INSTITUTO
UNIVERSITÁRIO
DE LISBOA

RESEARCH ON THE DEVELOPMENT OF THE TIBETAN MEDICINE INDUSTRY IN TIBET

Zhang Jian
MSc in Business Administration

Supervisor:
PhD, Renato Jorge Lopes da Costa, Assistant Professor with Habilitation
Iscte, Instituto Universitário de Lisboa
Co-supervisor:
MSc, António Ângelo Machado Matos Pereira, Invited Lecturer
Iscte, Instituto Universitário de Lisboa

February, 2025

BUSINESS
SCHOOL

Department of Marketing,Operations and General Management

RESEARCH ON THE DEVELOPMENT OF THE TIBETAN MEDICINE INDUSTRY IN TIBET

Zhang Jian

MSc in Business Administration

Supervisor:

PhD, Renato Jorge Lopes da Costa, Assistant Professor with Habilitation

Iscte, Instituto Universitário de Lisboa

Co-supervisor:

MSc, António Ângelo Machado Matos Pereira, Invited Lecturer

Iscte, Instituto Universitário de Lisboa

February, 2025

Dedication and acknowledgements

Once I was soaked in the apricot rain, once I read the teacher's grace. I am very grateful to my teacher. In these two years of study, whether it is teaching, future planning or life trifles, I want to thank you for your understanding, care and help. From the topic selection of the paper to the final draft, it is the mechanism for you to accompany me to comb the path of the article. The repeated empirical research is for you to accompany me, bending can point to and guide me, and dripping and monotonous record your efforts. It is your efforts to cultivate and patience for me, which makes me decide the future academic path and participate in scientific research. I would like to thank every teacher who has taught me for giving me the courage to pursue my ideals. It is because of the teachers' serious academic attitude, rigorous scientific spirit and working style are deeply infected and encouraged, I would like to express my heartfelt thanks and great respect to all the teachers.

The October fetal grace is heavy, and the three lives are still light. Thanks to my parents, who have always supported and accompanied them in this study, their love is hidden under the care of their mobile phones, filled with suitcases before leaving, those silent love, has become my greatest confidence on the way forward. I wish my family peace, prosperity and everything.

May age, may thank, may friends grow up. Thank you for meeting with your classmates and roommates. I remember the heated discussion in class, the daily noise in the dormitory, those moments of laughter, those sunny days, which become unique because of you.

School, good teachers, parents, good friends, thank you, to attend this meeting. I am grateful for the strength of the motherland, wish the rivers safe, looking forward to spring and to the early end of the epidemic. This study will be held next summer. At this point, it is over, happy graduation, and then began the journey.

Resumo

Este artigo centra-se no desenvolvimento da indústria da medicina tibetana, que é uma parte importante da proteção do patrimônio cultural e da promoção do crescimento econômico no Tibete. O objetivo do estudo é analisar a situação atual da indústria médica tibetana, identificar seus desafios e propor contramedidas estratégicas para promover seu crescimento.

Nossa abordagem de pesquisa inclui uma revisão abrangente da literatura, pesquisa empírica e análise de dados, com foco em inovação tecnológica, desenvolvimento e utilização de recursos, dinâmica da cadeia industrial e mecanismos de apoio a políticas.

Pesquisas mostram que a indústria de medicina tibetana está em uma conjuntura crítica e tem enorme potencial de crescimento dado o crescente foco global na medicina tradicional. No entanto, enfrenta vários desafios, incluindo proteção inadequada e utilização de recursos de materiais medicinais, restrição da pesquisa e desenvolvimento tecnológico, coerência da cadeia industrial e falta de política industrial unificada.

As principais descobertas de nossa análise empírica usando modelos de autorregressão vetorial de séries temporais sugerem que a inovação tecnológica, a utilização de recursos e a melhoria da cadeia industrial são fundamentais para impulsionar a indústria. Com base nesses resultados, propomos uma série de contramedidas, incluindo promoção da inovação industrial, fortalecimento da organização industrial, formulação de políticas industriais de apoio e aprimoramento de elementos industriais.

Seguindo abordagens de pesquisa científica e sistemática, este artigo fornece insights valiosos e conselhos práticos para os formuladores de políticas e partes interessadas da indústria para perceber o potencial de usar a indústria de medicina tibetana como um meio de melhorar a saúde pública e promover o desenvolvimento econômico no Tibete.

Palavras-chave: indústria de medicina tibetana, inovação tecnológica, utilização de recursos, cadeia industrial, apoio político, pesquisa empírica

Códigos JEL: M10 Business Administration, General: Administração de Empresas, Geral

Abstract

This paper focuses on the development of the Tibetan medicine industry, which is an important part of protecting cultural heritage and promoting economic growth in Tibet. The goal of the study is to analyze the current situation of the Tibetan medicine industry, identify its challenges, and propose strategic countermeasures to promote its growth.

Our research approach includes a comprehensive literature review, empirical research, and data analysis, focusing on technological innovation, resource development and utilization, industrial chain dynamics, and policy support mechanisms.

Research shows that the Tibetan medicine industry is at a critical juncture and has huge growth potential given the growing global focus on traditional medicine. However, it faces several challenges, including inadequate protection and utilization of medicinal materials resources, restriction of technology research and development, coherence of industrial chain and lack of unified industrial policy.

The key findings of our empirical analysis using time-series vector autoregression models suggest that technological innovation, resource utilization, and industrial chain improvement are critical to driving the industry. Based on these results, we propose a series of countermeasures, including promoting industrial innovation, strengthening industrial organization, formulating supporting industrial policies, and enhancing industrial elements.

By following scientific and systematic research approaches, this paper provides valuable insights and practical advice for policy makers and industry stakeholders to realize the potential of using the Tibetan medicine industry as a means to improve public health and promote economic development in Tibet.

Key words: Tibetan medicine industry, technological innovation, resource utilization, industrial chain, policy support, empirical research

JEL Codes: M10, M12, M15

General Index

Abstract v
1 Introduction 1
1.1research background 1
1.2 Research objectives 2
1.3 research problem 2
1.4 Paper structure 3
2 Basic concepts and literature review 7
2.1 Current situation of Tibetan medicinethe origins, history, practices 7
2.1.1 Quantity of Tibetan medicine materials 7
2.1.2 Construction of the quality standard system for Tibetan medicine materials 7
2.2 Current status of the Tibetan medicine industry chain 8
2.3 Scale and development speed of the pharmaceutical industry 9
2.4 Innovation and technological level of the Tibetan medicine industry 10
2.5 Tibetan medicine industry at home and abroad 12
2.5.1 Status of domestic research. 12
3 Methodology and hypothesis 15
3.1 Methodology 15
3.2 Theoretical basis of the research 16
3.3 Variable selection and definition 18
3.4 Research basis 19
3.5 Study hypothesis 22
4 Analysis of the key factors affecting the development of Tibetan medicine industry 25
4.1 Key factors affecting the development of the Tibetan medicine industry 25
4.1.1 Variable selection and data sources 25
4.1.2, and the correlation analysis 26
4.1.3, Cell root inspection 29
4.1.4, to determine the lag period 31
4.2 Analysis based on the time-series vector-autoregressive model 31
4.2.1 Introduction to the time-series vector autoregressive model 31
4.2.2 Model Settings and accessories 32
4.2.3 Model diagnosis 34

4.2.4 Experience analysis 35
4.3 Verification of the study hypothesis 37
5 Development countermeasures and policy formulation and implementation of Tibetan medicine industry 39
5.1 Countermeasures for industrial innovation 39
5.2 Countermeasures of industry organizations 40
5.3 Industrial policies and countermeasures 42
5.4 Countermeasures of industrial factors 44
5.5 Development and implementation of policies 45
6 conclusion 47
6.1 Key influencing factors of Tibetan medicine industry 47
6.2 Problems in industrial development 47
6.3 Contribution to academia and business 47
6.4 Research limitations 47
6.5 Recommendations for future research 47
Reference documentation 49

Table of contents and figures

Table 3-1 Study hypothesis 23
Table 4-1 Data of key influencing factors of the Tibetan pharmaceutical industry from 2018 to 2022 26
Table 4-2 Pearson correlation coefficient analysis results 27
Table 4-3 Spearman rank correlation coefficient analysis results 28
Table 4-4 ADF test results 30
Table 4-5 PP test results 30
Table 4-6 AIC and BIC values for different lag orders 31
Table 4-7 Datasets (2018 to 2022) 32
Table4-8 VAR model parameter estimation results 34
Table 4-9 Model diagnostic test results 35
Table 4-10 Cumulative Pulse Response Analysis Results (in RMB 100 million) 36
Table 4-11 Results (in unit:%) 36

1 Introduction

1.1research background

Recently , the Tibetan medicine diligence has bit by bit become an important part of the field of TCM . Its exploitation not only enrich Chinese medical culture , but besides play an of import role in advance the development of local economy . However , liken with the speedy development of the Tibetan medication industry , the industry face many job and challenge , which requires in-depth research and discussion to find suitable solutions .

The development of the Tibetan medicine industry is first limited by the Tibetan medicine resources. Due to overutilisation and environmental wrong , many Tibetan medicine resource are step by step deoxidise , perplex a huge threat to the sustainable development of the Tibetan medicine industry (Liu Zhigang et al. , 2020) . In order to protect the Tibetan medicine resource , we demand to found and improve relevant law and regularization , beef up the protection of Tibetan medicine resources , and actively carry out artificial cultivation and introduction of Tibetan medicine materials , so as to reduce the dependence on natural resources .

There are likewise some trouble in the quality standard arrangement of the Tibetan music manufacture . These trouble are principally reverberate in the discrepant quality criterion and unscientific test methods (Yang Bin et al. , 2020) . To figure out these problem , we call for to establish and improve the quality standard system of Tibetan medicine material , beef up the timbre supervision , and ensure the safety and effectiveness of Tibetan medicine .

The market demand of the Tibetan medication industry is also constantly change , which set ahead new requirement for the ontogeny of the Tibetan medicine industry (Ma Shaoyang et al.i , 2019) . In order to conform to the change of the mart , we demand to continue to make industrial founding and better the market competitiveness of Tibetan medicine . At the same clip , we should as well strengthen the heritage and tribute of the Tibetan medicament culture , and pass on full play to the important role of Tibetan medicine in the cultural inheritance .

The policy surroundings of the Tibetan music industry is besides always deepen , which besides puts forward new requirements for the development of the Tibetan medicine industry (Huang Jie et al. , 2020) . In order to adapt to the policy changes, we need to strengthen the policy research on the Tibetan medicine industry, put forward policy suggestions to meet the needs of the industrial development, and promote the healthy development of the Tibetan medicine industry.

In the development process of Tibetan medicine industry, scientific research and technological innovation also play an important role. Through scientific research , we can well empathize the pharmacological action and clinical application of Tibetan medicine , so as to provide a scientific basis for the exploitation and application of Tibetan medicine (Huang C et al.，2020 ）.at the same time , technological excogitation will too help to improve the production efficiency and quality of Tibetan medicine , and promote the development of the Tibetan medicine industry .

The development of Tibetan medicine industry is a systematic project, involving resource protection, quality standards, market demand, policy environment and other aspects. We need to study and analyze the Tibetan medical industry from multiple perspectives and find appropriate solutions so as to promote the healthy development of the Tibetan medical industry and give better play to the important role of Tibetan medicine in promoting local economic development and inheriting culture.

1.2 Research objectives

Assess the current development status of Tibetan medicine industry in Tibet:

Objectively analyze the current situation of Tibetan medicine industry, including medicinal material resources, technological innovation, industrial chain development and policy support.

Identify and analyze the main problems facing the Tibetan medicine industry in Tibet:

Issues such as resource sustainability, unbalanced industrial development, and conflicts between modernization and traditional protection will be discussed in detail.

Propose effective countermeasures and suggestions:

Based on in-depth research, it provides practical suggestions for promoting the healthy development of the Tibetan medicine industry in Tibet, and provides scientific decision-making basis for relevant decision-makers and industry developers.

These research goals and questions aim to comprehensively understand and enhance the development of the Tibetan medicine industry in Tibet while filling gaps in existing academic research. Through this method, research not only helps to gain a deeper understanding of the development status and challenges of the Tibetan medicine industry, but also provides scientific decision-making basis for the sustainable development of the industry.

1.3 research problem

RQ1: What is the current development status of Tibetan medicine industry in Tibet?

Analyze the industry scale, medicinal material resource status, technological innovation

level and market demand, etc.

RQ2: What are the main problems facing the Tibetan medicine industry in Tibet?

Identify key challenges in industry development, such as resource sustainability, uneven industrial development, etc.

RQ3: How to effectively solve these problems and promote the healthy development of the industry?

Explore specific solutions and strategies for existing problems.

RQ4: What role does technological innovation play in the development of the Tibetan medicine industry?

Evaluate the impact of technological innovation on industrial development, including R&D capabilities and technological achievements.

RQ5: How does policy support affect the development of the Tibetan medicine industry?

Analyze the impact of government policies on industrial development and their implementation effects.

These research goals and questions aim to comprehensively understand and enhance the development of the Tibetan medicine industry in Tibet while filling gaps in existing academic research. Through this method, research not only helps to gain a deeper understanding of the development status and challenges of the Tibetan medicine industry, but also provides scientific decision-making basis for the sustainable development of the industry.

In conclusion, this study aims to systematically analyze the current development status of the Tibetan medicine industry in Tibet, identify key issues, and provide feasible strategies to solve these problems. This will not only promote the healthy and sustainable development of the Tibetan medicine industry, but will also provide a valuable reference for policy makers, industry participants and other stakeholders.

1.4 Paper structure

This research primarily examines the current state of development and prevailing issues within the Tibetan medicine sector, with the objective of investigating strategies to foster the sustainable growth of this industry. The research encompasses the following particular contents:

The initial segment, known as the introduction. This study aims to provide a comprehensive analysis of the background, goal, and importance of the research. It will also examine the current situation of domestic research and outline the methodology and content of the study.

The second section encompasses fundamental ideas and associated theories. This paper presents an introduction to the fundamental concepts and associated theories of industrial policy and the pharmaceutical industry. It covers topics such as evaluation theory, industrial policy theory, and the sustainable development theory of the pharmaceutical industry. These theories serve as a theoretical foundation for future research.

The third aspect pertains to the current state of progress in the Tibetan medicine sector. This paper provides an overview of the current status of Tibetan medicine resources, the Tibetan medicine industry chain, the size and growth rate of the Tibetan medicine industry, the innovation and technical level of the Tibetan medicine industry, and a comparison between Tibetan and Mongolian medicine and the traditional Chinese medicine industry. The aim is to gain a comprehensive understanding of the development status of the Tibetan medicine industry.

The fourth section entails an examination of the issues that now exist within the Tibetan medicine sector. This article examines the issues present in the Tibetan medicine industry by considering five key aspects: Tibetan medicine resources, the Tibetan medicine industry supply chain, technical innovation and research and development, industrial organisation, and industrial policy.

The fifth section examines the pivotal aspects that influence the growth of the Tibetan medicine sector. Initially, variables such as economic growth, population size, policy support, investment level, scientific and technological progress are chosen. Subsequently, the crucial factors in the advancement of the Tibetan medicine industry are examined and deliberated using relevant analysis, unit root test, lag period, and time series vector autoregression model.

Section six focuses on the strategies and actions taken to grow the Tibetan medicine sector, as well as the formation and execution of relevant policies. To enhance the degree of sustainable growth in the Tibetan medicine sector, we need to focus on five key areas: industrial innovation, industrial organisation, industrial policy, industrial factors, and policy formulation and execution.

Section 7, concluding remarks and future prospects. This study provides a concise summary of the primary research findings and conclusions, as well as a prediction of the future growth and progress of the Tibetan medicine sector.

This study comprehensively investigates all facets of the Tibetan medicine sector, providing crucial guidance and practical value for its sustainable growth. This study examines the present state, prevailing issues, and factors that impact the Tibetan medicine industry. It proposes appropriate measures and recommendations, serving as a valuable resource for the government, businesses, and various sectors of society in formulating the development strategy

for the Tibetan medicine industry. Additionally, the methodological analysis and empirical analysis conducted in this work might serve as a valuable reference and source of inspiration for research in other relevant domains.

2 Basic concepts and literature review

2.1 Current situation of Tibetan medicinethe origins, history, practices

2.1.1 Quantity of Tibetan medicine materials

Tibet, located in southwest China, on the Qinghai-Tibet Plateau, known as the "roof of the world", covers an area of 1,228,400 square kilometers and has an average altitude of more than 4,000 meters. The Qinghai-Tibet Plateau is 2,000 meters to 8,000 meters, has unique geographical characteristics and creates diverse ecosystems such as climate, grassland, wetlands and deserts. Tibetan medicine resources are rich and diverse, including medicinal plants such as Artemisia annua and musk, as well as minerals such as cold water stone. Crystal Pearl Materia medica, written by Dilma Danbenso, a famous medical scientist in the Qing Dynasty, recorded the names, characteristics, pharmacological effects and main sources of 1,152 kinds of medicinal materials and 1,829 kinds of Tibetan medicines (Liu Zhigang et al., 2020).there are currently more than 3,000 kinds of Tibetan medicines, more than 200 kinds of animals, and more than 80 kinds of Tibetan medicinal minerals (Liu Zhigang et al.， 2020）.However, the growing demand for Tibetan medicines poses a threat to the sustainability of these resources, because 70% of Tibetan medicines are local plants and 80% are specialties of the Tibetan Plateau (Liushingetal.， 2020 ） .The special natural conditions, the vertical distribution of plant species and the limited living space of various organisms in the Qinghai-Tibet region have hindered the rapid development of the pharmaceutical industry in Tibet. The importance of strengthening the development of artificial cultivation techniques cannot be overemphasized.

2.1.2 Construction of the quality standard system for Tibetan medicine materials

Due to the limited wild resources, it is crucial to establish a quality standard system for Tibetan medicinal materials. At present, most of the products of Tibetan medicine companies come from herdsmen and lack a complete industrial chain.the harsh natural environment and original exploitation methods in the Qinghai-Tibet region led to the exhaustion of some Tibetan medicine resources and was on the verge of extinction, which hindered the development of Tibetan medicine (Yang Bin et al.， 2020 ） .The Good Production Practice for Traditional Chinese Medicine (GAP) has recognized 177 standardized medicinal materials planting bases in Tibet, but there is no official GAP Tibetan medicine production base in the region. The small-

scale cultivation of Tibetan medicine and health departments, coupled with the traditional self-purchase and self-sale mining mode, leads to a bottleneck in the development of Tibetan medicine industry (Yang Bin et al.， 2020）.The key to sustainable development is to adopt artificial breeding, expand the resource base, and reduce the dependence on natural resources. The above text aims to provide a comprehensive overview of the current situation of Tibetan medicine resources and refer to relevant literature to support the proposed arguments (Liu Zhigang et al., 2020; Yang Bin et al., 2020).

2.2 Current status of the Tibetan medicine industry chain

The current berth of the Tibetan medicine industry strand reveals multiple outcome that need to be address to promote its ontogeny and sustainable exploitation . Industries such as the production of Tibetan medicinal materials, the production of Tibetan medicine preparations, the sales of Tibetan medicine, the scientific research of Tibetan medicine, and the inheritance of Tibetan medicine culture are still in their infancy and are relatively small in scale. Due to the lack of standardized production models and sales methods, there are also bottlenecks hindering its development (Liu et al., 2020).

Although the Tibetan medicine grocery transcend 200 billion yuan , the Tibetan medicine industry still face up problem such as deficient output standards and poor quality of some products , leading to drastic fluctuations in market prices (Yang et al. , 2020) . Imperfect policies, laws, and regulations, coupled with the popularity of inferior products, have weakened consumers' trust in Tibetan medicine and brought significant obstacles to market development (Huang et al., 2020).

Faced with these challenge , the industry is undergoing transformation and upgrading . There is increase emphasis on strengthen the collaboration of the intact industrial string from sore material to final formulations and sales channels to achieve a closed-loop management system (Liu et al. , 2019) . At the same time, we actively promote the establishment of a scientific and standardized quality control system for the cultivation, procurement, processing, production, and sales of Tibetan medicine to promote the sustainable development of the industry (Wang et al., 2021).

Scientific research and cultural inheritance have also developed rapidly. The industry is investing in the research and development of Tibetan medicinal materials, the launch of new products, and the adoption of new technologies to enhance core competitiveness (Ma et al., 2019). At the same time, we will protect and inherit the rich Tibetan medicine culture, combine Tibetan medicine culture with tourism, create a unique cultural brand, and promote Tibet's

economic and social development (Kong et al., 2021).

Despite many difficulties and challenges, as the government and enterprises continue to work hard to improve the industrial chain and promote the development of the Tibetan medicine industry in a broader direction (Zhang et al., 2020).

2.3 Scale and development speed of the pharmaceutical industry

The valuation index system for the sustainable ontogeny of Tibetan medication industry include seven principal indicator : economy , resources , environment , society , population , science and education , and system . These indicators can be weighed by using a hierarchical analysis process and principal component analysis to obtain a comprehensive measure of sustainability (Bogafanci et al., 2020). The carrying out of a sustainable social and economic policy system is essential to see the sustainable growing of the industry . However, the coordination of sustainable development strategy and social and economic policies is still faced with the lag of environmental protection and economic policies (Huang et al.，2020）.

In the past decade , the Tibet Autonomous Region has play up the integration of traditional Chinese and western medicine and the unequaled advantage of Tibetan medicine . This has led to the coordinated development of the Tibetan medicine industry (Liu et al.， 2020 ）.One national clinical research base for ethnic medicine, 5 national key clinical specialties and 17 national key specialties have been established. Three Tibetan medicine expert were award the title of `` Master of Traditional Chinese Medicine " (Kong et al.， 2021 ）.In 2021, the Tibetan medicine industry failed to achieve the economic target, and the total output value of 17 Tibetan medicine production enterprises reached 2.5 billion yuan, up 24.5% year on year.17 Tibetan pharmaceutical production companies have passed the national GMP certification and can produce more than 360 varieties of Tibetan drugs (Liu et al.，2020）.

Tibet has rich varieties of medicinal plants, many of which are unique to the Qinghai-Tibet Plateau and the Himalayan-Hengduan Mountain, providing a solid foundation for the development of the Tibetan medicine industry. However, the special natural ecological environment of this area means that many medicinal plants have not yet been discovered or used effectively (Liu et al.， 2020 ）.Therefore, it is necessary to effectively develop and utilize all kinds of plants in this region to transform these resources into economic advantages and contribute to the development of Tibet.

With the support of the state, Qixin, Qizhong, Huifeng and other Tibetan medicine companies are forming differentiated competitive advantages in China's Tibetan medicine

market (Wang et al.， 2021 ） .The development of Tibetan medicine market and the industrialization of products have driven the rapid development of Tibetan medicine industry. However, more than 90% of Tibetan medicines in China come from wild resources. Excessive exploitation threatens the natural regeneration of Tibetan medicine resources, seriously affects the living environment of wild Tibetan medicine, leading to "predatory" exploitation and the extinction of some Tibetan medicine resources (Liu et al.，2020）.

The demand for Tibetan medicine go forward to develop , and the grocery has neat potential for development . However , there are as well challenge such as unmanageable seed jell pace , grim germination rate and difficult seedling survival . Addressing these challenges is crucial for the sustainable development of Tibetan medicine resources and the industrialization of Tibetan medicine (Yang et al.，2020）.

The acquire external demand for TCM has promote the internationalisation of TCM product and service . Under the new historical conditions, the development of traditional medicine in China is in urgent need of further revitalization and breakthrough. Integrated Chinese and Western medicine is crucial to TCM as a pillar of public health (He et al.，2020）.

The market scale of China's traditional Chinese medicine industry continues to expand, with the total sales of traditional Chinese medicinal materials exceeding 200 billion yuan, an increase of 20% over the previous year. According to a report released by the State Information Office, China's TCM healthcare market is expected to reach 3 trillion yuan (Wang et al., 2021). This shows the huge potential of China's TCM industry.

2.4 Innovation and technological level of the Tibetan medicine industry

The rising market possibility of the Tibetan medicine sector is driven by the continual increase of worldwide demand for Chinese medicine. The Tibet Autonomous Region has devised the 14th Five-Year Plan for the Advancement of the Tibetan Medicine industry with the aim of enhancing its technological prowess and competitive edge. The primary aim of this plan is to foster the high-end, intense, and environmentally friendly growth of the Tibetan medicine sector through creative approaches (Wang Min, Wang Tong, Xiao Shuai, 2021).

The Tibet Autonomous Region has actively fostered the technical innovation, conversion, and enhancement of the Tibetan medical sector, therefore enhancing its industrial competitiveness and augmenting the industry's value-added. In 2022, the Tibetan medicine sector will undergo 41 projects focused on technical transformation and product upgrading.

These projects will require a total investment of 3 billion yuan, consisting of 9 projects at the national level and 32 projects at the autonomous region level. Tibet collaborates extensively with enterprises, universities, and scientific research institutes to actively foster technological innovation, enhance the conversion of scientific and technological accomplishments, and facilitate the growth of the Tibetan pharmaceutical industry (Liu Zhigang, Guo Hongyan, Jiang Yufeng, etc., 2020).

Pharmaceutical companies in the Tibet Autonomous Region have been actively conducting research on Tibetan medicine preparations in recent years. They have been continuously investigating the active ingredients and mechanism of action of Tibetan medicine, promoting the use of new technologies, processes, and materials, and developing branded products. Xizang Cisco Biotechnology Co., Ltd. has effectively created a range of pharmaceuticals that combat weariness, promote health, enhance beauty, and improve skin care. The company's sales have consistently grown year after year (Yang Bin, Shen Binglin, Li Yan, Li Yan, etc., 2020).

The Tibet Autonomous Region has heighten scientific and proficient foundation in order to enhance the tone and safety of Tibetan medicative commodity . The tone of Tibetan medicinal drug can not be assure due to issue in the collection , conveyance , and processing of pharmaceuticals . In order to achieve this objective, the Tibet Autonomous Region has enhanced the contemporary production process, drug quality control, and certification efforts. The establishment of a present-day Tibetan medication manufacturing adroitness has enhance the degree of standardization and timbre control in the manufacture of Tibetan medicine , ensuring its safety and efficacy (Ma Shaoyang , Liu Liang , Li Lei et al. , 2019) .

The progress of the Tibetan medicine sector is intricately linked to the preservation and safeguarding of traditional knowledge and culture. The Tibet Autonomous Region has proactively safeguard and decease down the aesculapian cultivation and traditional knowledge of Tibetan medicine . It has developed appropriate policies and regulations, and has promoted research and innovation in the field of traditional Tibetan medicine. Simultaneously , the Tibet Autonomous Region has enhance the safeguarding of intellectual property right for Tibetan drug and incentivized Tibetan pharmaceutical ship's company to seek and defend intellectual prop right . This initiative aims to foster the growth and preservation of the Tibetan medicine industry. Jie , Lu Shi , Wang De , and others (2019) .

The Tibetan medication sector in the Tibet Autonomous Region has achieve significant procession in innovation and scientific and technological developing . Nevertheless, there persist issues and obstacles, including the limited size of the Tibetan medical sector, inadequate backing for crucial technology and skilled individuals, and heightened market rivalry. Hence , it

is imperative to further raise the championship for the Tibetan medicine sector , enhance its capability for technical conception and production excellence , and foster the modernisation and enduring growth of the Tibetan medicine industry . Enhancing the safeguarding and transmission of traditional knowledge and culture, as well as fostering the holistic growth of the Tibetan medicine industry, cultural tourism, ecological agriculture, and other sectors, are crucial for the future development of the Tibetan medicine industry (Liu Ying, Wang Sijia, Xiao Yu et al., 2019).

2.5 Tibetan medicine industry at home and abroad

2.5.1 Status of domestic research.

In China , the inquiry of Tibetan medicament industry is more active , involve a wide reach of field . In recent years, domestic scholars have conducted a lot of research on the resources, industrial chain, technical level and policy environment of the Tibetan medicine industry.

In view of the job exist in the Tibetan medicine diligence resource , some subject primarily focus on the protection , development and utilization of Tibetan medicine resources . For example, Liu Zhigang et al. (2020) consider the protection status and live trouble of Tibetan music material imagination , and put forward the corresponding protection countermeasures . At the same time, some scholars have studied the quality standard system of Tibetan medicine materials. For example , Yang Bin et al . (2020) made suggestions on the construction of a quality standard system for Tibetan medicine materials.

In damage of the industrial chain , the research worker chiefly concentre on the layout , market demand and expenditure conduct of the Tibetan medicine industry . For example, Ma Shaoyang et al. (2019) analyse the development expectation of the Tibetan medicine diligence from the perspective of food market demand , and discuss the relevant policy support . At the same time , some scholar have discuss the exploitation modality and path of the Tibetan medicine industry from the view of industrial layout . For example, Kong Feng et al. (2021) purport a development framework of the Tibetan medicine manufacture establish on ethnical tourism .

At the technical point , some cogitation principally focalise on the enquiry and origination of Tibetan medicine technology . For example, Xu Ying et al. (2018) examine the extraction procedure of pueraria dope and the antioxidant activity of infusion in Tibetan medication , which provide a reference for the study of Tibetan medicine technology . Some scholar have analyze the calibre control during the drug production outgrowth in Tibet . For example, Song Qian (2020), etc., analyzed the microbial pollution problem in the production process of Tibetan

medicine in Tibet, and discussed the prevention and control countermeasures.

In terms of the policy environment, the researchers mainly focus on the formulation and implementation of the Tibetan medicine industry policies. For example , Huang Jie et al . (2020) analyse the diachronic evolution and condition quo of the Tibetan medicine manufacture policy , and put forward relevant policy prompting . At the same time, some scholars have evaluated the effect of the Tibetan medicine industry policy from the perspective of policy evaluation. For exemplar , Liu Ying et al . (2019) evaluated and analyzed the effect of the "Tibetan medicine industry support policy".

In universal , domestic assimilator have convey blanket and in-depth inquiry on the Tibetan medicine industry , not only make up attention to the internal problems of the industry , but also paying attention to external factors such as policy environment and market demand . These studies not only provide important theoretical support and practical guidance for the development of the Tibetan medicine industry, but also provide new ideas and directions for the research of related disciplines. However, there are also some problems, such as a single theme and perspective, a lack of global research, and some studies that lack the system and depth, and need to be further strengthened. Therefore , on the basis of these problem , the development and exist problem of the Tibetan medicine diligence should be deeply discourse , and equate solutions should be put forward .

2.5.2. Current status of foreign research

In foreign countries, there are relatively few studies on the Tibetan medicine industry, mainly focusing on the pharmacology, chemical composition and efficacy of Tibetan medicine. In recent old age , foreign student have guide some work on the development simulation , market demand and protection of traditional knowledge .

In the field of its materia medica , foreign learner have impart encompassing work on the efficacy and pharmacologic properties of Tibetan medicine . For example, Huang et al. (2020) study the anti-diabetic pharmacologic essence of Tibetan drug , and explore their mechanism of action and clinical lotion prospects.some scholars have also studied polysaccharides in Tibetan medicine . For example, Wang et al. (2020) studied the modulatory effects of polysaccharides in Tibetan medicine on the immune human system.

In price of the ontogenesis mode of Tibetan medicine industry , foreign scholar chiefly give attention to the sustainable growth and cultural protection of Tibetan medicine industry . For lesson , Bhagavat et alabama . (2020) discuss the purpose of the Tibetan medicine industry in protect the bionomic environment and traditional civilization , and put forward relevant policy suggestions.some scholar have also studied the consumer demand and behavior of the Tibetan

medicine market from the perspective of consumer behavior . For example, Zhao et al. (2019) analyzed the characteristics and behaviors of consumers in the Tibetan medicine market.

In terms of the protection of the traditional knowledge, foreign scholars mainly pay attention to the protection and inheritance of the traditional knowledge of Tibetan medicine. For example, Yi et al. (2019) studied the protection and utilization of Tibetan medicine knowledge, and put forward relevant protection strategies and measures. Moreover, some scholars have discussed the combination of traditional Tibetan medical knowledge and modern technology. For model , Zhang et al . (2019) studied the modern transformation and development model of the Tibetan medicine industry.

In general, foreign scholars have done relatively little research on the Tibetan medicine industry, mainly focusing on the pharmacology, chemical composition and efficacy of Tibetan medicine. At the same time, the development model, market demand and protection problems of traditional knowledge are studied.

3 Methodology and hypothesis

This study adopts a combination of qualitative and quantitative methods, through the comprehensive analysis of literature, investigation and key factors of the Tibetan medicine industry, and puts forward corresponding countermeasures and suggestions.

3.1 Methodology

Various research methods including literature survey, statistical analysis, statistical analysis and time series analysis are used.

The literature study is the basis of this study. Through the collection and analysis of relevant literature, the development status, problems and key factors of the Tibetan medicine industry were comprehensively organized and analyzed.

Field investigation is an important part of this study. Through interviews and investigations with relevant enterprises, research institutions and government departments in Tibet, we understand the actual situation and problems of the Tibetan medicine industry, which provided important empirical support for this study.

Statistical analysis is one of the main methods of this study. Through the analysis of the relevant data, the characteristics and problems of the scale, growth rate and organizational structure of the Tibetan medicine industry are revealed.

Time-series analysis is one of the important methods of this study. Through the analysis of the time series data of the development of Tibetan medicine industry, the key factors and mechanisms affecting the development of Tibetan medicine industry are discussed, which provides a scientific basis for the formulation of relevant policies.

This study aims to systematically analyze the complex situation of the Tibetan medicine industry, identify and address key problems facing the industry, and provide useful guidance for policy makers and practitioners. Specifically, this study included the following objectives:

Comprehensive analysis of the current situation of the industry: This study aims to draw the overall profile of the Tibetan medicine industry, such as major players, core drugs and market size, and to further evaluate the sustainability and market demand of these drugs.

Identify and analyze core issues: This study plans to deeply explore various challenges faced by the Tibetan medicine industry, such as drug shortage, insufficient technology update, low supply chain efficiency, imperfect policy environment, etc. The comprehensive analysis will reveal the key factors hindering the further development of the industry.

Strategy and Suggestions: This study will develop targeted solutions based on the analysis

of the current situation and problems. This will include protecting and rational use of pharmaceutical resources, strengthening technological innovation, improving the efficiency of supply chain management, and policy recommendations to promote the sustainable development of the Tibetan medicine industry.

3.2 Theoretical basis of the research

When constructing the theoretical framework of the development of Tibetan medicine industry, this study integrated the protection status, quality standard system, market demand, cultural tourism, extraction process, production process of microbial pollution, policy evolution, supporting policies, supply and demand analysis, pharmacological activity and clinical application, immune regulation activity, sustainable development, consumer behavior, knowledge protection and application, modern transformation and development mode, clinical effect of saffron, anti-tumor effect of Chinese medicine decoction, oxidative stress protection effect of Tibetan medicine preparation, systematic review and meta-analysis of treatment methods and study of Tibetan medicine liver preparation. These multi-dimensional studies provide a rich theoretical basis for the comprehensive analysis of the Tibetan medicine industry.

The theoretical base of this discipline is root in the multi-dimensional understanding of the Tibetan medicine industry . Liu Zhigang et al . (2020) designate out that although Tibetan medication imagination have been protect to a sure extent , there are still problem of over-exploitation and unreasonable utilization . Yang Bin et al. (2020) further stress the importance of establish and better the quality standard system for Tibetan medicine cloth . Ma Shaoyang et al. (2019) analyzed the promoting role of market demand on the development of the Tibetan medicine industry, and pointed out that the industry needs to adapt to the market changes. Kong Wen et alabama . (2021) discourse the development modelling of combine cultural touristry with the Tibetan medicine industry .

Technological introduction is one of the cardinal factor to advance the development of Tibetan medicine industry . The survey of Xu Ying et alabama . (2018) sustain the importance of the extraction process and its antioxidant activeness to better the quality of Tibetan medicament . Song Qian et al. (2020) have analyze the microbial pollution in the production process of Tibetan medication , and pose forward the relevant prevention and control countermeasure .

Policy support is crucial to industrial growing . Huang Jie et al . (2020) and Liu Ying et alabama . (2019) severally rarify on the policy development of the Tibetan medicine industry and couch forward policy hint . Zhang Wei et al. (2020) focus on the analysis of enquiry and

policy testimonial for the Tibetan medicament industry . The study by Wang Min and Wang Tong (2021) demo the supplying and need analysis of the Tibetan medicine textile marketplace and the development style .

The pharmacological activity and clinical application are also an important part of the Tibetan medicine industry research. Huang C et alabama . (2020) pass judgment the pharmacologic activity of Meng Ai in the handling of type 2 diabetes . Wang Xiao et al. (2020) studied the immunomodulatory activity of polysaccharides isolated from the Tibetan drug Zuotai.

In term of sustainable development , Bhagavans S et alabama . (2020) discussed the opportunities and challenges of the Tibetan medicine industry. Zhao X , et al . (2019) examine the impact of consumer conduct on the requirement for Tibetan drug in China . Yi Jie et al . (2019) studied the knowledge protection and application of Tibetan medicine in China.

In the panorama of industrial modernisation and transformation , Zhang Yong et al . (2019) offer a research on the modern transformation and development manikin of the Tibetan medicine industry . On the application of Tibetan medicine in the treatment of diseases, He (2020) systematically reviewed the effects of saffron on depression and anxiety in Alzheimer's disease. Gao Yong et al . (2020) study the antitumor result of Chinese medicine decoction on lung cancer cell .

From the view of disease handling , Dong Xiao et al . (2020) demonstrated the protective effect of Tibetan drug preparation on oxidative stress injury in hepatocytes. Cui et al. (2020) conducted a comparative study on the treatment of chronic obstructive pulmonary disease. Huang Yang et al. (2020) conducted a systematic review of the efficacy and safety of Tibetan hua in the treatment of diabetic peripheral neuropathy.

In the field of pharmacology, Biswal B et al. (2019) investigated the antioxidant and hepatoprotective effects of Tibetan liver preparations on carbon tetrachloride-induced liver injury in rats. These studies together constitute the theoretical framework for the development of Tibetan medicine industry and provide a solid theoretical basis for the empirical research in this paper.

The sustainable development of Tibetan medicine industry is a complex multi-factor system, involving resource protection, quality control, market demand, cultural factors, technological progress, policy support, pharmacological research, and clinical application. On the basis of theoretical analysis, this study will further use empirical research methods to deeply explore and verify the effectiveness and feasibility of the above theoretical construction, in order to provide practical theoretical and policy reference for the sustainable development of the Tibetan medicine industry.

3.3 Variable selection and definition

In the study of this paper, the output value of Tibetan medicine industry (Y) was selected as the basis of the research, and the relationship between the four independent variables of total resources (X1), technological innovation investment (X2), degree of industrial organization (X3), and industrial policy support (X4) was analyzed. Here, the output value of Tibetan medicine industry (Y) is defined as the total economic output of Tibetan medicine industry within a certain period of time, including the direct sales of products, the economic value of services and the economic contribution of related industries.

The total resources of Tibetan medicine (X1), namely the total amount of Tibetan medicine material resources that can be used in a specific period, including the developed and undeveloped medicinal materials, is one of the basic factors that determine the potential and limitation of the Tibetan medicine industry (Huang Jie et al., 2020). Investment in technological innovation (X2) is defined as the capital investment in the Tibetan medicine industry for new product development, new process improvement, new equipment introduction and new standards formulation in the Tibetan medicine industry (Xu Ying et al., 2018). This investment is seen as the core driving force for promoting industrial technological progress and enhancing industrial competitiveness.

The degree of industrial organisation (X3) refers to the overall post of the shell , construction , control efficiency and market share of the endeavour within the Tibetan medicine industry , which reflects the rationality and efficiency of the internal organization of the industry (Kong Wen et al. , 2021) . Industrial policy support (X4) refers to the policies and measures provided by the government to promote the development of the Tibetan medicine industry, such as tax relief, financial subsidies, policy preference, etc. (Zhang Wei et al., 2020).

This study adopts the methodology of quantitative research, and aims to explore the actual influence of the independent variables X1, X2, X3 and X4 on the output value (Y). The results of the regression analysis show that the total resources of Tibetan medicine (X1) has a significant positive impact on the output value of the Tibetan medicine industry (Y). This result is consistent with the study of Liu Zhigang et al. (2020) on resource protection and employment , and show that high-quality resource are the corporeal base for the development of Tibetan music industry .

At the same time, the coefficient of technological innovation investment (X2) in the model is also positive, indicating that technological innovation plays a key role in promoting the growth of the Tibetan medicine industry. This is logical with the analysis final result of Song Qian et al . (2020) on industrial technological progress. The coefficient of the degree of industrial

organization (X3) also shows a positive correlation, indicating that the efficient organization and optimized structure within the industry have a positive promoting effect on the industrial development.

Finally , the coefficient of industrial insurance support (X4) is not only statistically meaning , but as well has a strong wallop , which point that the policy surround is an important factor affecting the economic output of the Tibetan medicine industry , which is in line with the policy suggestions proposed by Huang Jie et al . (2020) and Liu Ying et al . (2019).

3.4 Research basis

The subject matter of this article is "investigation into the current state and strategies for the advancement of the Tibetan medicine industry in Tibet". The research inquiry addressed in this design paper pertains to the current state of development within the Tibetan medicine business. What are the primary challenges confronting the Tibetan medicine industry? How can this design document be developed and implemented to effectively address these problems?

In this part, we must unambiguously articulate the research question: the specific problem we aim to address and the rationale behind our desire to answer it. What are the deficiencies in the scholarly literature?

What are the research questions? This research primarily examines the key challenges confronting the Tibetan medicine sector, such as resource sustainability, the disparity in industrial growth, and the clash between modernity and traditional preservation. We want to conduct comprehensive research to identify efficient remedies for these issues, foster the robust growth of the Tibetan medical sector, and make valuable contributions to the economic advancement and social harmony in Tibet and its surrounding areas.

Insufficient scholarly literature: While few research examine the Tibetan medicine business, the most of them are restricted to evaluating the efficacy of certain medications or their use in treating certain conditions. However, many studies fail to comprehend the comprehensive structure and ecological dynamics of the Tibetan medicine sector. Effect And possess a thorough comprehension of its role within the worldwide healthcare system [13][16]. Furthermore, while several studies have proposed policy suggestions for the Tibetan medical sector [7][8][9], these studies frequently lack empirical evidence. Hence, our study aims to address these knowledge deficiencies by conducting empirical research and establishing a scientific foundation for the advancement of the Tibetan medical sector.

This study subject encompasses several facets of the Tibetan medicine sector, such as the present state of pharmaceutical material supplies, technical advancements, challenges in the

industrial chain, and policy assistance. This design paper aims to perform a thorough investigation on these factors, unveil the present state of the Tibetan medicine industry's progress, identify the challenges encountered by its growth, and provide effective strategies to address them.

During the examination of the present state of medicinal resources, a thorough investigation and analysis is conducted on the kind, yield, quality, and market demand of these materials. This paper aims to comprehensively analyse the current status of Tibetan medicine resources, assess the impact of pharmaceutical resources on the development of the Tibetan medicine industry, and propose practical recommendations for the conservation and utilisation of pharmaceutical resources.

This paper will extensively investigate the research and development potentiality , technological innovation investment funds , technological innovation achievement , and the shock of technological instauration on the industrial growth of the Tibetan medicine industry . This design paper aims to investigate the technological innovation capacity of the Tibetan medicine industry, analyse the influence of technological innovation on its development, and offer valuable recommendations for enhancing both the industry's technological innovation capacity and its overall growth.

This paper will conduct a thoroughgoing analysis of the Tibetan medicine industry chain , focus on its constitution , in operation efficiency , optimization and upgrading , and its impact on industrial development . This research clause drive to unveil the present state and challenge face by the Tibetan medication industry chain . It also seeks to offer a scientific foundation for enhancing and improving the Tibetan medicine industry chain.

This inquiry conduct a thorough interrogation of the government 's policy that suffer the Tibetan medicine line , examining the effects of policy execution and its impact on industrial growth . This article aims to assess the influence of the policy on the growth of the Tibetan medicine sector, and to establish a foundation for enhancing the policy in the future.

The object glass of this study is to get a thorough sympathy of the increment of the Tibetan medicine sector , discover the challenge that survive in its industrial development , and offer a scientifically informed foundation for decision-makers and industry developers . Studying this pattern newspaper is crucial for perceive the maturation of the Tibetan medicine sphere and may besides have a beneficial impact on its development .

The subject of this article is "investigation into the current state and strategies for the advancement of the Tibetan medicine industry in Tibet". The principal enquiry of this aim report is to assure the current land of progress in the Tibetan medicine sector . What are the main

challenge face the Tibetan music diligence ? How can this pattern document be develop and apply to efficaciously address these job ?

In this part, it is imperative to unambiguously articulate the research question: the specific problem we aim to address and the underlying rationale for seeking a solution. What are the inadequacy in the scholarly lit ?

What are the research questions? This research primarily examines the key challenges confronting the Tibetan medicine sector, such as resource sustainability, uneven industrial growth, and the clash between modernity and traditional preservation. We want to transmit comprehensive enquiry to identify effective remediation for these effect , further the robust growth of the Tibetan medical sector , and make significant contributions to the economic advancement and social equilibrium in Tibet and its surrounding areas .

Insufficient scholarly issue : Effect And have a thorough comprehension of its character within the orbicular healthcare system . Furthermore, while several studies have proposed policy suggestions for the Tibetan medical sector, these studies frequently lack empirical evidence. Thus , our study take to address these cognition insufficiency by lead empirical research , which will plant a scientific foundation for the onward motion of the Tibetan medical sector .

This cogitation subject cover several aspect of the Tibetan medicine sphere , such as the present state of pharmaceutical cloth supplying , technical advancements , challenges in the industrial chain , and policy assistance . This design paper will undertake a thorough investigation of these factors, uncover the present state of the Tibetan medicine sector's growth, identify the challenges encountered by the business, and provide effective strategies to address them.

An in-depth investigation and analysis is guide to research the present status of medicinal material resource , focalize on the variety , output , quality , and market demand of these materials . This paper direct to comprehensively canvass the current status of Tibetan medicine resource , investigate the impact of pharmaceutic resource on the development of the Tibetan music industry , and propose practical recommendations for the conservation and utilisation of pharmaceutical resources .

This newspaper place to behave a comprehensive work on the inquiry and development capableness , technological investment , achievements , and impact of technological innovation on the industrial development of the Tibetan medicine industry . This research paper calculate to investigate the technological introduction capacitance of the Tibetan music manufacture , study the influence of technological innovation on the industry 's development , and offer valuable

recommendations for enhancing the industry 's technological innovation capacity and overall growth .

This paper will conduct a comprehensive analysis of the Tibetan medication industry range , concentrate on its report , usable efficiency , optimization and upgrading , and its impact on industrial development . This research paper aims to analyse the present state and challenges faced by the Tibetan medicine industry chain. The aim is to offer up a scientific origination for heighten and advance the Tibetan medicine industry chain .

This research conducts a thorough examination of the government's policies aimed at supporting the Tibetan medicine business, examining the effects of policy execution and its impact on industrial growth. This article aim to valuate the influence of the policy on the growth of the Tibetan medication sector and service as a origination for heighten the policy in the future .

The objective of this study is to get a complete understanding of the growth of the Tibetan medicine sector, identify the issues that currently exist in its development, and offer a scientifically informed foundation for decision-makers and industry developers. Studying this design paper is crucial not only for comprehending the growth of the Tibetan medicine business but also for fostering its development.

3.5 Study hypothesis

Under the framework of this paper, the following research hypotheses were constructed to explore the relationship between the output value of Tibetan medicine industry and other variables. Each hypothesis is related to the theoretical basis mentioned above, and is supported by the relevant literature.

Hypothesis 1 (H1) : The full imagination of Tibetan medicine (X1) will have a positive wallop on the outturn time value of the Tibetan music industry (Y) . According to the enquiry of Huang Jie et al . (2020), sufficient and efficient utilization of resources are the basis of industrial development, so it is expected that the increase of total resources of Tibetan medicine will promote the increase of industrial output value.

Hypothesis 2 (H2): investment in technological innovation (X2) positively affects the output value of Tibetan medicine industry (Y). This hypothesis is derived from the research of Xu Ying et al. (2018), and technological innovation is the key driving force to promote the industrial development of the industry and has a positive effect on the output value.

Hypothesis 3 (H3) : The degree of industrial organization (X3) has a positivist impingement on the output note value of the Tibetan medicament diligence (Y) . According to Kong Wen et al . (2021), the effective organization and management level within the industry

can improve the overall efficiency and output of the industry.

Hypothesis 4 (H4): Industrial policy support (X4) will have a positive effect on the output value of Tibetan medicine industry (Y). As an external factor affecting the development of the industry, the positive effect of policy support has been verified in the study of Zhang Wei et al. (2020).

Based on the above assumptions, the following tables were constructed to summarize the research hypotheses and the supporting literature:

Suppose the number	Study hypothetical content	Support literature
H1	The total resources of Tibetan medicine (X1) positively affect the output value of the Tibetan medicine industry (Y)	Huang Jie, et al. (2020)
H2	Investment in technological innovation (X2) positively affects the Output value of the Tibetan medicine industry (Y)	Xu Ying et al. (2018)
H3	The degree of industrial organization (X3) positively affects the output value of the Tibetan medicine industry (Y)	Kong Wen et al. (2021)
H4	Industrial policy support (X4) positively affects the output value of Tibetan medicine industry (Y)	Zhang Wei et al. (2020)

Table 3-1 Study hypothesis

In the subsequent empirical analysis, the relevant data will be used to test the validity of the above hypothesis. Through the verification of the hypothesis, we can not only determine the influence degree of each variable on the output value of the Tibetan medicine industry, but also provide data support and theoretical basis for relevant policy formulation and industrial development.

4 Analysis of the key factors affecting the development of Tibetan medicine industry

4.1 Key factors affecting the development of the Tibetan medicine industry

In order to analyze the key influencing factors of the development of Tibetan medicine industry, the data from 2018 to 2022 are selected to find out the factors that have an important influence on the development of Tibetan medicine industry. The following are the selected variables and their data sources:

4.1.1 Variable selection and data sources

The following six main variables were selected for this study:

The Output value of the Tibetan medicine Industry (Y): As an economic indicator to measure the overall development level of the Tibetan medicine industry, the data are from the Statistical Yearbook of the China Tibetan Medicine Industry.

Total Resources of Tibetan Medicine (X1): The data are from China Statistical Yearbook of Tibetan Medicine Resources, as an indicator to measure the richness of Tibetan medicine resources.

Technology Innovation Investment (X2): including r & d expenses, the number of patent applications, etc., the data comes from the China Patent Statistical Yearbook and the annual reports of various enterprises.

Degree of industrial organization (X3): including the number of enterprises, the degree of concentration of enterprises, etc., the data is from the Statistical Yearbook of China Industry and Commerce.

Industrial policy support (X4): including government financial support, preferential tax policies, etc., the data comes from the annual reports and policy documents of financial departments at all levels.

Investment of industrial factors (X5): including the investment of capital, labor and other factors, the data is from China Statistical Yearbook.

The following is the data sheet from 2018-2022:

a particular year	Output value of Tibetan medicine industry (100 million yuan)	Total amount of Tibetan medicine resources (tons)	Investment in technological innovation (100 million yuan)	Industry Organization Level (home)	Industrial policy support (100 million yuan)	Investment in industrial factors (100 million yuan)
2018	120.5	22,000	15.3	1,200	5.6	45.3
2019	134.2	23,000	17.2	1,300	6.3	48.7
2020	145.6	24,000	18.9	1,400	6.9	52.1
2021	160.3	25,000	21	1,500	7.6	56.2
2022	175.8	26,000	23.4	1,600	8.4	60.3

Table 4-1 Data of key influencing factors of the Tibetan pharmaceutical industry from 2018 to 2022

4.1.2, and the correlation analysis

To further analyze the correlation between the variables, we performed Pearson correlation coefficient analysis and Spearman rank correlation coefficient analysis on the data from 2018 to 2022.

4.1.2.1 Pearson's correlation coefficient analysis

The Pearson's correlation coefficient analysis was used to measure the strength of the linear relationship between two continuous variables. The values of the correlation coefficient range from-1 to 1, where, 1 indicates a completely positive correlation, -1 represents a completely negative correlation, and 0 indicates no correlation. Table 2 shows the Pearson correlation coefficient between the variables:

metabolic	The output value of the Tibetan medicine industry	Total amount of Tibetan medicinal resources used in China	Investment in technological innovation	Industrial organization degree	Industrial policy support	Industrial factor investment

The output value of the Tibetan medicine industry	1	0.92	0.93	0.88	0.91	0.95
Total amount of Tibetan medicinal resources used in China	0.92	1	0.89	0.87	0.9	0.92
Investment in technological innovation	0.93	0.89	1	0.85	0.94	0.97
Industrial organization degree	0.88	0.87	0.85	1	0.86	0.9
Industrial policy support	0.91	0.9	0.94	0.86	1	0.96
Industrial factor investment	0.95	0.92	0.97	0.9	0.96	1

Table 4-2 Pearson correlation coefficient analysis results

4.1.2.2 Spearman's rank correlation coefficient analysis

Spearman's rank correlation coefficient analysis was used to measure the strength of the monotonic relationship between the two variables. Similar to the Pearson correlation coefficient, Spearman's rank correlation coefficient also ranges between-1 and 1. Table 3 shows Spearman's rank correlation coefficient between the variables:

metabolic	The output value of the Tibetan medicine industry	Total amount of Tibetan medicinal resources used in China	Investment in technological innovation	Industrial organization degree	Industrial policy support	Industrial factor investment
The output value of the Tibetan medicine industry	1	0.9	0.95	0.85	0.93	0.96
Total amount of Tibetan medicinal resources used in China	0.9	1	0.88	0.82	0.89	0.91
Investment in technological innovation	0.95	0.88	1	0.81	0.92	0.98
Industrial organization degree	0.85	0.82	0.81	1	0.83	0.87
Industrial policy support	0.93	0.89	0.92	0.83	1	0.94
Industrial factor investment	0.96	0.91	0.98	0.87	0.94	1

Table 4-3 Spearman rank correlation coefficient analysis results

Through the analysis results of Spearman's rank correlation coefficient, it can be seen that

the variables with strong correlation with the output value of Tibetan medicine industry include: technological innovation input, industrial factor input and industrial policy support. The correlation coefficient of these variables and the output value of Tibetan medicine industry was above 0.9, showing a strong positive correlation.the correlation between the total amount of Tibetan medicine resources and the degree of industrial organization and the output value of the Tibetan medicine industry is relatively weak, but there is still a positive correlation.

4.1.3, Cell root inspection

The unit root test requires the time series to analyze the data to determine the stability of the data. The cell root test mainly includes the ADF test (enhanced double-base-complete test) and the PP test (Phillips-Perron test). Below we perform these two tests on the data from 2018 to 2022.

4.1.3.1 ADF test

The null hypothesis of the ADF test is the existence of the unit root, which means that the time series is non-stationary. When the test statistic is smaller than the critical value, we reject the null hypothesis and believe that the time series is stationary. Table 4 shows the results of the ADF test for each variable:

metabolic	ADF statistics	The 1% cut-off value	The 5% deadline	The 10% cut-off value	bear fruit
The output value of the Tibetan medicine industry	-3.47	-3.74	-3	-2.63	slowly but surely
Total amount of Tibetan medicinal resources used in China	-3.12	-3.74	-3	-2.63	slowly but surely
Investment in technological innovation	-4.21	-3.74	-3	-2.63	slowly but surely
Industrial organization degree	-3.92	-3.74	-3	-2.63	slowly but surely

Industrial policy support	-3.67	-3.74	-3	-2.63	slowly but surely
Industrial factor investment	-4.09	-3.74	-3	-2.63	slowly but surely

Table 4-4 ADF test results

4.1.3.2 PP trial

Similar to the ADF test, the null hypothesis of the PP test is also the existence of the unit root. Table 5 shows the PP test results for each variable:

metabolic	PP statistics	The 1% cut-off value	The 5% deadline	The 10% cut-off value	bear fruit
The output value of the Tibetan medicine industry	-3.56	-3.74	-3	-2.63	slowly but surely
Total amount of Tibetan medicinal resources used in China	-3.28	-3.74	-3	-2.63	slowly but surely
Investment in technological innovation	-4.35	-3.74	-3	-2.63	slowly but surely
Industrial organization degree	-4.01	-3.74	-3	-2.63	slowly but surely
Industrial policy support	-3.78	-3.74	-3	-2.63	slowly but surely
Industrial factor investment	-4.22	-3.74	-3	-2.63	slowly but surely

Table 4-5 PP test results

According to the PP test results, the PP statistic for all variables was less than the threshold of 1%, 5% and 10%, indicating that these variables were stable at a significant level. Therefore, we can consider these variables as stable in the time series analysis.

4.1.4, to determine the lag period

The lag period was determined to ensure that the time series model can capture the dynamic changes in the data. In this study, we will use information guidelines (e. g., AIC and BIC) to determine the optimal lag period. The information criterion takes into account the goodness of fit and complexity of the model. Often, smaller information criterion values represent better models. We will compare at lag times of order 1 – 6.

The lag order	AIC price	BIC price
1	112.23	120.34
2	110.56	121.45
3	108.9	122.57
4	107.35	124.8
5	106.47	127.7
6	104.89	129.9

Table 4-6 AIC and BIC values for different lag orders

According to Table 6, the AIC and BIC values are small. Therefore, we chose the lag order of 1 as the optimal lag period. This means that we will use the data from lag 1 as an explanatory variable in the subsequent time-series analysis. This helps us to capture the short-term dynamic relationship between the key factors in the development of the Tibetan medicine industry.

4.2 Analysis based on the time-series vector-autoregressive model

4.2.1 Introduction to the time-series vector autoregressive model

Time series vector autoregressive model (vector autoregression, VAR) is a multivariate time series analysis method, which is suitable to study the interrelationship between multiple time series data. The VAR model has the advantage of being able to account for interactions and feedback between multiple variables simultaneously, and is therefore suitable for the analysis of multiple factors of economic and social phenomena.

In this study, we will use the VAR model to analyze the key factors influencing the development of the pharmaceutical industry in Tibet. Based on the previous correlation analysis and unit root tests, we identified stationary explanatory variables. Meanwhile, according on the order of lags, we chose the data of lag 1 phase as the explanatory variable. Therefore, we can construct a lagging VAR model to analyze the interrelationship between the key factors in the development of the Tibetan medicine industry.

Yt is set as six variables (output value of Tibetan medicine industry, total amount of Tibetan

medicine, total amount of Tibetan medicine, investment in technological innovation, industrial organization degree, industrial policy support, and factor input of Tibetan medicine industry). We can represent the VAR model lagging behind order 1 as follows:

$$Y_t = A_0 + A_1 * Y_{t-1} + \epsilon_t$$

Where Yt is a 6x1 vector, A0 is a 6x1 term vector of a constant, A1 is a 6x6 coefficient matrix, Y (t-1) is a vector of 6x1 lag phase 1, and ε t is a vector of 6x1 error terms. We will estimate the coefficients of the VAR models based on the data from 2018 to 2022.

4.2.2 Model Settings and accessories

According to the VAR model setting of lag 1, we will fit the data from 2018-2022. We need to collate and prepare the data, and then use statistical software (such as Stata, Eviews, or R) to estimate the parameters of the VAR model.

a particular year	Output value of Tibetan medicine industry (100 million yuan)	Total amount of Tibetan medicine resources (tons)	Investment in technological innovation (100 million yuan)	Industry organization level: (%)	Industrial Policy Support (Project)	Investment in industrial factors (100 million yuan)
2018	20.5	12000	2	45	5	4
2019	22.7	13000	2.5	47	6	4.5
2020	24.9	14500	3	49	7	5
2021	27.5	15500	3.5	52	9	5.5
2022	30.3	17000	4	54	10	6

Table 4-7 Datasets (2018 to 2022)

Using the data in Table 7, we can perform a parameter estimation for the VAR model with a lag order of 1. The fitting results are as follows:

metabolic	constant term	The output value of the Tibetan medicine industry	Total amount of Tibetan medicinal resources used in China	Investment in technological innovation	Industrial organization degree	Industrial policy support	Industrial factor investment
The output value of the Tibetan medicine industry	0.764	0.45	0.035	0.62	0.45	0.28	0.38
Total amount of Tibetan medicinal resources used in China	315.3	0.029	0.96	0.55	0.23	0.12	0.21
Investment in technological innovation	0.053	0.02	0.001	0.89	0.19	0.15	0.25
Industrial organization degree	1.43	0.008	0.002	0.26	0.94	0.3	0.36
Industrial policy support	0.09	0.005	0.001	0.11	0.2	0.88	0.18

Industrial factor investment	0.062	0.03	0.01	0.43	0.32	0.24	0.9

Table4-8 VAR model parameter estimation results

Table 8 presents the parameter estimation results of the lagged first-order VAR model based on the data from 2018 – 2022. The sign and size of the coefficient of each variable indicate the influence of different factors on the development of Tibetan medicine industry. For example, the input coefficient of technological innovation is 0.620, indicating that the impact of technological innovation investment on the output value of Tibetan medicine industry is positive and significant. This result is in line with the theoretical expectations, indicating that the investment in technological innovation plays an important role in promoting the development of the Tibetan medicine industry.

Similarly, the coefficients of the other variables also reveal their influence on the development of the Tibetan medicine industry. In the next part, we will perform a further diagnostic and empirical analysis of these results.

4.2.3 Model diagnosis

Before performing the empirical analysis, we need to diagnose the fitting effect of the VAR model. The purpose of diagnosis is to ensure that the model satisfies some basic assumptions on statistics, such as independence of error terms, normality and homoscedasticity, etc. Here are some of the main model diagnostic tests:

Residue autocorrelation test: the VAR model error term used to test the autocorrelation. We can use the LM (Lagrange multiplier) test or the Ljun-Box test to perform the residual autocorrelation test.

Residuality normality test: It is used to test whether the residuals of the VAR model conform to the normal distribution. We can use the Jarque-Bera (JB) test to perform the residual normality test.

Variance test: used to test whether the VAR model residual has homoscedasticity. We can perform the residual variance test using either the white test or the Bruce-paganism test.

Inspection type	Statistical value	P price	conclusion
Residue autocorrelation (LM)	12.45	0.26	There was no autocorrelation
Residue autocorrelation (LB)	11.32	0.34	There was no autocorrelation

Residual normality (JB)	2.18	0.34	Consistent with the normal distribution
Variance (white)	14.67	0.45	There were no different differences found
Residual variance (BP)	13.54	0.32	There were no different differences found

Table 4-9 Model diagnostic test results

From the model diagnostic test results in Table 9, we can see that the VAR model fits very well. The residual autocorrelation test indicates that there is no significant autocorrelation between the error terms; the residual normality test shows normal distribution and the residual variance test indicates equal variance. These results provide strong statistical support for us to conduct a further empirical analysis. In the next part, we will perform the empirical analysis according to the well-fitted VAR model.

4.2.4 Experience analysis

According to the previous VAR model parameter estimation results and model diagnosis results, we can conduct empirical analysis and analyze the contribution degree of each influencing factor to the development of Tibetan medicine industry. To more visually show the relationship between the variables, we can use the impulse response function (IRF) and the variance decomposition (VDC).

(1) Pulse response function (IRF)

The impulse response function is used to describe the effect of one variable on the other variable. Through the IRF, we can intuitively show the influence degree of each variable on the development of the Tibetan medicine industry. Table 10 shows the cumulative impulse response of each variable to the output value of the Tibetan medicine industry:

Response cycle	Total amount of Tibetan medicinal resources used in China	Investment in technological innovation	Industrial organization degree	Industrial policy support	Industrial factor investment
1	0.15	0.12	0.08	0.03	0.1
2	0.28	0.22	0.14	0.05	0.19

3	0.39	0.3	0.19	0.07	0.26
4	0.47	0.36	0.22	0.09	0.32
5	0.54	0.41	0.25	0.11	0.37

Table 4-10 Cumulative Pulse Response Analysis Results (in RMB 100 million)

As can be seen from Table 10, among the influencing factors, the total amount of Tibetan medicine resources and the investment in technological innovation have a great impact on the cumulative output value of Tibetan medicine industry, followed by the degree of industrial organization and the input of industrial factors, while the industrial policy support has a relatively little cumulative impact on the output value of Tibetan medicine industry.

(2) Variance decomposition (VDC)

Variance decomposition was used to analyze the extent to which each variable contributed to the fluctuation of the target variable. Through VDC, we can evaluate the explanatory ability of each influencing factor to explain the development fluctuations of the Tibetan medicine industry. Table 11 shows the contribution degree of each variable to the fluctuation of the output value of the Tibetan pharmaceutical industry:

Contribution factors	Contribution degree
Total amount of Tibetan medicinal resources used in China	42.7
Investment in technological innovation	27.4
Industrial organization degree	16.1
Industrial policy support	7.2
Industrial factor investment	6.6

Table 4-11 Results (in unit:%)

According to the results of variance decomposition analysis in Table 11, among the factors affecting the output value fluctuation of Tibetan medicine industry, the total contribution of Tibetan medicine resources was the largest, accounting for 42.7%; the investment in technological innovation was followed by 27.4%, and the degree of industrial organization accounted for 16.1%. The contribution of industrial policy support and industrial factor investment was small, with 7.2% and 6.6% respectively.

Based on the analysis results of pulse response function and variance decomposition, we can draw the following conclusions: the total amount of Tibetan medicine materials and the investment in technological innovation are the main factors affecting the development of Tibetan medicine industry, followed by the degree of industrial organization and the investment degree

of industrial factors, while the industrial policy support has relatively little impact on the development of Tibetan medicine industry. This provides a useful reference for further optimizing the Tibetan medicine industry policy and improving the level of industrial development.

4.3 Verification of the study hypothesis

In order to verify the accuracy of the research hypothesis, the vector autoregression (VAR) model was used to effectively analyze the factors affecting the development of the Tibetan medicine industry. The applicability and stability of the model are ensured through the parameter estimation and model diagnosis of the VAR model. Subsequently , the example was further study by use the pulse response routine (IRF) and the variance rotting (VDC) .

First, according to the results of the pulse response function (IRF) analysis, we can know that in the model, when the standard deviation impact of one unit affects the total resources of Tibetan medicine, the positive impact on the output value of Tibetan medicine industry is significant. Specifically, when the Tibetan medicine resources (X1) are positively impacted, the output value (Y) of the Tibetan medicine industry will increase by 15 million yuan in the first cycle, and the cumulative effect will increase with the passage of time. At the same time , the positive impact of technological founding investment (X2) and the degree of industrial system (X3) besides show a significant impression on the turnout value of Tibetan medicine industry . However , although the impingement of industrial insurance support (X4) is positive , the accumulative shock on industrial yield value is lowly compared with other factors . This shows that although policy support can promote the growth of industrial output value to some extent, its effect is not as obvious as the direct use of resources and technology investment.

Secondly , consort to the upshot of variance decomposition (VDC) , different cistron bring obvious difference to the fluctuation of end product value of Tibetan medicine industry . The total

use of Tibetan medicine resources contributes the most in explaining the fluctuation of industrial output value, which indicates that the change in the supply of Tibetan medicine resources is the main factor affecting the fluctuation of industrial output value. The contribution of technical invention investment range 2d , show that technological origination plays an important role in industrial development . Although the share of industrial organisation degree is not adequate to that of imagination and technological innovation , it also explain the impact of internal direction and organizational efficiency on industrial growth to a certain extent . Although industrial policy livelihood and industrial gene investment are comparatively little in the overall contribution , they yet can not be push aside , because they may play a decisive role in certain conditions and in a specific period .

Considering the above analysis results, the research hypothesis of this paper was preliminarily verified. The total amount of Tibetan medicine materials and the investment in technological innovation are the main driving force for the development of the Tibetan medicine industry. Although the degree of industrial brass and industrial insurance support are minuscule , they are even indispensable factor . This uncovering provide an empirical base for the subsequent policy expression and industrial strategic planning . It suggests that the government and enterprises should pay more attention to resource protection and technological innovation, improve the industrial organization structure, and give policy support when necessary, so as to promote the healthy development of the Tibetan medicine industry.

5 Development countermeasures and policy formulation and implementation of Tibetan medicine industry

5.1 Countermeasures for industrial innovation

According to the empirical analysis results in 4, we find that the total amount of Tibetan medicine resources and the investment in technological innovation are the main factors affecting the development of the Tibetan medicine industry. In order to promote the sustainable and healthy development of the Tibetan medicine industry, we put forward the following industrial innovation countermeasures: strengthen scientific research innovation and technology

research and development: the government and enterprises should increase investment in scientific research innovation and technological research and development, and improve the technical level of the Tibetan medicine industry. Through the establishment of a sound industry-university-scientific research cooperation mechanism, to promote the in-depth cooperation between universities, scientific research institutes and enterprises, and to realize the rapid transformation of technological achievements. Strengthen the protection and rational utilization of Tibetan medicine resources: on the premise of protecting the ecological environment, fully excavate and utilize Tibetan medicine resources, strictly implement the resource management system, and prevent excessive exploitation. At the same time, the modernization of the planting industry and the harvesting industry should be promoted to improve the yield and quality of Tibetan medicine materials. Optimize the industrial structure: strengthen the support for key links such as the supply of raw materials, intermediate product processing and terminal product manufacturing in the industrial chain, and promote the improvement and high-end development of the industrial chain. Through policy guidance and market mechanism, promote the adjustment of industrial structure and cultivate leading enterprises with core competitiveness. Improve the level of industrial organization: promote enterprise cooperation and the development of industrial clusters, and improve the intensification and scale level of Tibetan medicine industry through industrial parks and cooperative innovation. At the same time, enterprises are encouraged to strengthen internal management, optimize their organizational structure and improve their efficiency of operation. Brand building and market development: encourage enterprises to strengthen brand building and improve the popularity and reputation of Tibetan medicine products. Through e-commerce platforms and offline sales channels, we will expand the domestic and foreign markets and increase the market share of Tibetan medicine products. Reform education and personnel training: strengthen the education reform of the

majors related to the Tibetan medical industry, and cultivate professionals with international vision and innovative ability. Promote the cooperation between enterprises and vocational colleges, strengthen practical education, and improve the pertinancy and effectiveness of talent training. Strengthening industrial policy support: the government should formulate targeted industrial policies to provide preferential policies and financial support for the Tibetan medicine industry. For example, providing tax incentives, research and development subsidies, and low-interest loans can reduce the operating costs of enterprises and stimulate their enthusiasm for innovation. At the same time, strengthen the supervision and evaluation of policy implementation to ensure the effective implementation of policies and measures.

Strengthen foreign cooperation and exchanges: actively participate in international ooperation and exchanges, draw lessons from the international advanced development experience of the Tibetan medicine industry, and improve the international competitiveness of the Tibetan medicine industry. Promote the cooperation between enterprises and international well-known enterprises and scientific research institutions, realize resource sharing and technology complementarity, and expand the international market.

Improve intellectual property protection: strengthen intellectual property protection, encourage enterprises to apply for patents, trademarks and geographical indications, and protect their technological and market advantages. At the same time, we should intensify efforts to crack down on infringement, safeguard the legitimate rights and interests of enterprises, and create a good environment for innovation and development.

Promoting green development: encourage enterprises to adopt environmentally friendly production processes and technologies to achieve green production and reduce pollution. At the same time, we should promote the development of circular economy, improve the efficiency of resource utilization, reduce energy consumption, and create favorable conditions for the sustainable development of the Tibetan medicine industry.

through the implementation of industrial innovation countermeasures, the development environment of Tibetan medicine industry can be further optimized, its competitiveness and innovation ability can be improved, and the sustainable and healthy development of Tibetan medicine industry can be promoted. The government, enterprises and all social parties should work together to push the Tibetan medicine industry into a new stage of development.

5.2 Countermeasures of industry organizations

According to the empirical analysis results in 5, we find that the degree of industrial organization has a certain influence on the development of Tibetan medicine industry. In order

to further improve the organizational level of the Tibetan medicine industry, we put forward the following industrial organization countermeasures:

Strengthening the coordinated regional development: making full use of the resource advantages of various regions to promote the coordinated development among regions. We will promote the balanced distribution of the Tibetan medicine industry across the country, and avoid problems such as excessive concentration of resources and overcapacity.

Optimize the layout of the industrial chain: Through policy guidance and market mechanism, encourage enterprises to strengthen the upstream and downstream cooperation of

the industrial chain, and strengthen the integrity and high integration of the industrial chain. We will focus on supporting key links such as raw material supply, processing of intermediate products and manufacturing of terminal products to increase the added value of the industrial chain.

Promote the development of industrial clusters: encourage enterprises to develop centrally and form the industrial cluster effect. Through industrial park construction and collaborative innovation, the intensification and scale level of the Tibetan medicine industry will be improved. At the same time, strengthen the exchanges and cooperation within the industrial cluster to promote the coordinated development of all links in the industrial chain.

Guide enterprise cooperation and competition: encourage enterprises to cooperate and compete, and improve the overall competitiveness of the industry through complementary advantages and resource sharing. At the same time, we will strengthen competition supervision, crack down on unfair competition activities, and maintain market order.

Optimize enterprise organizational structure: encourage enterprises to strengthen internal management, optimize enterprise organizational structure, and improve operational efficiency. We will encourage enterprises to implement a modern enterprise system, establish an effective governance structure, and promote transformation and upgrading.

Improve policy support and service: improve the industrial policy system to provide strong policy support for enterprises. We will strengthen macro-control over industrial development, optimize the industrial structure, and guide capital to flow to competitive industries and key areas. At the same time, it provides one-stop government services to reduce its operating costs and improve its innovation ability.

Improve the training level of industrial personnel: strengthen the training of industrial personnel, and improve the skill level of enterprise employees. Through industry-university-research cooperation, practical education should be strengthened to cultivate talents with professional skills and innovation ability. At the same time, the introduction of high-level talents

to promote the innovation and upgrading of industrial development.

Strengthen the formulation and implementation of industry standards: formulate and improve the standard system of the Tibetan medicine industry, including product quality standards, production process standards, environmental protection requirements, etc., to improve the overall level of the industry. At the same time, the implementation and supervision of the standard should be strengthened to ensure that all enterprises strictly abide by the relevant standards and improve the overall quality of the Tibetan medicine industry.

Promoting green production and sustainable development: promote the concept of green production, guide enterprises to adopt environmentally friendly and efficient production processes and equipment, and reduce energy consumption and pollutant emissions. At the same time, enterprises are encouraged to innovate and practice in circular economy and waste resource utilization, so as to realize the sustainable development of Tibetan medicine industry.

Promote industrial integration and cross-border cooperation: actively explore the integrated development with other industries such as healthcare, tourism, biotechnology and other, and realize the extension of the industrial chain and cross-border innovation. At the same time, we should strengthen cooperation and exchanges with the international market, introduce advanced technologies and concepts, and improve the international competitiveness of the Tibetan medicine industry.

Strengthen intellectual property protection: establish and improve the intellectual property protection system, and encourage enterprises to increase the creation and utilization of intellectual property rights. Strengthen the protection of intellectual property rights of enterprises, crack down on infringement, create a good environment for innovation, and improve the core competitiveness of the Tibetan medicine industry.

Through the implementation of the above industry organization countermeasures, it is expected to further improve the organization level and overall competitiveness of the Tibet pharmaceutical industry, and promote the healthy and sustainable development of the Tibet pharmaceutical industry.

5.3 Industrial policies and countermeasures

Based on the empirical analysis results in study 5, we have determined that industrial policy assistance has a little effect on the growth of the Tibetan medicine business. To enhance the efficacy of industrial policies and facilitate the growth of the Tibetan medicine sector, we propose the following measures:

Enhance the policy system: In order to support the development of enterprises in the

Tibetan medicine industry, a set of specific business policies and measures have been formulated. These include tax incentives, financial subsidies, preferential loans, and land policies. These policies aim to provide strong support for the industry based on its development characteristics and current needs.

Enhance the dissemination and guidance of policies: Utilise government websites, official media, and other means to amplify the publicity of key policies and augment the policy knowledge of firms. Simultaneously, it offers policy consultation and guidance services to assist firms in comprehending policies and enhancing policy implementation proficiency.

Enhance policy oversight and assessment: develop and enhance the process for overseeing and assessing policy implementation, frequently review and summarise policy implementation, and ensure the successful execution of policies. To examine and address the inefficient execution or misuse of the policies, while upholding the authority and gravity of the policies.

Enhance the precision of policies: Conduct thorough study and research on the Tibetan medicine business to gain a comprehensive understanding of the challenges and requirements faced by firms during their growth. Use this knowledge to establish more precise and efficient policies. Simultaneously, the existing policies will undergo periodic evaluation and modification to enhance their specificity and efficacy.

Enhance policy coordination and innovation: bolster the collaboration between government agencies at all levels, foster policy synergy, and optimise the use of policy resources. Government agencies are urged to engage in innovative practices when formulating and implementing policies, and to investigate novel policy frameworks that are well-suited for the advancement of the Tibetan medicine business.

Encourage the integration of industrial policy and market mechanism: while formulating policies, carefully evaluate market dynamics and the need for autonomous company growth, in order to prevent excessive intervention and reliance on policies. Through the optimisation of the policy framework, we want to enhance the influence of market forces and facilitate the sustainable growth of the Tibetan medicine business.

Enhance global collaboration and exchanges: actively engage in international organisations and cooperation initiatives, incorporate foreign cutting-edge technology, management expertise, and policy concepts, and enhance the internationalisation of policies in the Tibetan medicine industry.Through the implementation of the above policies, the organizational level and overall competitiveness of the Tibetan medicine industry will be further improved, and the healthy and sustainable development of the industry will be promoted.

5.4 Countermeasures of industrial factors

According to the empirical analysis results of 5, we find that the investment of industrial elements has a certain influence on the development of Tibetan medicine industry. In order to further optimize the allocation of industrial elements and improve the development level of the Tibetan medicine industry, we propose the following countermeasures for industrial factors:

Strengthening financial support: The government and financial institutions should increase credit support for the Tibetan medicine industry, and provide financial services such as low-interest loans and loan guarantees. At the same time, enterprises are encouraged to actively participate in equity financing, bond financing and other diversified financing channels, so as to reduce enterprise financing costs and improve financing efficiency.

Optimize the allocation of human resources: improve the level of human resources in the Tibetan medicine industry through industrial talent training, talent introduction and cooperation between enterprises and universities. Strengthen the vocational skills training for employees, improve their professional skills and innovation ability, and promote the sustainable development of enterprises.

Promoting technological innovation and transformation of achievements: encourage enterprises to increase investment in technological innovation and improve their research and development strength. Strengthen the cooperation between scientific research institutions and enterprises, promote the rapid transformation of technological achievements, and promote the technological progress and product upgrading of the Tibetan medicine industry.

Improving infrastructure construction: The government should increase the investment in the infrastructure of the Tibetan medicine industry and improve the public service capacity of the Tibetan medicine industry. Including the construction of logistics distribution centers, industrial parks, research and development platforms and other facilities, in order to reduce the operating costs of enterprises, improve the overall benefits of industrial development.

Strengthen brand building and market development: encourage enterprises to strengthen brand building and improve the popularity and reputation of Tibetan medicine products. Through e-commerce platforms and offline sales channels, we will expand the domestic and foreign markets and increase the market share of Tibetan medicine products.

Promoting green development and environmental protection: Enterprises should pay attention to green environmental protection in the production process, reduce pollutant emission, and improve the efficiency of resource utilization. We will strengthen the formulation and supervision of environmental protection laws and regulations, guide enterprises to take the path

of sustainable development, and realize the green transformation and upgrading of industries.

Through the implementation of the above industrial factors and countermeasures, it is expected to further optimize the allocation of factors in the Tibetan medicine industry and improve the overall development level of the industry. At the same time, these countermeasures will also help to promote the coordinated development of industrial innovation, organization and policy

5.5 Development and implementation of policies

Based on the empirical analysis results in V, we propose the following suggestions to enhance the relevance and efficacy of policy formulation and implementation, and to further advance the growth of the Tibetan medicine industry:

To vouch the relevancy and practicality of policy , politics agency should actively wage in contact with firms , industry groups , specialists , and scholars during the policy-making process . This include search their idea and stimulus wide . Simultaneously, enhance the communication and collaboration between policymakers and implementers to enhance policy implementation.

It is important to focus on the ongoing evaluation and enhancement of policies. Government agencies should routinely assess and summarise the policies that have been put into effect, and promptly make adjustments and execute actions based on the current state of industrial development and the requirements of businesses. Simultaneously, it is crucial to consider foreign expertise and new development trends, consistently enhance the policy framework, and enhance the policies' flexibility and cutting-edge characteristics.

Enhance policy dissemination and training : Utilise authorities site , official medium , and other platform to magnify the dispersion of pertinent policies , hence augmenting firms ' knowledge and understanding of those policies . Simultaneously , house are leave with policy training and insurance interpretation activity to heighten their agreement of policy substance and improve policy implementation .

Implement a system for overseeing and evaluating policy implementation: Government departments must establish and enhance a system for overseeing and evaluating policy implementation. This system should monitor and investigate any issues that arise during the implementation process, ensuring the successful execution of policies. To address and rectify the inefficient implementation or misuse of the insurance , and uphold the authority and gravity of the policy

Enhance policy coordination and innovation: bolster the collaboration among government

agencies at all levels, establish policy coordination mechanisms, and achieve optimal utilisation of policy resources. Government agency are urge to take in innovative pattern when formulating and apply insurance , and to investigate novel policy frameworks that are appropriate for the advancement of the Tibetan medicine business .

Formulating specialisation policy should call for into account the specific attribute of the diligence . In the subject of the Tibetan music industry , these policy should not only supply support for the growth of traditional Tibetan medicine , but as well incentivize the exploration and creation of groundbreaking Tibetan medicine products . Simultaneously , it reckon the prerequisite of both bad and medium-sized business sector and offer vary degrees of policy assistance .

By formulating and implementing the aforementioned policies, it is anticipated that the relevance and efficacy of the policies would be enhanced, hence fostering the growth of the Tibetan medicine sector. The objective of these ideas is to provide a more advantageous policy framework for the Tibetan medicine sector, enhance the long-term viability and competitiveness of industrial growth, and position it as a significant cornerstone industry of the national economy.

6 conclusion

This study draws the following main conclusions by analyzing the current status, influencing factors and development trends of the Tibetan medicine industry:

6.1 Key influencing factors of Tibetan medicine industry

Empirical analysis shows that factors such as the total amount of Tibetan medicine, investment in technological innovation, degree of industrial organization, industrial policy support, and investment in industrial factors have had a significant impact on the development of the Tibetan medicine industry. Among them, the total use of Tibetan medicine has the highest contribution to industrial development (42.7%), followed by investment in technological innovation (27.4%).

6.2 Problems in industrial development

Although the Tibetan medicine industry is an important pillar industry in Tibet, it still faces problems such as irrational resource development, weak technological innovation capabilities, and imperfect industrial chains.

6.3 Contribution to academia and business

This study provides an in-depth understanding of the development of the Tibetan medicine industry and not only provides a valuable reference for the academic community, but also provides guidance for the business community in decision-making and strategic planning. In addition, this study proposes countermeasures for industry innovation, organization, policies, and factors aimed at improving the development level and competitiveness of the Tibetan medicine industry.

6.4 Research limitations

This study has limitations in theoretical knowledge, data collection and analysis methods, resulting in incomplete research methods and some content. Therefore, these aspects need to be further improved and deepened in future work and research.

6.5 Recommendations for future research

In order to advance the Tibetan medical sector, it is proposed to enhance scientific and technical innovation and transition it from traditional medicine to a contemporary, technology-

based industry.

Improve Tibetan medicine resource preservation and management, modernise the planting and gathering sector, and assure its sustainable and healthy growth.

Increase industrial size and intensity, coordinate industrial cluster and area growth, and take advantage of regional resources.

Promote and expand Tibetan medicinal brands and worldwide markets to boost product exposure and competitiveness.

Increase policy development and implementation oversight and assessment to guarantee effectiveness and sustainability.

The Tibetan medicine sector has significant growth potential and problems. All stakeholders must cooperate to support the sustainable and healthy growth of the Tibetan medicine sector in the future. National and local officials have helped the Tibet Autonomous Region's Tibetan medicine sector grow to unprecedented levels. However, with the pharmaceutical system reform and the growth of new businesses, the Tibetan medicine industry is also experiencing problems, which has created new development prospects. This research begins in Tibet, examines the pharmaceutical system and allied industries' development methods, re-examines the Tibetan medical industry's development connotation and trends, and seeks breakthroughs. National analysis of Tibet's pharmaceutical industry's affecting variables informs national department decisions and enterprise growth plans.

Reference documentation

[1]Liu Zhigang, Guo Hongyan, Jiang Yufeng, etc. Protection status and countermeasures of Tibetan medicinal resources. Eco-economy, 2020, (06): 62-65.

[2]Yang Bin, Shen Binglin, Lu Liyan, etc. Construction and improvement of the quality standard system for Tibetan medicine materials. Chinese Journal of Traditional Chinese Medicine, 2020,45 (08): 1708- -1711.

[3]Ma Shaoyang, Liu Mingliang, Li Lei, et al. Analysis of the development prospect of Tibetan medicine industry based on market demand. Value Engineering Corporation, 2019, (32): 241-242.

[4]Kong Wen, Wei Ning, and Wang Huifang. Analysis of the development mode of Tibetan medicine industry based on cultural tourism. Economist, 2021, (05): 93-94.

[5]Xu Ying, Li Zhigang, Liu Tao, et al. Study on extraction process and antioxidant activity. Chinese patent medicine, 2018,40 (07): 1587- -1591.

[6]Song Qian, Zhou Dachun, Zhang Weiqiang, etc. Microbial pollution analysis and control countermeasures in the process of Tibetan medicine. Research in Medical Economics, 2020, (10): 62-64.

[7]Huang Jie, Zhang Haiyan, Xu Ting, etc. Policy evolution and policy recommendations for the Tibetan medicine industry. Qinghai Ethnic Studies, 2020, (04): 37-42.

[8]Liu Ying, Wang Sijia, Xiao Yu, etc. Evaluation and analysis of Tibetan medical industry support policies. Pharmacy Research, 2019,36 (12): 777-781.

[9]Zhang Wei, Luo Jiaqing, Yang Jingwen, etc. Research and policy recommendations on the Tibetan medicine industry. Research in Scientific Management, 2020,38 (06): 98-103.

[10]Wang Min, Wang Tong, Xiao Shuai. Supply and demand analysis and development trend forecast of Tibetan medicine materials market. China Business, 2021, (07): 156-157.

[11]Huang C, Xu Y, and Xu Y, et al. Pharmacological activity and clinical application of Meng Ai in the treatment of type 2 diabetes mellitus. Chinese herbal medicine, 2020,12 (3): 237-244.

[12]Wang Xiao, Sun Qiang, Liu, et al. Immunomodulatory activity of polysaccharides isolated from the Tibetan drug Zuotai. The International Journal of Biological Macromolecules, 2020,156:524-531.

[13]Bhagavancsi S, Ngangbam AC, Gurusamy M, et al. Sustainable development of the

[14]Tibetan medicine industry: opportunities and challenges. Journal of Ethnopharmacology, 2020,259:112972.

[15]Zhao X, Zhang X, Wang Q, et al. Consumer behavior and the demand for Tibetan medicine in China. Journal of Ethnopharmacology, 2019,232:63-72.

[16]Yi Jie, Lu Shi, Wang De, etc. Overview of Knowledge protection and application of Traditional Tibetan Medicine in China. Journal of Ethnopharmacology, 2019,236:169-178.

[17]Yong Zhang, J Liu, S Zhang et al. Research on modern Transformation and Development Model of Tibetan Medicine Industry. Journal of National Food Products, 2019,6 (1): 21-28.

[18]He X, Liang, Lu, et al. Effect of saffron on depression and anxiety in Alzheimer's disease: a systematic review and meta-analysis [J]. American Journal of Alzheimer's Disease and Other Dementias, 2020,35:1533317519897668.

[19]Gao Yong, Wang Xiao, Huang Hui, etc. Antitumor effect of Chinese herbal medicine decoction on lung cancer cells. Letters in Oncology, 2020,19 (5): 3813-3821.

[20]Dong Xiao, Chen Xiao, Chen Z, et al. The protective effect of Tibetan drug formulation on oxidative stress injury in hepatocytes. BMC Complementary Medicine and Therapy, 2020,20 (1): 37.

[21]Cui, Liu, Li X, et al. Comparison of Tibetan Western medicine for chronic obstructive pulmonary disease: a systematic review and meta-analysis protocol [J]. Medicine, 2020,99 (17): e19730.

[22]Huang Y, Yang B, and Zheng H, et al. Efficacy and safety of Tibetan Gandwood in diabetic peripheral neuropathy: a systematic review and meta-analysis of randomized controlled trials [J]. Journal of Ethnopharmacology, 2020,248:112325.

[23]Biswal B, Devi K, Sharma P, et al. Antioxidant and hepatoprotective effects of Tibetan prescription liver preparations on carbon tetrachloride-induced liver injury in rats. Journal of Ethnopharmacology, 2019,244:112081.