' behavioral attitudes (e.g., perceptions of tea quality, price, etc.) have a significant effect on tea consumption intentions.

H8: Social influences (e.g., advice from friends and family, recommendation from professionals, etc.) have a significant effect on consumers' intention to consume tea.

H9: The availability of tea products (purchase channels, price sensitivity, etc.) has a significant impact on consumers' willingness to consume tea.

This study will analyze the data on the basis of the above hypotheses, and ultimately determine the degree of influence of each variable on the willingness to consume tea through regression analysis, and identify the most influential factors. Through in-depth analysis of these factors, the study will provide strong data support and practical basis for the sustainable development of the tea industry in Sichuan. By analyzing the data, the study will reveal which factors have a significant influence on Sichuan consumers' tea consumption intention. The results of the analysis not only help to understand the behavioral changes of consumers in the process of urbanization, but also provide valuable references for the development of marketing strategies, branding, and product innovation in the Sichuan tea industry. In addition, the study will further explore how these influencing factors are related to the sustainable development of the Sichuan tea industry, and then propose specific measures to enhance consumers' tea consumption intention.

UNIVERSITI KEBANGSAAN MALAYSIA

5.2 DESCRIPTIVE ANALYSIS OF TEA CONSUMER BEHAVIOR

This section is based on the surveyed data on tea consumers in Sichuan Province and provides a preliminary overview of the current status of tea consumption.

The statistical analysis. Specifically, it includes consumers' basic information, consumers' knowledge and evaluation of tea, consumers' willingness to consume tea, the number of times they consume and the cost of tea, etc. It shows the specific behavior of tea consumers through descriptive statistical analysis.

5.2.1 Basic information about consumers

The gender ratio of tea consumers in this survey is basically equal, among 508 valid questionnaires, 247 (48.6%) are male and 261 (51.4%) are female, as shown in Figure 5.1. The age of tea consumers is mostly young and middle-aged, with the least number of those under 20 years of age, and the other age groups do not have a big difference, and the specific distribution is shown in Figure 5.2.

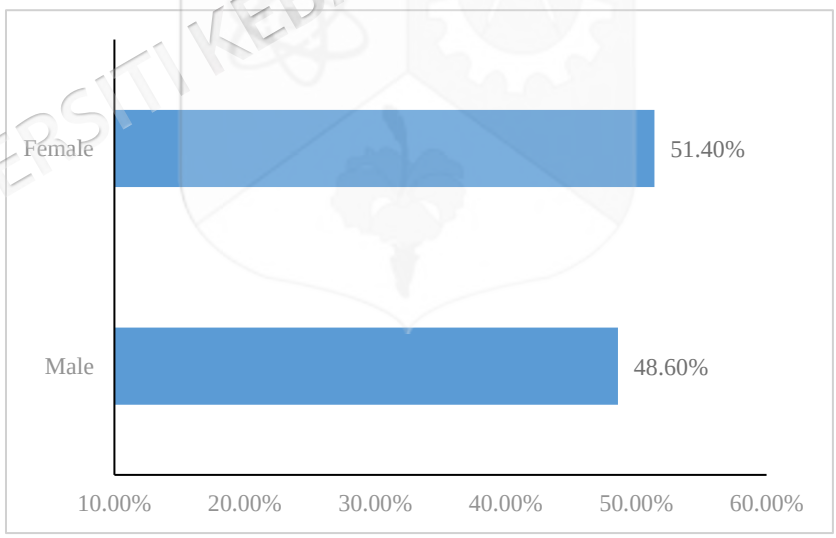

Figure 5.1 Gender distribution of consumers

UNIVERSITI KEBANGSAAN MALAYSIA

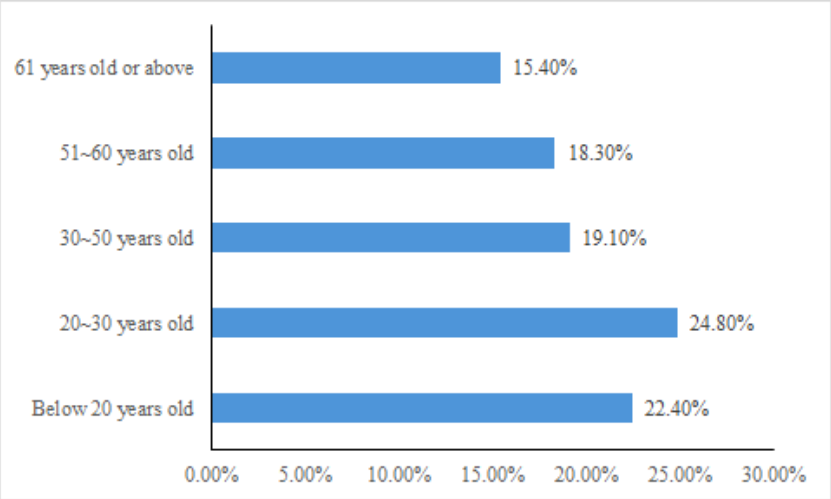

Figure 5.2 Age distribution of consumers

5.2.2 Educational level of consumers

Consumers' education level reflects their learning ability to a certain extent, almost all tea consumer behavior stems from learning, and there are two (2) types of learning, i.e. empirical and conceptual. The higher the level of education, the stronger the consumer's ability to discriminate, and the stronger the ability to judge all kinds of advertisements and promotional propaganda, and will not blindly follow these propaganda means. These consumer groups with a higher level of knowledge have a deeper understanding of environmental protection and pesticide residues, and they are more stringent in their requirements for tea quality, paying attention to the composition of the tea, its health and wellness effects, and the reputation of the brand. Overall, consumers are more educated, with the most consumers with university (including college) education (41.5%), the least consumers with postgraduate education, accounting for only 11.8%, and only elementary school educated consumers also amounted to 33 people, accounting for 6.5%. The education level is dominated by university education (41.5%), followed by high school or college education (28.7%), as shown in Figure 5.3.

UNIVERSITI KEBANGSAAN MALAYSIA

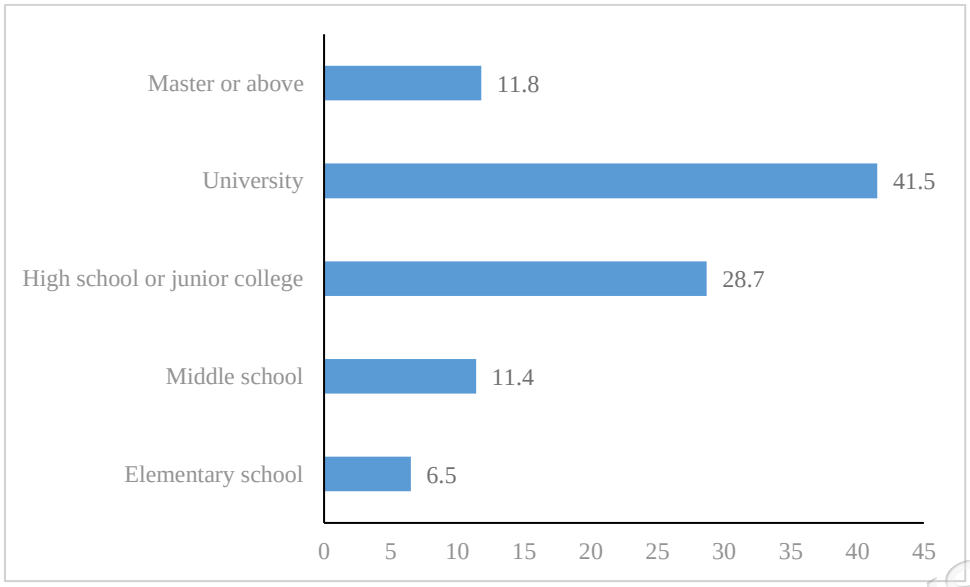

Figure 5.3 Educational attainment of consumers

5.2.3 Marital status of consumers

In the study of consumer behavior, marital status, as an important component of basic personal characteristics, is usually regarded as an important variable influencing consumer attitudes and behaviors. It has been shown that marital status not only affects an individual's lifestyle and consumption preferences, but also determines the stability and family orientation of their consumption decisions to a certain extent (Kotler & Keller 2016).

This study analyzed 508 valid questionnaires to obtain the specific distribution of consumers' marital status. As shown in Figure 5.4, 66.9% of the respondents are married, with the "married without children" group dominating at 48.2%, followed by the "unmarried" group at 33.1%, and the "married with children" group at 18.7%. The proportion of "married with children" is 18.7%. The results reflect that a larger proportion of the current sample is newly married or childless, and this group usually has stronger consumption potential and brand exploration willingness, especially in the health function and cultural value of tea products, showing a higher degree of interest.

Meanwhile, the unmarried group, as another major component, has a more personalized and socially oriented consumption behavior, tends to purchase through online platforms, and shows strong sensitivity to factors such as packaging, value, and

UNIVERSITI KEBANGSAAN MALAYSIA

communication. Although the proportion of married groups with children is relatively small, driven by the concept of “family health”, they usually pay more attention to product safety and functionality, and prefer green and organic tea products with high quality and traceability.

In summary, the marital status variable is of great significance in understanding the tea consumption preferences of different consumer groups in the context of urbanization, and it also provides a data basis and theoretical support for the subsequent segmentation of population positioning and product promotion strategy.

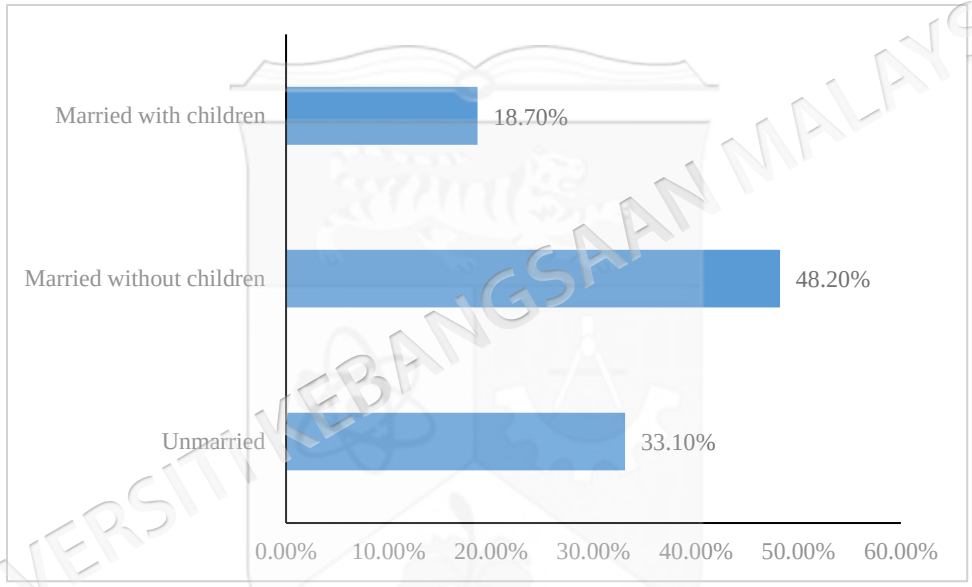

Figure 5.4 Marital status of consumers

UNIVERSITI KEBANGSAAN MALAYSIA

5.2.4 Monthly consumer income

Income level is a core economic variable that determines consumers’ purchasing power and willingness to consume. According to microeconomics theory, individual income has a direct constraining and guiding effect on their consumption behavior and is an important indicator of market purchasing power (Kotler & Keller 2016). In studies related to the sustainable development of the tea industry, the income variable has significant reference value for understanding consumers’ consumption frequency, brand choice and healthy green preference.

In this study, the option of “monthly income” was set in the questionnaire survey, and the valid samples were statistically analyzed, and the results are shown in Figure 5.5. The data show that the distribution of monthly income is relatively concentrated, mainly in the range of 3001-8000 yuan. Among them, the proportion of consumers in the range of 3001 to 5000 RMB is the highest, at 44.9%, followed by those in the range of 5001 to 8000 RMB, accounting for 27.8%, with the two (2) together accounting for 72.7% of the total sample. This data structure shows that this survey covers a large number of middle-income groups, which are representatives of the current urban middle class, and their consumption behavior is of great reference significance to the development of the mid-range market of the tea industry.

In addition, the monthly income group of 1,000 RMB and below accounted for 24.4%, mainly composed of school students, rural residents and some elderly people; the proportion of low-income group of 1,001 to 3,000 RMB was only 1%, and among the high-income group, those with more than 8,000 RMB only accounted for 2%. It can be seen that the proportion of high-income consumers in the sample is limited, which is related to the fact that tea is still mainly oriented to the mass consumer market, the level of economic development of the survey area and the composition of the population and other factors.

Although some respondents may have “underreported” their incomes when completing the questionnaire, for example, only filling in salary income, not including bonuses, allowances, part-time jobs, or business incomes, on the whole, the data in the sample still reflects the income distribution characteristics of tea consumers in Sichuan Province in a more realistic manner.

From the perspective of urbanization process, the continuous expansion of middle-income groups and the continuous enhancement of consumption ability means that the tea industry should pay more attention to the consumption psychology, value demands and consumption scenarios of this group in product positioning and market strategy. At the same time, moderate attention to the health consumption orientation of low-income groups and high-income groups of brand identity preferences, for the

UNIVERSITI KEBANGSAAN MALAYSIA

realization of the tea industry's multi-level market construction and sustainable development goals have positive significance.

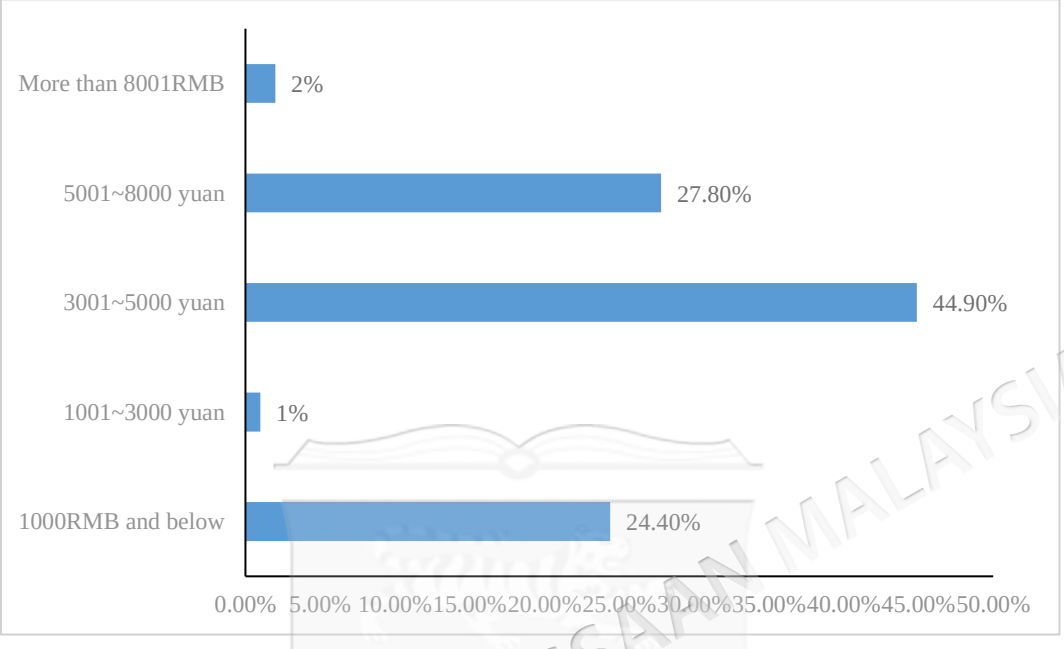

Figure 5.5 Monthly income of consumers

5.2.5 Occupation of consumers

In this study, the variable "occupation" was included in the questionnaire, and the valid questionnaires were statistically analyzed, and the results are shown in Figure 5.6. In terms of overall distribution, the sample covers a wide range of occupations in the primary industry (e.g., farmers), secondary industry (e.g., corporate employees and managers), and tertiary industry (e.g., civil servants, business organizers, and students), which makes the sample composition more diversified and representative. Specifically, business organization personnel accounted for the highest proportion of 32.7%, indicating that tea consumption has a high penetration rate among middle- and high-income groups engaged in frequent business and marketing activities, and that this group has strong consumption power and is more sensitive to brand, quality, and the experience of drinking tea in social scenes. This group is followed by the civil servants group, accounting for 24.4%. This group is generally better educated, more stable, and has a stronger preference for the pursuit of healthy lifestyles, cultural identity and ecological consumption, which is in line with the current trend of extending the tea industry to green, organic and cultural values. In addition, the proportion of students is

UNIVERSITI KEBANGSAAN MALAYSIA

also as high as 22.4%, which reflects that tea has a certain consumption base among young people, especially in the context of a strong cultural atmosphere in colleges and universities and an increased awareness of healthy beverages, the young consumer groups are becoming an important potential market for tea consumption.

In contrast, the traditional farmers' group accounted for 5.3% of the sample, while employees of enterprises accounted for 9.1%, and managers of enterprises accounted for only 1%. Among them, the farmers' group is a producer in the tea industry, and their consumption behavior is influenced by production habits and self-supply logic; while the lower proportion of business managers may be related to the small base of this group in the sample and the limited recovery rate of the questionnaire.

Overall, this survey has achieved a wide coverage of industrial fields in terms of occupational structure, reflecting a certain degree of sample balance, which can provide a data basis for the subsequent analysis of the differences in consumer behavior under different occupational backgrounds. Under the background of urbanization, with the continuous refinement of the division of labor and the increase of the proportion of the tertiary industry, the tea industry needs to pay more attention to the consumption characteristics of the service-oriented and knowledge-based occupational groups, and to strengthen the integration of product functionality and cultural value-added innovation, in order to better adapt to the needs of market transformation brought about by the changes in the structure of consumers.

UNIVERSITI KEBANGSAAN MALAYSIA

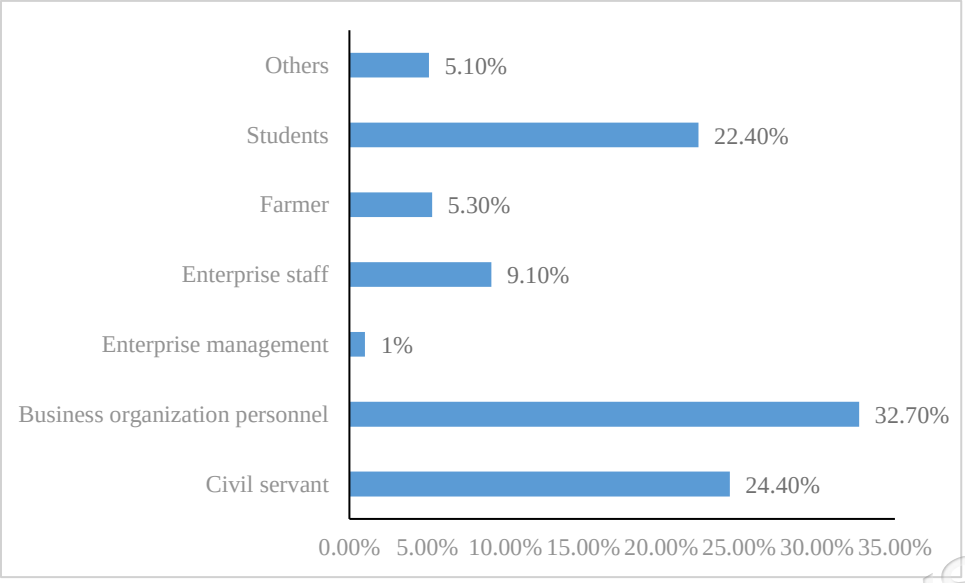

Figure 5.6 Occupational distribution of consumers

5.2.6 Level of urbanization of consumers' place of residence

Consumers' living place is an important variable that affects their consumption preference and behavior. In this study, a total of 508 valid questionnaires were recovered, of which 486 urban residents accounted for 95.7%, of which 71 people in first-tier cities, 233 people in second-tier cities, 182 people in third-tier cities and the following cities, and rural residents accounted for 22, the sample structure is more reasonable, with a strong representativeness, as shown in Figure 5.7.

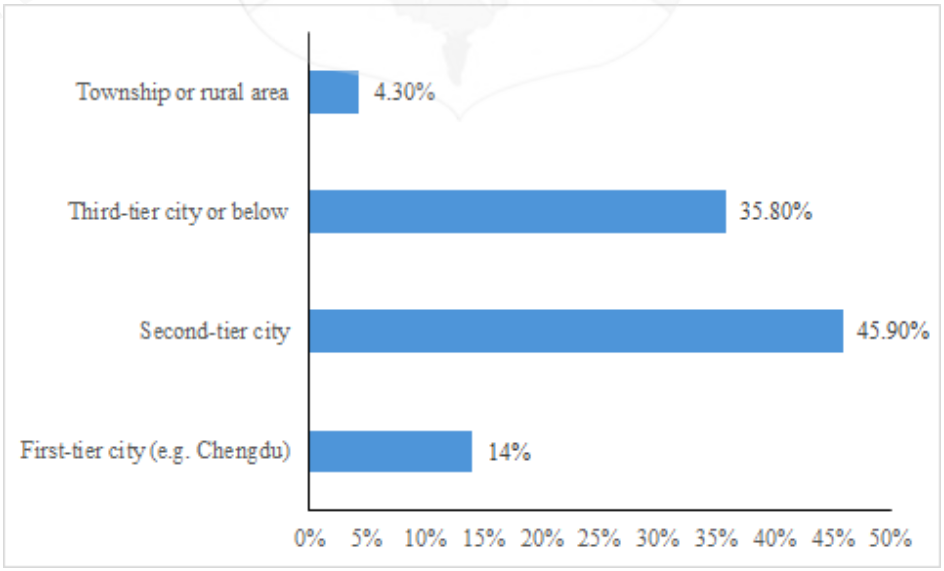

Figure 5.7 Level of urbanization of consumers' place of residence

UNIVERSITI KEBANGSAAN MALAYSIA

Through the cross-tabulation analysis of the amount and frequency of tea consumption, it is found that the amount of single tea consumption of rural residents is generally lower than that of urban residents. This difference may be attributed to the differences between urban and rural residents in terms of economic income, consumption structure and product availability. On the one hand, the overall income level of rural residents is lower, more sensitive to price; on the other hand, the purchase of tea in rural areas is relatively limited channels, mostly local bazaars and farmers' markets, and the penetration rate of branded and standardized high-end tea products is relatively low.

It is worth noting that in the rural sample, price reasonableness became an important factor influencing the choice of tea. Most rural consumers prefer cost-effective traditional tea products, emphasizing "practicality" and "taste"; while urban consumers are more concerned about the quality, packaging and cultural attributes of tea, and some of them have already integrated tea into their social and health care lifestyles, showing higher brand loyalty and consumption frequency. Some people have integrated tea into their social and health care lifestyles, showing higher brand loyalty and consumption frequency.

In addition, in terms of the choice of consumption venues, urban consumers mostly choose to make purchases at branded chain stores, e-commerce platforms or high-end supermarkets; while rural consumers rely more on traditional markets or small-scale tea stalls. This trend reveals, to some extent, the profound impact of urbanization on tea sales channels and consumer behavior patterns.

In summary, consumers' living place not only reflects the differences in economic conditions and lifestyles between urban and rural areas, but also largely influences consumers' functional cognition, price acceptance and brand preference for tea products, which is a key consideration in the subsequent layout of the regional tea industry's refined promotion and service provision.

UNIVERSITI KEBANGSAAN MALAYSIA

5.2.7 Consumer awareness and evaluation of tea

Consumers' perception of tea and information sources affect their consumption attitude and behavior to a certain extent. Under the background of urbanization, the change of information dissemination channels is profoundly reshaping the way of consumers' cognition, which also provides new paths for brand communication, product promotion and market penetration in the tea industry.

Table 5.8 of the findings of this study shows that the current main channels for consumers to obtain tea-related information show a diversified trend. Specifically, the proportion of consumers acquiring information through the Internet and social media (e.g., Xiaohongshu, Jieyin, etc.) is the highest, at 45.1%, indicating that digital media has become a key platform for promoting the dissemination of tea knowledge and consumption guidance. Meanwhile, traditional media (e.g., TV, radio, newspapers and magazines, etc.) still occupy a large share of 34.4%, and still have a strong influence in the middle-aged and old-aged groups, especially in the functional publicity and cultural dissemination of tea.

In addition, 13.6% of consumers obtained information through offline tea stores or tea fairs, indicating that face-to-face communication and physical experience play an important role in consumers' cognitive and purchasing decisions in specific consumption scenarios. Comparatively speaking, the proportion of those who learned about tea through friends and relatives' recommendation was only 1%, reflecting that tea consumption decision-making is increasingly inclined to individualization and autonomy, and the direct role of word-of-mouth effect in the current audience has declined.

From the perspective of urbanized communication paths, the rapid rise of social media platforms and short video content allows consumers to visualize information about origin, technology and culture, and this "immersive" cognitive path is highly attractive to young and middle-aged people. In terms of information credibility, consumers are still highly dependent on the content output of professional platforms

UNIVERSITI KEBANGSAAN MALAYSIA

and brands, which makes brand building and content planning particularly critical in the new communication landscape.

To summarize, the diversification of consumers' knowledge of tea is closely related to the evolution of media structure. Tea industry enterprises and policy promoters should take into account the information acceptance preferences of different groups of people, strengthen the professionalism and credibility of the content supply of the Internet channel, and at the same time, combine the traditional communication methods with the offline experience scenarios, so as to realize the synergistic enhancement of the dissemination of tea culture and market education.

Table 5.1 Consumer awareness pathways for tea

	Frequency	**Percentage**
Traditional media (TV and radio, newspapers and magazines)	175	34.4
Internet/social media (e.g., Xiaohongshu, Jieyin)	229	45.1
Recommended by friends and relatives	5	1
Offline tea shops/ exhibitions	69	13.6
Others	30	5.9

Under the background of accelerating urbanization, consumers' cognitive patterns and evaluation systems of agricultural products, especially tea products, are becoming more and more diversified and rationalized. Based on a consumer questionnaire, this study explores consumers' comprehensive perceptions and evaluations of price, brand, quality, functionality and safety of tea in the context of urbanization.

The results of the survey show that most consumers are neutral about the price of tea in the market, with 45.2% of respondents believing that "the price is moderate and cost-effective" and 31.6% believing that "the price is on the high side and the cost-effectiveness is low". This suggests that consumers are generally cautious about the price of tea in the current market environment, especially in the face of a wide variety of categories and origins, and cost-effectiveness has become an important consideration in influencing purchasing decisions (Chen 2014). In terms of brand influence, more than

UNIVERSITI KEBANGSAAN MALAYSIA

60% of consumers said that brand plays an important role in their consumption decisions, of which 31.2% believe that “brand is very important and directly affects the purchase decision”, and another 28.9% said that “brand is important, but it is not the only criterion”. It can be seen that the brand is not only the core element of market positioning and communication of tea enterprises, but also a key external signal for consumers to measure the trust of the product.

Regarding the functional value of tea, such as health and wellness, refreshing the mind, etc., 42.7% of consumers gave positive comments, believing that tea is “significantly better than other beverages”, which shows that consumers recognize the dual attributes of tea as a “daily drink + health care product”. Meanwhile, in the dimension of emotional value, 43.8% of consumers agree that “drinking tea is an important part of culture and socialization”, reflecting that tea culture and identity still have a strong influence in the new consumer context.

In terms of product quality, only 24.8% of consumers believe that the quality of current tea is “very good and trustworthy”, while more than 60% of consumers (65.3%) believe that the quality of tea is “average” or “needs to be improved”. Consumers’ uncertainty about quality is often associated with news stories about pesticide residues, adulteration and over-processing of tea, indicating that the market still needs to make sustained efforts in standardization and information transparency.

Regarding pesticide residues and food safety of tea, consumers generally have a certain degree of concern. Survey data show that 48.6% of consumers on the safety of tea “more trust” or “very trust”, but there are more than 10% of the respondents (12.4%) said “basic distrust” or even “don’t trust at all”. This result shows that although most consumers are willing to trust the regulatory system and brand reputation, some still have reservations about tea safety due to information asymmetry or consumer experience.

In terms of trust pathways, the main channels for consumers to acquire knowledge related to tea safety include social media (45.1%), traditional media (34.4%) and offline publicity such as tea exhibitions or tea estate experiences (13.6%). This

UNIVERSITI KEBANGSAAN MALAYSIA

suggests that companies and the government should make concerted efforts in content credibility, information accessibility and experiential communication when conducting consumer education.

To explore consumers' familiarity with Sichuan tea categories and their general cultural perceptions of tea, this study included an open-ended exploratory question in the questionnaire. The purpose of this item was to elicit respondents' spontaneous cognitive responses regarding tea consumption, rather than to conduct a precise measurement of a single latent construct.

The results indicate that only approximately 52% of respondents completed this open-ended question, suggesting that a considerable proportion of participants experienced difficulty or lacked confidence in articulating tea categories during the survey process. This finding reflects, to some extent, the relatively limited familiarity of ordinary consumers with tea classifications, particularly with respect to professional terminology and varietal differentiation.

During data coding, a substantial number of spelling errors and name confusions were identified. For example, "Mengding Ganlu" was written as "Mengding Green Dew", "Emei Snow Buds" as "Emei Snow Tea", "Sichuan Black Tea" as "Sichuan Tea Red", and "Zhuyeqing" as "Green Bamboo Leaf". These inaccuracies not only reveal consumers' limited proficiency in tea nomenclature but also point to deficiencies in current tea-related science communication and public education.

In terms of category recognition, Sichuan-produced green and black teas were mentioned most frequently, including Mengding Ganlu, Emei Snow Buds, Zhuyeqing, and Sichuan Gongfu Black Tea, indicating that these representative local tea brands have achieved relatively high public awareness. At the same time, some respondents listed non-Sichuan teas such as Pu'er, Longjing, and Biluochun, suggesting that contemporary tea consumption cognition is increasingly shaped by national-level brands and cross-regional exposure.

UNIVERSITI KEBANGSAAN MALAYSIA

It should be noted that phenomena similar to “homonyms” and “synonyms”, commonly observed in traditional Chinese medicine, also occur in the tea domain. For instance, some respondents confused “Emei Maofeng” with “Emei Snow Buds,” or treated “Que She” and “Zhuyeqing” as interchangeable products. Such patterns indicate that, at the general consumer level, tea knowledge often remains impressionistic and experience-based, rather than grounded in systematic distinctions based on origin, processing techniques, or quality grades.

Overall, these cognitive inconsistencies do not necessarily imply a lack of consumer interest or engagement. Instead, they highlight structural gaps in tea culture dissemination, public education, and brand communication. Strengthening multi-channel knowledge transmission—such as through short-video platforms, tea culture exhibitions, and cultural festivals—may enhance consumers’ understanding of tea varieties and cultural meanings, thereby supporting the broader recognition and dissemination of Sichuan tea brands at the national level (Zhao & Kong 2024).

5.2.8 Consumer willingness to consume tea analysis

Of the 508 valid samples in this survey, the questionnaire data shows that the proportion of respondents with the intention to consume tea is 60.8%, while the proportion of those who clearly indicated no intention to consume is 39.2%, see Figure 5.8.

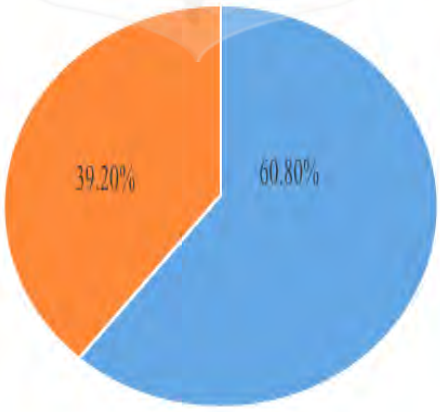

Figure 5.8 Statistics of tea consumption willingness

UNIVERSITI KEBANGSAAN MALAYSIA

This result shows that there is a higher overall acceptance of tea products, but also reveals that there are still nearly 40% of the group has not been effectively covered, reflecting the current tea industry in consumer education. It also reveals that nearly 40% of the groups are still not effectively covered, reflecting that there is still room for improvement in consumer education, product awareness and market guidance. In addition, in order to further clarify the motivation behind the willingness to consume tea, this study also investigated the main reasons for consumers to choose or not to choose tea. From the research data, consumers tend to choose tea consumption mainly due to the following factors, tea health function identity is strong, a considerable portion of consumers regard tea as a "health", "refreshing" and other functions of the natural health drinks; taste and double attraction of taste and culture, a high proportion of consumers agree with the taste experience and cultural and emotional value of tea (such as social, identity symbols); the influence of friends and family, and brand trust, friends and family recommendations; acquaintances tea brand experience; live with the goods and other ways to a certain extent affects the willingness to consume.

In contrast, the respondents do not choose tea consumption mainly for these considerations. Price perception is high, some consumers believe that the current market price of tea is high, cost-effective is not strong; quality and standardization of doubt, more consumers reflected in the survey, the quality of tea is unstable, the market lacks uniform standards, there is a "difficult to distinguish between the real and the fake" concerns; access to channels is not convenient, especially for those who live in the third tier of the following cities or rural areas, the respondents raised concerns about the convenience of access to quality tea products. Respondents, especially those living in cities below the third tier or in rural areas, are concerned about the accessibility of quality tea products.

Although 60.8% of the respondents indicated that they are willing to consume tea, there is still a certain deviation from the actual frequency of tea purchase and annual consumption amount. This shows that in the process of transformation from "willingness" to "behavior", it is still affected by multiple factors such as price, cognition, trust, usage habits, etc., and the subsequent transformation path of consumption still needs to be accurately guided.

UNIVERSITI KEBANGSAAN MALAYSIA

5.2.9 Analysis of the frequency and cost of consumer tea

Among the valid samples of this research, the frequency of tea consumption by consumers shows a high degree of dailyization. The data show that the proportion of respondents who drink tea four (4) times or more per day reaches 56.3%, of which 30.1% drink tea four (4) times per day and 26.2% drink tea more than four (4) times per day; 23.4% drink tea three (3) times per day, 16.3% drink tea two (2) times per day, and 3.9% drink tea one (1) time per day. It can be seen that the overall frequency of tea consumption in Sichuan Province is high, and tea has been deeply integrated into their daily lives, becoming an important part of their daily beverages.

At the same time, the level of consumers' annual consumption expenses also presents obvious stratification characteristics. In the past year, the proportion of those whose tea consumption amount was 1001 yuan and above was the highest, amounting to 34.4%; followed by those whose consumption amount was 501~1000 yuan, accounting for 21.5%, reflecting the centralized distribution of high-end and mid-range consumer groups respectively; while those whose annual consumption amount was 201~500 yuan accounted for only 9.1%, and those whose consumption amount was 100 yuan and below accounted for 10%. This consumption structure indicates that under the current background of consumption upgrading and promotion of tea culture, some consumers have shown strong brand loyalty and willingness to invest in tea, while the middle- and low-end consumer groups still focus on practical consumption, as shown in Table 5.2.

From the overall trend, the Sichuan tea market is showing a "high-frequency drinking" and "hierarchical consumption" parallel characteristics. On the one hand, high-frequency tea drinking behavior for the formation of rigid demand for tea products to provide the conditions; on the other hand, the differentiation of the consumption level requires the tea industry in the product structure of the precise positioning, not only to provide cost-effective daily drinks, but also need to meet the demand for high value-added functional or cultural tea products. The accelerated pace of life and the diversification of consumption scenarios in the context of urbanization have also provided a realistic impetus for the growth of tea consumption frequency and expenses.

UNIVERSITI KEBANGSAAN MALAYSIA

Table 5.2 Analysis of the frequency and cost of tea consumption

		Frequency	Percentage
How many times a day, you drink tea?	1 time	20	3.9
	2 times	83	16.3
	3 times	119	23.4
	4 times	153	30.1
	More than 4 times	133	26.2
How much did you spend on tea consumption in the past year?	100 yuan or less	51	10
	101~200 yuan	127	25
	201~500 yuan	46	9.1
	501~1000 yuan	109	21.5
	1001 yuan or more	175	34.4

5.2.10 Main places where consumers consume tea

According to the survey data, the distribution of tea consumption venues shows a significant diversification trend as shown in Figure 5.9, of which “other” venues (e.g., non-fixed consumption scenarios such as traveling, outdoor picnics, and gatherings) accounted for 29.5% of the total number of tea consumption venues, which highlights the flexibility and scenario extensibility of tea consumption (Czarniecka-Skubina et al. 2022). Modern consumers are gradually shifting the use of tea from a fixed home or office beverage to a wider range of life scenarios, reflecting the trend of integrating tea culture with modern lifestyles.

Secondly, office and home followed with 25.8% and 19.3% respectively, indicating that tea has a wide application base in daily work and home life, and has become an important part of the public’s daily beverage (Abeygoonaratne & Kularatne 2015). Especially in the work scenario, tea is favored by the office population due to its properties such as refreshing the mind and freshening the breath.

In addition, teahouses (8.5%) and leisure and entertainment venues (16.9%), although relatively low in proportion, also show the important function of tea in socializing and leisure (Boinwad & Shinde 2024). Although the proportion of teahouses is relatively small, its cultural and ceremonial nature still makes it irreplaceable in the

UNIVERSITI KEBANGSAAN MALAYSIA

middle- and high-end consumer market, while tea drinking in entertainment venues serves more for relaxed socialization and scene experience, reflecting the market potential of tea driven by the dual demand of "pleasing oneself" and "pleasing others". This reflects the market potential of tea under the dual drive of "pleasing oneself" and "pleasing others" consumption.

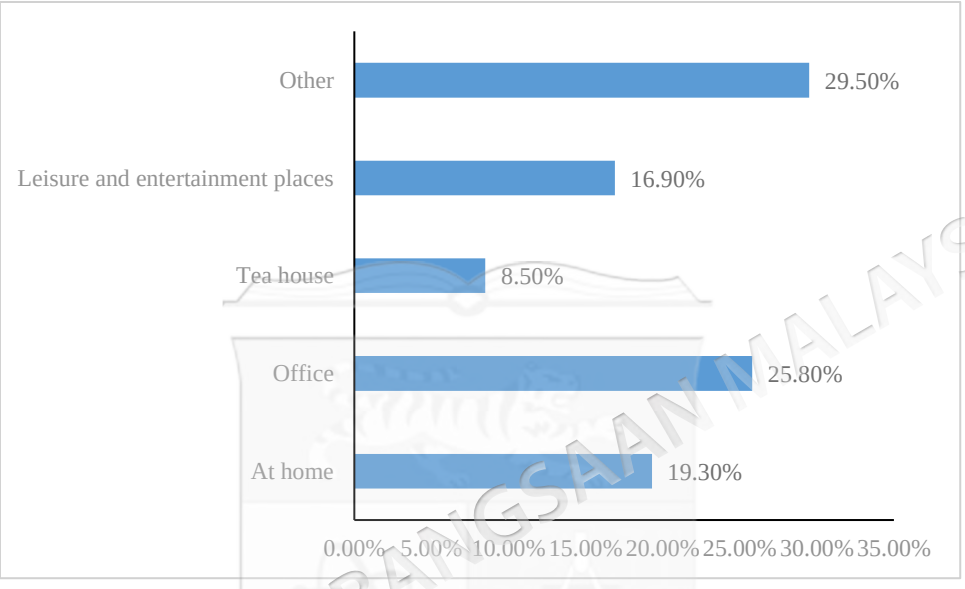

Figure 5.9 Main places where consumers consume tea

The tea demand of different consumption places has its own characteristics: on the one hand, it should strengthen the supply of convenient and lightweight products in daily high-frequency scenarios such as "office-family", and enhance the daily tea drinking experience; on the other hand, it should develop high-quality and culturally strong tea products for situational consumption such as "teahouse". On the other hand, for contextual consumption such as "tea houses" and "leisure places", high-quality tea products with a strong sense of culture should be developed to promote the extension of tea from functional consumption to cultural value-based consumption, and to provide directional support for the differentiated layout and sustainable development of the tea industry (Huang 2024).

Finally, in terms of brand awareness, the survey results show that 57.2% of consumers think that the brand is "very important" or "important", and the brand has become an important factor influencing the purchase decision of tea, especially in the

middle and high price range, the brand's protection and the function of brand as a guarantee and status symbol is more prominent (Bandara et al. 2021).

In addition, the most important factors for consumers when choosing to buy tea are, in descending order: tea quality (36.4%), price (31.6%), origin (18.1%), packaging (9.5%) and brand awareness (4.4%), which indicates that consumers are still oriented to the actual perceived value of the tea as the core of their tea purchasing decisions, with "value for money" and "quality stability" becoming the core evaluation basis (Tan et al. 2020).

5.3 METHOD SELECTION – LOGISTIC REGRESSION ANALYSIS

Multiple regression analysis has been widely used as a standard statistical tool in the social sciences. As a multivariate analysis, it is able to provide more in-depth explanatory power for social phenomena. It is not a rare case in social science research that the dependent variable is qualitative, and many of the behaviors to be studied, as well as the attitudes and preferences behind them, are qualitative. People in social life are involved in a large number of decisions, such as political elections, whether to join a social group, whether to sign a contract, whether to migrate, whether to have another child, etc. These behaviors, decisions, and preferences are qualitative, sometimes choosing between a small number of types, and sometimes even just whether or not or positive or negative, and social science research needs to explore what are the factors that can influence these decisions or actions. Logistic regression is what is applied to non-continuous variables to do multiple regression analysis.

Logistic function is also known as growth function. This function was first proposed by Belgian scholar, P.F. Verhulst in 1838, but was lost after that. In 1920, American scholars Robert B. Pearl and Lowell J. Reed rediscovered this function in the study of fruit flies and began to popularize its application in population estimation and forecasting, which attracted widespread attention (Shryock et al. 1976). The logistic model is a generalized linear model widely used in dichotomous problems, the core of which is the mapping of linear regression results to probability values (in the range

[0,1]) via S-shaped (logistic) curves to describe the probability of an event occurring. It is analyzed in its common form below:

Modeling:

The logistic function is modeled as:

$$P = \frac{L}{1+exp\,[-(a+bt]}\ where\ exp[u]\ =\ e(u) \qquad \ldots(5.1)$$

where *t* is the time, *P* is the population size at time *t*, *L* is the maximum limit value of *P*, and *a* and *b* are the relevant parameters, respectively. According to the requirements of the nonlinear probability model, *P* needs to be replaced by the probability *p=p(y=1)*, and the upper limit needs to be changed to 1. Thus, the domain of probability values is restricted to a reasonable range between (0, 1). Both the upper limit *p=1* and the lower limit *p=0* are horizontal asymptotes; in fact, no matter how the values of the parameters and independent variables change, the function value will never reach either the upper or lower limit point. In addition, since we may not necessarily use time as the independent variable, we change *t* to *x* to generalize to any of the independent variables, and there is no restriction on its domain of values. Thus, the logistic probability function is obtained. In Equation (5.1) *L* is the asymptotic upper bound (often taken as 1) and (*a* + *bt*) is the linear prediction part. When *L = 1*, the linear combination (*a* + *bt*) is converted to a probability by means of an exponential function.

The conceptual function of logistic is defined as:

$$P = \frac{L}{1+exp\,[-(a+bx)]} \qquad \ldots(5.2)$$

Equation 5.2 is an equivalent expression with variable substitution, and essentially still generates the probabilities by combining the linear term (*-a/b - x*) with the exponential function.

It can be further rewritten as:

$$P = \frac{\mathrm{L}}{1+\exp\left[b(-a/b-x\right]} \quad \ldots(5.3)$$

From the above equation we can see that Equation 5.3 highlights two (2) useful parameters. The first is *b* and the second is *-a/b*.

On this principle, multiple independent variables are introduced into the logistic probability function to complete the multivariate analysis. The multivariate linear combination $a+b_{(1)\,x1}+b_{(2)\,x2}+b_{(3)\,x(3)\,+}\ldots+b_{(k)\,xk}$, is denoted by $ii\sum xb$, where the constant term *a* is denoted by b_0 and x_0 is always equal to 1. Then, for further simplicity of the derivation, $z = \sum b_{(i)\,xi}$ and the logistic probability function can be expressed as:

$$P = \frac{L}{1+exp\left[-\sum b_i x_i\right]} = \frac{exp\,(z)}{1+exp\,(-z)} \quad \ldots(5.4)$$

Equation 5.4 is applied to the multidimensional features (x_i) and outputs the classification probability by taking the weighted sum of the features as input.

Multiplying the numerator and denominator of the right-hand term in the above equation by the same *exp(z)* gives:

$$P = \frac{exp\,(z)}{1+exp\,(z)} \quad \ldots(5.5)$$

which is also one of the common expressions for the logistic probability function (Guo 1999).

In order to move the linear combination of independent variables part of the regression equation $Z = \sum b(i)\ xi$ to one side of the equation alone on the basis of the above logistic probability function, so that the equation can be expressed as a linear form of the independent variables, the following series of transformations of the equation are carried out:

$$p[1 + exp(z)] = exp(z) \quad \ldots(5.6)$$

UNIVERSITI KEBANGSAAN MALAYSIA

$$p + p * exp(z) = exp(z) \quad \ldots(5.7)$$

$$p = (1 - p)exp(z) \quad \ldots(5.8)$$

$$\frac{p}{1-p} = exp(z) = exp(\sum bixi) \quad \ldots(5.9)$$

Finally, taking logarithms on both sides of the equation yields a linear expression for the probability as a function of the independent variable:

$$\text{In}\frac{p}{1-p} = z = \sum bixi \quad \ldots(5.10)$$

The logistic general form obtained by taking the above equation and doing the Rogisti transformation:

$$Logit(p) = \sum b(i)\ xi \quad \ldots(5.11)$$

5.4 CONSTRUCTION OF EMPIRICAL MODEL OF FACTORS INFLUENCING THE WILLINGNESS TO CONSUME TEA

In order to examine the degree of influence of each factor on consumers' willingness to choose tea consumption, we used a dichotomous classification.

Logistic regression model, the logistic general form was used to build the regression model to get logistic.

General form of regression:

$$Logit(p) = \ln\left(\frac{p}{1-p}\right) = b_0 + b_1x_1 + b_2x_2 + \cdots + b_nx_n \quad \ldots(5.12)$$

where *y=1* means yes, *y=0* means no, and *p* is the probability of the dependent variable *y=1*.

UNIVERSITI KEBANGSAAN MALAYSIA

Occurrence rate, and the parameters ($B= b_{(0)}, b_{(1)}, b_{(2)}, ...b_n$) are the regression coefficients, $n=42$, and the variable interpretations are shown in Table 5.3. p is the probability of the event occurring, taking values between 0 and 1. The right hand side of the equation is a linear combination. Where b_0 is the intercept term, ($b_1 b_2 b_n$) are the regression coefficients and ($x_1 x_2 x_n$) are the independent variables. These independent variables can be various factors that affect the willingness to consume tea, such as consumer age, income level, awareness of tea, etc.

5.5 ANALYSIS OF THE RESULTS OF THE IDENTIFICATION OF FACTORS INFLUENCING THE WILLINGNESS TO CONSUME TEA

In order to explore the influencing factors of urbanization process on the sustainable development of Sichuan tea industry, this study adopts binary logistic regression (BLR). This method is applicable to the analysis of dichotomous dependent variables, which can effectively assess the degree of influence of each independent variable on the dependent variable and reveal the main influencing factors. In this study, the forward stepwise conditional method was selected for modeling through SPSS software to further improve the predictive accuracy and statistical efficiency of the model, and the categorical independent variables were consumer age, consumer education, consumer occupation, monthly income, marital status, and consumer occupation. The categorical variables of the independent variables are consumers' age, consumers' occupation, monthly income, marital status, current urbanization level, the most important information when purchasing tea, consumers' knowledge of Sichuan tea, consumers' evaluation of tea prices in the market, consumers' evaluation of the importance of tea brands, consumers' evaluation of the functional value of tea, consumers' evaluation of the taste of tea, consumers' evaluation of tea quality, consumers' evaluation of tea emotional value, consumers' evaluation of whether they know about tea, whether consumers are aware of the GAP production of tea, the degree of consumers' concern about pesticide residues in tea, the degree of consumers' trust in the safety of tea in the market, the number of times tea has been consumed in the past year, the amount of money spent on tea consumption in the past year, the degree of consumers' satisfaction with the most recent purchase of tea, whether consumers would recommend Sichuan tea to others, and the attitudes of friends and relatives towards tea around them. Whether consumers are influenced by their friends and relatives in choosing to buy tea, whether

UNIVERSITI KEBANGSAAN MALAYSIA

consumers are influenced by the advice of professionals, whether consumers are willing to follow the advice of tea experts and tea masters in purchasing specific types of tea, whether consumers are influenced by marketing campaigns, the main scenarios in which consumers consume tea, the locations where consumers often drink tea, the difficulty in obtaining tea according to consumers, the main influencing factors for consumers' choice of tea, the difficulty in obtaining tea according to consumers, the difficulty in obtaining tea according to consumers, the main influencing factors for consumers' choice of tea, the main factors influencing consumers' choice of tea, the main reasons why consumers choose tea, the main reasons why consumers do not choose tea, and consumers' overall assessment of the quality and standardization level of tea in the current market, among 34 variables. The two (2) variables of gender of consumers and consumers' willingness to consume tea were taken as binary dummy variables (No=0, Yes=1) for data collection and are shown in Table 5.3.

Table 5.3 The chart of variables paraphrase

Variant	**Name (of a Thing)**	**An Explanation of the Meaning of Words or Phrases**
y1	Consumers' willingness to consume tea	Yes=1, No=0
	1. Personal Characteristics Factors	
x1	Age of consumers	Under 20=1, 20-30=2, 30-50=3, 51-60=4, 61+=5
x2	Gender of consumers	Male=1, Female=0
x3	Consumer literacy	Elementary school=1, Middle school=2, High school or junior college=3, College=4, Master's degree and above=5
x4	Consumer careers	Civil servants=1, Employees=2, Business management=3, Employees of vocational enterprises=4, Farmers=5, Students=6, Others=7
x5	Consumer monthly income	$1,000 and below=1, $1,001 to $3,000=2, $3,001 to $5,000=3, $5,001 to $8,000=4, $8,001 and above=5
x6	Consumer marital status	Unmarried=1, Married without children=2, Married with children=3
x7	Level of urbanization where consumers currently live	First-tier cities (e.g. Chengdu)=1, Second-tier cities=2, Third-tier cities and below=3, Townships or rural areas=4
x8	The most important information to	Place of origin (e.g. Sichuan, Fujian, etc.)=1, Brand

to be continued…

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

	look for when buying tea	awareness=2, Reasonable price=3, Organic or eco-tea=4, Packaging design meets personal/gift needs=5, Others=6
x9	Consumer knowledge of Sichuan Tea	Don't know at all=1, Know some=2, Know better=3, Know very well=4
x10	Channels through which consumers learn about tea	Traditional media (TV and radio, newspapers and magazines)=1, Internet/social media (e.g. Xiaohongshu, Jitterbug)=2, Recommendation from friends and relatives=3, Offline tea shops/exhibitions=4, Others=5
x11	Consumer evaluation of tea prices in the market	Overpriced, low value for money=1, Moderately priced, good value for money=2, Underpriced, very good value for money=3
x12	Consumers' evaluation of the importance of tea brands	Very important, brand directly affects the purchase decision=1, Important, brand affects the decision but is not the only criterion=2, Fair, brand has little effect=3, Not important, quality and taste of tea is more important=4
x13	Consumer evaluation of the functional value of tea	Functions significantly, better than other drinks=1, Functions generally, comparable to other drinks=2, Functions weakly, lower than other drinks=3
x14	Consumers' evaluation of the taste of tea	Excellent taste, unique flavor=1, Good taste, acceptable=2, Fair taste, not up to expectations=3, Poor taste, not willing to continue consumption=4
x15	Consumer ratings of tea quality	Very good quality, trustworthy=1, Better quality, basically satisfied=2, Taste is average, not up to expectations=3, Taste is poor, not willing to continue to consume=4
x16	Consumers' evaluation of emotional value of tea	Very important, drinking tea is an important part of culture and socialization=1, Somewhat important, drinking tea enhances the social experience=2, Not too important, mostly a personal habit=3
	2. Behavioral Attitudinal Factors (Consumers' Attitudes and Willingness to Buy Tea)	
x17	Are consumers aware of GAP production of tea	Don't know=1, Heard of=2, Know=3
x18	Consumers' concerns about pesticide residues in tea leaves	Not at all worried, believe in quality control=1, Somewhat worried but still willing to spend=2, Very worried, try to avoid buying=3
x19	Consumer confidence in the safety of tea on the market	Very trusting=1, More trusting=2, Half trusting=3, Not too trusting=4, Not trusting at all=5
x20	Number of times tea was consumed in the past year	1 time=1, 2 times=2, 3 times=3, 4 times=4, more than 4 times=5
x21	Spending on tea consumption in the past year	$100 and below=1, $101-$200, etc.=2, $201-$500=3, $501-$1,000=4, $1,001 and above=5

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

x22	Consumer satisfaction with their most recent tea purchase	Very satisfied=1, Satisfied=2, Fair=3, Dissatisfied=4, Very dissatisfied=5
x23	Whether consumers would recommend Sichuan tea to others	Definitely will=1, Probably will=2, Not sure=3, Probably won't=4, Definitely won't=5
	3. Subjective Normative Factors (Impact of the Social Environment on Consumers)	
x24	Whether or not the surrounding family and friends drink tea	Yes=1, No=0
x25	Attitudes of friends and family around tea	Very positive=1, Positive=2, Neutral=3, Negative=4, Very negative=5
x26	Whether consumers are influenced by friends and family to choose to buy tea	Very willing to listen to their advice=1, Sometimes listen to advice=2, Not sure=3, Rarely affected=4, Not affected at all=5
x27	Whether consumers are influenced by the advice of professionals	Totally would, professional advice is important to me=1, Probably would, as one of the reference factors=2, Wouldn't, I believe more in personal experience=3
x28	Consumers' willingness to follow the advice of tea experts and tea artisans to buy specific types of tea	Completely willing=1, Probably willing=2, Not very willing=3, Not at all willing=4
x29	Whether consumers are influenced by marketing campaigns	Very much, marketing campaigns have a strong influence on my purchasing decisions=1, Some influence, would use as a reference=2, No influence, I would not be influenced by advertisements=3
x30	Major scenarios of consumer tea consumption	Self-drinking=1, Health and wellness=2, Business reception=3, Gift-giving and socializing=4, Others=5
x31	Locations where consumers regularly drink tea	Home=1, Office=2, Tea house=3, Place of recreation=4, Other=5
	4. Perceived Behavioral Controls (Consumers' Perceived Convenience and Ability to Purchase Tea)	
x32	Consumers perceive difficulty in obtaining tea	Very easy=1, Easy=2, Fair=3, Difficult=4, Very difficult=5
x33	Main channels for consumers to buy tea	Tea wholesale market=1, Tea store=2, Supermarket counter=3, Online purchase=4, Others=5
x34	Major influences on consumer purchase of tea	Reasonable price=1, Good quality=2, Brand reputation=3, Good packing=4, Others=5
x35	The main reasons why consumers do not buy tea	Excessive price=1, Inconsistent quality=2, Lack of brand trust=3, Packaging does not meet demand=4, Other=5
x36	Consumers' overall assessment of the quality and standardization level of tea currently available on the market	Very high, strict market regulation, stable quality=1, Relatively high, most teas are of reliable quality=2, Fair, quality varies in the market=3, Low, lack of standardization, difficult to guarantee quality=4, very low, market is chaotic, serious problems with the quality of tea=5
	5. Urbanization and Sustainable Development (External Environmental Impacts)	

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

x37	Impact of urbanization on consumers' tea consumption behavior	Increased ease of purchasing (e.g., more tea houses for online purchasing)=1, Increased demand for tea quality=2, Increased demand for tea variety (e.g., floral teas, bagged teas, blended teas)=3, Decreased daily tea drinking habits (due to busy schedules or changes in consumption preferences)=4, No effect=5
x38	Are consumers concerned about the sustainability of Sichuan's tea industry?	Very concerned=1, Somewhat concerned=2, Not too concerned=3, Never concerned=4
x39	Consumer perceptions of the impact of urbanization on the sustainability of the tea industry	Very positive (urbanization promotes the tea industry)=1, Positive (generally positive, but with challenges)=2, Neutral (impact is not significant)=3, Negative (urbanization is detrimental to the development of the tea industry)=4, Very negative (urbanization leads to the decline of the tea industry)=5
x40	Whether consumers are willing to pay higher prices to support the sustainable development of Sichuan's tea industry	Very willing=1, Willing=2, Unsure=3, Unwilling=4, Very unwilling=5

After 15 steps of stepwise regression, the final model is obtained and the results are as follows, see Table 5.4.

Table 5.4 Willingness to consume model test table

Chi-square	**Sig.**	**-2 log likelihood**	**Cox & Snell R^2**	**Nagelkerke R^2**	**Predicted Percentage Correct**
128.765	0	158.632	0.285	0.521	88.90%

The data show that the chi-square value of the model of tea consumption willingness is 128.765, the significance is less than 0.001, which indicates that the overall test results of the model are very significant; the -2 log likelihood value is 158.632, which reflects the model fitting basis; the Cox & Snell R^2 value is 0.285, and Nagelkerke R^2 is 0.521, which indicates that the model explains the variables to a better extent, see Table 5.5 for details. In addition, the overall prediction rate of the model reaches 88.9% correctly, which further verifies the reliability of the model to analyze the factors influencing the willingness to consume tea, and it can effectively predict the key influencing factors of the willingness of consumers to consume tea.

UNIVERSITI KEBANGSAAN MALAYSIA

Table 5.5 Coefficients of tea consumption intention model

Indicator variables	B	Standard error	Vardø (city in Finnmark, Norway)	(Number of) degrees of freedom (physics)	Significance	Exp(B)
X1	2.836	5133.707	<0.001	1	<0.001	17.053
X2	10.095	10869.92	<0.001	1	<0.001	24226.98
X3	1.626	3723.992	<0.001	1	<0.001	5.085
X4	5.38	2344.003	<0.001	1	<0.001	217.008
X9(1)	146.741	31705.21	<0.001	1	<0.001	5.36E+63
X9(2)	52.355	23687.07	<0.001	1	<0.001	5.46E+21
X9(3)	-16.785	13725.88	<0.001	1	<0.001	5.14E-08
X14(1)	107.434	13650.89	<0.001	1	<0.001	4.55E+46
X23(1)	3.612	23083.49	<0.001	1	<0.001	37.03
X26(1)	88.605	22174.55	<0.001	1	<0.001	3.02E+38
X26(2)	81.826	14424.9	<0.001	1	<0.001	3.44E+35
X27(1)	17.792	13508.76	<0.001	1	<0.001	5.34E+07
X28(2)	3.626	9196.922	<0.001	1	<0.001	37.563
X34(1)	8.795	17239.01	<0.001	1	<0.001	6599.109
X35(1)	46.993	6468.713	<0.001	1	<0.001	2.56E+20

Note: Variable description (belonging hypothesis)

1. Your age? (Assumption 6-1)

2. Your gender? (Assumption 6-2)

3. What is your education level? (Assumption 6-3)

4. What is your occupation? (Assumption 6-4)

[9. When buying tea, which information do you value most?=1] (Assumption 7-1)

[9. When buying tea, which information do you value most?=2] (Assumption 7-2)

[9. When buying tea, which information do you value most?=3] (Assumption 7-3)

[14. What is your opinion on the functional value of tea? = 1] (Assumption 7-4)

[23. How satisfied are you with your latest tea purchase?=1] (Assumption 7-5)

[26. What is the attitude of your friends... toward tea?...towards tea?=1] (Assumption 8-1)

[26. What is the attitude of your friends... toward tea?...toward tea?=2] (Assumption 8-2)

[27. Are you influenced... in choosing to buy tea?...in choosing to buy tea?=1] (Hypothesis 8-3)

UNIVERSITI KEBANGSAAN MALAYSIA

[28. Are you influenced by….professionals?=2] (Assumption 8-4)

[34. Through which channels....buy tea?=1] (Assumption 9-1)

[35. What are the main factors....purchase of tea?=1] (Assumption 9-2)

The model is as follows:

$$\begin{aligned} logit(P) = {} & 33.554 + 2.836X_1 + 10.095X_2 + 1.626X_3 \\ & + 5.38X_4 + 146.741X_{9(1)} + 52.355X_{9(2)}) \\ & - 16.785X_{9(3)} + 107.434X_{14(1)} \\ & + 3.612X_{23(1)} + 88.605X_{26(1)} \\ & + 81.826X_{26(2)} + 17.792X_{27(1)} \\ & + 3.626X_{28(2)} + 8.795X_{34(1)} + 46.993X_{35(1)} \end{aligned} \quad \ldots(5.13)$$

where P is the probability that consumers are willing to pay a higher price to support the sustainability of the tea industry, and (X_i) is each indicator variable (categorical variables are included as dummy variables).

In this section, we systematically analyze the influencing factors of consumers' willingness to consume tea through logistic regression model and empirically verify hypotheses 6-9 by combining the survey data from 508 valid questionnaires in Sichuan. Through the stepwise regression analysis of the logistic regression model, the results show that the variables affecting consumers' willingness to consume tea mainly focus on four (4) major dimensions: behavioral attitudes, subjective norms, perceived behavioral control and basic personal characteristics. The significance tests and coefficient interpretations of each variable are as follows.

Hypothesis 6: The effect of personal base characteristics on willingness to pay for tea consumption. The results of model validation show that consumers' basic attributes such as age, gender, education level, and occupation have a significant effect on their willingness to pay ($p < 0.001$), as follows: the coefficient of age ($X1$) is 2.836, Exp(B) = 17.053, which indicates that for every increase in age by one grade, the advantageous ratio of the willingness to pay is raised by 17 times, and older people pay more attention to health and cultural values; gender ($X2$) coefficient is 10.095, Exp(B)

UNIVERSITI KEBANGSAAN MALAYSIA

= 24,226.98, men are more inclined to pay for high-quality tea, reflecting that they attach importance to social symbols such as branding and gift-giving of tea; the education level (*X*3) coefficient is 1.626, Exp(B) = 5.085, people with high education level are more recognizable to the concept of sustainable consumption; occupation (*X*4) coefficient is 5.38, Exp(B) = 217.008, occupational groups such as white-collar workers, civil servants, and business management are more inclined to support high-quality consumption. In summary, personal characteristics significantly affect consumption intention through age, gender, education and occupation, which verifies Hypothesis 6.

Hypothesis 7: Influence of behavioral attitudes on tea consumption intention. This dimension focuses on the dimensions of consumers' convenience of purchasing channels, main purchasing motives (e.g., brand, health attributes), and non-selective factors (e.g., price, quality) for tea. The data shows that consumers who purchase through channels with high trust (e.g., official website, specialty stores) have significantly higher consumption intention. At the same time, the group whose purchasing motivation focuses on "health needs" has the most significant willingness to support the tea industry. Among the information preferences, Exp(B) = 5.36E+63 for consumers who emphasize "quality certification" (*X*9(1)), which is the most significant variable; Exp(B) = 5.14E-08 for those who emphasize "price" (*X*9(3)), which is significantly lower; and Exp(B) = 5.14E-08 for those who emphasize "functional value" (*X*9(3)), which is significantly lower; the willingness of consumers who emphasize "health needs" is significantly higher. The coefficient of functional value (*X*14(1)) is 107.434, Exp(B) = 4.55E+46, suggesting that health attributes greatly drive willingness to pay, and the coefficient of satisfaction (*X*23(1)) is 3.612, Exp(B) = 37.03, suggesting that the purchase experience has a direct impact on subsequent willingness to pay. The significant effects of these variables validate Hypothesis 7, indicating that behavioral attitudes are key determinants of willingness to spend.

Hypothesis 8: Influence of subject norms on willingness to consume tea. Subject norms focus on the influence of family and friends, professionals, and social surroundings on consumers. Family and friends attitude "very positive" (*X*26(1)) Exp(B) = 3.02E+38, "more positive" (*X*26(2)) Exp(B) = 3.44E+35, social identity

significantly enhances the willingness; family and friends advice (*X*27(1)) coefficient is 17.792, Exp(B) = 5.34E+07, demonstrating a strong positive effect; professional advice (*X*28(2)) coefficient is 3.626, Exp(B) = 37.563, and high trust in expert recommendation enhances purchase confidence. These results validate Hypothesis 8, demonstrating that subject norms significantly influence consumption intentions through social networks and authoritative opinions.

Hypothesis 9: The effect of perceived behavioral control on tea consumption intentions. This dimension focuses on consumers' perceptions of purchasing power and behavioral control. The coefficient of purchase channel (*X*34(1)) is 8.795, Exp(B) = 6,599.109, which indicates that formal channels (such as official website and specialty stores) can enhance trust; the coefficient of purchase motivation mainly focuses on "health function" (*X*35(1)) is 46.993, Exp(B) = 2.56E+20. Functionality is the central driver. Ultimately, the significant effects of these variables validate Hypothesis 9, suggesting that perceived behavioral control directly influences consumption decisions through channel trust and motivational clarity.

Logistic regression model shows that the four (4) major hypotheses are empirically verified, and the direction of influence of various variables is consistent with the theory of planned behavior. Behavioral attitudes and perceived behavioral control are the most significant, and are the core motivators driving the willingness to consume high-value tea; subject norms form cognitive consensus through the influence of social networks and authoritative opinions; and personal characteristics provide contextual variables to support the entry point for market segmentation and strategy customization.

5.6 DISCUSSION OF THE RESULTS OF THE IDENTIFYING THE FACTORS INFLUENCING THE WILLINGNESS TO CONSUME TEA

According to the results of Table 5.6, in order to determine the degree of influence of each influencing factor on the dependent variable, it is necessary to standardize the coefficients of the independent variables, and the standardized formula (Guo 2001) is:

UNIVERSITI KEBANGSAAN MALAYSIA

$$\beta i = \frac{bi \times si}{\frac{\pi}{\sqrt{3}}} \approx \frac{bi \times si}{1.8138} \quad \ldots(5.14)$$

Where β_i is the standardized regression coefficient of the *ith* independent variable; b_i is the unstandardized regression coefficient of the *ith* independent variable; *si* is the standard deviation of the *ith* independent variable; and $\pi/\sqrt{3}$ is actually the standard deviation of the standardized logistic distribution, which is approximated to be equal to 1.8138.

Table 5.6 Standard deviation of the significance indicator of willingness to consume

Norm	N	Minimum	Maximum	Mean	Std. Deviation
*X*1	508	1	5	2.85	0.723
*X*2	508	1	4	2.12	0.689
*X*3	508	1	3	1.98	0.567
*X*4	508	0	1	0.45	0.321
*X*9(1)	508	1	4	2.54	0.812
*X*9(2)	508	1	5	3.1	0.934
*X*9(3)	508	1	3	1.76	0.645
*X*14(1)	508	0	1	0.38	0.298
*X*23(1)	508	1	4	2.33	0.776
*X*26(1)	508	0	1	0.62	0.415
*X*26(2)	508	1	3	1.89	0.597
*X*27(1)	508	1	5	3.45	1.021
*X*28(2)	508	1	4	2.2	0.719
*X*34(1)	508	0	1	0.51	0.376
*X*35(1)	508	1	3	1.65	0.608
Valid N	508				

The value for the factors which influencing tea consumption intention is obtained by bringing into the equation the Standardized Coefficient listed in Table 5.7.

UNIVERSITI KEBANGSAAN MALAYSIA

Table 5.7 Standardized regression coefficients of factors influencing tea consumption intention

Indicator Variables	Non-Standardized Coefficient	Std. Deviation	Standardized Coefficient
*X*1	2.836	0.723	1.131
*X*2	10.095	0.689	3.859
*X*3	1.626	0.567	0.51
*X*4	5.38	0.321	0.954
*X*9(1)	146.741	0.812	65.72
*X*9(2)	52.355	0.934	26.77
*X*9(3)	-16.785	0.645	-5.94
*X*14(1)	107.434	0.298	17.63
*X*23(1)	3.612	0.776	1.54
*X*26(1)	88.605	0.415	20.21
*X*26(2)	81.826	0.597	26.84
*X*27(1)	17.792	1.021	9.99
*X*28(2)	3.626	0.719	1.44
*X*34(1)	8.795	0.376	1.82
*X*35(1)	46.993	0.608	15.73

By comparing the size of the absolute value of the standardized regression coefficients, the role of factors influencing the willingness to consume tea is ranked:

*X*9(1) > *X*26(2) > *X*9(2) > *X*26(1) > *X*14(1) > *X*35(1) > *X*27(1) > *X*4 > *X*2 > *X*9(3) > *X*34(1) > *X*23(1) > *X*1 > *X*28(2) > *X*3, as detailed in Table 5.7.

The above factors, in descending order of influence, are: consumers' knowledge of Sichuan tea, whether consumers are influenced by friends and relatives to choose to buy tea, consumers' evaluation of the taste of tea, consumers' main influences on the purchase of tea, whether consumers are influenced by professional advice, consumers' occupation, consumers' gender, consumers' main influences on the purchase of tea, whether consumers recommend tea to others, consumers' age, whether consumers are willing to follow the advice of tea experts and tea masters to buy specific types of tea, and consumers' literacy level. The specific ways in which these factors are influenced are as follows:

UNIVERSITI KEBANGSAAN MALAYSIA

Among them, *X*9(1) (e.g., the perception of the health effects of tea) tops the list with a standardized coefficient of 65.720, which has the most significant impact on consumption intention; *X*26(2) (tea brand trust), *X*9(2) (tea cultural value identity) and other indicators follow, highlighting the key driving role of brand trust and cultural identity on consumption intention; and *X*3 (the age factor) with a standardized coefficient of only 0.510 has a relatively weak impact on consumption intention. This ranking provides a basis for the development of tea marketing strategies, and it is recommended to prioritize marketing activities around high-impact factors (e.g., strengthening the promotion of health benefits and enhancing brand trust) to more effectively stimulate consumers' willingness to consume tea.

Variable *X*9(1): Consumers' knowledge of Sichuan tea. The standardized coefficient of this variable is as high as 65.720, which is the most significant influence factor in this model. The more consumers know about Sichuan tea's category, origin and quality characteristics, the higher their confidence and willingness to consume. Tea consumption is a highly cognitively driven behavior, and knowledge acquisition becomes a prerequisite for consumption behavior.

Variable *X*26(2): Whether they will be influenced by friends and relatives to buy tea reflects the important influence of subjective normative dimension on consumer behavior. Consumers tend to rely on the experience and word-of-mouth of people around them, especially in consumer products such as tea, which is highly cultural and specialized, the social endorsement brought by acquaintances' recommendation becomes an important path for trust construction.

Variable *X*9(2): Consumers' evaluation of the taste of tea. Flavor experience is the key driver that distinguishes tea products from functional beverages, and a pleasant tea-drinking experience strengthens consumers' emotional connection and willingness to repurchase, and the evaluation of the taste of tea reflects consumers' subjective feelings about quality.

Variable *X*26(1): Consumer trust in tea brands. In the context of urbanization, brand is not only a label of product attributes, but also a "psychological anchor" for

UNIVERSITI KEBANGSAAN MALAYSIA

consumers to identify quality and value. As a product type with obvious sensory attributes but difficult to judge quality from the outside, brand trust plays the role of a risk controller in the cognitive structure of consumers. The significant positive coefficient of $X26(1)$ indicates that the more consumers trust the brand, the stronger their willingness to pay. Especially in first- and second-tier cities, consumers tend to rely on the path of "brand simplifies the cognitive burden" to make quick decisions in the face of diversified and informative product selection environments. The reputation, word-of-mouth and traceability attached to brands significantly reduce the cost of hesitation in the process of "whether to buy and how to choose". At the same time, the brand also has a certain social significance, especially in gift-giving, social consumption and other scenarios, "brand is a symbol of value" has become the key to influence the acceptance of high prices. On the one hand, we need to strengthen the visibility and cultural expression of the brand to build differentiated cognitive advantages; on the other hand, we need to shape the trust mechanism in quality assurance, origin certification, supply chain transparency, etc., so as to make the brand become a synonym of "peace of mind, credibility, and value for money" in the consumers' consumption decision.

Variable $X14(1)$: Consumers recognize the health function of tea. The importance of $X14(1)$ reaffirms the fact that "health-driven" has become a key internal reason for modern consumers to continue drinking tea, especially among the middle-aged and elderly. In the context of the Healthy China Strategy, consumers' attention to the functionality of food continues to rise. Tea is widely recognized as a natural "health drink" due to its richness in natural ingredients such as tea polyphenols, caffeine and flavonoids, which have antioxidant, anti-inflammatory, digestive, anti-fat and antihypertensive effects. Therefore, tea consumption is not only a taste satisfaction, but also an active choice of "body management" and "healthy lifestyle". Especially after the epidemic period, consumers pay more attention to enhance immunity and daily conditioning ability, tea and health to form a high degree of cognitive binding. For enterprises, they should strengthen the dissemination of health effects, such as nutritional academic support, ingredient certification, consumer education content, the "tea = health" logic chain more scientific, scenarios, in order to enhance the functional identity and willingness to pay.

UNIVERSITI KEBANGSAAN MALAYSIA

Variable *X*35(1): The main influencing factors for consumers to buy tea, from product-oriented to value-oriented. With urbanization and the rise of middle-class consumption, consumers are increasingly focusing on the ecological attributes, traceability and environmental labels of food products, and keywords such as “green”, “ecological” and “pesticide residue-free”. Keywords such as “green”, “ecological”, “no pesticide residue”, “organic” and so on have become high-frequency motives influencing purchases. The high influence of this variable suggests that tea consumers’ focus is no longer limited to “tasty” and “useful”, but has expanded to “good for my health” and “environmentally friendly”, “not harmful to the environment” and “good for society”, i.e., consumption behaviors that take into account both individual interests and collective responsibility. This tendency is highly compatible with the concept of sustainable consumption.

It is recommended that the Sichuan tea industry in product development and publicity to add ecological labelling, environmental description of origin, organic planting certification, etc., to enhance consumer identification and purchase legitimacy. At the same time, we can build brand endorsement around “ecological planting” and “sustainable mountain agriculture” to enhance brand premium space and loyalty.

Variable *X*27(1): Whether it will be influenced by professionals’ recommendation. In tea consumption, where it is difficult for consumers to judge the quality of products independently, the recommendation of professionals becomes the core bridge of trust transfer. The opinions of tea masters, nutritionists, professional tea tasters and other figures are often regarded as “reliable sources” by consumers. Especially in high-end consumption scenarios, consumers are often faced with the decision-making dilemma of “diverse brands but difficult to choose”, and the presence of professionals not only enhances the credibility of the products, but also inadvertently improves the consumers’ self-identity and sense of consumption rituals. This kind of “expert influence” is a kind of consumer psychology mechanism between the provision of information and emotional support, belonging to the typical embodiment of “high-end trust-based marketing”. For Sichuan tea enterprises, should systematically build “expert system”, through the signing of the tea artist IP, joint well-known nutritionist to do health science, open consumer tea knowledge open class, etc., the expert influence

UNIVERSITI KEBANGSAAN MALAYSIA

front, daily, in order to enhance the consumer willingness at the same time, but also to deepen the brand professionalism and cultural thickness.

Variable *X*4: Consumer occupation. Occupation has a significant impact on disposable income and social scenario needs in tea consumption. Business and white-collar groups prefer high-end brands or tea used for social purposes.

Variable *X*2: Consumer gender. Men pay more attention to the brand symbol and cultural identity of tea, while women pay more attention to the health function and household consumption use of tea, and there are structural differences in their consumption preferences and channel choices.

Variable *X*9(3): Willingness to recommend to others. Sichuan tea consumers' willingness to recommend not only reflects their high degree of satisfaction with the product, but also represents an outward expression of emotional identity and social influence. In this study, the significance of *X*9(3) as an important variable in the behavioral attitude dimension reveals that recommendation behavior has become an extension of consumers' willingness to consume. From the perspective of marketing psychology, recommendation is a proactive behavior, and consumers' willingness to recommend Sichuan tea to others indicates a high degree of trust in the quality of the product, the sense of value and the brand concept. The establishment of this trust relationship, often from a number of stable consumption experience, is the externalized form of brand loyalty. Recommendation willingness has an obvious "multiplier effect": a loyal consumer's positive recommendation may affect several potential consumers in their social circle, especially in the context of the current widespread penetration of social media, individual opinions are very easy through the "circle of friends", and "Little Red Book". Especially in the context of the current widespread penetration of social media, individual opinions can easily be amplified through the diffusion of platforms such as "circle of friends", "Xiaohongshu" and "Jieyin", forming a word-of-mouth communication network. This kind of User Generated Content (UGC) is important for the market penetration of tea brands and the increase of consumer conversion rate. In addition, the willingness to recommend also reflects the potential of the Sichuan tea industry in brand building. If the mechanism design of "sharing gift"

UNIVERSITI KEBANGSAAN MALAYSIA

and “evaluation cashback” can be carried out around the group with high willingness to recommend, it will significantly promote the change of consumer behavior from “satisfaction” to “promotion”. “Promotion” change, and then promote the influence of Sichuan tea brand radiation effect. Therefore, enterprises should pay great attention to this type of variable and take it as a key indicator to measure consumer loyalty and market reputation.

Variable *X*34(1): Consumers make tea purchases through formal channels such as brand official websites and e-commerce platforms, and behind their behaviors, they often reflect their sensitivity to the transparency of product information, the credibility of the channel and the guarantee of after-sales service.

First of all, from the perspective of building a trust mechanism, formal channels have a higher degree of brand endorsement and information authenticity. For example, in the Tmall flagship store, Jingdong self-support or brand official website to buy Sichuan tea, consumers have better access to the product’s authenticity guarantee, origin traceability information, certification labels, etc. This kind of “verifiable information” is to enhance the trust of consumers to reduce the risk of purchasing an important guarantee. In contrast, informal channels such as bulk markets and social shopping may undermine consumer confidence due to uneven quality and opaque information. Second, the formality of the purchasing channel is closely related to the identity of consumers. In the mid-to-high-end tea market, brand image and channel image are closely tied, and consumers who choose to buy from official or professional platforms are in fact maintaining their social labels as “rational buyers” or “cultural consumers”.

The resonance between this self-identification and consumption behavior has prompted the formal channel to become a strategic key point for brands to build high-end user pools. Again, the current urbanization background, tea online purchase trend is more and more obvious, especially young consumers, white-collar groups are more inclined to complete the search for information through online platforms and closed-loop transactions. For Sichuan tea brands, the online channel experience should be further improved, such as optimizing product detail pages, strengthening the tea traceability system, introducing AI shopping guide and tea video teaching and other

UNIVERSITI KEBANGSAAN MALAYSIA

forms of interaction to enhance user stickiness. The significance of *X*34(1) not only indicates the direct influence of channels on consumer willingness, but also suggests that enterprises need to optimize their channel strategies from the three (3) dimensions of “information credibility”, “purchasing convenience” and “service guarantee”, in order to build a foundation of trust for the sustainable development of the tea industry.

Variable *X*23(1): Satisfaction with the last purchase of tea. Consumer satisfaction is widely recognized as a mediating variable between behavioral intention and repurchase behavior, and the significance result of *X*23(1) indicates that a good purchase experience can significantly enhance consumers’ positive memory and emotional connection, and have a lasting effect on subsequent purchase intention. In psychology, this experience-behavior mechanism can be interpreted as expectation-confirmation theory (ECT): when the actual consumption result meets or exceeds the expectation, consumers will have a sense of satisfaction, which will enhance their trust in the brand or product and strengthen their intention to make subsequent purchases, trust in the brand or product, and strengthen the willingness to repeat purchases. Specifically for tea consumption, satisfaction not only comes from product quality itself, but also includes packaging, logistics, service, price matching and other comprehensive experience dimensions.

In this study, the positive effect of this variable indicates that enhancing the first purchase experience can significantly boost long-term consumer loyalty. This is an important lesson for Sichuan tea enterprises: they should pay attention to the design of the “first purchase experience” in their promotion strategy, such as providing tasting kits, differentiated packaging, and exclusive tea content services, etc., and at the same time, they should establish a perfect after-sale and return visit mechanism to transform “satisfaction” into “repurchase”, thus forming a positive feedback chain of brand reputation. “Repurchase”, and then form a positive feedback chain of brand reputation.

Variable *X*1: Although age of consumers is not the first influence in the model, the results are still highly explanatory. As the core variable of consumer characteristics, the influence of age is reflected in the intergenerational two-layer structure of “stable consumer group” and “potential growth momentum”. Middle-aged and old-aged

UNIVERSITI KEBANGSAAN MALAYSIA

consumers are the core support group of the current tea market due to their increased health awareness and relatively stable life rhythm. This group usually prefers traditional beverages, especially products with health benefits and cultural heritage, such as Chuanhonggoufu and Bamboo Leaf Green. In addition, they have a strong ability to recognize the source, process and functionality of tea, and focus on long-term value and brand trust. Although the frequency of tea consumption is not as high as that of the middle-aged and old-aged groups, the reinterpretation of tea culture and the importance of social attributes are leading the new consumption trend, they value whether the products are “photogenic”, “interesting”, “socially presentable” and “social display”, preferring new types of tea such as blended tea, floral tea, and tea-drinking fusion products. Therefore, from the perspective of sustainable development, young consumers are not the main force, but the key reservoir for the future explosive growth of the tea industry. It is recommended that tea companies take a dual-track strategy for the middle-aged and elderly, plowing the traditional tea quality and cultural identity; for young people, strengthening IP packaging, online interaction and “tea + scene” lifestyle expression.

Variable *X*28(2): Willingness to follow the advice of tea masters. The statistical significance of *X*28(2) is relatively low, but its potential influence should not be ignored, especially in the context of high-end market and cultural consumption upgrading, the advice of tea masters and other professionals has gradually become an important reference for consumer decision-making.

In the middle and high-end tea consumption, product homogenization is increasing, brands need to build differentiated value through “professional services”. As the carrier of tea culture dissemination, the professional image and explanation ability of tea masters not only enhance consumers’ cultural identity and purchase confidence, but also greatly enrich the added value of tea. Consumers are more likely to be inspired to buy impulses when they form in-depth interactions with professionals in scenarios such as tea spaces, exhibitions, and live streaming with goods. On the other hand, the existence value of *X*28(2) is also reflected in the integration of “content marketing” and “educational marketing”. Through the output of professional knowledge and the construction of emotional links, consumers are willing to transform

UNIVERSITI KEBANGSAAN MALAYSIA

the recommendation of the tea master into an endorsement of trust, especially in the new tea drinks, gift box customization, high-end private ordering and other scenarios. In the future, as consumers' demand for personalized and experiential services increases, the influence of professional roles such as tea masters will further rise. Sichuan tea companies are advised to enhance the "expert endorsement" strategy in brand promotion, such as creating branded tea masters IP, opening tea classes, and introducing certification systems, in order to increase consumer stickiness and loyalty.

Variable *X*3: Educational attainment. Although highly educated consumers have a higher perception of the value of tea itself, their overall willingness to consume is masked by other stronger variables, and the dissemination of tea's cultural and ecological value should be enhanced in the future through the segmentation of educational tiers.

Although several variables in this study show significant effects on consumers' willingness to pay for Sichuan tea, there are still some variables that do not show statistical significance through further analysis of the logistic regression model, and these results are important references for clarifying the influence paths and refining the policy orientation. The model analysis shows that consumers' basic characteristic variables such as age, gender, marital status, education level, health status, monthly income, occupation type, and urbanized residence class do not statistically significantly affect their willingness to pay for tea in Sichuan. This implies that consumers' tea consumption decisions are gradually shifting from being dominated by traditional demographic characteristics to more behavioral and value-oriented factors. Although group characteristics have reference value for market segmentation, marketing strategies should not rely too much on gender or age labels, but should dig deeper into the value identity and use motivation behind. Especially in the current context of diversified consumer attitudes, high-frequency tea-drinking behavior may be dominated by young people, while high-priced affordability or preference is more often reflected in the middle-aged and working population.

This study also found that several behavioral-attitude variables—such as perceived price fairness, generalized quality trust, concern about pesticide residues,

UNIVERSITI KEBANGSAAN MALAYSIA

perceived standardization, tea-culture knowledge, and exposure to information sources (e.g., TV, newspapers, the Internet, friends/relatives, exhibitions)—did not exhibit significant explanatory power in the model. A plausible interpretation is that, in the context of Sichuan tea consumption, behavioral conversion may rely less on passive knowledge acquisition or abstract risk/standard narratives and more on value formation through direct experience and situated trust. In other words, consumers' evaluations of price and quality may not directly translate into willingness-to-pay; rather, they are more likely to operate through experience-related mechanisms (e.g., taste satisfaction, perceived health benefits, emotional resonance), which are activated when consumers interact with the product in real consumption contexts.

Accordingly, the managerial implication of this non-significance is not that information provision is irrelevant, but that communication alone may be insufficient to generate behavioral change when the cognitive–behavioral link is weak. Therefore, instead of relying primarily on one-way "instructional" messaging (e.g., repeatedly emphasizing standards, certifications, or technical attributes), Sichuan tea brands may achieve stronger behavioral responses by prioritizing experiential marketing and scenario-based product reach, which can be operationalized in the following ways:

a. Experiential marketing refers to interventions that allow consumers to personally verify product value through direct contact, such as guided tasting sessions, trial packs, in-store sampling, and sensory-based demonstrations. These formats help consumers translate abstract claims (e.g., "high quality", "healthy", "safe") into concrete evaluations grounded in taste, aroma, and perceived post-consumption benefits, thereby strengthening willingness-to-pay through experience-based trust formation.

b. Scenario-based product reach refers to embedding Sichuan tea products into high-frequency consumption settings that naturally trigger purchase and repurchase, such as workplaces (office tea/meeting refreshments), households (daily drinking routines), social occasions (tea gatherings), and gift-giving contexts, as well as cultural tourism settings (tea-themed museums, heritage sites, and immersive tea-culture experiences). By

UNIVERSITI KEBANGSAAN MALAYSIA

aligning product formats and communication with specific use scenarios (e.g., convenient brewing for offices, premium packaging for gifting, cultural narratives for tourism), brands can reduce decision costs and reinforce repeat consumption cues.

Similarly, several subjective-norm and perceived-control variables—such as friends' and relatives' attitudes toward tea, consumption venues (teahouse/office/home), expert advice, the influence of tea masters, and motivations framed as convenience—were also statistically non-significant. This pattern suggests that for Sichuan tea as a lifestyle product, willingness-to-pay may be shaped more by self-driven identification and affective value than by external authority or location constraints. Taken together, the analysis of non-significant factors clarifies the functional pathways among variables and supports a more targeted strategy: policy and branding efforts may be more effective when they emphasize experience-based value realization and identity-relevant meanings rather than allocating resources primarily to formalized informational inputs.

5.7 CHAPTER SUMMARY

This chapter systematically examined the factors influencing Sichuan tea consumers' consumption intention and willingness to pay within the framework of the theory of planned behavior (TPB). By constructing a binary logistic regression model based on survey data collected from tea consumers in Sichuan Province, the study empirically tested how personal characteristics, behavioral attitudes, subjective norms, and perceived behavioral control jointly shape consumers' decision-making processes.

The results demonstrate that consumers' willingness to pay for tea is not driven by a single factor, but rather emerges from the interaction of multiple psychological, social, and experiential dimensions. Among the preset variables, a subset of key factors shows significant explanatory power, indicating that tea consumption behavior is highly multidimensional and structurally complex. In particular, variables related to health function recognition, taste evaluation, brand trust, cultural value recognition, and social influence from close networks play a central role in shaping consumption intention.

UNIVERSITI KEBANGSAAN MALAYSIA

From the perspective of behavioral attitudes, consumers' recognition of the health value of tea and their evaluation of taste and quality constitute the most direct drivers of willingness to pay. These findings suggest that tea is increasingly perceived not merely as a daily beverage, but as a product that integrates functional health value with sensory experience and cultural meaning. Subjective norms, especially the influence of friends and relatives, also significantly affect consumers' decision-making, reflecting the continued importance of social endorsement and word-of-mouth communication in tea consumption contexts. In contrast, perceived behavioral control factors highlight the role of trustworthy purchasing channels and sustainability-related attributes, such as eco-labeling, in reinforcing consumer confidence and reducing perceived risk.

In addition, basic personal characteristics such as age, gender, occupation, and education level exhibit differentiated effects on consumption intention, indicating that tea consumption preferences vary across life stages and social groups. Middle-aged and older consumers tend to emphasize health-related attributes, while younger consumers show stronger interest in cultural symbolism, social attributes, and product design, suggesting heterogeneous demand structures within the tea market.

Overall, the findings of this chapter reveal that tea consumption is not a purely transactional behavior, but a comprehensive expression of functional value perception, cultural identity, and social interaction. The empirical evidence enriches the application of the theory of planned behavior in the context of agricultural product consumption under urbanization and provides practical implications for the sustainable development of the Sichuan tea industry. Specifically, enhancing consumer education on tea culture, strengthening experience-based value communication, fostering positive word-of-mouth networks, and aligning products with diverse consumption scenarios may help transform consumption intention into actual purchasing behavior and support the high-quality and sustainable growth of the industry.

UNIVERSITI KEBANGSAAN MALAYSIA

CHAPTER VI

QUALITATIVE ANALYSIS OF THE MECHANISMS INFLUENCING TEA CONSUMPTION INTENTION AND BEHAVIOR

6.1 INTRODUCTION

Building on the quantitative analyses in the previous chapters that identified key factors influencing tea consumption intention in Sichuan Province, this chapter introduces a qualitative research approach to further explore the underlying mechanisms shaping consumer tea consumption behavior under the context of urbanization. While the preceding econometric models focused on testing the statistical significance of variable relationships, this chapter aims to uncover the behavioral formation logic and contextual dynamics that cannot be fully explained by quantitative methods alone.

Focusing on consumers as the core analytical unit, this chapter collects qualitative data from key actors within the tea consumption ecosystem. Semi-structured interviews were conducted with 12 industry experts, including university scholars, industry association leaders, and senior managers from leading tea enterprises. In addition, in-depth investigations were carried out among 25 representative production and sales enterprises across eight (8) major tea-producing regions in Sichuan Province, covering plantation management, processing systems, and brand retail terminals. To enhance contextual validity, scenario-based simulation discussions were employed, guiding respondents to assess consumer behavior changes across typical consumption settings such as offices, households, social occasions, and tourism contexts.

Qualitative data were systematically analyzed using NVivo 15. Through open coding, 100 initial concepts were identified, which were subsequently integrated into 21 context-specific subthemes via axial coding. In the selective coding stage, these subthemes were consolidated into four (4) core categories corresponding to the theory

UNIVERSITI KEBANGSAAN MALAYSIA

of planned behavior: personal characteristics, behavioral attitudes, subjective norms, and perceived behavioral control. This coding process does not merely replicate existing theoretical constructs but refines and contextualizes them, revealing distinctive behavioral patterns associated with urbanization, such as health-oriented consumption, experiential value recognition, reliance on acquaintance networks, and channel trust perception.

By integrating these qualitative insights with the quantitative findings presented in Chapters 4 and 5, this chapter establishes a coherent analytical linkage from statistical associations to behavioral mechanisms. Moreover, it extends the analysis to inform the design of sustainable development pathways for the Sichuan tea industry under urbanization. In doing so, this chapter provides both micro-level behavioral explanations and meso-level strategic implications, forming a critical bridge between consumer behavior mechanisms and the industry-level sustainable development strategies elaborated in Chapter 7.

6.2 CODING RESULT

6.2.1 Open coding

By analyzing 120,000 words of interview text line by line, 100 initial concepts were extracted from consumer behavioral descriptions, which are shown in Table 6.1. For example, (a1) “under 20 years old love fruity tea” was extracted from the statement “consumers under 20 years old prefer fruity tea”, and (a7) “men pay more attention to cost-effective” was extracted from the statement “men pay more attention to cost-effective, and women pay more attention to brand image”. This stage focuses on maintaining the originality of the concepts, such as retaining specific consumer scenarios such as “portable tea”, “health benefits tea”, etc., resulting in a total of 33 consumer characteristic labels (a1-a33), 25 behavioral attitude labels (b1-b25), 22 subjective normative labels (c1-c22), and 20 behavioral control labels (d1-d20).

UNIVERSITI KEBANGSAAN MALAYSIA

Table 6.1 Chart of variables paraphrase

Tab (of a window) (computing)	Open Coding	Tab (of a window) (computing)	Open Coding
a1	Under 20s love fruity teas	b18	Assessment of quality as superior or to be improved
a2	21-30 years old prefer portable tea	b19	High or low trust in tea safety
a3	31-50 years old love traditional tea	b20	Post-purchase satisfaction rating of very satisfied or dissatisfied
a4	51-60 years old tea leaves with high steeping resistance	b21	Willingness to positively or negatively recommend Szechuan tea
a5	Over 61 years of age rejuvenating potent teas	b22	Willingness to recommend other specialty teas
a6	Men love heavy flavored tea, women love light flavored tea	b23	Easily influenced to buy by other people's recommendations
a7	Men are more interested in value for money, women are more interested in brand image	b24	Frequent or occasional referrals to friends and family
a8	Men tend to buy tea online	b25	Focus on the feedback of friends and family after purchase
a9	Primary school degree seeks simple, easy-to-brew tea	c1	Frequency of tea drinking among friends and relatives
a10	Junior high school education loves affordable tea	c2	Family and friends' attitudes toward tea
a11	High school diploma heavy taste rich tea	c3	Friends and family share new tea situation
a12	Bachelor's degree focuses on the cultural connotations of tea	c4	Friends and family share tea drinking experience
a13	Masters and above chasing high quality tea	c5	Degree to which expert advice is followed
a14	Civil servants re-brand quality tea	c6	Like the taste category expert advice
a15	Social tea for corporate personnel	c7	Like the efficacy category expert advice
a16	Farmers focus on economical and practical tea	c8	Degree of influence by promotional activities
a17	Students love convenient fashion tea	c9	Love the live promotion format
a18	Other occupations choose tea according to work scenarios	c10	Preferred form of advertising promotion

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

a19	Low-income concerns about low-priced tea	c11	Prefer trade show promotion format
a20	Lower-middle income chasing cost-effective tea	c12	Self-drinking tea according to personal taste
a21	Middle-income tea with a heavy quality-price balance	c13	Gift-giving focuses on branded packaging
a22	Middle and high income willing to try high-end tea	c14	Choosing the right social tea for a party
a23	High-income chasing rare and expensive teas	c15	With or without the intention of collecting tea
a24	Unmarried people love personalized tea	c16	Selecting specific medicinal teas for health
a25	Married with no kids and value quality and taste of tea	c17	Tea habits at home
a26	Married with children considering family sharing tea	c18	Tea options in the office
a27	Divorced people choose tea according to their personal preferences	c19	Consumption preferences at teahouses
a28	Widows and orphans choose convenient and simple tea	c20	Tea options for the casual
a29	Rural love for local traditional tea	c21	Tea preferences when traveling
a30	Smaller cities heavy on cost-effective tea	c22	Tea drinking preferences in hotels
a31	Medium-sized cities chasing diverse teas	d1	Abundance of purchasing channels
a32	Big cities focus on brand innovation tea	d2	Ease of purchasing tea
a33	Mega-cities chase high-end specialty teas	d3	Is there a buying point nearby?
b1	Willingness to consume tea for health and wellness	d4	Waiting time for receiving and picking up
b2	Unwilling to consume tea because of the hassle of brewing	d5	Purchases on e-commerce platforms
b3	Frequency of purchases reflects the strength of willingness to consume	d6	Specialty store purchases value quality
b4	Tendency to drink tea several times a day or occasionally	d7	Specialty store purchases value service
b5	Have an expectation of monthly spending amount	d8	Shopping at supermarkets and malls at your convenience

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

b6	Pursuing quality certifications such as organic and green	d9	Participation in the exhibition to purchase tea
b7	Attention to price sensitivity	d10	Purchase of tea through microbusinesses
b8	Trusted brands	d11	Purchase of tea through surrogate purchasing
b9	Prefer minimalist or fine packaging	d12	Health functions impact on purchase
b10	Focus on antioxidant and other health benefits	d13	Price factors on purchases
b11	Understanding Sichuan tea specialty varieties	d14	The extent to which quality factors influence purchases
b12	Knowing the various channels for purchasing tea	d15	The extent to which packaging factors influence purchase intentions
b13	Familiar with common tea brands	d16	Evaluation of overall tea quality
b14	Getting to know the health benefits of tea	d17	Evaluation of tea taste (full-bodied, light, etc.)
b15	Likes sweet and bitter flavors	d18	Evaluation of tea aroma (strong, light, etc.)
b16	Evaluation of tea prices as high or reasonable	d19	Evaluation of tea color (clear, cloudy, etc.)
b17	Perception of brand image as good or fair	d20	Evaluation of tea leaf bottom (intact, broken, etc.)

6.2.2 Spindle type coding

Using the “tree node” function of NVivo15, the initial concepts are grouped into 21 sub-themes. For example, a1-a5 is integrated as A1 “Age factor”, which includes the preference of young people for fruit-flavored tea to the demand of old people for health tea; b1-b5 is integrated as B1 “Consumption willingness tendency”, which covers the health motivation and convenience barriers, as shown in Table 6.2.

UNIVERSITI KEBANGSAAN MALAYSIA

Table 6.2 Spindle type coding

Tab (of a window) (computing)	Spindle type coding	Open coding
A1	Age factor	a1-a5
A2	Gender difference	a6-a8
A3	Impact of level of education	a9-a13
A4	Occupational affiliation	a14-a18
A5	Income and consumption	a19-a23
A6	Role of marital status	a24-a28
A7	Impact of residential urbanization	a29-a33
B1	Propensity to consume	b1-b5
B2	Purchase information follow	b6-b10
B3	Tea awareness	b11-b15
B4	Market evaluation attitudes	b16-b20
B5	Recommendation of willingness to perform	b21-b25
C1	Impact of tea drinking by family and friends	c1-c4
C2	Professional advice reference	c5-c7
C3	Marketing role	c8-c11
C4	Selection of tea uses	c12-c16
C5	Tea drinking place preferences	c17-c22
D1	Difficulty in getting tea	d1-d4
D2	Purchase channel options	d5-d11
D3	Purchase factors to consider	d12-d15
D4	Comprehensive quality assessment	d16-d20

6.2.3 Selective coding

Based on the results of the spindle-based coding, see Table 6.3 for details, through the systematic integration of the core categories, four (4) major core categories are formed at this stage: basic consumer personal characteristics (A1-A7), consumer behavioral attitudes (B1-B5), subjective consumer norms (C1-C5), and consumer behavioral control (D1-D4) as shown in Table 6.3.

UNIVERSITI KEBANGSAAN MALAYSIA

Table 6.3 Selective coding

Tab (of a window) (computing)	Selective coding	Open coding
A	Basic characteristics of individual consumers	A1-A7
B	Consumer behavioral attitudes	B1-B5
C	Subjective consumer norms	C1-C5
D	Consumer behavior control	D1-D4

6.3 IN-DEPTH INTERVIEW TEST

During the iterative coding and constant comparative analysis process, no new core categories or significant concepts emerged from the additional data, and the existing coding framework was sufficient to explain the major phenomena and relationships observed across all research materials. According to the criteria of qualitative research, theoretical saturation is considered achieved when no new theoretical concepts or categories are generated from further data analysis (Glaser & Strauss 1967). Therefore, by integrating the results of the coding consistency test and data control analysis, this study concludes that theoretical saturation has been reached.

In addition to theoretical saturation testing, this study conducted a coding consistency test to ensure the reliability and stability of the qualitative analysis. Following Strauss and Corbin's (1998) methodological guidelines, a two-coder strategy was adopted. Specifically, an independent coder was invited to re-code 45% of the original interview transcripts based on the established coding system.

Subsequently, Cohen's Kappa coefficient was calculated to assess the degree of agreement between the two (2) coders. According to the criteria proposed by Landis and Koch (1977), a Kappa value between 0.81 and 1.00 indicates "near-perfect agreement," thereby confirming the robustness and reliability of the coding results.

It should be noted that this "in-depth interview test" does not refer to an additional round of interviews, but rather to a methodological validation procedure applied to the existing in-depth interview data. This process ensures the theoretical completeness, explanatory power, and methodological rigor of the qualitative findings,

UNIVERSITI KEBANGSAAN MALAYSIA

providing a solid foundation for subsequent theoretical integration and practical recommendations.

Table 6.4 Comparison of Kappa consistency coefficients

Selective Coding	Spindle Type Coding	Open Coding	Kappa Factor
A Basic characteristics of individual consumers	A1 Age factor	a1 Under 20 loves fruity teas	0.871
		a2 21-30 years old tend to be portable tea packs	0.907
		a3 31-50 years old love traditional tea	0.88
		a4 Tea brewing resistance at 51-60 years of age	0.874
		a5 61 years old and above health effects tea	0.883
	A2 Gender differences	a6 Men prefer heavy flavored teas, women prefer light flavored teas	0.91
		a7 Men are more interested in value for money and women are more interested in brand image	0.831
		a8 Men tend to buy tea online	0.84
	A3 Impact of level of education	a9 Primary education seeking simple and easy to make tea	0.905
		a10 Junior high school education love affordable tea	0.897
		a11 High school diploma heavy taste rich tea	0.913
		a12 Bachelor's degree focusing on the cultural connotations of tea	0.826
		a13 Master's degree and above chasing high quality tea	0.863
	A4 Occupational affiliation	a14 Civil servants brand quality tea	0.854
		a15 Selection of social tea for business people	0.828
		a16 Farmers focus on economical and practical tea	0.902
		a17 Students love convenient fashion tea	0.918
		a18 Other occupations selecting tea by work scenario	0.851
	A5 Income and consumption	a19 Low-income focus on low-priced tea	0.855
		a20 Lower-middle income chasing cost-effective tea	0.849
		a21 Middle-income tea with quality-price	0.897

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

		balance	
		a22 Upper-middle income willing to try high-end tea	0.856
		a23 High-income chasing rare and expensive tea	0.854
	A6 Role of marital status	a24 Unmarried people love personalized tea	0.865
		a25 Married with no kids and emphasizes quality and taste	0.893
		a26 Married with children considering family sharing tea	0.831
		a27 Divorced people choose tea according to personal preference	0.896
		a28 Convenient and simple tea for widows and orphans	0.914
	A7 Impact of residential urbanization	a29 Rural love of local traditional tea	0.83
		a30 Small city heavy cost-effective tea	0.848
		a31 Medium-sized cities pursuing diversified tea	0.915
		a32 Tea for large cities focusing on brand innovation	1.014
		a33 Mega-cities chasing high-end specialty teas	0.887
B Consumer behavioral attitudes	B1 Propensity to consume	b1 Willingness to consume tea for health and wellness	0.864
		b2 Unwilling to consume tea because of the hassle of brewing	0.812
		b3 Frequency of purchases reflects the strength of willingness to consume	0.891
		b4 Tendency to drink tea several times a day or occasionally	0.869
		b5 Expectation of monthly consumption amount	0.817
	B2 Purchase information concerns	b6 Pursue quality certifications such as organic and green	0.871
		b7 Focus on price sensitivity	0.848
		b8 Trust in a well-known brand	0.828
		b9 Prefer minimalist or beautiful packaging	0.884
		b10 Health benefits such as antioxidants are	0.806

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

		intended	
	B3 Level of tea awareness	b11 Understanding the specialty varieties of Sichuan tea	0.843
		b12 Knowing the various channels for purchasing tea	0.834
		b13 Familiarize yourself with common tea brands	0.808
		b14 Be clear about the health effects of tea	0.882
		b15 Preference for sweet and bitter flavors	0.898
	B4 Market evaluation attitudes	b16 Tea prices rated as high or reasonable	0.831
		b17 Perception of brand image as good or fair	0.835
		b18 Quality assessed as excellent or needs improvement	0.829
		b19 High or low confidence in tea safety	0.877
		b20 Post-purchase satisfaction as very satisfied or dissatisfied	0.836
	B5 Demonstration of willingness to recommend	b21 Willingness to positively or negatively recommend Szechuan tea	0.834
		b22 Willingness to recommend other specialty teas	0.845
		b23 Easily influenced to buy by others' recommendations	0.873
		b24 Frequent or occasional referrals to friends and relatives	0.811
		b25 Focus on post-purchase evaluation feedback from friends and relatives	0.876
C Subjective consumer norms	C1 Impact of tea drinking by friends and relatives	c1 Frequency of tea drinking with friends and relatives	0.894
		c2 Attitudes of friends and relatives toward tea	0.81
		c3 Sharing of new tea with friends and relatives	0.828
		c4 Sharing of tea drinking experience with friends and relatives	0.895
	C2 Professional recommendation reference	c5 Degree of adherence to expert advice	0.994
		c6 Like the taste category expert advice	0.867
		c7 Like the efficacy category expert advice	0.844
	C3 Marketing role	c8 Degree of exposure to promotional activities	0.787

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

		c9 Like the live promotion format	0.866
		c10 Preferred form of advertisement promotion	0.844
		c11 Prefer trade show promotion format	0.792
	C4 Tea use selection	c12 Choose your own tea according to your personal taste	0.846
		c13 Gift-giving focuses on branded packaging	0.823
		c14 Selecting social tea for parties	0.803
		c15 With or without intention to collect tea leaves	0.859
		c16 Selection of specific medicinal teas for health maintenance	0.854
	C5 Tea drinking place preference	c17 Tea habits at home	0.89
		c18 Tea selection in the office	0.863
		c19 Consumption preferences at teahouses	0.857
		c20 Tea selection for leisure	0.866
		c21 Tea drinking preferences when traveling	0.893
		c22 Tea drinking preferences in hotels	0.814
D Consumer behavior control	D1 Difficulty in getting tea	d1 Abundance of purchasing channels	0.823
		d2 Ease of purchasing tea	0.888
		d3 Availability of nearby buying points	0.88
		d4 Waiting time for receiving and picking up goods	0.896
	D2 Choice of purchase channels	d5 Purchases on e-commerce platforms	0.809
		d6 Buying at a specialty store values quality	0.846
		d7 Specialty store purchases value service	0.837
		d8 Shopping at supermarkets and malls when convenient	0.811
		d9 Purchase of tea at participating exhibitions	0.885
		d10 Tea purchases through microbusinesses	0.901
		d11 Purchase of tea leaves through surrogate purchasing	0.834
	D3 Purchase factor considerations	d12 Impact of health functions on purchases	0.838
		d13 Influence of price factors on purchases	0.832
		d14 Extent to which quality factors influence	0.88

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

	purchases	
	d15 Extent to which packaging factors influence purchase intentions	0.839
D4 Integrated quality assessment	d16 Evaluation of overall tea quality	0.837
	d17 Evaluation of tea taste (mellow, light, etc.)	0.848
	d18 Evaluation of tea aroma (strong, light, etc.)	0.876
	d19 Evaluation of tea soup color (clear, cloudy, etc.)	0.814
	d20 Evaluation of tea leaf bottom (intact, broken, etc.)	0.879

The results of this test show that the Kappa coefficients of each category are between 0.806 and 1.014, all of which exceed the standard line of 0.80, indicating that the coding results have a high degree of consistency, which is in line with the data quality requirements of the qualitative study, and the specific data are shown in Table 6.4. Especially in the main categories of "basic characteristics of consumers", "consumer behavioral attitudes", "subjective norms of consumers" and "consumer behavioral control", the Kappa values of the indicators are stable, reflecting the standardization and stability of the coding system. This reflects the standardization and stability of the coding system.

In summary, this study ensures the scientificity and credibility of the analysis of the in-depth interview data through a strict consistency testing procedure, which provides a solid guarantee for the validity of the subsequent theoretical constructs and research conclusions.

6.4 ANALYSIS OF IMPACT MECHANISMS

6.4.1 Mechanisms of influence of basic personal characteristics of consumers on tea consumption

Consumers' basic personal characteristics are like cornerstones that profoundly influence tea consumption willingness and behavior, building a unique consumption

UNIVERSITI KEBANGSAAN MALAYSIA

pattern from multiple dimensions (Lin 2011). In terms of the age factor, there are significant differences between consumers of different age groups.

a. Age Factors

1. 31-50 years old: This age group, with rich life experience, tends to favor traditional tea. One interviewee said, *"I've been drinking tea for many years, and I still think that traditional teas like Longjing and Tieguanyin have a mellow taste, and the more I drink, the more I enjoy it"*. The deep cultural heritage and rich flavor attract them.
2. 51-60 years old: This group is more inclined to drink durable tea, focusing on affordability and convenience. One interviewee stated, *"As I get older, I drink more cups of tea, and durable tea is more cost-effective, I don't have to change tea frequently"*.
3. Over 61 years old: Health needs dominate their consumption choices. One interviewee mentioned, *"I now drink tea with health benefits, like Pu'er ripe tea, good for the stomach and intestines, I feel at ease drinking it"*.

b. Gender Differences

1. Men: Men prefer tea with strong flavors, focusing on cost-effectiveness, and often purchase tea online for convenience. A male respondent said, *"I like tea with a strong and mellow flavor, like rock tea, which is intense to drink. When buying tea, I definitely consider the cost-effectiveness, and online shopping is convenient with more choices and transparent prices, plus it can be delivered to your door"*.
2. Women: Women favor fragrant teas and place more importance on the brand image. A female respondent mentioned, *"I prefer fragrant teas, such as Biluochun, which smells great and is refreshing to drink. When buying tea, I prioritize the brand; big brands feel more reliable, and the packaging is also nice"*.

UNIVERSITI KEBANGSAAN MALAYSIA

c. Education Level and Occupation

1. Low education (elementary school and below): These consumers prefer simple and easy-to-brew tea, emphasizing convenience.
2. Junior high school education: Consumers with this level of education tend to prefer affordable tea.
3. Bachelor's degree and above: As education levels increase, consumers' focus shifts toward the cultural connotation and quality of tea. For example, a respondent with a bachelor's degree said, *"Drinking tea isn't just about drinking, but also about the culture behind it, like the history of tea and how to brew it, which are all very interesting"*.

d. Occupational Differences

1. Civil servants: Focus on brand quality to meet social needs. One civil servant said, *"I usually buy tea from well-known brands, quality is guaranteed, and it's suitable for both gifts and personal consumption"*.
2. Business people: Choose tea based on social occasions. A businessperson said, *"For social occasions, I choose tea depending on the person, to maintain face and satisfy their tastes"*.
3. Farmers: Focus on economy and practicality.
4. Students: Pursue convenience and fashion.

e. Income and Spending Power

1. Low-income group: Prefer low-priced tea.
2. Low-middle income group: Seek cost-effectiveness.
3. Middle-income group: Seek a balance between quality and price.
4. Middle-high income group: Try high-end teas and are willing to pay more for quality.

UNIVERSITI KEBANGSAAN MALAYSIA

5. High-income group: Prefer rare and expensive teas. A high-income respondent said, *"I'm more interested in rare and expensive teas, which I think have collectible value and show taste"*.

f. Marital Status

1. Unmarried group: Prefer personalized tea that reflects their own style.
2. Married without children: Focus on quality taste.
3. Married with children: Consider tea that is acceptable for the whole family and convenient for everyone to drink together.
4. Divorced: Choose tea based on personal preferences.
5. Widowed or orphaned: Choose convenient and simple tea.

g. Degree of Residential Urbanization

1. Rural areas: Prefer local traditional tea, as it is familiar and part of their routine.
2. Small cities: Focus on cost-effectiveness.
3. Medium-sized cities: Pursue diversity in tea options.
4. Large cities: Focus on brand innovation.
5. Mega cities: Pursue high-end specialty teas. A respondent from a large city said, *"In big cities, there are many brands and new teas, and I pay attention to well-known brands and innovative tea products"*.

Degree of residential urbanization affects tea consumption preferences, with rural areas preferring local traditional tea, small cities focusing on cost-effectiveness, medium-sized cities pursuing diversification, large cities focusing on brand innovation, and megacities pursuing high-end specialties (Zhao & Kong 2024).

This study analyzes the differences in tea consumption behavior based on various demographic characteristics (such as age, gender, education level, occupation, income, marital status, and residential location). It reveals how social, cultural, and

UNIVERSITI KEBANGSAAN MALAYSIA

economic backgrounds influence the tea consumption patterns in Sichuan Province. These demographic variables and their relationships with tea consumption intentions and behaviors provide important insights for the sustainable development of the tea industry in the context of urbanization.

6.4.2 Mechanisms of consumer behavioral attitudes on tea consumption

Consumer behavioral attitudes are like a compass, precisely influencing tea consumption willingness and behavior, reflecting the consumers' deepest knowledge, evaluation and purchase tendency of tea. Consumption willingness directly determines whether consumers buy tea and the frequency and amount of purchase. Consumers who think that tea has health and wellness benefits are more willing to consume tea, as the interviewee said, "*Nowadays, everyone pays attention to health, and drinking tea is healthful and good for the body, so I have to drink tea every day*". While consumers who find brewing troublesome may reduce their willingness to consume, an interviewee complained, "*Brewing tea is too troublesome, you have to prepare the tea utensils, boil the water, and master the brewing method, there is no time to get it, so I seldom drink tea*". Purchase frequency and consumption amount expectation reflect the strength of consumption willingness, consumers who buy frequently and have higher consumption amount expectation have higher demand and love for tea.

Purchase information concern reflects the degree of importance that consumers attach to various types of information when buying tea. The pursuit of organic green and other quality certification of consumers, the importance of tea quality assurance, an interviewee said: *"certified tea, feel more secure quality, drink at ease, I only buy organic certification of tea"*. Concerned about the price-sensitive consumers, in the purchase of the price will be compared and weighed, an interviewee said: *"buy tea definitely want to look at the price, too expensive to afford, I will be more than a few comparisons before buying"*. Consumers who trust well-known brands, that the brand represents the quality and taste assurance, a consumer said: *"The big brand of tea, quality, taste is more guaranteed, I have been buying a well-known brand of tea"*. Consumers who prefer simple or exquisite packaging, packaging plays an important role in their purchasing decision. One consumer mentioned, *"Tea with good-looking*

UNIVERSITI KEBANGSAAN MALAYSIA

packaging is comfortable to give as a gift or to drink by oneself, and I will give priority to tea with exquisite packaging". Consumers who care about antioxidant and other health effects will choose tea according to their own health needs, for example, a respondent with high blood lipids said, *"I understand the effects of tea, like I have high blood lipids, I will choose tea with lipid-lowering effects"*.

The level of tea knowledge affects the scope and precision of consumers' tea choices. Consumers who understand the special varieties of Sichuan tea, know a variety of channels for purchasing tea, are familiar with common tea brands, are aware of the health effects of tea, and like different flavors, are able to choose tea that meets their needs in a more targeted manner. An interviewee who understands Sichuan tea said, *"I know that there are many special varieties of Sichuan tea, like Mengdingshan tea, which has a unique taste and very local characteristics, and I often buy Sichuan tea to drink"*. A consumer familiar with a variety of channels to buy tea said, *"Now buy tea channels, online and offline can buy, it is very convenient, I will choose to buy channels according to different situations"*.

Market evaluation attitudes reflect consumers' overall perception of and satisfaction with the tea market and influence their subsequent purchase behavior. Price evaluation of tea, brand image perception, quality assessment, safety trust, and post-purchase satisfaction all influence whether consumers buy that tea again or choose another tea. For example, consumers who have a good evaluation of a tea brand image and high post-purchase satisfaction are more likely to buy that brand of tea again; one consumer said, *"I think this brand of tea has a good brand image, and the quality is good, and I've bought it several times and am satisfied with it, so I will continue to buy it in the future"*. Consumers who perceive the price of tea to be high or assess the quality to be average may turn to other brands or varieties, with one consumer saying, *"Some tea prices are too high, beyond my affordability, and the quality is average, so I won't buy it again, and will try other brands"*. The willingness to recommend performance reflects word-of-mouth communication and social influence among consumers. Consumers who actively recommend tea may influence others' purchasing decisions; consumers who are susceptible to purchases influenced by others' recommendations are more likely to be influenced by word-of-mouth in social networks, and

UNIVERSITI KEBANGSAAN MALAYSIA

recommendations and sharing by friends and relatives play an important role in their tea consumption choices. One consumer said, *"I think Sichuan tea is very good and will recommend it to my friends around me, and I will be more interested in trying the tea recommended by my friends*".

6.4.3 Mechanisms of consumer subjective norms on tea consumption

Consumers' subjective norms are like a pair of invisible hands, indirectly acting on tea consumption willingness and behavior through social influences and environmental factors. The influence of friends and relatives is an important social factor. The frequency of drinking tea, their attitudes towards tea, sharing of new tea, and sharing of tea drinking experience can all influence consumers' exposure to and perception of tea. If friends and relatives drink tea frequently and have positive attitudes, consumers are more likely to develop a tea drinking habit under their influence, as the interviewee said, *"My family members love tea, and under their influence, I also drink tea every day, and they often share new teas with me, so that I can learn about a lot of different teas"*. The sharing of new teas and tea-drinking experiences by family and friends can broaden consumers' knowledge of tea and stimulate their desire to buy and try new teas.

Reference to professional advice guides consumer decision-making. Consumers with a high degree of listening to expert advice will refer to it when choosing tea, especially in terms of taste and efficacy. For example, consumers who like the taste of expert advice will choose a tea that meets their taste needs based on the expert's evaluation of the tea's taste. A consumer said, *"The expert's evaluation of the tea's taste is very professional, and I will refer to their advice to choose a tea, such as the expert's comment that a certain tea has a mellow taste, and I'll go and try it"*. Like the efficacy of expert advice consumers, according to their own health needs, reference to expert analysis of the efficacy of tea to choose, a focus on health consumers said, *"the advice on the efficacy of tea, I choose the right tea is very helpful, such as the experts said that a certain kind of tea for the stomach and intestines, I will buy to drink"*.

The role of marketing promotion influences consumers' willingness to buy through a variety of marketing techniques. Consumers who are highly influenced by

UNIVERSITI KEBANGSAAN MALAYSIA

promotions will increase their purchases during promotions, with one consumer saying, *"When there are promotions, I will buy more tea and feel that it is more cost-effective"*. Consumers who prefer different forms of promotions such as live streaming, advertisements, and exhibitions will learn about new tea products as a result of these promotions, which will create a desire to buy. For example, through live promotion, consumers can visualize the appearance of tea and the brewing process, increasing their interest in purchasing. One consumer mentioned, *"It's very convenient to watch live broadcasts to buy tea, you can visualize how the tea looks like, and you can also interact with the anchor, and I've bought quite a lot of tea through live broadcasts"*.

The choice of tea use reflects the functional needs of consumers for tea in different scenarios. According to the personal taste selection of self-drinking tea, reflecting the consumer's satisfaction of self-preference; gift focus on brand packaging, consider the social value of the gift; selection of social tea suitable for the party, to meet the needs of social occasions to create the atmosphere; collection of tea intention of consumers, valuing the value of the tea collection; for the health of the selection of a specific medicinal tea, based on the demand for health and wellness. A consumer said: *"I buy tea according to their favorite flavor, drink happy is the most important. Gift words, definitely want to choose a good brand, beautifully packaged tea, have face"*.

Tea-drinking place preference reflects consumers' needs for tea adaptation in different scenarios. At home, office, teahouse, leisure, traveling and hotel, consumers have different choices of tea and different ways of drinking tea. At home, they pursue a relaxed atmosphere and choose their favourite tea sets and tea leaves; in the office, they focus on the convenience of brewing to refresh themselves; in teahouses, they enjoy the environment and services and try specialty teas; in leisure venues, they focus on relaxation and choose mild teas; when traveling, they carry portable teas to experience the local tea culture; and in hotels, they want to have tea that is of good quality and easy to brew. One consumer said: *"When drinking tea at home, I like the relaxed atmosphere and will choose my favorite tea sets and tea leaves. Drinking tea in the office is mainly for refreshment, and will choose tea that is easy to brew"*.

UNIVERSITI KEBANGSAAN MALAYSIA

6.4.4 Mechanisms of consumer behavior control on tea consumption

Consumer behavioral control factors are like regulating valves that directly influence tea purchase decisions and consumption experience. Difficulty in acquiring tea is the first factor that affects the purchase decision. The richness of purchasing channels determines how easy it is for consumers to buy tea, as the interviewee said, *"There are many channels to buy tea nowadays, online there are e-commerce platforms, and offline there are specialty stores and supermarkets, which are easy to buy, which allows me to buy my favourite tea at any time"*. Difficulty in buying tea, especially niche teas, may limit consumer choices, as one consumer said, *"There are some niche teas that are hard to buy locally, and it's too much of a hassle to go through a substitute or online shopping, so I seldom try them"*. The availability of nearby purchase points affects immediate purchase demand, one consumer mentioned, *"If there is a tea store near my home, it will be more convenient to buy tea and I can go to buy it at any time, I often buy tea from the tea store near my home"*. The waiting time for receiving and picking up the goods affects the online consumers' buying mood and willingness to buy again, and the waiting time is too long which may reduce the motivation to buy, a consumer complained, *"When buying tea online, I hope that the time of receiving the goods can be faster, and waiting for too long will affect the mood of buying, last time I waited for a long time before I received the tea, and I may not buy it in that store in the future"*.

The choice of purchasing channels reflects consumers' preferences and needs for different channels. Consumers who buy on the e-commerce platform value its many choices, price transparency and convenience; consumers who buy in specialty stores value quality or service, respectively, choose specialty stores because they can provide better product quality assurance or quality service; consumers who buy in supermarkets and shopping malls at their convenience utilize shopping convenience to buy; consumers who participate in trade fairs to buy tea, learn about new teas and industry information through the trade fairs; and through micro-merchants, consumers who buy tea on behalf of others to meet the demand for tea from specific regions or specialties. A consumer buying tea on an e-commerce platform said, *"There are many types of tea on e-commerce platforms, the price is also advantageous, and you can also read the evaluation, I often buy tea online"*. A consumer who bought tea in the store said, *"The*

UNIVERSITI KEBANGSAAN MALAYSIA

quality of tea in the store is guaranteed, you can see the real thing, it's more assured, and the service is also very good, it will help introduce the tea and provide brewing advice".

Purchase factor considerations determine the weight of a consumer's purchase decision. The extent to which factors such as health function, price, quality and packaging influence purchasing decisions varies from consumer to consumer. Consumers who are concerned about health, health functions have a big impact on purchasing; consumers who pay attention to cost-effective, price factors have a significant impact; consumers who pursue quality, quality factors play a key role; and packaging factors have a smaller impact on some consumers' willingness to buy. A consumer focusing on health said, *"Now all focus on health, the health function of tea is an important factor in my choice, I will choose tea with health effects".* A consumer focusing on cost-effective said, *"The price is a must consider, to be within their own financial affordability, I will choose cost-effective tea".*

Comprehensive quality assessment is the key to consumers' overall satisfaction with tea. The evaluation of the overall quality, taste, aroma, soup color and leaf bottom of tea leaves directly affects the degree of consumer recognition of tea leaves. Tea with mellow taste, strong aroma, clear soup color and intact leaf bottom tends to get higher evaluation from consumers, increasing the likelihood of consumers buying again and recommending it to others; on the contrary, poor quality tea will reduce consumers' satisfaction and affect their subsequent purchasing behavior. One consumer commented, *"This tea has a mellow taste, strong aroma, clear soup color and complete leaf bottom, I am very satisfied and will buy it again and recommend it to my friends". While another consumer said, "The tea I bought last time did not taste good, and the aroma was not strong, the soup color was cloudy and the leaf bottom was broken, I was very dissatisfied and would not buy it again".*

On the basis of the empirical analysis in the Chapters 4, 5 and 6 mentioned above, the conceptual model of this study is shown in Figure 6.1 after being adjusted and revised accordingly. The impact of urbanization on the sustainable development of the tea industry in Sichuan Province can be clearly seen.

UNIVERSITI KEBANGSAAN MALAYSIA

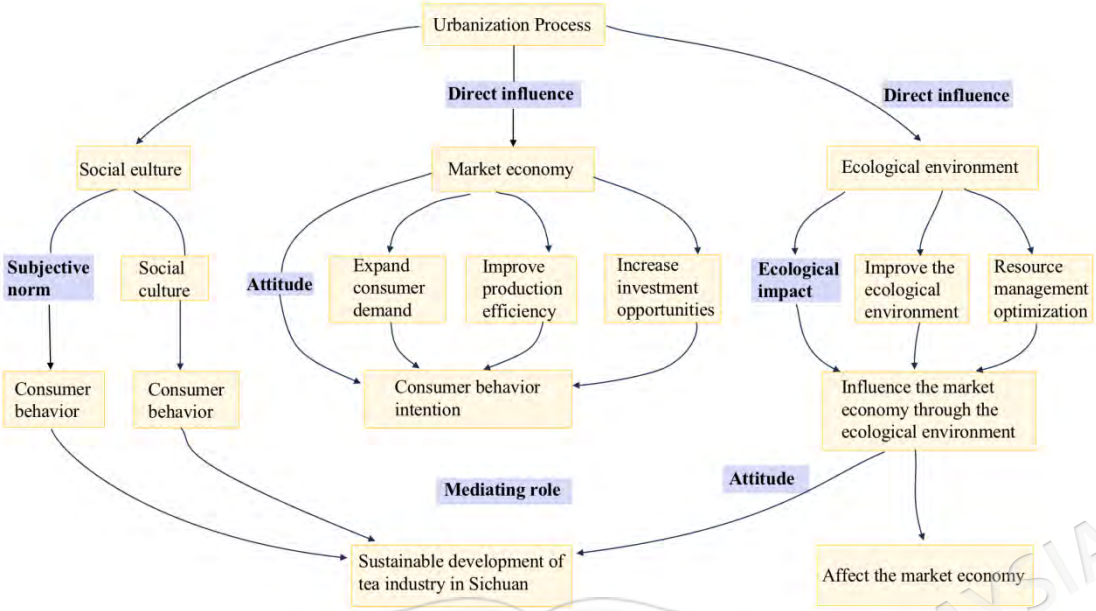

Figure 6.1 Revised conceptual model of the impact of urbanization on the sustainable development of the Sichuan tea industry

Compared with the initial conceptual framework presented in Figure 1.1, Figure 6.1 represents a substantively revised and empirically grounded model. While Figure 1.1 was constructed as a theoretical and hypothesis-driven framework based on the triple bottom line theory and the theory of planned behavior, Figure 6.1 reflects a model refinement grounded in the integrated findings of quantitative and qualitative analyses.

Specifically, Figure 6.1 adds value in three (3) key aspects. First, it distinguishes clearly between direct effects of urbanization on market economy, social culture, and ecological environment, and indirect effects transmitted through consumer behavioral intention. This distinction was not explicitly articulated in the initial framework.

Second, the revised model explicitly identifies consumer behavioral intention as a mediating mechanism linking urbanization processes and the sustainable development of the Sichuan tea industry. This mediating role is empirically supported by structural equation modeling and consumer behavior analysis, and further interpreted through qualitative coding results.

Third, Figure 6.1 reorganizes the original conceptual relationships into three (3) functional clusters—social-cultural influence, market-economic transmission, and ecological feedback—thereby transforming the original static framework into a

UNIVERSITI KEBANGSAAN MALAYSIA

dynamic mechanism-oriented model. This allows for a clearer explanation of how urbanization reshapes industrial sustainability through behavioral, cultural, and ecological pathways.

Accordingly, Figure 6.1 should be understood not as a repetition of the original framework, but as a theory-refined and evidence-based conceptual contribution that advances understanding of the interaction between urbanization, consumer behavior, and sustainable development in the tea industry.

6.5 SUSTAINABLE DEVELOPMENT PATHWAYS FOR SICHUAN'S TEA INDUSTRY

This chapter centers its research on consumers, employing qualitative research methods to systematically analyze the mechanisms influencing tea consumption behavior in Sichuan Province. It further expands this analysis to explore sustainable development pathways for the tea industry in Sichuan under the context of urbanization. Data collection covers the three (3) main entities in the tea consumption ecosystem: first, through semi-structured interviews, in-depth interviews were conducted with 12 industry experts (including university scholars, industry association leaders, and technical and market managers from leading tea companies), covering key issues such as changes in consumer behavior, market trend assessments, and bottlenecks in industrial transformation. Second, 25 representative production and sales enterprises from eight (8) core tea-producing regions in Sichuan were selected for in-depth research on their urbanization response practices across planting bases, processing chains, and brand retail terminals, forming a comprehensive industrial chain sample structure.

To further enhance the systematic nature and theoretical depth of the research, this study introduced scenario simulation discussion methods to assist expert interviews, guiding interviewees to assess and recreate behavioral changes in typical consumption scenarios (such as office, social, family, and tourism settings), thereby more precisely depicting the consumption logic and behavioral evolution mechanisms under urbanization contexts. Using NVivo 15 software for coding analysis, the 120,000-word interview and survey materials were systematically organized, ultimately extracting 100 initial concepts. Through axial and selective coding, 21 sub-themes were

UNIVERSITI KEBANGSAAN MALAYSIA

identified and further integrated into four (4) core categories: “consumer personal characteristics”, “behavioral attitudes”, “subjective norms”, and “behavioral control” forming a comprehensive model of the mechanisms influencing consumer tea consumption behavior.

Furthermore, based on the comprehensive analysis results from Chapters 4, 5, and this chapter, the study extends to designing sustainable development pathways for Sichuan’s tea industry under the influence of urbanization on social culture and the ecological environment. By identifying changes in consumer structure, the evolution of cultural identity, and the restructuring of ecological space, a development framework comprising three (3) modules— “Ecological Protection First—Cultural and Human Resource Restructuring—Industrial Collaborative Innovation”—and six (6) strategies was constructed. Additionally, the study proposed four (4) logical mechanisms—“multivariate coupling”, “path dependence resolution”, “consumption structure traction”, and “technology-culture dual empowerment” to comprehensively support the tea industry’s coordinated development in achieving ecological resilience enhancement, social foundation stabilization, and market structure optimization amid the urbanization wave.

Therefore, this chapter not only systematically reveals the influence pathways of tea consumption behavior in Sichuan at the micro-level but also responds to the social, cultural, and ecological challenges brought by urbanization at the meso-level. It provides theoretical foundations and path guidance for the formulation of sustainable strategies in Chapter 7, thereby establishing a research loop from “consumption behavior mechanisms” to “industrial strategy construction”.

6.5.1 Building a sustainable development path for the tea industry

Against the backdrop of growing global awareness of sustainable development, the transformation of the agricultural industry increasingly emphasizes the threefold synergy of economic growth, ecological protection, and social equity. As a composite of cultural and ecological industries, the sustainable development path of Sichuan’s tea industry must be embedded in the three (3) dimensions of economy, society, and

UNIVERSITI KEBANGSAAN MALAYSIA

ecology proposed by the "triple bottom line theory" (Elkington 1997), forming a systematic and dynamic path system. Based on the analysis of urbanization impacts in Chapters 4 to 6, this study proposes a "three-module, six-strategy" pathway model for the sustainable development of Sichuan's tea industry from the perspectives of the industrial chain and regional governance.

Table 6.5 Framework for the sustainable development of Sichuan's tea industry

Module Classification	Strategy Name	Specific Pathways and Implementation Mechanisms	Target Results
1. Prioritizing ecological protection	Reconstruction of tea garden ecosystems	Promote the three-dimensional planting model of "forest-tea symbiosis" and "tea-forest rotation" to enhance ecological stability and land utilization efficiency. Establish an organic certification system to promote standardized green farming practices and ecological monitoring Introduce remote sensing and intelligent sensing systems to monitor pests, diseases, and soil degradation, enabling precise ecological management	Enhancing ecological carrying capacity and building a green production system
	Environmentally adaptive spatial governance	▪ Utilize the peripheral areas of urban expansion for ecological renovation of slopes, embankments, and abandoned lands ▪ Establish a regional-scale "tea garden land use red line" Control mechanism, and establish ecological buffer zones in conjunction with national land use planning Implement a "ecological compensation + returning farmland to tea cultivation" policy to motivate farmers to protect their land	Responding to the impact of urbanization and protecting the ecological space of tea gardens
2. Cultural and human resource transformation	Tea culture heritage and identity building	Establish projects such as "tea culture in schools" and "tea intangible cultural heritage transmission bases" to promote regional cultural identity education.	Strengthen local cultural foundations and enhance industrial soft power

… to be continued

UNIVERSITI KEBANGSAAN MALAYSIA

… continuation

		Develop a regional cultural geography identification project to enhance cultural recognition. Utilize new media platforms to disseminate local tea art, tea-making techniques, and tea-drinking customs, thereby reshaping the tea culture ecosystem.	
	Talent return and generational renewal	Establish fiscal incentive mechanisms such as the "Young Tea Entrepreneurship Fund" and the "Tea Industry New Farmers Support Program." Establish a county-level tea vocational education system and introduce composite courses combining tea art, e-commerce, and marketing Establish a "tea technician grading certification system" to enhance the professionalization and occupational appeal of the workforce	Alleviate population decline and aging, and rebuild the human resources support system.
3. Industrial synergy and market innovation	Brand system construction and channel integration	Promote a dual-layer co-construction mechanism of "Sichuan tea regional public brand + corporate brand" and standardize the brand image identification system Build a diversified integrated sales system of "online e-commerce + live streaming + offline experience" to expand the mid- to high-end market. Guide the main production areas to build a unified "quality certification + origin traceability + logistics tracking" platform to enhance brand trust and traceability	Build brand barriers and adapt to consumption upgrades
	Digital guidance for consumer behavior	Utilize big data to analyze consumer profiles and preferences, driving precise product development Establish a database of tea consumer behavior and regularly publish urban tea consumption index reports Combine short video dissemination, scenario-based consumption, and user co-creation mechanisms to enhance consumer emotional attachment and engagement	Meet diverse consumer needs and stimulate internal market momentum

UNIVERSITI KEBANGSAAN MALAYSIA

To address the multifaceted ecological, social, and economic challenges facing Sichuan's tea industry in the context of urbanization, the sustainable development pathway framework proposed in this thesis exhibits the following four (4) key characteristics. These characteristics reflect the comprehensiveness of policy design, the precision of regional governance, the coordination of institutional mechanisms, and the foresight of technological approaches, thereby offering significant theoretical innovation and practical guidance.

1. Systematic: Establishing a comprehensive, end-to-end sustainable transformation pathway. The development pathway proposed in this study breaks away from the previous narrow focus on either tea cultivation or sales, instead adopting a holistic approach spanning the entire process from "cultivation—processing—cultural heritage—market consumption". It integrates four (4) dimensions: ecological system protection, cultural resource reconstruction, labor force restructuring, and market mechanism optimization. Through innovative design of ecological agriculture models, reconstruction of cultural identity mechanisms, intergenerational replenishment of human resources, and diversified guidance of consumer demand, this study achieves a structural restructuring of the entire Sichuan tea industry chain, thereby enhancing the overall system's sustainability resilience. This systemic framework aligns with the theoretical logic of complex agricultural socio-ecological systems' co-evolution (Folke 2006) and provides an empirical model for integrated structural agricultural sustainability.

2. Balancing regional and differentiated approaches: Spatial adaptation strategies based on urbanization gradients. Considering the significant spatial imbalance in urbanization levels within Sichuan Province (e.g., significant differences in land use, industrial structure, and population mobility between the Chengdu Plain Economic Zone and the southern Sichuan hilly mountainous region), this pathway system proposes targeted "differentiated" regional strategies. Urban core areas should focus on brand innovation and the creation of consumption scenarios; urban fringe areas should strengthen land use regulations and ecological restoration; while traditional tea-growing regions such as hilly and mountainous areas should prioritize ecological cultivation and cultural heritage

UNIVERSITI KEBANGSAAN MALAYSIA

preservation, achieving spatial coupling and gradient adaptation of regional resources and functions. Such spatial hierarchical pathway design not only embodies the regional governance philosophy of "adapting to local conditions" but also aligns with the theory of "multi-scale agricultural ecosystem management" (Turner et al. 2003).

3. Policy guidance and market mechanism synergy: Institutional supply and economic incentives go hand in hand. This approach emphasizes the synergistic role of institutional forces and market mechanisms, breaking the dichotomy between "government-led" and "market-driven" approaches. On the one hand, through government-led initiatives such as the "ecological compensation mechanism", "Tea Industry Revitalization Special Fund", and "Intangible Cultural Heritage Inheritance Incentive Program", a robust institutional support system is established. On the other hand, market mechanisms guide brand development, consumption structure optimization, and channel integration to enhance the industry's market responsiveness and profitability. This reflects the implementation logic of "modernization of national governance capabilities" in the agricultural sector and aligns with the basic view of institutional economics regarding the "endogenous interactive relationship between effective institutional arrangements and market performance" (North 1990). At the same time, this institution-market coupled governance model provides a practical operational path for the sustainable transformation of the tea industry.

4. Digital empowerment: Reconstructing the industrial ecosystem with technological means. This research path introduces big data analysis, remote sensing technology, intelligent monitoring systems, and short video social media dissemination mechanisms to endow traditional agricultural industries with a digitally driven core. At the production end, remote sensing monitoring and digital farming platforms enable dynamic monitoring and precise management of tea garden pests and diseases, soil fertility, and climate risks. At the sales end, short videos, live-streaming e-commerce, and social media channels are used to disseminate tea culture and tea brands, fostering interactive co-creation between "product-culture-user", thereby enhancing consumer loyalty and emotional connections. This information technology-based

UNIVERSITI KEBANGSAAN MALAYSIA

agricultural digital transformation path not only enhances the transparency and responsiveness of the tea industry chain but also facilitates the development of a virtuous cycle of integrated “smart agriculture” and “smart consumption”, aligning with the policy orientation of the “Digital Rural Development Strategy Outline” to empower rural revitalization through digital technology.

6.5.2 Sustainable development logic diagram of Sichuan tea industry driven by urbanization

The innovation of this path model lies in coupling the “urbanization pressure variable” with the “triple bottom line logic”, breaking through the traditional one-dimensional thinking of “ecological priority” or “industrial priority” in agricultural sustainability research. It forms a theoretical framework of cultural-ecological-industrial triadic interaction and dynamic adaptation, providing a reference path for other specialty agricultural industries.

UNIVERSITI KEBANGSAAN MALAYSIA

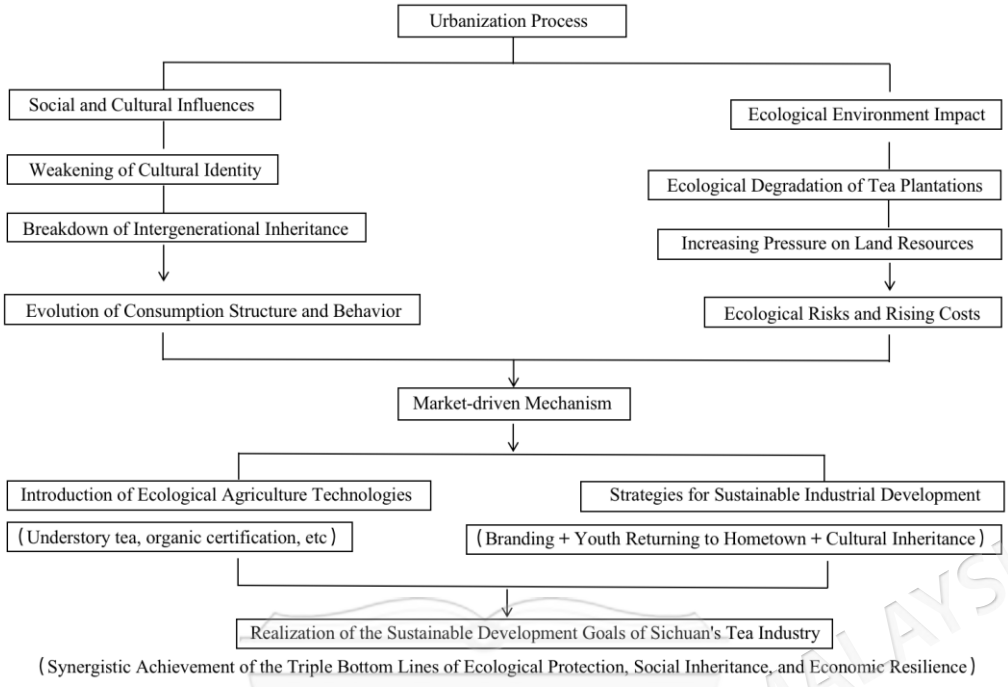

Figure 6.2 Logical diagram of the impact of urbanization on the sustainable development of Sichuan's tea industry

6.5.3 Data support and strategy recommendations

Based on the empirical and qualitative analyses conducted in Chapters 4 to 6 of this study, the structural impacts faced by Sichuan's tea industry in the context of urbanization can be summarized into six (6) core variables. These variables exhibit profound transformations across dimensions such as land resources, labor force structure, ecological carrying capacity, consumer perception, cultural heritage, and distribution channels, posing systemic challenges to the sustainable development of the tea industry. Based on the triple bottom line framework and supported by multi-source data, this thesis matches urbanization impact variables with industrial response mechanisms to form the following strategy linkage matrix as shown in Table 6.6:

Table 6.6 Showing the relationship between urbanization impact variables and tea industry strategy responses

Urbanization Impact Variables	Specific Impacts at the Industry Level	Development Strategy Recommendations	Implementation Mechanism and Target Setting
Land use changes	Reduction in tea garden area, conflicts over development of marginal land	Promotion of ecological tea garden renovation Promotion of composite planting and utilization of slopes and undergrowth	Formulate control standards for "tea garden ecological red lines" and incorporate them into the overall urban and rural land use plan Promote three-dimensional agricultural models such as under-forest tea cultivation and tea-forest intercropping to improve the utilization rate of marginal land Guide land flows to accumulate in ecologically efficient areas
Labor migration	Loss of tea farmers and aging of the farming population	Strengthen skills training and establish incentives for young people to return to their hometowns to start businesses	Establish a county-level "tea industry vocational education system" and set up comprehensive training content covering "harvesting and processing, e-commerce, and branding" Distribute funds for returning entrepreneurs and offer tax reduction policies to encourage young farmers to return to their hometowns
Ecological pollution	Increased risk of pesticide residues, higher thresholds for ecological certification	Promote green certification and establish an ecological compensation mechanism	Promote government-led incentive policies for organic tea certification to increase the proportion of green products Explore ecological compensation mechanisms to provide subsidies for tea gardens that preserve natural boundaries and enhance ecological supply capacity.
Upgrading of consumption structure	Expansion of mid- to high-end markets, increased demand for health and cultural functions	Product innovation in branding, functionality, and socialization	Focusing on the development direction of "function + scenario", design products such as "Three Highs Regulation Tea", "Social Scenario Tea" and "Office Convenience Tea" Build a regional brand cluster to form a consumer brand recognition system of "Sichuan Tea + Culture + Health"
Weakening cultural identity	Disruption in the dissemination of local tea culture, declining participation of young people in tea culture	Tea culture revitalization project promotes the protection and revitalization of intangible cultural heritage	Establish "Tea Culture in Schools" and "Intangible Cultural Heritage Tea Art Bases" to increase intergenerational awareness and transmission frequency

… to be continued

… continuation

			Collaborate with the tourism and cultural and creative industries to build "immersive" tea culture experience products and reshape regional cultural identity
Digital communication enhancement	Consumer behavior is becoming more visual, fragmented, and IP-oriented	Strengthening e-commerce live streaming promotion to build Sichuan tea IP and short video communication matrix	Establish a "Sichuan Tea New Media Content Ecosystem Platform" to integrate resources from live streamers, enterprises, and content creators Build a three-pronged Sichuan tea online brand communication system consisting of "trending topics + social tags + cultural narratives"

To further enhance the resilience and collaborative development of Sichuan's tea industry in the context of urbanization, it is essential to understand the logical mechanisms underlying its sustainable development pathways from the perspective of multi-variable system evolution. Building on the aforementioned urbanization variables and strategy matrix, this thesis distills a theoretical framework of "four-dimensional synergy", comprising multi-variable coupling mechanisms, path dependence and structural lock-in, consumer structure restructuring orientation, and technology-culture dual empowerment pathways. This framework not only reveals how Sichuan's tea industry can transform urbanization pressures into development momentum but also provides a systematic theoretical foundation for implementing these pathways.

1. Multi-variable coupling mechanism: The systemic interplay of urbanization variables and the need for coordinated governance. The influencing variables in the urbanization process do not exist in isolation but are mutually nested and cross-evolve, forming a highly coupled systemic pressure. For example, "land use changes" often directly trigger "ecological pollution" issues, especially in urban fringe areas, where the rapid conversion of land functions (such as agricultural land to construction land) disrupts the stability of the original tea garden ecosystem, leading to negative externalities such as increased pesticide use and weakened soil and water conservation. Additionally, "labor migration" and "weakened cultural identity" exhibit significant interactive relationships. The former causes generational discontinuity in the tea industry, while the latter

accelerates the marginalization of tea culture and its disconnection from consumption.

Therefore, when responding to these variable shocks, we cannot rely on a "single-cause countermeasure" logic, but should instead construct a composite ecological and social governance structure. This requires that ecological space protection and social mechanism adjustments be "launched simultaneously", that is, introducing an ecological sensitivity assessment mechanism into land planning while overlaying cultural heritage protection policies to achieve a coordinated management model that integrates "resources, ecology, and culture" in a three-dimensional manner (Liu et al. 2016).

2. Path dependence and structural lock-in: An analysis of institutional inertia and barriers to transformation within the tea industry. The historical path of Sichuan's tea industry is deeply embedded in the local agricultural structure and social cognitive system, resulting in strong path dependence. For example, major production areas are concentrated in traditional green tea-producing regions, and consumers and industry practitioners generally have low acceptance of "non-green tea products", thereby inhibiting the willingness to develop products such as black tea and white tea. Additionally, the current tea certification system prioritizes static indicators (such as planting scale and tea tree varieties) over dynamic transformation potential. This "certification barrier" objectively creates institutional exclusion of new entrants or innovative entities.

   Such structural lock-in phenomena are the key factors causing the industry's delayed response and lack of transformation momentum. Therefore, institutional innovation and technological empowerment measures are needed to drive path restructuring. For example, reforming the certification mechanism by introducing a comprehensive evaluation system that integrates "ecological service value + cultural value + consumer experience", while leveraging digital tools such as remote sensing and big data to enhance the dynamism and transparency of certification, breaking the inertia of traditional paths, and improving institutional adaptability (Pierson 2000).

UNIVERSITI KEBANGSAAN MALAYSIA

3. Consumer structure reshaping orientation: Driving industrial upgrading pathways from the demand side. Data analysis in Chapter 5 shows that the middle-class and young consumers in the urbanization process have undergone significant structural changes in their expectations for tea products: on the one hand, consumers place greater emphasis on the health functionalities of tea (such as antioxidant and sleep-aid properties), while on the other hand, brand image, social attributes, and cultural-emotional value have become important decision-making references. This trend indicates that the traditional "production-oriented supply model" can no longer meet consumers' diverse needs. Therefore, Sichuan's tea industry must transition from a "supply-logic" approach to a "demand-responsive structural supply" model. This requires producers and business entities to demonstrate a higher level of consumer understanding and user co-creation in product R&D, packaging design, communication language, and even scenario construction. For example, launching portable bagged tea tailored for "office scenarios", customized cultural and creative teaware sets for "social scenarios", and IP collaboration series for "young people's culture" can enhance market responsiveness and brand differentiation (Prahalad & Ramaswamy 2004).

4. Dual empowerment pathway of technology and culture: Building a three-dimensional interconnected system of "Culture-Consumption-Media". Qualitative research in Chapter 6 shows that digital communication tools (such as live-streaming e-commerce and short video platforms) are gradually becoming the primary channels influencing tea consumption behavior, particularly among young people, whose consumption decisions are significantly influenced by visual content, narrative culture, and interactive social media. In this context, the sustainable development path for Sichuan's tea industry cannot rely solely on "cultural output" or "technological promotion", but must instead achieve dual empowerment through technology and culture, building a cross-media consumption ecosystem centered on content-driven innovation. Specifically, enterprises and local governments need to collaborate to create a "culture + media + consumption" integration matrix to promote the construction of a cross-media value chain. This involves telling "Sichuan tea stories" on short video platforms, achieving "interactive scenario sales" on live

UNIVERSITI KEBANGSAAN MALAYSIA

streaming platforms, and incorporating local culture and ethnic identity into IP design to achieve brand personification, consumption immersion, and cultural sharing. For example, developing the "Emei Snow Bud × Youth National Style Tea Affairs" co-branded product transforms traditional culture into consumable, shareable, and social media content, thereby facilitating the conversion of cultural capital into market capital (Bourdieu 1984).

6.6 CHAPTER SUMMARY

This chapter employs qualitative research methods to systematically explore the consumption intentions and behavioral mechanisms of tea consumers in Sichuan Province within the context of urbanization. Based on 12 in-depth interviews with industry experts and field research at 25 tea companies, which yielded 120,000 words of raw data, open-ended, axial, and selective coding methods were used to construct four (4) core categories: consumer personal characteristics, behavioral attitudes, subjective norms, and behavioral control. The study reveals the multidimensional driving mechanisms of consumer behavior in an urbanized context, providing a solid theoretical foundation for the industry to adapt to shifts in consumption patterns.

First, from the individual consumer perspective, factors such as age, gender, educational attainment, occupational type, income level, marital status, and the urbanization level of the residence significantly influence tea preferences and consumption intentions. The study found that consumers exhibit strong stratification and generational differences across dimensions such as flavor type, packaging aesthetics, health functionality, price sensitivity, and brand loyalty. These divisions reflect how urbanization is fostering trends toward "group labeling" and "scenario segmentation" in tea consumption, emphasizing the need for market supply to adapt to changes in population structure.

Second, the behavioral attitude dimension, starting from consumers' internal motivational systems, reveals how perceptions of tea's health value, cultural emotional projections, price evaluation systems, and quality trust mechanisms shape purchasing motivations. Tea no longer exists solely as a daily beverage but simultaneously

UNIVERSITI KEBANGSAAN MALAYSIA

embodies the triple values of “health—identity—social interaction”. Research indicates that urbanization has facilitated a behavioral transformation among consumers, shifting from function-oriented to culture-oriented and from price-oriented to experience-oriented.

UNIVERSITI KEBANGSAAN MALAYSIA

CHAPTER VII

CONCLUSION AND POLICY RECOMMENDATIONS

7.1 MAIN FINDINGS

This chapter serves as a concluding synthesis of the study and focuses on integrating the key empirical findings from Chapters 4, 5, and 6, rather than reiterating methodological procedures or data analysis processes. Building upon the quantitative and qualitative results, this chapter distills the core mechanisms through which urbanization influences the sustainable development of the Sichuan tea industry from social-cultural, market-economic, and ecological-environmental perspectives.

On this basis, the chapter further identifies the theoretical contributions of the study and translates the research findings into targeted policy recommendations and managerial implications. By emphasizing synthesis, interpretation, and application, this chapter aims to provide a coherent bridge between empirical evidence and practical strategies for promoting the sustainable transformation of the Sichuan tea industry under the ongoing urbanization process.

7.1.1 The impact of urbanization on the sociocultural aspects of Sichuan's tea industry

With the acceleration of urbanization, the Sichuan tea industry has experienced significant changes at the sociocultural level, especially in terms of the diversification of consumer groups. Urbanization has contributed to the transformation of consumers' lifestyles, especially among younger groups, where tea consumption is no longer just a traditional daily drink, but is closely linked to health, lifestyle, and cultural identity (Czarniecka-Skubina et al. 2022). Especially young consumers are increasingly concerned about healthy tea drinking, and tea is not only seen as a natural health drink,

UNIVERSITI KEBANGSAAN MALAYSIA

but also as a symbol representing a healthy lifestyle. The demand for healthy tea drinking has driven the rise of highly functional teas (e.g., antioxidant, lipid-lowering teas, immune-regulating teas, etc.), a trend that is particularly evident in urbanization (Islam & Han 2012).

At the same time, with the gradual enhancement of consumers' brand identity of tea, tea is no longer just a mere consumer product, but more of a status symbol and cultural icon (Band & Shah 2014). Especially among modern consumers, the brand is no longer just a symbol of product quality, but also carries consumers' identification with tea culture. For example, the brand image of Sichuan's local tea culture, traditional craftsmanship, and regional specialty teas has gradually become an important element of marketing. Some brands have begun to focus on combining local characteristics with modern tea culture, using new communication methods such as digital media and social platforms to make Sichuan tea culture more widely spread (Chen & Li 2020).

With urbanization, the diversification of the consumer base, especially the importance of healthy tea drinking and tea brand identity among the younger generation, is driving the rise of the market for high-functionality teas (e.g., antioxidant, lipid-lowering teas, immune-regulating teas, etc.). This trend is in line with the study by Smith and Liu (2019), which highlights the role of urbanization in promoting tea culture identity among consumers, especially among the younger group, where tea is not just a beverage, but also a representation of a healthy lifestyle. In addition, Chen and Li (2020) discussed how the communication of tea brand culture can be strengthened through social media and digital marketing to meet the needs of modern consumer groups, especially in the context of rapid urbanization (Chen & Li 2020), which is also in line with the findings of the present study, suggesting that the Sichuan tea culture has been given new opportunities in the modern consumer environment through digital communication and innovative means have been given new opportunities, and that cultural identity and brand influence play an important role in the process of urbanization.

In conclusion, the results of the study show that urbanization has a significant effect on labor resources in the tea industry. According to the results in Chapter 4, the

UNIVERSITI KEBANGSAAN MALAYSIA

p-value is 0.005 (p<0.01), indicating that urbanization has a significant impact on the labor resources of the tea industry. A large number of rural laborers flow to the city, resulting in the tea industry facing a labor shortage (Zhang 2018), which affects the production and processing of tea; the urbanization process has a significant impact on the inheritance and preservation of traditional culture in the tea industry, which was obtained through the analysis in Chapter 5, with a *p-value* of 0.056 (p<0.1), and although close to the level of significance, the results failed to pass the rigorous test of significance (p>0.05). This indicates that urbanization has a certain impact on the inheritance and protection of traditional culture, but this impact fails to reach a statistically significant level, and may be interfered by other variables; the urbanization process has a significant impact on the cultural identity of the tea industry, and the results of the empirical analysis in Chapter 6 show a *p-value* of 0.018 (p<0.05), which indicates that the urbanization process significantly enhances the consumer's Sichuan tea cultural identity. Consumers pay more attention to the cultural background and traditional values of tea, which enhances brand loyalty and cultural identity in the tea market (Q2).

In terms of the impact of labor resources, my study points out that the urbanization process exacerbates the loss of labor, resulting in the tea industry facing a labor shortage, while the existing literature focuses more on how modernization and technology reduces the dependence on labor, a finding that enriches the body of existing literature (Bu et al. 2020). The literature focuses more on how modernization and automation technologies in the tea industry reduce the reliance on labor, whereas my study points out that the urbanization process exacerbates the loss of labor, resulting in the tea industry facing labor shortage. Most of the existing literature focuses on the direction of technological substitution of labor, however, my study focuses on the labor shortage in the tea industry in the context of urbanization leading to rural-urban labor mobility. The difference may be related to labor mobility in specific areas of Sichuan, especially in the more rapidly urbanizing areas, where changes in rural labor mobility and employment opportunities may have affected the availability of labor in the tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

However, urbanization has also brought challenges to the transmission of local tea culture. The process of urbanization has resulted in more and more young people leaving traditional agricultural areas and moving to cities, leading to the risk of losing part of the traditional tea culture and handmade tea-making techniques (Smith & Liu 2019). The original inheritance of local tea culture has encountered resistance in the context of modernization, especially among the younger generation of consumers, where traditional tea culture is relatively less recognized and valued. Therefore, how to inherit and promote Sichuan tea culture through modernization is an urgent problem for the tea industry in the process of urbanization. The dissemination and innovation of modern tea culture provides opportunities, for example, through tea culture festivals, tea art performances, and digital tea culture promotion, which can preserve the traditional essence while meeting the needs of contemporary consumers. The transmission and preservation of traditional culture had an effect in my study, but failed to reach significance (p=0.056, close to the level of significance). This is in contrast to studies by Smith and Liu (2019) and Chen and Li (2020), which emphasized the increased cultural identity and the importance of tea culture among young consumers. My study suggests that although urbanization promotes consumers' identification with tea culture, traditional tea culture is relatively less recognized and valued as young people move more to cities. In contrast, other literature may have focused more on changes in overall cultural identity and failed to focus on specific problems in the process of cultural transmission, such as the gradual disappearance of traditional craftsmanship and low awareness of local tea culture among young consumers. While urbanization provides opportunities for modern communication and innovation, it also poses challenges to the transmission of local tea culture. This is in contrast to much of the literature that emphasizes urbanization for the transmission and dissemination of traditional culture. Most of the literature focuses on urbanization as a driving force for cultural innovation; however, the study emphasizes the departure of young people from rural areas, leading to the loss of traditional handicrafts and difficulties in the transmission of tea culture. This difference may stem from the particular context of Sichuan's tea industry in the context of urbanization, where the transmission of traditional tea culture has encountered practical difficulties in the context of rapid urbanization and the migration of young people to cities. Much of the literature fails to

UNIVERSITI KEBANGSAAN MALAYSIA

focus on the dual nature of traditional culture in the context of urbanization - as both a driving force and a challenge.

The social culture of the tea industry plays a mediating role in the impact of urbanization on the market economy of the tea industry, and the analysis in Chapter 6 shows a *p-value* of 0.038 (p<0.05), which indicates that the social culture of the tea industry does play a mediating role in the impact of urbanization on the market economy. The sociocultural factors further contribute to the growth of the market economy by influencing consumers' identification with tea, which is consistent with the findings of Zhang (2018) and Smith and Liu (2019) (Q4), highlighting how socio-culture affects consumer decision-making and market economic growth, which is consistent with my results. However, my study concludes that sociocultural mediation in urbanization on the market economy of the tea industry is significant, which is not common in some studies, especially in those involving agriculture and traditional industries. Many studies have focused on the direct impact of technological innovations or policies on industry development, with less consideration given to the mediating role of cultural factors. In this study, by combining Sichuan tea culture with the demands of a modern market economy, findings propose how social culture can play an indirect role in promoting a market economy. This research perspective is more unique and may reflect a unique path for the Sichuan tea industry to promote market economic growth through tea culture and brand communication in the context of globalization and modernization.

7.1.2 Urbanization as a catalyst for the market economy

With the advancement of urbanization, the market demand structure of Sichuan tea industry has changed significantly. Urbanization has a significant effect on the change of market demand in the tea industry. According to the empirical results in Chapter 4, the *p-value* is 0.032 (p<0.05), indicating that urbanization has a significant effect on the change of market demand. The urbanization process promotes consumer demand for high-quality, green, and eco-friendly tea, which significantly enhances the market demand of the tea industry in Sichuan; urbanization has a significant effect and impact on the market investment opportunities in the tea industry. The test conducted by

UNIVERSITI KEBANGSAAN MALAYSIA

structural equation modelling (SEM) in Chapter 5, with a *p-value* of 0.021 (p<0.05), indicates that urbanization has a significant positive impact on the market investment opportunities in the tea industry, especially in the production of green and eco-friendly teas and high-end teas. According to the analysis in Chapter 6, the *p-value* is 0.049 (p<0.05), indicating that urbanization has a significant impact on the increase of production costs in the tea industry. Changes in land use and increase in labor costs have a negative impact on the production costs of the tea industry (Q1).

In the past, consumers focused more on the basic functions of tea (e.g., taste and quality). However, with urbanization and diversification of lifestyles, consumer demand for tea has become more focused on its ecological attributes and green functions. Against this backdrop, high-quality and green eco-tea has become a prioritized consideration for consumer choice, driving the rapid growth of the high-end tea market. Consumers are beginning to prefer tea with eco-labelling and organic certification, which is directly contributing to the transition of the tea industry towards green sustainability. Zhang et al.'s (2021) study shows that the increase in consumer demand for green products is driving the development of the high-end market, especially in the tea industry, where the demand for green and organic products is growing significantly (Zhang et al. 2021). In addition, Wang et al. (2020) stated that the increasing demand for green consumption and environmental awareness promoted the transition of the tea industry towards green production. These studies further validate the findings of this study that urbanization drives the market economy of the Sichuan tea industry, suggesting that green and eco-friendly tea has become a preferred criterion for consumers to purchase tea, and that it promotes the transition of the Sichuan tea industry towards green and sustainable production.

At the same time, competition in the market is becoming more intense, especially in the production and marketing of tea in Sichuan. With the diversification of market demand and changes in consumer preferences, companies not only face the challenge of how to ensure the quality of tea, but also need to invest more resources in marketing and brand building. For example, tea companies are attracting consumer attention by building a strong brand image and focusing on packaging design and cultural delivery of tea. In this process, the Sichuan tea industry needs to combine local

UNIVERSITI KEBANGSAAN MALAYSIA

cultural characteristics with modern brand marketing to create a tea brand image that meets contemporary market demands. The urbanization process has significantly contributed to the increase in production costs, mainly in terms of land use changes and rising labor costs. This is different from some of the studies in the existing literature. Most of the literature focuses on how technological innovations and large-scale production can reduce production costs, especially in the application of automation and modern production methods in tea. However, land resource constraints and labor loss due to urbanization are the main factors driving up production costs in my study. Most of the existing literature focuses on how technology and innovation contribute to production efficiency, while this study highlights the resource constraints and rising labor costs associated with urbanization. This discrepancy may be due to the specific urbanization context of the Sichuan region, where the faster rate of urbanization has led to higher costs in the production chain rather than relying on technological innovation to solve production problems. The importance of branding and marketing in dealing with market competition, especially in the context of urbanization, tea companies need to strengthen their brand image building, packaging design and cultural transmission. This is verified in the literature, but in the combination of local culture and modern brand marketing, i.e., tea enterprises should focus on local characteristics and cultural connotations in brand marketing. This perspective has not been sufficiently emphasized in some of the literature. Sichuan tea culture has a deep historical heritage, but in the process of rapid urbanization, how to combine local characteristics with modern market demand is a special challenge for the Sichuan tea industry. Therefore, my study provides more specific practical guidance on marketing strategies and cultural heritage.

In order to cope with the fierce market competition, enterprises in the Sichuan tea industry not only need to improve the technical level in the production process, but also need to innovate in sales channels, exploring new sales channels such as e-commerce platforms and social media. At the same time, enterprises also need to pay more attention to the interaction with consumers, listen to market demand, and promote the development of personalization and customization of the tea industry to meet the diverse needs of different consumer groups.

UNIVERSITI KEBANGSAAN MALAYSIA

7.1.3 Ecological pressure and green production challenges

The empirical findings of this study indicate that while urbanization creates new opportunities for the upgrading of the Sichuan tea industry, it also generates substantial ecological pressure and poses significant challenges to green production. Drawing on the results presented in Chapters 4, 5, and 6, this section identifies multiple pathways through which urbanization affects the ecological environment of tea production and, in turn, the sustainability of the industry.

First, this study finds that urbanization exerts a statistically significant negative impact on the ecological environment of tea plantations. The structural equation modeling results in Chapter 4 show that the effect of urbanization on tea plantation ecology is significant (p=0.042, p<0.05), indicating that urban expansion, infrastructure development, and changes in resource allocation place direct pressure on the stability of tea-growing ecosystems. While previous studies reviewed in Chapter 2 have generally suggested that urbanization constrains agricultural ecosystems, the present study advances this understanding by demonstrating how such pressures manifest concretely in major tea-producing areas of Sichuan.

Second, the results confirm that urbanization significantly accelerates changes in land-use patterns within the tea industry. As reported in Chapter 5, the empirical test reveals a significant relationship between urbanization and land-use change in tea-producing areas (p=0.035, p<0.05). The expansion of urban land has led to the conversion of some tea plantations into industrial, residential, or infrastructure uses, thereby reducing the spatial basis for tea cultivation. These finding highlight land-use transformation as a critical constraint on the long-term sustainability of the Sichuan tea industry, rather than a purely contextual background factor.

Third, this study demonstrates that urbanization indirectly intensifies ecological stress through increased environmental pollution. The analysis in Chapter 6 shows that the impact of urbanization on environmental pollution is statistically significant (p=0.023, p<0.05), particularly with respect to water quality and ambient environmental conditions affecting tea plantations. This result suggests that ecological pressure arises

not only from land scarcity but also from declining environmental quality under urbanization.

More importantly, this study identifies the ecological environment as a mediating mechanism in the relationship between urbanization and the market economy of the tea industry. The mediation analysis in Chapter 5 indicates that the ecological environment plays a significant intermediary role between urbanization and market-economic outcomes (p=0.049, p<0.05). This constitutes a key original contribution of the present research. While much of the existing literature focuses on the direct effects of urbanization on either ecological conditions or economic performance, this study reveals how ecological conditions influence market outcomes by shaping green product supply and consumer environmental awareness.

When combined with the consumer behavior results, the findings suggest that increasing ecological pressure has coincided with a rising market demand for green and eco-friendly tea products in Sichuan. In this context, ecological quality is no longer merely a constraint on production, but increasingly functions as a source of market value. This indicates that ecological protection can become an endogenous driver of industrial upgrading rather than a purely regulatory burden.

At the same time, this study emphasizes that green production is not a cost-free transition. Urbanization-driven increases in land prices, labor costs, and management complexity impose tangible constraints on tea enterprises attempting to adopt organic cultivation practices and ecological protection measures. Compared with existing studies discussed in Chapter 2, which often emphasize the benefits of green production, the present research highlights the practical trade-offs between technological requirements, cost pressures, and ecological objectives from the perspective of industry actors.

Based on these findings, this study argues that achieving sustainable development in the Sichuan tea industry under urbanization requires coordinated advancement of ecological protection and green production through technological innovation and policy support. Only by transforming ecological constraints into

UNIVERSITI KEBANGSAAN MALAYSIA

competitive advantages can the industry realize the dual objectives of economic growth and ecological sustainability.

7.1.4 Impact of consumer behavior on the development of the tea industry

With the advancement of urbanization, consumer behavior has changed significantly. The diversified needs of consumers are reflected in their preferences for tea's health functions, brand image, price sensitivity and purchase channels (Hao et al. 2019). Younger generation consumers, especially white-collar workers in cities, are more inclined to buy tea with health functions, especially antioxidant, weight loss, refreshing and other efficacy tea. In addition, brand image, packaging design and cultural value of tea have gradually become important criteria for consumers to choose tea (Zhou & Huang 2020).

Behavioral attitudes in tea consumption decisions (willingness to consume, number of times consumed, cost of consumption, channel source of understanding tea, quality taste and function of tea, and safety of tea) have a significant effect on tea consumption intention. The results in Chapter 6 show a *p-value* of 0.022 (p<0.05), indicating that behavioral attitudes in tea consumption decision-making have a significant effect on consumption intentions, especially in terms of perceived health functions, quality taste and safety. In the existing literature, studies on consumers' perceived behaviors have focused on price sensitivity, quality evaluation, and choice of purchasing channel (Xu et al. 2021), but my study demonstrates through empirical data how these factors work together and have a significant impact on tea consumption intentions. In particular, the thesis study takes into account the changes in urbanization and modern consumers, especially when consumers are faced with multiple choices (e.g., online vs. offline channels, trade-offs between price and brand, etc.) when shopping, and how to weigh these factors becomes crucial in influencing their purchase decisions. This perspective is understudied in the existing literature, especially in the transformation process of traditional consumer goods (e.g., tea).

The subjective norms of tea consumption decision-making (the willingness of surrounding family and friends to consume tea, the attitude of surrounding family and

UNIVERSITI KEBANGSAAN MALAYSIA

friends towards the willingness to consume tea, the willingness degree of consumers to follow the recommendations of family and friends, the degree of consumers to listen to the recommendations of tea professionals, and the main scenarios of tea consumption) have a significant impact on the willingness to consume tea, and the analysis in Chapter 5 shows that the *p-value* is 0.041 (p<0.05), indicating that social norms (recommendation of friends and family, expert advice) have a significant effect on tea consumption intention, especially in brand selection, consumers are more inclined to follow the recommendations in the social circle. The perceived behaviors of tea consumption decisions (consumers' reasons for choosing tea, consumers' reasons for not choosing tea, consumers' overall evaluation of the quality and standard level of tea, and the main channels for consuming tea) have a significant effect on tea consumption intention, and Chapter 6 shows a *p-value* of 0.035 (p<0.05), suggesting that consumers' perceived behaviors on the quality of tea, the price, and the channels for purchasing tea have a significant effect on their willingness to consume (Q7, Q 8, Q 9). Social norms (e.g., recommendations from family and friends, advice from professionals) have a significant effect on consumers' willingness to consume tea, especially in terms of brand choice. This finding is consistent with the existing literature. Social influences (e.g., recommendations from family and friends) are often an important determinant when consumers make purchase decisions (Smith et al. 2018). Thus, this study further validates this by demonstrating the influence of social norms in tea consumption decisions, especially in brand selection. Li and Zhang (2019) also discuss the role of social factors in consumer purchase decisions, especially in consumer goods in traditional industries such as tea, where the influence of family, friends, and professional advice on consumer choice is more significant.

The basic personal characteristics of consumers (age, gender, education, occupation, income, marriage, and level of urbanization of the place of residence) have a significant effect on the willingness to consume tea. The analysis in Chapter 5 shows a *p-value* of 0.003 (p<0.01), indicating that consumers' personal characteristics have a significant effect on tea consumption intentions. In particular, there is a significant difference in consumers' willingness to consume tea under the influence of factors such as age, gender and income (Q6). Zhou and Huang (2020) showed that consumers' personal characteristics, especially age and income level, significantly affect their

UNIVERSITI KEBANGSAAN MALAYSIA

willingness to consume green and healthy teas. Hao et al. (2019) further pointed out that young consumers are increasingly health-conscious, and they pay more attention to the health functions and brand value of tea, which directly affects their purchasing decisions. These findings are consistent with the findings of this study, suggesting that the behavior and preference of tea consumption are significantly influenced by personal characteristics.

Younger consumers tend to focus on the fashionable and social attributes of tea, while older consumers pay more attention to the health functions and taste quality of tea (Chen et al. 2020). Higher income groups are more inclined to choose high-end brands and customized products, while lower- and middle-income groups pay more attention to cost-effectiveness and tend to choose moderately priced tea. Enterprises in the Sichuan tea industry should conduct accurate market positioning and product development according to these consumer characteristics, segment market demand, and launch tea products that meet different consumer needs. Meanwhile, with the popularization of e-commerce platforms and online shopping, the choice of channels for consumers to buy tea has also changed (Luo et al. 2020). Consumers in the process of urbanization are more inclined to buy tea through e-commerce platforms, social media and other channels, which requires tea enterprises to strengthen the construction of online sales channels and improve the operational capacity of e-commerce platforms to adapt to the new consumption trend. Tea enterprises should conduct precise market positioning based on consumers' individualized needs, especially in product development and the launch of customized tea. While existing literature has also emphasized the growth of market segmentation and personalized demand, fewer have specifically pointed out that the tea industry needs to be so meticulous in customized product development to meet the needs of different consumer groups. Most of the existing studies have focused on the traditional tea market and consumer groups, failing to adequately take into account the modern consumer demand for personalized and customized products, especially as the demand for customized and personalized tea products is becoming more pronounced with urbanization and the increased health awareness of the younger generation of consumers. Therefore, the study presents this unique perspective, especially in the Sichuan tea industry, where companies need to

UNIVERSITI KEBANGSAAN MALAYSIA

strengthen the design and promotion of personalized products based on the combination of local characteristics and modern consumer demand.

The process of urbanization has driven a shift in consumer demand for tea from basic functions to multi-faceted needs such as health functions, brand identity, and price sensitivity, especially among young consumers, where tea is not only a daily drink, but also a representation of health and lifestyle. This finding is consistent with Zhou and Huang's (2020) study, which noted that age, income, and health awareness significantly influence consumers' purchase intentions, especially in terms of their willingness to consume green and healthy teas. The preference of young consumers' health functions and their identification with tea brands in your study are highly consistent with the findings of Zhou and Huang (2020). Hao et al. (2019) further showed that young consumers are more concerned about the health functions and brand value of tea, which directly influences their purchase decisions. Similarly, your study shows that young consumers prefer tea with healthy functions, especially tea with antioxidant, weight loss, and energizing effects, reinforcing this healthy tea drinking trend.

7.2 RESEARCH CONTRIBUTION

7.2.1 Theoretical contributions

Building upon existing studies on urbanization and industrial sustainability, this research takes the Sichuan tea industry as its empirical focus and systematically examines how the urbanization process influences the sustainable development of traditional specialty industries through multiple interacting mechanisms, with particular emphasis on consumer behavior as a key transmission pathway. At the theoretical level, the study not only deepens and extends prior research on urbanization and sustainable development, but also makes substantive contributions in terms of analytical structure reconstruction, behavioral mechanism integration, measurement innovation, and contextualized theoretical explanation.

UNIVERSITI KEBANGSAAN MALAYSIA

a. Reconstructing a multidimensional analytical structure of urbanization's impact on industrial sustainability

Unlike conventional studies that treat sustainability as a single outcome variable, this research conceptually disaggregates "industrial impact" into three (3) interrelated dimensions—market economy, sociocultural system, and ecological environment. Through this structural reconstruction, industrial sustainability is redefined as a multidimensional and dynamically evolving system, in which different subsystems respond to urbanization through differentiated yet interconnected pathways.

This theoretical reframing moves beyond an economically reductionist view of urbanization effects and embeds industrial sustainability within a broader framework of economic performance, cultural transformation, and ecological constraints, thereby enhancing the explanatory depth of urbanization–industry sustainability theory.

b. Constructing and empirically validating a multidimensional Integrated Framework of "Urbanization–Consumer Behavior–Industrial Sustainable Development"

At the level of theoretical integration, this study moves beyond the prevailing approaches that primarily attribute the impacts of urbanization to production-side factors, factor mobility, or policy interventions. Instead, it formally introduces consumer behavior as a key micro-level mediating mechanism linking the macro-level process of urbanization with industrial-level sustainable development outcomes.

Grounded in the triple bottom line (TBL) framework and the theory of planned behavior (TPB), this study constructs a multi-layered analytical framework in which industrial sustainability is conceptualized across three (3) core dimensions: market economy, social system, and ecological environment. Within this structure, and in light of the highly culture-embedded nature of the Sichuan tea industry, the social dimension is further refined in a contextualized manner, with particular attention given to cultural identity, brand cultural value, and social norms as key mechanisms shaping consumer behavior and market evolution.

UNIVERSITI KEBANGSAAN MALAYSIA

Empirical results demonstrate that urbanization influences industrial sustainability not only through structural or economic channels, but also by reshaping consumers' behavioral attitudes, cultural identification, and behavioral intentions, which in turn alter market demand structures, industrial upgrading trajectories, and pathways toward green transformation. The findings indicate that, in traditional and culturally embedded industries, cultural elements do not function as external or additional factors beyond the social dimension; rather, they constitute integral components of the social system itself, exerting profound influence on industrial sustainability by shaping consumer cognition and behavioral choices under conditions of urbanization.

Without departing from the foundational paradigm of the triple bottom line theory, this integrated theoretical model enhances its explanatory power for culturally embedded industries. It directly addresses a critical gap in the existing literature concerning the lack of explanatory linkage between macro-level urbanization processes and micro-level industrial behavioral mechanisms, and offers a novel analytical perspective for understanding the behavioral and social foundations of industrial sustainable development.

c. Developing and validating a multidimensional consumer behavior scale adapted to the urbanization context

At the methodological and theoretical interface, this study develops and validates a revised multidimensional consumer behavior scale tailored to the specific context of urbanization and the Sichuan tea industry. Existing consumer behavior scales are predominantly derived from general food consumption or green consumption studies and are often insufficient to capture the cultural, ecological, and behavioral complexity of traditional industries under rapid urbanization.

Grounded in the TPB framework and informed by systematic literature review, in-depth interviews, and multiple rounds of expert consultation, the revised scale comprises four (4) core dimensions:

UNIVERSITI KEBANGSAAN MALAYSIA

1. Behavioral attitudes, capturing consumers' evaluations of health functions, quality experience, and emotional value of tea;
2. Subjective norms, reflecting the influence of kinship networks, sociocultural identity, and group interactions on consumption decisions;
3. Perceived behavioral control, focusing on consumers' subjective judgments regarding channel reliability, affordability, and accessibility;
4. Extended cultural and green cognition, measuring awareness of green production practices, ecological labels, and the cultural value of local tea.

Reliability and validity tests confirm that the revised scale exhibits strong structural stability, internal consistency, and explanatory power. The scale fills a theoretical and methodological gap in measuring consumer behavior within the context of urbanization and traditional specialty industries, and provides a replicable and extensible measurement tool for future research.

d. Identifying the mediating and synergistic roles of sociocultural and ecological mechanisms

Beyond consumer behavior, this study explicitly incorporates sociocultural and ecological systems as dual mediating mechanisms in the urbanization–industry relationship, and constructs and empirically tests a multi-path model of "urbanization → sociocultural system/ecological environment → market economy → sustainable industrial development".

The findings indicate that sociocultural and ecological factors are not merely external constraints, but act as structural forces that actively shape industrial trajectories through cultural identity reconstruction, value reconfiguration, and ecological feedback mechanisms. In the context of the Sichuan tea industry—a highly culture-embedded sector—local tea culture, brand cultural value, and green consumption awareness function as critical bridges linking urbanization to market growth. This insight extends sustainability theory by emphasizing the structural role of non-economic factors in industrial evolution under urbanization.

UNIVERSITI KEBANGSAAN MALAYSIA

e. Advancing a contextualized theoretical explanation for traditional specialty industries under urbanization

By situating the analysis within the Sichuan tea industry—characterized by deep cultural heritage, ecological sensitivity, and accelerated urbanization—this study moves beyond theoretical perspectives predominantly derived from eastern China or generalized agricultural sectors. The findings demonstrate that, in culturally embedded traditional industries, urbanization does not necessarily erode industrial foundations or cultural value. Instead, it may foster new forms of sustainability through consumption upgrading, cultural value reconstruction, and the expansion of green demand.

This contextualized contribution enriches theoretical understanding of the relationship between urbanization and traditional cultural industries and provides a transferable analytical framework for studying sustainability transitions in other regionally distinctive sectors.

7.2.2 Methodological contributions

This study makes innovative methodological contributions, especially in the combination of qualitative and quantitative research methods as well as the design and application of empirical analysis models, demonstrating a unique perspective and practicality different from that of traditional studies. In tea industry research, especially in the complex topic of the impact of urbanization on the tea industry in Sichuan, a single quantitative or qualitative research method cannot comprehensively reveal the complex relationships among various social, economic, and ecological factors. In order to solve this problem, this study adopts a combination of qualitative and quantitative research methods, providing richer background information for the quantitative study through qualitative data collection means such as in-depth interviews and expert interviews, and analyzing the quantitative data through structural equation modeling (SEM), so as to reveal more comprehensively the multilevel impacts of urbanization on the social, economic, and ecological dimensions of the tea industry in Sichuan. Through in-depth and expert interviews, the study was able to obtain first-hand information about the Sichuan tea industry in the context of urbanization, especially detailed insights about subjective factors such as social and cultural identity, brand identity, and consumer

UNIVERSITI KEBANGSAAN MALAYSIA

behavior. The qualitative data not only helped the researcher to understand consumer behavior and attitudes in the tea industry, but also provided a clear theoretical framework and variable design direction for the subsequent quantitative analysis. For example, the study clarifies how sociocultural factors can further drive market demand for tea in Sichuan by enhancing consumer identity.

a. Integrated analysis combining qualitative and quantitative research methods

In the quantitative part, this study used structural equation modelling (SEM) to analyze the data. SEM can not only deal with complex multivariate relationships, but also effectively verify the individual paths and causal relationships in the hypothetical model. Through the path analysis, it is found that the impact of urbanization process on the tea industry in Sichuan is mainly reflected in the interaction of three (3) dimensions, namely, market demand, sociocultural factors, and ecological and environmental pressures. SEM analysis not only reveals the relationships among different factors, but also verifies the significance of these relationships, which provides a strong empirical support for the sustainable development of the tea industry.

By combining qualitative and quantitative research methods, the study avoids the limitations of a single approach. For example, qualitative research provides insightful understanding in identifying variables and theory construction, while quantitative research verifies the validity of hypothesized models through precise statistical analysis. This combination of methods gives the research not only theoretical depth but also the broad applicability of empirical analysis. Qualitative research provides a theoretical foundation for quantitative analysis, while quantitative analysis provides empirical evidence for the validation of the theoretical framework, and the two (2) complement each other to ensure the scientificity and reliability of the research results.

b. Constructed an empirical analysis model for Sichuan tea industry

In constructing the model, this study builds the hypothetical paths affecting the sustainable development of the Sichuan tea industry based on the triple bottom line theory (TBLT) and the theory of planned behavior (TPB), which are based on the

UNIVERSITI KEBANGSAAN MALAYSIA

sociocultural, economic, and ecological dimensions, respectively. In particular, sociocultural factors (e.g., brand identity, tea culture identity, etc.) are introduced into the model, which is a part usually neglected in urbanization studies, but for Sichuan tea industry, its cultural identity and local characteristics are crucial for market demand and brand development.

Through empirical analysis, the study reveals how urbanization affects the sustainable development of the tea industry through different paths (e.g., changes in market demand, transformation of consumer behavior, and intensification of ecological pressure). The results of the path analysis show that factors such as social and cultural identity, brand loyalty and green consumption demand play a key role in market demand, while land use change and ecological pressure are one of the major constraints to the sustainable development of the tea industry.

This study proposes a specific path for the sustainable development of the tea industry in Sichuan through the construction of an empirical model and data analysis. The study suggests that in order to achieve long-term sustainable growth of the Sichuan tea industry in the future, it is necessary to promote green production while enhancing consumers' identification with tea culture and brands, and expanding market share through innovative marketing strategies. In addition, enterprises need to upgrade technology in the production process, adopt green technology, and reduce the negative impact on the environment in order to realize a win-win situation for both economic and ecological benefits.

7.2.3 Practical contributions

From a practical perspective, this study moves beyond descriptive accounts of urbanization's impacts and proposes operational and policy-relevant pathways for promoting the sustainable development of the tea industry under conditions of rapid urbanization.

First, at the enterprise level, by identifying consumer behavior as a critical mediating mechanism, the study provides a theoretical basis for shifting from production-centered strategies toward demand-oriented and value-driven development

UNIVERSITI KEBANGSAAN MALAYSIA

models. The findings indicate that urban consumers increasingly prioritize green production, cultural value, and ecological responsibility. Accordingly, tea enterprises can enhance long-term competitiveness by integrating green technologies, cultural narratives, and brand strategies rather than relying solely on scale expansion or cost reduction.

Second, at the level of public governance, the study extends conventional policy perspectives—often focused on production subsidies or industrial expansion—toward a framework of ecological–cultural–market coordination. The results suggest that social culture and ecological environment can be transformed from regulatory constraints into sources of development momentum through appropriate institutional design. This insight provides empirical support for local governments to adopt integrated policy tools that combine ecological protection, cultural heritage preservation, and consumption guidance in the context of urbanization.

Third, in terms of regional development practice, the Sichuan tea industry case demonstrates the feasibility of value regeneration based on local culture and ecological resources. The differentiated experiences across tea-producing regions in Sichuan offer transferable lessons for other regions with similar endowments, showing how traditional industries can achieve modernization without cultural homogenization or ecological degradation.

Finally, at the strategic level, the development logic proposed in this study—"ecological priority, cultural empowerment, and collaborative innovation"—offers systematic guidance for industry organizations and enterprises formulating medium- and long-term development strategies. This framework supports the coordinated enhancement of economic performance, social legitimacy, and ecological resilience of the tea industry amid ongoing urbanization.

a. Policy support for addressing urbanization challenges in the Sichuan Tea industry

This study demonstrates that effective policy design is essential for guiding the Sichuan tea industry toward long-term sustainability. Based on the research findings, the following policy-oriented recommendations are proposed.

UNIVERSITI KEBANGSAAN MALAYSIA

1. Promoting green production technologies through institutional policy instruments

   The results highlight green production technologies as a key pathway for mitigating ecological pressure and enhancing industrial sustainability. Government authorities should actively guide tea enterprises toward environmentally friendly production models through explicit policy instruments, including:

   i. Providing fiscal subsidies, tax incentives, and green credit programs to reduce the cost burden associated with organic cultivation, ecological pest control, and sustainable farming practices;

   ii. Incorporating green production standards into agricultural support policies and industry access regulations, thereby transforming green practices from voluntary choices into institutionally encouraged behaviors;

   iii. Strengthening public agricultural extension services to deliver technical training and advisory support, particularly for small and medium-sized tea enterprises, ensuring that policy incentives are effectively translated into practice.

2. Supporting ecological tea garden development through land-use and industrial policies

   To address land scarcity and ecological stress arising from urban expansion, governments should employ spatial governance and industrial support policies to promote the development of ecological tea gardens. Specific measures include:

   i. Clearly defining the functional status of ecological tea gardens within land-use planning and farmland protection policies to ensure the long-term stability of high-quality tea-growing areas;

   ii. Offering targeted financial subsidies, ecological compensation, and certification incentives to tea gardens that meet ecological standards, guiding enterprises toward environmentally friendly, standardized, and scalable production models;

UNIVERSITI KEBANGSAAN MALAYSIA

iii. Integrating ecological tea garden development with rural revitalization, ecological compensation, and green development policies to form a coordinated, cross-sectoral policy support system.

3. Strengthening tea culture preservation and transmission through public cultural policies

Empirical evidence from this study indicates that tea cultural identity significantly enhances consumer brand loyalty and market demand. Accordingly, tea culture should be incorporated into public cultural and cultural–industrial integration policies. Governments may:

i. Allocate dedicated cultural funds and apply intangible cultural heritage protection policies to support the systematic documentation and dissemination of regional tea culture;

ii. Encourage tea enterprises to participate in tea culture festivals, exhibitions, tea ceremonies, and cultural tourism initiatives, thereby fostering synergies between culture, industry, and consumption;

iii. Use policy guidance to prevent the marginalization of tea culture during urbanization, positioning it instead as a public cultural resource that enhances regional branding and industrial value.

b. Strategic support for market positioning and branding of tea enterprises

With the acceleration of urbanization and the continuous upgrading of consumer demand, competition in the Sichuan tea industry has intensified markedly. In this context, market positioning and brand strategy have become critical strategic tools for tea enterprises to maintain competitiveness and achieve sustainable development. This subsection focuses on strategic-level market positioning and brand orientation, addressing what kind of market position tea enterprises should adopt under changing urban consumption structures.

Empirical results from this study indicate that consumers' age, income level, health awareness, and cultural preferences significantly influence tea consumption intentions. These findings suggest that a "one-size-fits-all" market strategy is no longer

UNIVERSITI KEBANGSAAN MALAYSIA

effective. Instead, tea enterprises should establish clear and differentiated strategic positioning based on major consumer segments. For example, younger urban consumers tend to value health functions, brand image, and lifestyle symbolism, while middle-aged and older consumers place greater emphasis on traditional attributes, functional benefits, and product reliability.

At the strategic level, brand building should move beyond basic product differentiation and incorporate cultural value construction and identity-based branding. As a culturally embedded product, Sichuan tea carries strong regional, historical, and symbolic meanings. Enterprises are therefore encouraged to integrate local tea culture, traditional craftsmanship, and regional identity into their brand narratives, transforming tea consumption from a purely functional act into a form of cultural and lifestyle expression.

Moreover, the study highlights that brand trust and cultural recognition function as important mediating mechanisms linking consumer behavior and market performance. Strategic market positioning should thus emphasize long-term brand credibility, consistent quality signals, and coherent cultural messaging, rather than short-term price competition. In this sense, market positioning is not merely a marketing technique but a strategic orientation that shapes enterprises' development paths in the urbanization process.

Overall, this subsection establishes a strategic framework for market positioning and branding, clarifying the direction and principles that Sichuan tea enterprises should follow in response to urbanization-driven changes in consumer structure and value orientation.

c. Promoting the practical application of eco-friendly production models

Under the ecological and environmental pressure, and resource constraints faced by the tea industry in Sichuan, promoting the implementation of eco-friendly production models has become the key to the sustainable development of the tea industry.

UNIVERSITI KEBANGSAAN MALAYSIA

1. Increase the research, development and application of green technologies. With the aggravation of problems such as land resource constraints and environmental pollution, tea enterprises must increase their investment in green production technologies and promote the application of green technologies, such as organic tea cultivation and green pest prevention and control technologies, in order to reduce the negative impact on the environment. The government and tea enterprises should strengthen cooperation to promote the research, development and application of relevant technologies to ensure the green development of the tea industry.

2. Construction and protection of eco-tea gardens. In the process of urbanization, the area of tea gardens is gradually decreasing, and some of the tea gardens have been converted into industrial land or land for urban development. Therefore, tea enterprises should strengthen the construction and protection of eco-tea gardens by adopting soil and water conservation and eco-agriculture, etc., to protect the soil, conserve water resources and reduce environmental pollution while maintaining tea production. By establishing eco-friendly tea plantations, not only can they improve the quality and market competitiveness of tea, but they can also meet the needs of modern consumers for green and environmentally friendly products.

3. Strengthening sustainable development strategies and policy support. In addition to the self-efforts of tea enterprises, the government should also introduce policies to support the development of eco-friendly production modes, such as incentivizing the implementation of green production by tea enterprises through green certifications, environmental incentive policies, etc. This will help the tea industry in Sichuan to meet the needs of consumers in terms of both economic and ecological benefits. This will help the Sichuan tea industry to realize a win-win situation in terms of economic and ecological benefits while meeting consumers' green consumption needs.

7.3 MANAGEMENT INSIGHTS

This thesis examines the impact of urbanization on the sustainable development of the tea industry in Sichuan. After analyzing the dimensions of changing market demand,

UNIVERSITI KEBANGSAAN MALAYSIA

sociocultural factors, and ecological pressures, it provides the following insights into the management practices of the tea industry in Sichuan. These insights are intended to help the tea industry promote its sustainable development and ensure its long-term competitiveness and ecological balance in the face of urbanization challenges.

7.3.1 Recognize and value the role of sociocultural factors in the development of the tea industry

This study shows that sociocultural factors play an important role in mediating the sustainable development of the tea industry in Sichuan during the urbanization process. With the advancement of urbanization, consumers' cultural identity and brand loyalty have a significant impact on tea consumption willingness, especially among young consumer groups, where the brand and cultural value of tea become an important purchase determinant. Therefore, tea enterprises should take the heritage of tea culture and brand building as an important part of their development strategy, and promote the modern dissemination and youthful development of tea culture, so as to enhance consumers' identification with Sichuan tea brands and further promote market growth.

In the process of urbanization, the needs of consumers are gradually changing, especially young consumer groups, who are more inclined to buy tea that not only has health functions and eco-friendly attributes, but also attaches great importance to the cultural value represented by tea. Research shows that brand culture occupies an increasingly important position in modern consumer purchasing decisions, especially in the era of globalization and information technology, the cultural connotation of the brand has become one of the important criteria for consumers to choose products. Therefore, Sichuan tea enterprises should actively strengthen the construction of brand culture, the local tea culture and modern brand marketing for effective combination, so as to enhance the market competitiveness of the brand. The enhancement and integration of cultural connotation, Sichuan tea enterprises should deeply excavate and refine the uniqueness of Sichuan tea culture, combined with modern brand marketing, to form a brand image with a deep cultural heritage and a wide sense of identity. For example, Sichuan's famous tea (such as Mengding Ganlu, Emei snow buds, etc.) has distinctive regional characteristics, these local tea culture should become the core element of brand marketing. At the same time, tea companies should be through the

UNIVERSITI KEBANGSAAN MALAYSIA

cultural story and the narrative of tea culture heritage, the local tea culture in a modernized and internationalized way to consumers, so that the brand is closer to the emotional needs of consumers. Multi-channel dissemination of brand culture, with the popularization of social media and e-commerce platforms, tea companies should take advantage of emerging communication channels (such as WeChat, Weibo, short video platforms, etc.) to improve the efficiency of tea culture dissemination. Utilizing social media to interact with young consumers, with the help of online marketing activities, brand cooperation and other methods, to continuously enhance consumer identification and loyalty to the brand. Especially among young groups, social media has become an important source of reference for purchasing decisions. Through accurate content marketing and social network communication, tea companies can attract more young consumers and enhance consumer loyalty to Sichuan tea through the dissemination of brand culture and in-depth interaction.

Tea culture education, as an important way to enhance consumers' cultural identity, has a far-reaching impact on the sustainable development of the tea industry in Sichuan. By carrying out various tea culture activities, it not only enhances consumers' understanding of tea, but also deepens their sense of identification with Sichuan tea culture. This sense of identity not only enhances the emotional connection of consumers, but also promotes the loyalty of tea brands, which in turn promotes the stability and expansion of the market. Sichuan tea companies can regularly organize tea culture festivals, tea performances, tea culture lectures and other activities to allow consumers to personally participate in the experience of tea culture. These activities not only help to enhance consumer recognition of Sichuan tea, but also can enhance the emotional connection of consumers to tea culture through a variety of forms of interactive sessions. For example, tea performances can enhance consumers' identification with tea culture by demonstrating traditional tea techniques and allowing them to better understand the production process and cultural background of tea. Tea companies can further enhance consumers' understanding and learning of Sichuan's tea culture through tea culture education programs, such as tea art courses and tea ceremony lectures. This not only helps consumers understand the history, value and connotation of tea culture, but also promotes them to form a more rational consumption concept, and promotes their loyalty and willingness to buy tea brands.

UNIVERSITI KEBANGSAAN MALAYSIA

7.3.2 Enhancing the perceived value of tea through multiple channels

In the context of urbanization, consumers' needs are increasingly diversified, especially in terms of health functions and brand culture, which are of growing concern to consumers. Tea companies must deeply understand the differences in consumer needs and target the perceived value of tea to enhance consumer satisfaction and brand loyalty. This study shows that perceived value, which covers emotional, social and functional values, plays an important mediating role in influencing consumer satisfaction.

With the increasing health awareness of modern consumers, the health function of tea has become a key factor in consumers' choice of tea. Studies have shown that consumers have a higher preference for teas with health functions such as antioxidant and immunomodulation, and the demand for health-functional teas has increased significantly, especially among young, middle-aged and elderly groups (Li & Zhang 2019). Therefore, tea enterprises should increase their investment in the innovation and research and development of functional tea and launch tea products with clear health benefits. Tea companies can utilize modern technologies, such as gene technology and biotechnology, to develop functional teas, such as antioxidant teas, fat-reducing teas, and immune-regulating teas, which will satisfy the growing consumer interest in tea functionality (Wang et al. 2020). Supported by scientific experiments and clinical data, the market persuasiveness and brand credibility of the products will be further enhanced. In addition to product innovation, tea companies should also focus on brand promotion by demonstrating the health functions of tea through scientific proof (e.g., research reports and clinical trials) and highlighting its health attributes in advertising and marketing. Through cooperation with health media and platforms, tea companies can increase product exposure and attract more consumer groups concerned about healthy lifestyles.

Emotional value and cultural identity play an increasingly important role in modern consumers' purchasing decisions, especially for young consumers, a brand is not only a representation of product quality, but it also carries the functions of emotional resonance and cultural identity. Research shows that consumers tend to buy brands that resonate with them on an emotional level. Therefore, tea companies should strengthen

the emotional connection with consumers through the brand story and the transmission of tea culture.

Studies have shown that consumers are increasingly inclined to choose environmentally certified products, especially green tea that focuses on eco-friendliness (Zhang et al. 2021). Tea enterprises should introduce green technologies such as organic planting techniques and green pest control to reduce the negative impact on the environment. In addition, tea enterprises can also reduce environmental pollution in the production process through green packaging (e.g., biodegradable materials), which is in line with modern consumers' demand for environmental protection.

In order to enhance consumer trust, tea companies should actively apply for and promote green certifications (e.g., organic certification, environmentally friendly certification, etc.), through which the market competitiveness of tea is enhanced. At the same time, tea companies should also be clearly labeled on product packaging with environmental labels to convey the environmental value of tea to consumers and meet the needs of environmentally friendly consumer groups.

This study provides tea companies with multifaceted strategies to enhance the perceived value of tea, especially in the areas of health function enhancement, emotional resonance and green certification. Tea enterprises should meet the increasingly diversified needs of consumers by innovating their products, strengthening their brand culture, and enhancing the green attributes of their products, which in turn will enhance consumer satisfaction and loyalty. These strategies will not only help tea enterprises to enhance market competitiveness, but also promote the sustainable development of the tea industry in Sichuan.

7.3.3 Promoting the implementation of eco-friendly production models

Problems such as land resource constraints and environmental pollution brought about by urbanization have put Sichuan's tea industry under severe ecological and environmental pressure. As land has been converted to urban development land in large quantities, agricultural resources, especially land for tea plantations, have become increasingly scarce, which poses a huge challenge to the sustainable development of the

UNIVERSITI KEBANGSAAN MALAYSIA

tea industry. At the same time, the excessive use of pesticides, chemical fertilizers and other chemical substances has also exacerbated the pollution of the ecological environment, leading to a series of problems such as soil degradation and water pollution. Therefore, tea companies must increase the research, development and application of green production technologies to ensure that the tea industry minimizes the negative impact on the ecological environment during the production process. This study emphasizes that green production is not only necessary to improve the sustainability of the tea industry, but also a key driver of tea market growth.

Green technology is a core element in realizing the sustainable development of the tea industry, and tea enterprises should actively invest resources in developing and applying more environmentally friendly production technologies. Studies have shown that the adoption of green technology can not only effectively reduce the impact of agricultural production on the environment, but also improve the quality of tea and meet modern consumer demand for eco-friendly products (Li & Zhang 2019). Tea enterprises should gradually shift to organic tea cultivation by reducing the use of pesticides and chemical fertilizers, adopting environmentally friendly means such as biological control to control pests and diseases, and using natural fertilizers (e.g., composting) and ecological planting techniques (e.g., mulching planting) to enhance soil fertility while reducing the pollution of the soil and water sources by chemical substances. Organic tea not only meets the growing demand for healthy consumption, but also improves market competitiveness through organic certification. Traditional pest control usually relies on chemical pesticides, but this approach poses a potential threat to the ecosystem and human health. Tea companies should actively adopt green prevention and control technologies such as biological control techniques, natural enemy introduction, and plant source pesticides to effectively prevent the occurrence of pests and diseases, as well as to protect the biodiversity of tea gardens and the balance of the ecosystem. Through the development of new environmentally friendly agents and prevention and control technologies, tea enterprises can effectively control pests and enhance the green attributes of their products. Most tea gardens in Sichuan Province are located in mountainous areas with limited water resources, so tea enterprises need to take water conservation measures to reduce water consumption. Through drip irrigation technology, water recycling systems and other water-saving technologies, not only can

UNIVERSITI KEBANGSAAN MALAYSIA

improve the efficiency of water resources, but also to protect the growth of tea trees in the dry season and reduce water pollution.

The construction of eco-tea gardens is a key link in realizing sustainable production. The government and tea enterprises should jointly promote the construction of eco-tea gardens to ensure that tea gardens realize sustainable production in the process of green development through soil and water conservation, ecological vegetation restoration and biodiversity protection. The terrain of tea plantations is mostly hilly and mountainous, which is prone to soil erosion. Therefore, tea enterprises should implement soil and water conservation measures, such as the construction of terraced tea gardens and protective forests, to reduce soil erosion and maintain the ecological balance of tea gardens. Through rational planning and construction, ensure that the tea garden can maintain soil fertility for a long time and avoid soil degradation caused by excessive development. Eco-tea garden is not only a place for tea production, but also an ecosystem. Tea enterprises should restore and protect the biodiversity of the tea plantation through diversified planting, forest and tea symbiosis, etc., to create an ecological environment conducive to the growth of tea trees. Through rational planning of the relationship between the tea garden and the surrounding natural environment, not only can improve the quality of tea, but also enhance the ecological service function of the tea garden.

In order to realize green production, government policy support is crucial. Policy guidance not only provides financial support, but also incentivizes tea enterprises to invest more resources in technological innovation and ecological protection. The government should introduce more active policy measures to promote the popularization and application of green production. The government should provide green credit and financial subsidies for tea enterprises to support them in purchasing green technology equipment, remodelling production lines, and promoting the research, development and application of green technologies. For example, it can provide low-interest loans for tea enterprises to purchase organic planting technology and equipment, or provide funds to support tea enterprises to build eco-tea gardens and environmental protection facilities. For tea enterprises that meet environmental standards, the government should provide tax incentives to encourage more tea

UNIVERSITI KEBANGSAAN MALAYSIA

enterprises to adopt green production technologies. At the same time, the government can also strengthen its support for green certification of tea enterprises, such as organic tea certification and green tea plantation certification, to help tea enterprises improve market competitiveness and increase consumer trust in green tea products. The government should formulate green production standards and environmental technical specifications to clarify the environmental protection requirements that tea enterprises should comply with during the production process, so as to promote the development of the industry as a whole in a green and sustainable direction. In addition, the government should strengthen green technology training and policy publicity to help tea enterprises understand and master green production technology, so as to enhance the overall environmental awareness and practice level of the industry.

In response to the ecological and environmental pressures facing the tea industry in Sichuan during the process of urbanization, it is important to adopt a combination of green production technologies and ecological tea plantation construction in order to reduce the negative impacts on the environment and to improve the tea industry's ability to develop in a sustainable manner. Through policy support, green technology research and development, and ecological protection measures, the Sichuan tea industry is able to realize a win-win situation for both environmental protection and economic benefits while ensuring tea quality and market competitiveness. Cooperation among the government, tea enterprises and related industries will provide a solid foundation for the green transformation of Sichuan's tea industry.

7.3.4 Precise market positioning and product innovation

The empirical findings indicate that urban consumers' tea preferences are increasingly diversified, reflecting variations in health concerns, lifestyle choices, and consumption scenarios. To translate strategic positioning into market performance, tea enterprises must develop product portfolios aligned with specific consumer segments. For instance, health-oriented consumers may be targeted through functional tea products emphasizing antioxidant, weight-management, or wellness attributes, while culturally oriented consumers may be served through products highlighting traditional craftsmanship, regional origin, and ceremonial value.

UNIVERSITI KEBANGSAAN MALAYSIA

Product innovation should also extend beyond tea formulations to include packaging design, consumption scenarios, and usage convenience. Urban lifestyles favor products that are portable, visually appealing, and suitable for multiple contexts such as offices, social gatherings, and gifting. Differentiated packaging sizes, modern design elements, and scenario-based product lines can effectively enhance consumer engagement and perceived value.

In addition, price differentiation plays an important role in operationalizing market positioning. The study finds clear heterogeneity in price sensitivity across income groups. Accordingly, tea enterprises should adopt tiered pricing strategies, offering premium products with strong cultural and quality attributes for high-income consumers, while maintaining cost-effective product lines for mass-market segments. Such differentiation helps avoid excessive price competition and supports sustainable profit structures.

Importantly, product innovation should remain consistent with the overall brand strategy and sustainability orientation. Innovations aligned with green production, ecological certification, and traceability not only meet consumer expectations but also reinforce brand credibility and long-term competitiveness.

7.4 RESEARCH LIMITATIONS AND FUTURE PROSPECTS

Despite the theoretical, methodological, and practical contributions of this study to understanding the impacts of urbanization on the sustainable development of the Sichuan tea industry, several limitations remain and provide directions for future research.

First, regarding the research scope, this study focuses on the tea industry in Sichuan Province. Although Sichuan represents a culturally rich and ecologically sensitive tea-producing region undergoing rapid urbanization, substantial differences exist across tea-producing areas in terms of natural conditions, industrial structures, and urbanization trajectories. Therefore, the generalizability of the findings beyond Sichuan remains limited. Future studies could adopt a comparative, cross-regional approach to

UNIVERSITI KEBANGSAAN MALAYSIA

examine how urbanization affects tea industries in different geographic and institutional contexts.

Second, in terms of research design, this study primarily employs a static analytical framework to examine relationships at a specific point in time. However, urbanization is an inherently dynamic and long-term process, and its impacts on consumer behavior and industrial sustainability may vary across different stages. Future research could incorporate dynamic modeling approaches or longitudinal data to capture temporal changes in urbanization processes and their evolving effects on the tea industry.

Third, with respect to analytical perspective, this study mainly emphasizes economic and sociocultural dimensions, while ecological and spatial dynamics could be further explored. Future research may benefit from integrating interdisciplinary perspectives from sociology, ecology, and geography to better understand labor mobility, resource allocation, and spatial restructuring under urbanization.

Finally, regarding data limitations, this study relies primarily on questionnaire surveys and interview data collected within a limited time frame and geographic area. Although these data provide valuable insights, future studies could enhance robustness by expanding sample coverage, incorporating multi-source data, and conducting longitudinal surveys.

Overall, while this study provides an integrated understanding of the mechanisms linking urbanization, consumer behavior, and the sustainable development of the tea industry, future research can further deepen and extend these findings through broader regional coverage, dynamic analysis, and interdisciplinary integration.

UNIVERSITI KEBANGSAAN MALAYSIA

REFERENCES

Abeygoonaratne, M.V.C. & Kularatne, M.G. 2015. Factors influencing tea consumption behavior in Sri Lanka (with special reference to Ratmalana divisional secretariat in Colombo district). *Proceedings of the 1st National Symposium of Social Sciences Undergraduates (NSSU)*, pp. 73.

Adam, B. & Fritzsche, S. 2012. The European city – a model for future urban development and its elements. *DIE ERDE – Journal of the Geographical Society of Berlin* 143: 105–127.

Aditya, K., Kumar, R., Bharti & Sanyal, S. 2023. Environmental impact of green house gas emissions from the tea industries of northeastern states of India. *Frontiers in Sustainable Food Systems* 7:1220775.

Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50(2): 179–211.

Ansari, R., Harris, M., Hosseinzadeh, H. & Zwar, N. 2020. Application of structural equation modeling in assessing the self-management activities of patients with type 2 diabetes. *Journal of Primary Care & Community Health* 11: 1 – 8.

Arhin, I., Mei, H., Li, J., Gyamfi, E., Antwi-Boasiako, A., Chen, X., Li, X. & Liu, A. 2023. Aanalysis of the determinants of sustainable agricultural technologies adoption in tea production in China: a systematic review. *International Journal of Agricultural Sustainability* 21(1): 2239047.

Baharum, H., Ismail, A., Awang, Z., McKenna, L., Ibrahim, R., Mohamed, Z. & Hassan, N. 2023. Validating an instrument for measuring newly graduated nurses' adaptation. *International Journal of Environmental Research and Public Health* 20(4): 2860.

Baldisserotto, M.L., Griep, R., Oates, J. & Theme-Filha, M. 2022. Cross-cultural adaptation of the Postpartum Bonding Questionnaire (PBQ) to Brazil: assessment of the measurement properties of construct validity and reliability. *Current Psychology* 42: 26275–26285.

Bandara, A., Gayathri, H. & Lankapura, A. 2021. Factors affecting the consumer's branded tea purchase decision: a case study in the Western Province, Sri Lanka. *Asian Journal of Economics, Business and Accounting* 21(10):67-73.

Basu, A. 2021. Cronbach's alpha. *Qeios*: 1 – 2.

Ben Amara, D., Zhu, Q., Qiao, J., Isaac, S. & Regmi, K. 2024. China's transition to a low-carbon economy and climate resilience: the impact of sustainable modernization indicators. *Journal of Geographical Sciences* 34: 2145–2165.

Bhattacharyya, S., Bera, R. & Seal, A. 2023. Tea quality and value-added marketing potential of safe and sustainable tea in Indian domestic market. *International Journal of Plant & Soil Science* 35(14): 410 – 424.

Bishop, J. & Verleger, M.A. 2013. The flipped classroom: a survey of the research. Paper presented at 2013 ASEE Annual Conference & Exposition. Organized by

American Society for Engineering Education (ASEE). Atlanta, Georgia, 23 – 26 June.

Boinwad, D.L. & Shinde, R.S. 2024. Tea trends in Latur City: Understanding consumer demands and market dynamics. *International Journal of Scientific Research in Science and Technology* 11(3): 190 – 201.

Bollen, K.A. 1989. *Structural Equations with Latent Variables.* Wiley: New York.

Bourdieu, P. 1984. *Distinction: A Social Critique of the Judgement of Taste.* Trans. by Nice, R. Cambridge, MA: Harvard University Press.

Brakman, S., Garretsen, H. & Marrewijk, C. 2016. Urban development in China. *Cambridge Journal of Regions, Economy and Society* 9: 467–477.

Brenner, N. 2004. Urban governance and the production of new state spaces in western Europe, 1960–2000. *Review of International Political Economy* 11(3): 447–488.

Brown, T.A. 2006. *Confirmatory Factor Analysis for Applied Research.* New York: Guilford Press.

Bu, X., Nguyen, H., Chou, T.P. & Chen, C.-P. 2020. A comprehensive model of consumers' perceptions, attitudes and behavioral intention toward organic tea: evidence from an emerging economy. *Sustainability* 12(16): 6619.

Byrne, B.M. 2016. *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming.* 3rd Edition. New York: Routledge.

Campos, J., Carrascosa, A.C., Bonafé, F. & Marôco, J. 2014. Severity of temporomandibular disorders in women: validity and reliability of the Fonseca Anamnestic Index. *Brazilian Oral Research* 28: 16–21.

Campos, J., Spexoto, M., Serrano, S. & Marôco, J. 2016. Psychometric characteristics of the functional assessment of cancer therapy-general when applied to Brazilian cancer patients. *Health and Quality of Life Outcomes* 14: 8.

Cao, Z., Liu, Y. & Zhang, H. 2019. Research on the influencing factors of the transformation of scientific and technological achievements in universities. *2018 2nd International Conference on Education Innovation and Economic Management (EIEM 2018)*, pp. 151–155.

Chandramohan, S. 2018. The impact of urbanization on rural-urban migration and sustainable development in Asia. *Economic Development Journal* 24(3): 52 – 68.

Chen, D. 2020. Adoption of environmental protection technologies for improving tea quality and promoting green development. *Sustainable Agriculture Journal* 31(2): 51–58.

Chen, F.Q. & Jiang, A.Q. 2013. Product preference of urban residents' tea consumption and its influencing factors—Micro demonstration based on MNL model. *Food and Nutrition in China* 19(10): 36–41.

Chen, F.-q., Li, S., Jiang, R. & Jiang, A. 2016. What factors are influencing tea consumption among Chinese urban residents? *International Journal of Consumer Studies* 40(3): 249–254.

Chen, P., Li, C., Chen, S., Li, Z., Zhang, H. & Zhao, C. 2022. Tea cultivation suitability evaluation and driving force analysis. *Remote Sensing* 14: 2412.

Chen, Y. & Li, X. 2020. Digital marketing and the development of tea culture: the role of social media in promoting regional tea brands. *Journal of Marketing and Consumer Research* 8(4): 12-21.

Chen, Y., Li, M. & Hatab, A. 2020. A spatiotemporal analysis of comparative advantage in tea production in China. *Agric. Econ. – Czech* 66(12): 550–561.

Chen, Y.F. 2019. Ecological challenges and countermeasures in the development of Sichuan's tea industry. *Modern Agricultural Research* 10(3): 45–51.

China Tea Circulation Association. 2018. *Annual Report on tea Industry in China.* Beijing: China Tea Circulation Association.

Choi, P.S., Lee, S., Moon, I.J. & Na, S.Y. 2013. China's urbanization: consumption, construction and risks. *KIEP World Economic Update* February: 1 – 4.

Christmann, A. & Van Aelst, S. 2006. Robust estimation of Cronbach's alpha. *Journal of Multivariate Analysis* 97: 1660–1674.

Chunla, L., Peilin, L., Songlin, M. & Mei, X. 2011. Path analysis on the development and cultivation of the tea industry in China. *Resources Science* 33(12): 2376–2385.

Cochran, W.G. 1977. *Sampling Techniques.* 3rd Edition. New York: John Wiley & Sons.

Creswell, J.W. & Poth, C.N. 2017. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches.* 4th Edition. Thousand Oaks: Sage Publications.

Czarniecka-Skubina, E., Korzeniowska-Ginter, R., Pielak, M., Sałek, P., Owczarek, T. & Kozak, A. 2022. Consumer choices and habits related to tea consumption by Poles. *Foods* 11(18): 2873.

Deng, X., Zhong, H., Bai, X., Zhao, T. & Wang, M. 2013. Opportunities and challenges for development of urbanization in Western China. *Chinese Journal of Population Resources and Environment* 11(3): 236–243.

DeVellis, R.F. 2017. *Scale Development: Theory and Applications.* 4th Edition. Thousand Oaks: Sage Publications.

Dharmadasa, R., de Silva, R.G.P., Wijewardhana, H.V.P. & Vithanage, S.S. 2019. Impact of organic farming on annual average income and cost of production of tea smallholders in Sri Lanka. *Journal of Agriculture and Value Addition* 2(1): 21–29.

Ding, X., Lu, Q., Li, L., Li, H. & Sarkar, A. 2023. Measuring the impact of relative deprivation on tea farmers' pesticide application behavior. *Horticulturae* 9(3): 342.

UNIVERSITI KEBANGSAAN MALAYSIA

Elkington, J. 1997. *Cannibals with Forks: The Triple Bottom Line of 21st Century Business.* Oxford, UK: Capstone Publishing.

Fan, X. 2024. Research on the coupling of ecological environment and socio-economic development in resource-based cities. *Sustainable Cities and Society* 114: 105810.

Feng, M. 2005. The tourist development value of food resources – Taking Chengdu Tea House for example. *Journal of Nanning Vocational University.* https://consensus.app/papers/the-tourist-development-value-of-food-resources-taking-min/a46f1534682756ce919f15bb0208073a [14 October 2022].

Folke, C. 2006. Resilience: the emergence of a perspective for social–ecological systems analyses. *Global Environmental Change* 16(3): 253–267.

Fuad, D.R.S.M., Musa, K. & Khalid, H. 2023. Factor Analysis on the school innovation culture scale in the Malaysian context. *International Journal of Academic Research in Business and Social Sciences* 13(9): 1807–1825.

Gan, L., Wei, L., Huang, S., Lev, B. & Jiang, W. 2022. Evaluation of city–industry integration development and regional differences under the new urbanization: a case study of Sichuan. *Applied Sciences* 12(9): 4698.

Glaser, B.G. & Strauss, A.L. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Mill Valley, CA: Sociology Press.

Guan, X. & Jiangfan, Y. 2015. Comparative study of tea consumption between urban and rural residents in China. *Journal of Tea Science* 35(4): 397 – 403.

Guo, Z. 1999. *Social Statistical Analysis Methods.* Beijing: Renmin University of China Press.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. & Tatham, R.L. 2006. *Multivariate Data Analysis.* 6th Edition. Upper Saddle River, NJ: Pearson Prentice Hall.

Han, J.L., Jin, F. & Egashira, K. 2007. Environmental impact assessment of tea garden soils by the heavy metal concentration in Yantai City of Shandong Province, China. *Journal of The Faculty of Agriculture Kyushu University* 52: 135–139.

Han, J.-L., Jin, F.-S. & Egashira, K. 2007. Environmental impact assessment of tea garden soils by heavy metal concentration in Shandong, China. *Journal of The Faculty of Agriculture Kyushu University* 52(1): 135 – 139.

Han, S. & Qin, B. 2005. The cities of Western China: a preliminary assessment. *Eurasian Geography and Economics* 46(5): 386–398.

Harris, J.M. 2000. Basic principles of sustainable development. Global Development and Environment Institute working paper 00-04, Tufts University.

He, P., Li, G., Lin, Z., Yao, X., Zhao, Y. & Li, X. 2013. Study on crop planting regionalization based on land suitability evaluation. *Journal of Southern Agriculture* 44(5): 859–864.

Herath, H., Dorabawilla, B.M.N.K., Alwis, J. & Batagoda, B. 2013. Potential of organic tea production in Sri Lanka as a measure of environmental management.

Proceedings of the Seventh Annual Forestry and Environment Symposium 2001, pp. 63.

Howard, J. 2010. The teahouse: small business, everyday culture, and public politics in Chengdu, 1900–1950 (review). *Harvard Journal of Asiatic Studies* 70: 220–226.

Hu, L.T. & Bentler, P.M. 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling* 6(1): 1–55.

Huang, C. 2024. Understanding female consumer psychology and marketing strategies in China's tea beverage industry. *Advances in Economics, Management and Political Sciences* 141(1):136–143.

Huang, P. & Guangzao, J. 2002. Discussion of some issues in developing newly planted tea field in Sichuan basin. *Southwest China Journal of Agricultural Sciences* 15(4): 110–112.

Huang, Z. 2007. Role of confirmatory factor analysis in checking questionnaire's construct validity. *Chinese Journal of Public Health* 23(10): 1198–1199.

Hudson, R. & Pinder, D. 1991. Western Europe: challenge and change. *The Geographical Journal* 157: 80.

Islam, M. & Han, J.-H. 2012. Perceived quality and attitude toward tea & coffee by consumers. *International Journal of Business Research and Management (IJBRM)* 3(3): 100–112.

Iweala, S. & Sun, Y. 2022. The many aspects of voluntary sustainability governance: unpacking consumers' support for tea standards in China and the UK. *Cleaner and Responsible Consumption* 7: 100080.

Ji, N. 2024. Development of sustainable urban-rural integration: Dongtan case study. *Journal of Architectural Research and Development* 8(5): 41 – 65.

Jähnke, P. 2002. Restructuring of spatial relations of business services in metropolitan regions. Paper No. 337. IRS Institute for Regional Development and Structural Planning.

Jöreskog, K.G. & Sörbom, D. 1996. *LISREL 8: User's Reference Guide.* Mooresville: Scientific Software International.

Kang, H. 2013. A guide on the use of factor analysis in the assessment of construct validity. *Journal of Korean Academy of Nursing* 43(5): 587–594.

Karunaratne, G., Nissanka, S., Punyawardena, B. & Gunawardena, A. 2015. Vulnerability of tea sector for climate change in the major tea growing regions in central hills of Sri Lanka. *Journal of Environmental Professionals Sri Lanka* 4(1): 29–48.

Kline, R.B. 2015. *Principles and Practice of Structural Equation Modeling.* 4th Edition. New York: Guilford Press.

Konold, T.R. & Sanders, E. 2023. The SEM reliability paradox in a Bayesian framework. *Structural Equation Modeling: A Multidisciplinary Journal* 31(1): 97–117.

Landis, J.R. & Koch, G.G. 1977. The measurement of observer agreement for categorical data. *Biometrics* 33(1): 159–174.

Le, V.S., Herrmann, L., Bräu, L. & Lesueur, D. 2023. Sustainable green tea production through agroecological management. *Soil Use and Management* 39(3): 1185–1204.

Li, B. & Piachaud, D. 2006. Urbanization and social policy in China. *Asia-Pacific Development Journal* 13(1): 1–26.

Li, F. 2008. Inheritance and promotion of traditional tea culture by tourism industry. *Journal of Anhui Agricultural Sciences* 36(18): 7837–7838.

Li, F. 2021. Cultural innovation and sustainable development of the tea industry: a case study of Sichuan's tea industry. *Tea Industry Development* 23(2): 110–116.

Li, H. 2018. Impact of urbanization on the ecological environment of the tea industry. *Environment and Development* 30(6): 97–103.

Li, H. 2020. Application of advanced detection technologies such as HPLC and GC-MS in tea enterprises in Sichuan Province. *China Food Safety Journal* 16(5): 102–108.

Li, J.H. 2020. Current situation and problems of Sichuan's tea industry. *Tea Science and Technology* 38(2): 98–102.

Li, M. & Wang, Y. 2020. The regulatory role of technological innovation and policy in the relationship between market demand and production costs in the tea industry. *Industrial Economics and Development* 39(5): 48–56.

Li, W. 2014. Research of tea culture protection based on sustainable development—the case of the planning for Chengjia Town. *Journal of Human Settlements in West China (西部人居环境学刊)* 29(4): 94–98.

Li, W.J. 2013. A study on the path of transforming Chinese tea producing technologies into tourism products. *Journal of Anhui Agricultural Sciences* 41(16): 7244–7245. (in Chinese).

Li, X. 2017. Research on the development strategy of the tea industry in the process of urbanization. *Journal of Tea Culture* 22(2): 80–85.

Li, X. 2017. Urbanization and its impact on rural economic structures in China. *Journal of Urban Studies* 34(1): 12–29.

Li, X., Huang, B., Li, X, & Lai, S. 2021. Facing the transformation and upgrading of regional economy, build a multi-disciplinary cross-integration innovative talent training system - taking the School of Mechanical Engineering of Sichuan University of light chemical industry as an example. *Theory and Practice of Social Science* 3(5): 68–77.

UNIVERSITI KEBANGSAAN MALAYSIA

Li, Y. & Zhang, H. 2019. The influence of ecological farming practices on sustainable tea production in China. *Journal of Agricultural Sustainability* 17(3): 215–229.

Li, Y., Beeton, R., Sigler, T. & Halog, A. 2016. Modelling the transition toward urban sustainability: a case study of the industrial city of Jinchang, China. *Journal of Cleaner Production* 134: 22–30.

Li, Y., Beeton, R., Sigler, T. & Halog, A. 2019. Enhancing the adaptive capacity for urban sustainability: a bottom-up approach to understanding the urban social system in China. *Journal of Environmental Management* 235: 51–61.

Liu, C.Y. 2020. Urban consumers' preferences for high-end and organic tea products. *Consumer Market* 31(2): 51–58.

Liu, H. 2019. Application of ecological agricultural technology in Sichuan's tea industry. *Agriculture and Ecological Environment* 17(4): 234–241.

Liu, H. 2021. Enhancing tea culture dissemination through modern media and innovation. *Cultural Innovation Review* 20(2): 63–70.

Liu, H., Zhang, J. & Wu, W. 2019. Tea culture and its impact on brand loyalty: a case study of Sichuan tea industry. *International Journal of Hospitality and Tourism Management* 7(1): 65-74.

Liu, J. 2018. A typical example of the survival pathway of Sichuan opera based on the field investigation of Chengdu Yuelai Tea Garden. *Advances in Social Science, Education and Humanities Research* 289: 659–664.

Liu, J. 2021. The rise of consumer brand awareness and loyalty under urbanization. *Marketing Research* 29(2): 55–62.

Liu, J., Hull, V., Batistella, M., DeFries, R., Dietz, T., Fu, F., Hertel, T.W., Izaurralde, R.C., Lambin, E.F., Li, S., Martinelli, L.A., McConnell, W.J., Moran, E.F., Naylor, R., Ouyang, Z., Polenske, K.R., Reenberg, A., de Miranda Rocha, G., Simmons, C.S., Verburg, P.H., Vitousek, P.M., Zhang, F. & Zhu, C. 2013. Framing sustainability in a telecoupled world. *Ecology and Society* 18(2): 26.

Liu, J., Qian, C. & Li, X. 2024. Livelihood and food security in the context of sustainable agriculture: evidence from tea agricultural heritage systems in China. *Foods* 13(14): 2238.

Liu, J., Wang, L. & Zhang, X. 2018. Challenges and opportunities in sustainable tea production: a case study from the Sichuan tea industry. *Sustainable Agriculture Review* 10(4): 147–163.

Liu, J.Y. 2019. Research on environmental pollution issues faced by tea planting areas during urbanization. *Tea Industry Research* 28(4): 45–53.

Liu, S. 2020. The impact of tea production on regional economic growth in China: a case study of Sichuan province. *Journal of Agricultural Economics* 39(2): 72–84.

Liu, T. 2021. Application of big data analysis and internet marketing strategies in tea brand building. *Digital Marketing Review* 20(3): 47–55.

Lu, C.H. 2007. Assessing construct validity: the utility of factor analysis. *Journal of Research on Measurement Sciences* 15: 79–94.

Lu, D.B., Ying, B.F. & Ma, J.H. 2016. Present situation and development ideas of tea production mechanization in Zhejiang Province. *China Tea Processing* 2016(1): 16–20. (in Chinese).

Luo, Y., Liu, X., Wang, W., Qin, Y., Škare, M. & Wu, B. 2025. Accelerating urban energy transitions: harnessing EEET framework dynamics. *Environmental Science and Pollution Research* 32(42): 4408–4428.

Lü, J. 2018. The marginalization risk of traditional tea culture under modern consumption models. *Traditional Culture Studies* 17(4): 70–76.

Lü, J. 2019. Urban-rural differentiation of tea consumption markets under urbanization. *Modern Rural Economy* 20(3): 73–79.

Machado, P.M.A., Campelo, C.L., Oliveira, J.V.P., Batista, R., Simões, V.F. & Santos, A.M. 2021. Analysis of the AUDIT factor structure in adolescents between 18 and 19 years. *Revista de Saúde Pública* 55: 27.

Maimaitiming, A. & Cao, H. 2010. Urban transition in Western China. *International Conference on Management and Service Science,* pp. 1–4.

Mao, L., Ma, J., Wu, W., Jiang, W. & Fan, S. 2024. Research on the antecedent configurations of tea agricultural heritage systems for sustainable development from a symbiotic perspective. *Agriculture* 14(10): 1828.

Martins, M.B.L., Silveira, M.F., Maia, M.B., Farias, P.K.S., Ferreira, R.C., Pinto, R.A., Crespo, T.S. & Ferreira, E.F.E. 2023. Psychometric properties of an oral health literacy scale for people living with diabetes. *Brazilian Oral Research* 37: e022.

Mei, J. 2010. Review of tea plantation mechanization in China. *Tropical Agricultural Engineering* 34(5): 13–16. (in Chinese).

Millath, M.A. & Ali, K.M. 2019. Awareness on sustainability perspective among consumers of tea. *Restaurant Business* 118(7): 111–117.

Mokyr, J. 2003. Why was the industrial revolution a European phenomenon? *Supreme Court Economic Review* 10: 27–63.

Mu, L., Chen, Q. & Liang, F. 2019. Research on the combination path of tea culture experience and urban leisure tourism. *Proceedings of the 2019 International Conference on Management, Education Technology and Economics (ICMETE 2019),* pp. 594–596.

Mudoi, D.K. 2018. Organic tea products: a study on perceptions of urban consumers in Golaghat District of Assam. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)* 23(9): 40–47.

Munasinghe, M., Deraniyagala, Y., Dassanayake, N. & Karunarathna, H.M.H.L. 2017. Economic, social and environmental impacts and overall sustainability of the tea sector in Sri Lanka. *Sustainable Production and Consumption* 12: 155–169.

Nair, K.P. 2020. Tea (Camellia sinensis L.). In Nair, K.P. (ed.). *Tree Crops: Harvesting Cash from the World's Important Cash Crops,* pp. 333-362. Cham: Springer.

National Development and Reform Commission. 2020. *Digital Rural Development Strategy Outline. [Digital Rural Development Strategy Outline]*. Beijing: National Development and Reform Commission http://www.gov.cn/zhengce/2020-05/10/content_5519156.htm [23 September 2023].

Nie, J., Kiminami, A. & Yagi, H. 2024. Assessing the sustainability of urban agriculture in Shanghai's nine agriculture districts: a decadal analysis (2010–2020). *Agriculture* 14(4): 631.

Nilsson, L. & Bellander, L. 2011. Western European urban systems, 1950–2000. *European Journal of Spatial Development*: 23–41.

North, D.C. 1990. *Institutions, Institutional Change and Economic Performance.* Cambridge, UK: Cambridge University Press.

Okamoto, N. 2019. Spatial and institutional urbanisation in China. *Asia-Pacific Journal of Regional Science* 3: 863–886.

Okoli, C. & Pawlowski, S.D. 2004. The Delphi method as a research tool: an example, design considerations and applications. *Information & Management* 42(1): 15–29.

Pedrosa, R., Rodrigues, R., Oliveira, H.C. & Alexandre, N.M. 2016. Construct validity of the Brazilian version of the self-efficacy for appropriate medication adherence scale. *Journal of Nursing Measurement* 24: 18E–31E.

Peters, G. 2014. The alpha and the omega of scale reliability and validity: why and how to abandon Cronbach's alpha. *The European Health Psychologist* 16: 56–69.

Pierson, P. 2000. Increasing returns, path dependence, and the study of politics. *American Political Science Review* 94(2): 251–267.

Prahalad, C.K. & Ramaswamy, V. 2004. *The Future of Competition: Co-Creating Unique Value with Customers.* Boston, MA: Harvard Business School Press.

Pretty, J. 2003. Social capital and the collective management of resources. *Science* 302(5652): 1912–1914.

Prunuske, A.J., Batzli, J.M., Howell, S.M. & Miller, S. 2012. Using the flipped classroom model in a large introductory genetics course. *Medical Science Educator* 22(4): 180–181.

Pu, Y., He, X., Wang, Y., Li, M. & Xie, Y. 2019. Development countermeasures of tea enterprises from the perspective of regional brand construction: taking Sichuan Meng-top Camellia as an example. *2019 3rd International Conference on Economics, Management Engineering and Education Technology (ICEMEET 2019),* pp. 764–769.

Qiu, Y. 2017. The strengthening of government supervision on food safety under urbanization. *Agricultural Economy* 37(6): 77–83.

UNIVERSITI KEBANGSAAN MALAYSIA

Qiu, Y. 2020. Promoting rural tea consumption through tea tourism and tea culture education. *Rural Revitalization Studies* 5(2): 84–90.

Quan, Q.E. 2016. Development of tea machinery under new normal of Chinese tea industry *China Tea Processing* 2016(1): 5–8.

Rahmanita, R., Basamah, S.A. & Rudiansyah, R. 2024. Cultural comparisons: a comparison of tea drinking traditions in Java and Sichuan. L*inguistik, Terjemahan, Sastra (LINGTERSA)* 5(2): 76–84.

Sarmah, H.K. & Choudhury, S. 2013. An investigation on the effect of bias on determination of sample size on the basis of data related to the students of schools of Guwahati. *International Journal of Applied Mathematics & Statistical Sciences* 2(1): 33–48.

Sathyanarayana, S. & Mohanasundaram, T. 2024. Fit indices in structural equation modeling and confirmatory factor analysis: reporting guidelines. *Asian Journal of Economics, Business and Accounting* 24(7): 561–577.

Sekaran, U. & Bougie, R. 2013. *Research Methods for Business: A Skill-Building Approach.* 6th Edition. Chichester: Wiley.

Seng, L.-Y., Wei, C.F. & Zhang, Y. 2021. Exploring the influence of psychological empowerment on student's learning performance in a blended learning environment. *ICAIE 2021: 2nd International Conference on Artificial Intelligence and Education*, pp. 314–318.

Shryock, H.S., Siegel, J. & Associates. 1976. *Studies in Population: The Methods and Materials of Demography*. San Diego: Academic Press.

Smith, H. & Liu, C. 2019. Cultural heritage and tourism: understanding the role of cultural identity in brand loyalty in the Chinese tea industry. *Tourism and Cultural Heritage Journal* 22(5): 453–469.

Sohn, J., Hewings, G.J.D. & Kim, T.J. 2004. Intra-metropolitan agglomeration, information technology and polycentric urban development. *Contributions to Economic Analysis* 266: 213–247.

Strauss, A. & Corbin, J. 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* 2nd Edition. Los Angeles: Sage Publications.

Su, M., Wall, G. & Wang, Y. 2019. Integrating tea and tourism: a sustainable livelihoods approach. *Journal of Sustainable Tourism* 27(11): 1591–1608.

Sun, T., Qi, Y. & Liu, X. 2014. Changing intra-metropolitan spatial distribution of employment with economic restructuring in Beijing Metropolitan Area. *Econ. Geogr.* 34: 97–104.

Sun, Y., Shao, X., Li, X., Guo, Y. & Nie, K. 2019. How live streaming influences purchase intentions in social commerce: an IT affordance perspective. *Electronic Commerce Research and Applications* 37 (September–October): 100886.

UNIVERSITI KEBANGSAAN MALAYSIA

Syahfitri, J., Firman, H., Redjeki, S. & Sriyati, S. 2020. Construct validity of critical thinking disposition test in biology. *Bioedukatika* 8: 1–6.

Tan, J., Xu, Q. & Li, T. 2020. An empirical analysis of scented tea market based on theory of consumer behavior. *2020 8th International Education, Economics, Social Science, Arts, Sports and Management Engineering Conference (IEESASM 2020),* pp. 428–433.

Tan, Y. & Xu, H. 2018. A literature review of sustainable urbanization in China. *Proceedings of the 21st International Symposium on Advancement of Construction Management and Real Estate,* pp. 89–96.

Tan, Y. 2022. Market analysis of new tea industry based on questionnaire survey. *BCP Business & Management* 24: 140–148.

Tang, Q., Liao, C.L. & Shan, H.L. 2004. Primary study on ecological effects of artificial complex tea fields in Western part of Sichuan Province. *Journal of Sichuan Agricultural University* 22(1): 41–44.

Tavakol, M. & Dennick, R. 2011. Making sense of Cronbach's alpha. *International Journal of Medical Education* 2: 53–55.

Thapa, M. & Lal, U. 2016. Environmental dynamics and its impacts upon the productivity of tea in Puttabong (Tukvar) tea garden of Darjeeling Himalaya, India. *Journal of Tea Science Research* 6(9): 1–4.

The World Bank Development Research Center of the State Council & the People's Republic of China. 2014. *Urban China: Toward Efficient, Inclusive, and Sustainable Urbanization.* Washington D.C.: World Bank Group.

Tilman, D., Cassman, K.G., Matson, P.A., Naylor, R. & Polasky, S. 2002. Agricultural sustainability and intensive production practices. *Nature* 418(6898): 671–677.

Turner, B.L., Matson, P.A., McCarthy, J.J., Corell, R.W., Christensen, L., Eckley, N., Hovelsrud-Broda, G.K., Kasperson, J.X., Kasperson, R.E., Luers, A., Martello, M.L., Mathiesen, S., Naylor, R., Polsky, C., Pulsipher, A., Schiller, A., Selin, H. & Tyler, N. 2003. Illustrating the coupled human–environment system for vulnerability analysis: three case studies. *Proceedings of the National Academy of Sciences* 100(14): 8080–8085.

Van der Werf, H.M.G. & Petit, J. 2002. Evaluation of the environmental impact of agriculture at the farm level: a comparison and analysis of 12 indicator-based methods. *Agriculture, Ecosystems & Environment* 93(1-3): 131–145.

Venkatesh, V. & Bala, H. 2008. Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences* 39(2): 273–315.

Wan, D. & Jiao, C. 2023. Research on the development of tea industry in Yibin City. *Frontiers in Business, Economics and Management* 9(1): 20–23.

Wang, C., Zhao, M., Xu, Y., Zhao, Y. & Zhang, X. 2023. Ecosystem service synergies promote ecological tea gardens: a case study in Fuzhou, China. *Remote Sensing* 15(2): 540.

UNIVERSITI KEBANGSAAN MALAYSIA

Wang, H. & Zhang, Y. 2018. Tea culture and its impact on consumer behavior in Sichuan. *Journal of Cultural Studies* 31(3): 45–59.

Wang, H. & Zhang, Y. 2019. What factors are influencing tea consumption among Chinese urban residents? An empirical study. *International Journal of Consumer Studies* 40(3): 249–254.

Wang, L. 2020. Urbanization and the decline of daily and community-based tea culture. *Urban Culture Research* 25(3): 34–41.

Wang, Q. 2019. Regional characteristics and the challenges for Sichuan tea brand expansion. *Regional Economy Review* 35(2): 60–67.

Wang, Q. 2021. Exploring the impact of urban industrial innovation on sustainable rural development based on the rise of new teahouses in China. *Modern Economics & Management Forum* 3(5): 1042.

Wang, X. 2018. The impact and challenges of urbanization on the tea industry. *Tea Industry Research* 45(3): 56–62.

Wang, X., Sun, M., Xiong, Y., Liu, X., Li, C., Wang, Y. & Tan, X. 2024 Restriction site-associated DNA sequencing (RAD-seq) of tea plant (Camellia sinensis) in Sichuan province, China, provides insights into free amino acid and polyphenol contents of tea. *PLoS ONE* 19(12): e0314144.

Wang, Y., Li, F. & Zhang, R. 2020. Green consumption in China: a study of consumer demand for organic and ecological products in the tea sector. *Journal of Environmental Economics* 29(2): 124–140.

Wei, J.J. 2018. Sustainable development path of the Sichuan tea industry. *Journal of Sichuan Agricultural University* 34(5): 123–130.

Wise, N. 2016. Outlining triple bottom line contexts in urban tourism regeneration. *Cities* 53 30–34.

Wu, C. 2015. Developing situation of tea harvesting machines in Taiwan. *Engineering, Technology & Applied Science Research* 5(4): 871–875.

Wu, F. & Zhang, L. 2020. Economic transition and urbanization: a new paradigm in China's economic growth. *International Journal of Economics and Urban Development* 46(4): 35–51.

Wu, J., Hu, J., Zhao, X., Sun, Y. & Hu, G. 2023. Role of tea plantations in the maintenance of bird diversity in Anji County, China. *PeerJ* 11:e14801.

Wu, L., Mao, X., Yang, X., Li, Z. & Fang, S. 2017. Sustainability assessment of urban water planning using a multi-criteria analytical tool: a case study in Ningbo, China. *Water Policy* 19: 532–555.

Wu, X.B. 2020. Expansion of the tea beverage market driven by urbanization and consumption upgrading. *Beverage Industry* 26(5): 88–95.

Wu, Z., Zhao, C. & Chen, M. 2016. Research on scientific & technological achievements transformation of Sichuan provincial state-owned enterprises of China. *American Journal of Industrial and Business Management* 6(7): 815–821.

Xi, G., Jiang-fan, Y., Xiang-ying, X. & Li-qiong, L. 2011. Research on the status of Chinese tea consumption and factors of tea consumer's behavior. *Journal of Tea Science* 31(6): 546–551.

Xiaoyu, X., Jen-Her, W. & Qi, L. 2020. What drives consumer shopping behavior in live streaming commerce? *Journal of Electronic Commerce Research* 21(3): 144–167.

Xie, T. 2021. High-end market strategies for tea enterprises under urban consumption upgrading. *Marketing Science* 27(6): 66–72.

Xie, W. 2024. Research on green technology innovation issues and paths in the green development of Sichuan counties. *International Journal of Social Sciences and Public Administration* 3(1): 113–122.

Yajun, G. & Liu, D. 2011. Comprehensive evaluation on sustainable development model of Xinyang tea industry. *Journal of Huazhong Agricultural University* 4: 42–46.

Yan, C., Bo, L., Liang, H., Zhengyu, W. & Xiao, L. 2011. Design and application of the management platform for Sichuan innovation team of modern agriculture industry technology system. *Agricultural Network Information* 9: 103–107.

Yang, F. 2020. Opportunities for tea brand promotion under the development of the internet. *E-commerce and Internet Economy* 26(4): 88–94.

Yang, G., Gong, G., Luo, Y., Yang, Y. & Gui, Q. 2022. Spatiotemporal characteristics and influencing factors of tourism–urbanization–technology–ecological environment on the Yunnan–Guizhou–Sichuan region: an uncoordinated coupling perspective. *International Journal of Environmental Research and Public Health* 19: 8885.

Yang, G., Wu, X. & Wu, J. 2013. Study on the characteristics of competition in Sichuan tea industry. *Asian Agricultural Research* 5: 47-49.

Yang, H.W. 2019. Changes in tea market demand and its impact on the Sichuan tea industry. *Market Research* 41(4): 114–120.

Yang, Q. 2011. Road of brand innovation for private enterprises in main tea production area-analysis on "herding effect" in Mingshan county, Sichuan Province. Working paper in Proceedings of the 2011 International Conference on Management and Service Science, 2011. Organized by IEEE, Wuhan, China, 12–14 August.

Yang, X.L. 2019. Influence of organic certification and health concepts on tea consumption in urban areas. *Urban Consumer Research* 19(2): 56–62.

Yi, P., Shi, R., Li, W. & Dong, Q. 2024. Evaluation of the coordination-difference-driven sustainability of 12 urban agglomerations in China based on the dynamic probability weighting method. *Sustainable Cities and Society* 116: 105904.

Yu, L., Wang, S., Li, T. & Hân, L. 2021. Response of soil faunal communities to tea tree cultivars in western Sichuan. *Scientia Horticulturae* 275: 109701.

Zha, C. 2006. Study on the origin of tea culture. *Journal of Nanjing Agricultural University*. 6(2): 92–97.

Zhang, B. 2015. Study on the production situations and the countermeasures of Sichuan tea garden. *Journal of Anhui Agricultural Sciences* 43(13): 304–306

Zhang, C.B. & Li, Y. 2019. How social media usage influences B2B customer loyalty: roles of trust and purchase risk. *Journal of Business and Industrial Marketing* 34: 1420–1433.

Zhang, G. 2002. Urbanization strategy for developing China's west. *Journal of Northwest University (Philosophy and Social Sciences Edition)* 32(1): 11–15. (in Chinese).

Zhang, H. & He, X. 2011. Strengthening the construction of innovation team to promote the development of agriculture industry. *Science and Technology Management Research* 16:32–36.

Zhang, J., Lu, M., Song, Z. & Zhang, Z. 2022. Research on the development of tea culture tourism products under the background of cultural and tourism integration - a case study of Taiping Houkui. *Frontiers in Humanities and Social Sciences* 2(11): 243–252.

Zhang, K.H. 2002. What explains China's rising urbanization in the reform era? *Urban Studies* 39(12): 2301–2315.

Zhang, L. 2008. Conceptualizing China's urbanization under reforms. *Habitat International* 32(4): 452–470.

Zhang, M. & Huang, J. 2018. The impact of urbanization on agricultural production systems in China. *Agricultural Systems* 166: 167–176.

Zhang, P., Xu, Z. & Wang, Q. 2021. The rise of the green market in China's tea industry: implications for sustainable business practices. *Business Strategy and the Environment* 30(1): 12–22.

Zhang, Q. 2021. Tea-tourism integration as a new form of cultural innovation in Sichuan. *Tourism and Cultural Creativity Studies* 19(6): 88–95.

Zhang, Q., Gao, W., Su, S., Weng, M. & Cai, Z. 2017. Biophysical and socioeconomic determinants of tea expansion: apportioning their relative importance for sustainable land use policy. *Land Use Policy* 68: 438–447.

Zhang, T. 2019. Ecological environmental issues and countermeasures of Sichuan's tea industry. *Ecological Economy* 35(2): 66–70.

Zhang, W. 2012. Study on the revival and development of western Sichuan tea culture. *Journal of Anhui Agricultural Sciences* 40(10): 2541–2542.

Zhang, W. 2019. Overcoming regional limitations in promoting Sichuan tea brands. *International Business Research* 30(6): 77–84.

Zhang, W., Rong, J., Wei, C., Gao, L. & Chen, J. 2018. Domestication origin and spread of cultivated tea plants. *Biodiv Sci* 26(4): 357–372.

Zhang, X. 2019. Analysis of changes in consumer tea consumption behavior under the background of urbanization. *Consumer Economics* 38(5): 112–119.

Zhao, H. & Kong, L. 2024. Study on the construction of new tea drinking consumption space under the symbolic perspective. *Frontiers in Business, Economics and Management* 14(1): 106–108.

Zhao, J.J. 2021. Changes in tea consumption behavior under urbanization: a study based on fast-paced lifestyles. *Tea Economy and Culture* 22(3): 34–41.

Zhao, J.W. 2017. A study on the impact of urbanization on Sichuan's tea industry. *Agricultural Economics* 28(1): 77–84.

Zhao, L. 2019. Brand development and market influence of Sichuan tea in the domestic market. *Journal of Chinese Tea Culture* 18(4): 130–145.

Zhao, L. 2019. Changing consumer behavior in urbanized China: the demand for healthy and organic food products. *Journal of Consumer Behavior* 16(5): 239–256.

Zhao, L. 2023. The economic and environmental impacts of urbanization in China. *Highlights in Business, Economics and Management* 5: 142–146.

Zhao, X. 2019. Current situation and countermeasures for the protection and inheritance of traditional tea techniques in Sichuan's tea industry. *Tea Industry Research* 21(2): 78–85.

Zhao, X. 2019. Protection and inheritance strategies of traditional techniques in Sichuan tea industry. *Cultural Industry Research* 31(2): 72–79.

Zhao, X. 2020. The impact of urbanization on the sustainable development of the tea industry. *Journal of Urban Development Studies* 16(2): 55–62.

Zhao, X. 2022. Exploring the impact of urban industrial innovation on sustainable rural development based on the rise of new teahouses in China. *Modern Economics & Management Forum* 3(5): 318–322.

Zhao, X., Wang, H., Gao, F., Wang, P. & Wang, B. 2022. Realization of sustainable development goals in the tea industry: a case study of Lincang City, Yunnan Province. *Advances in Earth Science* 37(10): 1066-1078.

Zheng, H. 2023. The analysis of sustainable business model in traditional Chinese tea industry. *Proceedings of the 2nd International Conference on Financial Technology and Business Analysis*, pp. 107–111.

Zhong, Y., Zhang, L. & Tang, Z. 2024. The path to urban sustainability: urban intelligent transformation and green development—evidence from 286 cities in China. *Sustainability* 16(23): 10394.

Zhou, H. 2020. The impact of tea production mechanization on production efficiency and quality. *China Agricultural Mechanization* 40(4): 22–30.

Zhou, J. & Huang, L. 2021. Predictors of organic tea purchase intentions by Chinese consumers. *Journal of Agribusiness in Developing and Emerging Economies* 11(3): 269–283.

UNIVERSITI KEBANGSAAN MALAYSIA

Zhou, Y., Huang, X. & Wang, M. 2017. Assessment of ecological tea garden development in mountainous areas: evidence from China. *Ecological Economy* 33(4): 72–78. (in China).

Zhu, L. 2020. Integration and development of tea culture inheritance and modern consumption patterns. *Tea Ceremony and Modern Culture* 19(1): 45–51.

Zhu, Z. 2024. Urbanization and externalities: a case study in rural China. *Journal of Education, Humanities and Social Sciences* 42: 168–182.

Zi Hua, Z., Jamaludin, O. & Shu Ing, D. Investigation on the space patterns and influential factors for distribution of traditional villages in Sichuan. *Constr*. 4(2): 93–207.

Zongmao, C., Xiaoling, S. & Shan, J. 2011. Science innovation and sustainable development of tea industry. *Journal of Tea Science* 5: 463–472.

Zou, L.L. 2022. Strategies for enhancing Sichuan tea brand influence in the context of urbanization. *Marketing Science* 27(5): 45–53.

Özogul, S. 2019. Transformative spatial governance: new avenues for comprehensive planning in fragmented urban development. Ph.D. Thesis, University of Amsterdam.

UNIVERSITI KEBANGSAAN MALAYSIA

APPENDIX A

IN-DEPTH INTERVIEW ONLINE

This interview will focus on "the impact of urbanization on the sustainable development of the tea industry in Sichuan," paying particular attention to changes in the tea industry in terms of the market economy, social culture, and the ecological environment, as well as their impact. The main purpose of the interview is to further refine the main factors affecting the sustainable development of the tea industry by understanding the views of people involved in the tea industry and consumers.

The interview participants include tea producers, industry experts, tea sellers, and consumers. The following are the main questions and structure of the interview:

Group 1: Market Demand and Consumer Behavior

(1) Have you noticed any impact of urbanization on the demand for tea? If so, in what specific areas? For example, changes in consumers' focus on tea quality, functionality, or brand.
(2) How do you think consumers' purchasing decisions have changed with the advancement of urbanization? For example, has there been an increase in demand for tea with health benefits? Has there been an increase in consumers' attention to tea brands and cultural identity?
(3) In the context of urbanization, how do you think the Sichuan tea industry can adapt to the ever-changing market demands? For example, how can tea companies innovate products and explore new markets?

Group 2: Social Culture and Brand Culture

(1) What role do you think tea culture plays in the urbanization process?
(2) In the modern consumer market, has the transmission of tea culture been influenced by urbanization?
(3) How much do you identify with Sichuan tea culture?
Do you believe that urbanization has driven the modernization of tea culture? Does this mode of transmission help attract new consumers?
(4) What practices do you think Sichuan tea companies have adopted in brand culture development that are worth learning from?
(5) How can local tea culture be integrated into modern brand building and marketing?

Third Group: Green Production and Ecological Sustainability

(1) Have you noticed the impact of urbanization on the ecological environment of Sichuan's tea industry? For example, have issues such as land resource scarcity and environmental pollution affected tea production?
(2) In the tea production process, which ecological protection measures do you consider most important?
(3) Are there conscious efforts to promote green production models and the development of ecological tea gardens?

UNIVERSITI KEBANGSAAN MALAYSIA

(4) What efforts do you think the government and tea companies should make to promote the green development of the tea industry? For example, is more policy support needed? Is the promotion of green technology sufficient?

Fourth Group: Consumer Perceptions of Tea Brands and Functions

(1) In your opinion, which is more important to consumers when choosing tea: brand culture or health benefits?
(2) Among younger consumers, have health benefits and brand loyalty become the primary drivers of purchase decisions?
(3) When purchasing tea, do you prefer to choose tea with organic certification or green environmental labels?
(4) If so, what impact does this shift in demand have on the tea industry?
(5) How do you think tea companies should enhance consumers' perceived value through product innovation? For example, functional innovations in tea products or cultural marketing strategies.

Group 5: Market Positioning and Product Innovation

(1) How do you think the Sichuan tea industry should conduct precise market positioning based on consumer needs?
(2) How can the needs of different consumer groups be met, particularly among younger consumers?
(3) How do you think tea companies can leverage emerging channels such as e-commerce platforms and social media for effective marketing?
(4) Can these channels help tea companies stand out in the modern market?
(5) Would you be willing to pay more for premium, customized, or functional tea products? If so, is this related to perceptions of brand, quality, or health benefits?

UNIVERSITI KEBANGSAAN MALAYSIA

APPENDIX B

PRE-SURVEY QUESTIONNAIRE (FACTORS INFLUENCING THE SUSTAINABLE DEVELOPMENT OF THE TEA INDUSTRY IN URBANIZED AREAS)

Given that there are fewer studies on the factors influencing the development of urbanization on the sustainable development of the tea industry in Sichuan Province, this paper focuses on how a variety of factors in the urbanization process affect the sustainable development of the tea industry. The study involves the influence of economy, social culture, ecological environment and other aspects. Economic factors brought about by the urbanization process, such as the reorganization of land resources, changes in labor structure, infrastructure construction and changes in market demand, all have an important impact on the production costs, market competitiveness and investment opportunities of the tea industry. These economic factors directly affect the economic efficiency and development mode of tea industry. As for sociocultural factors, population mobility and cultural changes triggered by urbanization may lead to challenges in the inheritance and protection of traditional tea culture. At the same time, changes in urban residents' perception of and identification with tea culture may also affect the social basis and market demand for tea industry. Ecological factors should also not be ignored in the process of urbanization. Urban expansion and changes in land use may adversely affect the ecological environment of tea plantations, which in turn affects the quality and yield of tea. Meanwhile, environmental pollution problems may also pose a threat to the sustainability of the tea industry. Combining theories of urbanization development, such as Urban Ecosystem Theory (UET) and Sustainable Development Theory (SDT), can provide a deeper understanding of the interactions between these factors and their long-term impacts on the tea industry. The Urban Ecosystem Theory emphasizes the ecological balance and optimal allocation of resources in the process of urbanization, while the Sustainable Development Theory focuses on how to maintain a balance between environmental protection and cultural heritage while developing the economy. Through the lens of these theories, this paper analyzes how to maintain the traditional advantages of the tea industry while promoting its organic integration with modern economic development in the urbanization process of Sichuan Province. This will provide a strong theoretical basis for policy makers to develop more scientific and reasonable measures to promote the sustainable development of the tea industry.

First Consultation and Revision

Expert feedback and advice:

1. Increase the coverage of the questionnaire to cover more detailed questions about the tea industry.
2. Adjust the wording of some questions to make them clearer and easier to understand.
3. Add open-ended questions for more expert input.

Revised questionnaire:

Introduction Dear Survey Participants: Hello! Thank you for participating in this survey on "The Impact of Urbanization on the Sustainable Development of Tea industry in Sichuan Province". Your answers will help us to understand the impact of urbanization on the tea industry and provide reference for related policy making. This questionnaire is anonymous, and all data will be used for scientific research purposes only, and your privacy will be strictly protected.

Part I: Basic Information on Respondents

1. Your gender:
   male
   women

2. Your age:
   18-25
   26-35
   36-45
   46-55
   56 and above

3. Your occupation:
   tea grower
   Tea company employees
   Staff of tea-related government departments
   consumers
   (sth. or sb) else

4. Your region:
   Ya'an prefecture level city in Sichuan
   Meishan prefecture level city in Sichuan
   Yibin prefecture level city in Sichuan
   Leshan prefecture level city in Sichuan
   (sth. or sb) else

Part II: The Impact of Urbanization on the Economy of the Tea industry

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
5	What do you think is the impact of urbanization on					

UNIVERSITI KEBANGSAAN MALAYSIA

	the market demand for tea industry?					
6	What do you think is the impact of investment opportunities from urbanization on the tea industry?					
7	To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs) in the tea industry?					

Part III: The sociocultural impact of urbanization on the tea industry

1. Please rate the following statements according to your actual situation: 1 = very strong, 2 = fairly strong, 3 = average, 4 = weak, 5 = weak or no effect

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
8.	Does urbanization have an impact on the labor shortage in the tea industry?					
9.	Do you think urbanization has an impact on the preservation and transmission of tea culture?					

UNIVERSITI KEBANGSAAN MALAYSIA

10.	Does urbanization affect local residents' identification with tea culture?					

Part IV: Impact of urbanization on the ecological environment of cultural industries

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
11	What is the impact of urbanization on the ecology of tea plantations?					
12	What is the impact of land use change in tea gardens as a result of urbanization?					
13	What is the impact of environmental pollution due to urbanization on the tea industry?					

Part V: Impact of urbanization on the sustainable development of the tea industry

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

UNIVERSITI KEBANGSAAN MALAYSIA

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
14	How strong do you think the Sichuan government's policies and regulations affect the tea industry?					
15	What do you think is the impact of infrastructure development during urbanization on the tea industry?					
16	What is the impact of technological progress on tea productivity and product quality during urbanization?					

Part VI: Open-ended questions

17. Please describe what other important impacts of urbanization on the tea industry do you think?

Second consultation and revision

Expert feedback and advice:

1. Add more options to make the questions more specific.
2. Some of the issues were categorized to better reflect the impact of the different aspects.
3. Add background information questions to better understand the respondent's background.

Revised questionnaire:

Adjustments were made from the first revised questionnaire as follows:

UNIVERSITI KEBANGSAAN MALAYSIA

Introduction Dear Survey Participants: Hello! Thank you for participating in this survey on “The Impact of Urbanization on the Sustainable Development of Tea industry in Sichuan Province”. Your answers will help us to understand the impact of urbanization on the tea industry and provide reference for related policy making. This questionnaire is anonymous, and all data will be used for scientific research purposes only, and your privacy will be strictly protected.

Part I: Basic information about the respondent (add background questions)

1. Your gender:
   male
   women

2. Your age:
   18-25
   26-35
   36-45
   46-55
   56 and above

3. Your occupation:
   tea grower
   Tea company employees
   Staff of tea-related government departments
   consumers
   (sth. or sb) else

4. Your region:
   Ya’an prefecture level city in Sichuan
   Meishan prefecture level city in Sichuan
   Yibin prefecture level city in Sichuan
   Leshan prefecture level city in Sichuan
   (sth. or sb) else

5. The number of years you have been engaged in the tea industry:
   Less than 1 year
   1-5 years
   5-10 years
   More than 10 years

Part II: Impact of urbanization on the economy of the tea industry (new specific option)

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

UNIVERSITI KEBANGSAAN MALAYSIA

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
5	What do you think is the impact of urbanization on the market demand for tea industry?					
5a	What do you think is the impact of urbanization on the market price of tea industry?					
6	What do you think is the impact of investment opportunities from urbanization on the tea industry?					
6a	Do you think the investment opportunities brought about by urbanization have increased the competitiveness of the tea industry?					
7	To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs) in the tea industry?					

UNIVERSITI KEBANGSAAN MALAYSIA

Part III: The sociocultural impact of urbanization on the tea industry (new specific option)

1. Please rate the following statements according to your actual situation: 1 = very strong, 2 = fairly strong, 3 = average, 4 = weak, 5 = weak or no effect

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
8	Does urbanization have an impact on the labor shortage in the tea industry?					
8a	Has urbanization led to changes in the workforce structure of the tea industry?					
9	Do you think urbanization has an impact on the preservation and transmission of tea culture?					
9a	Has urbanization contributed to the modernization and innovation of tea culture?					
10	Does urbanization affect local residents' identification with tea culture?					
10a	Has urbanization changed the interest and participation of local residents in tea culture?					

UNIVERSITI KEBANGSAAN MALAYSIA

Part IV: Impact of urbanization on the ecosystem of cultural industries (new specific option)

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
11	What is the impact of urbanization on the ecology of tea plantations?					
11a	Has urbanization led to the destruction or degradation of tea plantation ecosystems?					
12	What is the impact of land use change in tea gardens as a result of urbanization?					
12a	Has urbanization led to a reduction or change in the use of land for tea plantations?					
13	What is the impact of environmental pollution due to urbanization on the tea industry?					
13a	Has urbanization increased environmental protection pressures on the tea industry?					

UNIVERSITI KEBANGSAAN MALAYSIA

Part V: Impact of urbanization on the sustainable development of the tea industry (new specific option)

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
14	How strong do you think the Sichuan government's policies and regulations affect the tea industry?					
14a	Do you think government policies have been effective in protecting the development of the tea industry?					
15	What do you think is the impact of infrastructure development during urbanization on the tea industry?					
15a	Do you think the infrastructure development has improved the operational efficiency of the tea industry?					
16	What is the impact of technological progress on tea productivity and product quality during urbanization?					

UNIVERSITI KEBANGSAAN MALAYSIA

16a	Do you think technological advances have contributed to the modernization of the tea industry?					

Part VI: Open-ended questions (adding background information)

18. What is your specific position in the tea industry?
19. Could you please describe what other important impacts of urbanization on the tea industry you think are important?

Third consultation and revision

Expert feedback and advice:

1. The questionnaire was further streamlined and optimized to ensure that it was easy to complete and understand.
2. Add some contrasting questions to better analyze the impact of urbanization on different aspects.

Revised questionnaire:

Adjustments were made to the second revised questionnaire as follows:

Introduction Dear Survey Participants: Hello! Thank you for participating in this survey on "The Impact of Urbanization on the Sustainable Development of Tea industry in Sichuan Province". Your answers will help us to understand the impact of urbanization on the tea industry and provide reference for related policy making. This questionnaire is anonymous, and all data will be used for scientific research purposes only, and your privacy will be strictly protected.

Part I: Basic information about the respondent (remove question 5, because the Ministry of Consumer or Other Occupations designed the question on years of experience)

1. Your gender:
   male
   women

2. Your age:
   18-25
   26-35
   36-45
   46-55
   56 and above

3. Your occupation:
   tea grower
   Tea company employees

UNIVERSITI KEBANGSAAN MALAYSIA

Staff of tea-related government departments
consumers
(sth. or sb) else

4. Your region:
Ya'an prefecture level city in Sichuan
Meishan prefecture level city in Sichuan
Yibin prefecture level city in Sichuan
Leshan prefecture level city in Sichuan
(sth. or sb) else

Part II: Impact of urbanization on the economy of the tea industry (combining similar issues and simplifying the presentation)

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
5	What do you think is the impact of urbanization on the market demand for tea industry?					
6	What do you think is the impact of investment opportunities from urbanization on the tea industry?					
7	To what extent does urbanization lead to an increase in production costs (e.g., land and labor costs) in the tea industry?					

Part III: The sociocultural impact of urbanization on the tea industry (merging similar issues and simplifying the presentation)

1. Please rate the following statements according to your actual situation: 1 = very strong, 2 = fairly strong, 3 = average, 4 = weak, 5 = weak or no effect

UNIVERSITI KEBANGSAAN MALAYSIA

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
8	Does urbanization have an impact on the labor shortage in the tea industry?					
9	Do you think urbanization has an impact on the preservation and transmission of tea culture?					
10	Does urbanization affect local residents' identification with tea culture?					

Part IV: Impact of urbanization on the ecosystem of cultural industries (consolidation of similar issues, simplified presentation)

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
11	What is the impact of urbanization on the ecology of tea plantations?					
12	What is the impact of land use change in tea gardens as a result of urbanization?					

UNIVERSITI KEBANGSAAN MALAYSIA

13	What is the impact of environmental pollution due to urbanization on the tea industry?					

Part V: Impact of urbanization on the sustainable development of the tea industry (combining similar issues and simplifying the presentation)

1. Please rate the following statements in terms of your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no impact

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
14	How strong do you think the Sichuan government's policies and regulations affect the tea industry?					
15	What do you think is the impact of infrastructure development during urbanization on the tea industry?					
16	What is the impact of technological progress on tea productivity and product quality during urbanization?					

UNIVERSITI KEBANGSAAN MALAYSIA

APPENDIX C

PRE-SURVEY QUESTIONNAIRE (THE IMPACT OF CONSUMER VALUE CHOICES ON THE SUSTAINABLE DEVELOPMENT OF SICHUAN'S TEA INDUSTRY

We are conducting a study on the impact of urbanization on the sustainable development of Sichuan's tea industry. This questionnaire aims to understand your attitudes toward tea consumption, your preferences, and the value factors you consider important. Your responses will be of great assistance to our research. All data will be used solely for academic research purposes, and your personal information will be strictly confidential.

Part One: Basic Information

1. Your gender:
   [ ] Male
   [ ] Female

2. Your age:
   [ ] Under 20 years old
   [ ] 20–30 years old
   [ ] 30–50 years old
   [ ] Over 50 years old

3. Your education level:
   [ ] Junior high school or below
   [ ] High school or vocational school
   [ ] Associate degree
   [ ] Bachelor's degree
   [ ] Master's degree or above

4. Your occupation:
   [ ] Government official
   [ ] Public institution staff
   [ ] Enterprise/company management
   [ ] Enterprise/company staff
   [ ] Farmer
   [ ] Student
   [ ] Other

5. Marital status:
   [ ] Unmarried (including divorced or widowed)
   [ ] Married

6. Number of children:
   [ ] No children
   [ ] 1 child
   [ ] 2 children
   [ ] 3 children
   [ ] 4 or more children

UNIVERSITI KEBANGSAAN MALAYSIA

7. Your monthly income:
   [ ] $1,000 or less
   [ ] $1,001–$3,000
   [ ] $3,001–$5,000
   [ ] $5,001–$8,000
   [ ] $8,001 or more

Part Two: Urbanization Background

8. How would you rate the current level of urbanization in your city? (Multiple selections allowed)
   [ ] Rapid population growth and expansion of urban scale
   [ ] Rapid economic development and significant industrial restructuring
   [ ] Modernization of lifestyle and significant changes in tea consumption habits
   [ ] Significant changes in the ecological environment and reduction in urban greening
   [ ] Improved infrastructure and more convenient dissemination of tea culture

9. During the urbanization process, what changes have you experienced that have influenced your tea consumption? (Multiple selections allowed)
   [ ] Weakening of traditional tea drinking culture, with younger people preferring modern tea drinks
   [ ] Decline in tea houses and tea lounges, with diversification of tea-drinking venues (e.g., coffee shops, book cafes, etc.)
   [ ] Increased online purchasing channels, leading to changes in tea consumption methods
   [ ] Faster pace of life, with a preference for convenient tea drinks (e.g., tea bags, ready-to-drink tea)
   [ ] Income growth driven by urbanization, leading to higher demands for tea quality
   [ ] No significant changes

10. In your opinion, what are the main impacts of urbanization on the tea industry in Sichuan? (Multiple selections allowed)
   [ ] Increased market demand, driving the upgrading and development of the tea industry
   [ ] Promoted brand building, enhancing the market competitiveness of Sichuan tea
   [ ] Accelerated industrial integration, with a clear trend toward large-scale operations among tea enterprises
   [ ] Increased tea production costs, such as rising land and labor costs
   [ ] Reduction in rural tea gardens, with urban expansion encroaching on tea-growing areas

11. In the context of urbanization, what do you believe is the most important strategy for the tea industry to achieve sustainable development? (Multiple selections allowed)
   [ ] Developing smart agriculture to improve tea production efficiency

UNIVERSITI KEBANGSAAN MALAYSIA

[ ] Strengthening brand building to enhance the market recognition of Sichuan tea
[ ] Deepening the exploration of tea culture value to enhance young consumers' sense of identification
[ ] Expanding online sales channels to promote digital marketing
[ ] Promote green farming and enhance environmental awareness

12. What significant changes have you observed in the Sichuan tea industry during the urbanization process?
[ ] Diversification of tea varieties
[ ] Internationalization of tea brands
[ ] Modernization of tea processing enterprises
[ ] Globalization of the tea market
[ ] Other

13. What differences do you observe in consumer demand for tea at different stages of urbanization?
[ ] Initial stage: Greater emphasis on price
[ ] Intermediate stage: beginning to focus on quality
[ ] Advanced stage: pursuing brand and cultural value
[ ] Other, please specify: _____

Part Three: Personal Tea Drinking Habits

14. What tea brands do you usually drink? (Multiple selections allowed)
[ ] Zhuyeqing
[ ] Wenjun Tea
[ ] Emei Mountain Tea
[ ] Mengding Mountain Tea
[ ] Other

15. Where do you usually drink tea? (Multiple selections allowed)
[ ] At home
[ ] Office/workplace
[ ] Tea house/tea lounge
[ ] Friends' gathering place
[ ] Other

16. At what times of the day do you usually drink tea? (Multiple selections allowed)
[ ] Morning
[ ] Afternoon
[ ] Evening
[ ] Night

Part Four: Internal Factors

17. Where do you usually purchase tea? (Multiple selections allowed)
[ ] Tea wholesale market
[ ] Tea specialty stores, chain stores
[ ] Gifts from others
[ ] Supermarket counters

UNIVERSITI KEBANGSAAN MALAYSIA

[ ] Small tea shops
[ ] Online shopping

18. How many people around you drink tea?
[ ] Almost no one likes it
[ ] Few people like it
[ ] Some people like it
[ ] Many people like it

19. What are your main motivations for purchasing tea? (Multiple selections allowed)
[ ] To refresh and quench thirst
[ ] For health and wellness
[ ] Social needs
[ ] Collecting hobby

20. How knowledgeable are you about tea?
[ ] Not knowledgeable
[ ] Some knowledge
[ ] Fairly knowledgeable

21. When selecting tea, what factors do you value most? (Multiple selections allowed)
[ ] Price
[ ] Quality
[ ] Brand
[ ] Packaging
[ ] Recommendations from others

Part Five: External Factors

22. How do you usually determine the quality of tea? (Multiple selections allowed)
[ ] Price
[ ] In-store tasting
[ ] Recommendations from others
[ ] Brand
[ ] Other

23. What factors do you consider most important when choosing tea packaging?
[ ] Individual small bags, loose tea in metal (paper) boxes
[ ] With packaging, appropriate packaging, resistant to tea compression
[ ] No preference

24. Through which channels do you most frequently purchase new-style tea beverages? (Multiple selections allowed)
[ ] Tea wholesale markets
[ ] Tea specialty stores, chain stores
[ ] Gifts from others
[ ] Supermarket counters
[ ] Small tea shops

UNIVERSITI KEBANGSAAN MALAYSIA

[ ] Online shopping
[ ] Other

New-style tea beverage consumption

25. How has your consumption frequency of new-style tea beverages changed over the past five years?
[ ] Significantly increased
[ ] Slightly increased
[ ] Remained unchanged
[ ] Slightly decreased
[ ] Significantly decreased

26. Compared to five years ago, how has your willingness to consume new-style tea beverages changed?
[ ] Significantly increased
[ ] Slightly increased
[ ] No change
[ ] Slightly decreased
[ ] Significantly decreased

27. In your opinion, how has the popularity of new-style tea drinks over the past five years affected traditional tea consumption?
[ ] Significantly increased traditional tea consumption
[ ] Slightly increased traditional tea consumption
[ ] No effect
[ ] Slightly decreased traditional tea consumption
[ ] Significantly decreased traditional tea consumption

28. Over the past decade, how have your tea consumption habits changed? (Multiple selections allowed)
[ ] Purchased tea more frequently
[ ] More inclined to purchase high-quality tea
[ ] More concerned about the brand and origin of tea
[ ] Purchased tea less frequently

Conclusion

Thank you for taking the time to participate in our survey! Your opinions are very important to our research. If you are willing to participate in follow-up interviews or learn more, please leave your contact information.

UNIVERSITI KEBANGSAAN MALAYSIA

APPENDIX D

FORMAL SURVEY QUESTIONNAIRE (FACTORS AFFECTING THE SUSTAINABLE DEVELOPMENT OF THE TEA INDUSTRY IN URBANIZATION

Introduction

I am a doctoral student at the National University of Malaysia conducting research on the impact of urbanization on the sustainable development of the tea industry in Sichuan Province. I hope the following questionnaire can provide you with some assistance. Completing this questionnaire will take approximately 10 minutes of your time. Please answer the questions honestly and select the appropriate options. Thank you for participating in this survey on the impact of urbanization on the sustainable development of the tea industry in Sichuan Province. Your responses will help us understand the various impacts of urbanization on the tea industry and provide valuable insights for policy-making. This questionnaire is anonymous, and all data will be used solely for research purposes. Your privacy will be strictly protected.

Part I: Basic Information on Respondents

1. Your gender:
   Male
   Female

2. Your age:
   18-25
   26-35
   36-45
   46-55
   56 and above

3. Your occupation:
   Tea Farmer
   Employee of Tea Enterprises
   Tea industry related government department staff
   Consumer
   Others

4. Your region:
   Ya'an
   Meishan
   Yibin
   Leshan
   Other_____

UNIVERSITI KEBANGSAAN MALAYSIA

Part II: The Impact of Urbanization on the Economy of the Tea Industry

1. Please rate the following statements according to your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no effect.

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
5	What do you think is the impact of urbanization on the market demand for tea industry?					
6	What do you think is the impact of investment opportunities brought about by urbanization on the tea industry?					
7	To what extent does urbanization lead to an increase in production costs (e.g. land and labor costs) in the tea industry?					

Part III: The Sociocultural Impact of Urbanization on the Tea Industry

1. Please rate the following statements according to your reality: 1 = very strong, 2 = fairly strong, 3 = average, 4 = weak, 5 = very weak or no effect

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
8	Does urbanization have an impact on the shortage of labour for the tea industry?					

UNIVERSITI KEBANGSAAN MALAYSIA

9	Do you see that urbanization have an impact on the protection and inheritance of tea culture?					
10	Does urbanization have an impact on the identity of local residents in tea culture?					

第四部分：城市化对文化产业生态环境的影响

1. Please rate the following statements according to your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no effect.

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
11	What is the impact of urbanization on the ecology of tea gardens?					
12	What is the impact of urbanization on land use change in tea plantations?					
13	What is the impact of environmental pollution caused by urbanization on the tea industry?					

UNIVERSITI KEBANGSAAN MALAYSIA

Part V: The Impact of Urbanization on the Tea Industry

1. Please rate the following statements according to your actual situation: 1 = very large, 2 = relatively large, 3 = average, 4 = small, 5 = little or no effect.

Title Number	Title	Personal Situation				
		Very Large	Relatively Large	General	Comparatively Small	Little Or No Effect
14	What do you think is the strength of the influence of the Sichuan government's policies and regulations on the tea industry?					
15	What do you think is the impact of infrastructure construction on the tea industry in the process of urbanization?					
16	What is the impact of technological progress on tea production efficiency and product quality in the process of urbanization?					

UNIVERSITI KEBANGSAAN MALAYSIA

APPENDIX E

FORMAL SURVEY QUESTIONNAIRE (THE IMPACT OF CONSUMER VALUE CHOICES ON THE SUSTAINABLE DEVELOPMENT OF SICHUAN'S TEA INDUSTRY

Hello! We are conducting research on the impact of urbanization on the sustainable development of the tea industry in Sichuan Province. This is part of a doctoral dissertation study aimed at understanding your tea consumption behavior and its influencing factors. The questionnaire includes sections on personal basic characteristics, consumers' tea consumption intentions and behavior, consumers' behavioral attitudes, normative influences, and perceived behavioral control over tea consumption decisions. Your responses will be of great assistance to our research. All data will be used solely for academic research purposes, and your personal information will be strictly confidential.

Part One: Personal Basic Characteristics

1. What is your age?
   - A. Under 20 years old
   - B. 20–30 years old
   - C. 30–50 years old
   - D. 51–60 years old
   - E. Over 61 years old

2. What is your gender?
   - A. Male
   - B. Female

3. What is your educational attainment?
   - A. Elementary school
   - B. Junior high school
   - C. High school or vocational school
   - D. College
   - E. Master's degree or higher

4. What is your occupation?
   - A. Government official
   - B. Public institution employee
   - C. Business manager
   - D. Company employee
   - E. Farmer
   - F. Student
   - G. Other

5. What is your monthly income?
   - A. $1,000 or less
   - B. $1,001–$3,000
   - C. $3,001–$5,000
   - D. 5,001–8,000 yuan

UNIVERSITI KEBANGSAAN MALAYSIA

E. 8,001 yuan and above

6. What is your current marital status?
   A. Unmarried
   B. Married with no children
   C. Married with children

7. What is the level of urbanization where you currently reside?
   A. First-tier city (e.g., Chengdu)
   B. Second-tier city
   C. Third-tier or lower city
   D. Town or rural area

Part Two: Behavioral Attitude Factors (Consumers' Attitudes Toward Tea and Purchase Intentions)

8. Are you willing to consume tea?
   A. Yes
   B. No

9. When purchasing tea, which information do you value most?
   A. Place of origin (e.g., Sichuan, Fujian, etc.)
   B. Brand recognition
   C. Whether the price is reasonable
   D. Whether it is organic or eco-friendly tea
   E. Whether the packaging design meets personal/gifting needs
   F. Other

10. How familiar are you with Sichuan tea?
   A. Not at all
   B. Somewhat familiar
   C. Fairly familiar
   D. Very familiar

11. Through which channels do you learn about tea?
   A. Traditional media (TV, radio, newspapers, magazines)
   B. Internet/social media (e.g., Xiaohongshu, Douyin)
   C. Recommendations from friends and family
   D. Offline tea shops/exhibitions
   E. Other

12. How would you evaluate the prices of tea on the market?
   A. Prices are too high, poor value for money
   B. Prices are reasonable, good value for money
   C. Prices are too low, excellent value for money

13. How important is the tea brand to you?
   A. Very important, brand directly influences purchasing decisions
   B. Important, brand influences choice but not the sole criterion

UNIVERSITI KEBANGSAAN MALAYSIA

C. Average, brand has little influence
D. Not important, tea quality and taste are more important

14. How do you evaluate the functional value of tea? (e.g., health and wellness, refreshing, etc.)
A. Significant functional benefits, better than other beverages
B. Average functional benefits, comparable to other beverages
C. Weak functional benefits, inferior to other beverages

15. How do you evaluate the taste of tea?
A. Excellent taste, unique flavor
B. Good taste, acceptable
C. Average taste, did not meet expectations
D. Poor taste, unwilling to continue consuming

16. How do you evaluate the quality of tea?
A. Excellent quality, trustworthy
B. Good quality, basically satisfactory
C. Average quality, room for improvement
D. Poor quality, not trustworthy for use

17. How would you rate the emotional value of the tea? (e.g., cultural identity, status symbol, social function, etc.)
A. Very important; drinking tea is an important part of culture and social interaction
B. Somewhat important; drinking tea enhances social experiences
C. Not very important; mainly a personal habit

18. Are you familiar with GAP production for tea?
A. No
B. Heard of it
C. Yes

19. How concerned are you about pesticide residues in tea?
A. Not at all concerned; I trust quality control
B. Somewhat concerned, but still willing to consume
C. Very concerned; I try to avoid purchasing

20. How much do you trust the safety of tea on the market?
A. Very much
B. Somewhat
C. Somewhat doubtful
D. Not very much
E. Not at all

21. Approximately how many times did you consume tea in the past year?

22. Approximately how much did you spend on tea consumption in the past year?
A. $100 or less

UNIVERSITI KEBANGSAAN MALAYSIA

B. $101–$200
C. $201–$500
D. $501–$1,000
E. Over $1,001

23. How satisfied were you with your most recent tea purchase?
A. Very satisfied
B. Satisfied
C. Average
D. Dissatisfied
E. Very dissatisfied

24. Would you recommend Sichuan tea to others?
A. Definitely
B. Probably
C. Not sure
D. Probably not
E. Definitely not

Part Three: Subjective Normative Factors (Social Environment's Influence on Consumers)

25. Do your family and friends drink tea?
A. Yes
B. No

26. What is your family and friends' attitude toward tea?
A. Very positive
B. Positive
C. Neutral
D. Negative
E. Very negative

27. Would you be influenced by your family and friends when choosing to purchase tea?
A. I would be very willing to follow their advice
B. I would sometimes follow their advice
C. Not sure
D. Rarely influenced
E. Not at all influenced

28. Are you influenced by the advice of professionals (such as tea experts, tea artists, nutritionists, etc.)?
A. Completely influenced; professional advice is very important to me
B. Possibly influenced; it is one of the factors I consider
C. Not influenced; I rely more on personal experience

29. Would you follow the recommendations of tea experts or tea masters to purchase specific types of tea?

UNIVERSITI KEBANGSAAN MALAYSIA

A. Completely willing
B. Might be willing
C. Not very willing
D. Completely unwilling

30. Are you influenced by market promotions (such as advertisements, live-streamed product sales, or brand promotions)?
A. Very much so; market promotions have a strong influence on my purchasing decisions
B. Some influence; I consider them as a reference
C. No influence; I am not influenced by advertisements

31. What is the primary purpose of your tea consumption?
A. Daily personal consumption
B. Health and wellness
C. Business entertainment
D. Gift-giving and socializing
E. Other

32. Where do you usually drink tea?
A. At home
B. At the office
C. At a tea house
D. At leisure and entertainment venues
E. Other

Part Four: Perceived Behavioral Control (Consumers' Perceptions of Convenience and Ability to Purchase Tea)

33. How difficult do you find it to obtain tea?
A. Very easy
B. Easy
C. Average
D. Difficult
E. Very difficult

34. Through which channels do you primarily purchase tea?
A. Tea wholesale markets
B. Tea specialty stores
C. Supermarket counters
D. Online purchases
E. Other

35. What are the main factors influencing your purchase of tea?
A. Reasonable price
B. High quality
C. Brand reputation
D. Elegant packaging
E. Other

UNIVERSITI KEBANGSAAN MALAYSIA

36. What are the main reasons you do not purchase tea?
    A. Price is too high
    B. Quality is inconsistent
    C. Lack of brand trust
    D. Packaging does not meet needs
    E. Other

37. What is your overall evaluation of the current quality and standardization level of tea in the market?
    A. Very high, strict market regulation, stable quality
    B. Fairly high, most tea is reliable in quality
    C. Average, quality varies greatly in the market
    D. Low, lack of standardization, quality is difficult to guarantee
    E. Very low, chaotic market, serious tea quality issues

Part Five: Urbanization and Sustainable Development (External Environmental Influences)

38. How do you think the urbanization process has influenced your tea consumption behavior?
    A. Increased purchasing convenience (e.g., online purchasing, more tea houses)
    B. Raised quality expectations for tea
    C. Increased demand for tea diversity (e.g., flower tea, bagged tea, blended tea)
    D. Reduced daily tea drinking habits (due to busy work schedules or changes in consumption preferences)
    E. No impact

39. Do you pay attention to the sustainable development of Sichuan's tea industry?
    A. Very much
    B. Somewhat
    C. Not very
    D. Not at all

40. How do you view the impact of urbanization on the sustainable development of the tea industry?
    A. Very positive (urbanization promotes tea industry development)
    B. Positive (overall positive, but with challenges)
    C. Neutral (impact not significant)
    D. Negative (urbanization is detrimental to tea industry development)
    E. Very negative (urbanization leads to the decline of the tea industry)

41. Would you be willing to pay a higher price to support the sustainable development of Sichuan's tea industry?
    A. Very willing
    B. Willing
    C. Undecided
    D. Unwilling

UNIVERSITI KEBANGSAAN MALAYSIA

E. Very unwilling

Conclusion

Thank you for taking the time to participate in our survey. Your opinions are very important to our research. If you are willing to participate in follow-up interviews or learn more, please leave your contact information. This questionnaire integrates multiple dimensions such as urbanization progress, personal characteristics, consumer behavior attitudes, normative beliefs, and perceived behavioral control to comprehensively investigate the consumption behavior of Sichuan tea consumers and its influencing factors. We hope this questionnaire can help you collect valuable data and provide support for your research.

UNIVERSITI KEBANGSAAN MALAYSIA