



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Study on Comparative Advantage of Plateau Characteristic Agriculture in Yunnan

Xiaobo DONG¹, Liangzheng CHEN¹, Maoqing YANG², Rui CHEN¹, Ziyun PENG¹, Yuan YUAN^{1*}

1. Institute of Agricultural Economics and Information Research, Yunnan Academy of Agricultural Sciences, Kunming 650200, China; 2. School of Tourism and Geographical Science, Yunnan Normal University, Kunming 650092, China

Abstract To find the highlighted advantage and development space of plateau characteristic agriculture in Yunnan, using qualitative and quantitative combining methods, comparative advantage of plateau characteristic agriculture in Yunnan is evaluated comprehensively. Qualitative takes Sichuan, Chongqing, Guizhou and Guangxi adjacent to Yunnan and Southeast Asian countries which are opening focus of "bridge-head" as reference objects, while quantitation takes 32 provinces of whole country except Hongkong and Macao as reference objects, and there are 4 kinds of qualification indexes and 6 kinds of quantitation indexes containing 44 sub-items. Results show that comprehensive comparative advantage coefficient of plateau characteristic agriculture in Yunnan is 1.55, and it has 3 kinds of comprehensive comparative advantages: diversity, ecological security and time difference complementation. The research results could provide references for agricultural development in Yunnan and other plateau regions.

Key words Plateau characteristic agriculture, Comparative advantage, Development space

1 Introduction

Location and geographical advantages of Yunnan Province are significant, and agricultural variety resources and climate resources are extremely abundant. In 2014, total agricultural output value reached 326.1 billion yuan, which increased by 6.1% over the previous year. Among them, agricultural output value was 180.5 billion yuan, which increased by 5.9%; output value of forestry was 30.3 billion yuan, which increased by 8.9%; output value of animal husbandry was 97.5 billion yuan, which increased by 5.4%; output value of fishery was 7.8 billion yuan, which increased by 9.6%; output of service industry for agriculture, forestry, animal husbandry and fishery was 10 billion yuan, which increased by 7.6%^[1]. At present, industrial system of plateau characteristic agriculture in Yunnan Province has begun to take shape, and agriculture presents the trend of yield and benefit simultaneously increasing, and yields, prices and qualities of major agricultural products increase. The development of plateau characteristic agriculture has had better agricultural foundation. With the increase of border opening intensity, and continuous acceleration of regional economic cooperation step, such as Greater Mekong regional cooperation, China – ASEAN Free Trade Area, and "two corridors and one ring", chance and challenge co-exist when Yunnan is compared with the developed provinces, cities and districts, surrounding countries, and the development requirement of plateau characteristic agriculture under new situation. On the one

hand, when compared with the developed provinces, cities and districts, and surrounding countries, Yunnan faces the challenge. On the other hand, when compared with development requirement of plateau characteristic agriculture under new situation, there is still gap in Yunnan. As the plateau region, Yunnan Province should grasp strategic opportunity in plateau characteristic agriculture development and eco-civilization construction, accelerate transforming development manner, promote agricultural transformation development, and impel the process of modern agriculture, which has significant and far-reaching significance^[2]. At present, representative and typical measurement methods of comparative advantage at home and abroad mainly include dominant comparative advantage method^[3–6], domestic resource cost method which includes social net income, domestic resource cost and effective protection rate^[7–14], social cost efficiency^[15], comprehensive comparative advantage method^[16–19], PAM (Policy Analysis Matrix) model^[20], SPEARMAN rank correlation coefficient and linear regression empirical analysis^[21]. Based on the background, by selecting southwest region and Southeast Asian surrounding countries as comparative objects, and using qualitative and quantitative combining methods, we try to find the highlighted advantages and characteristics of Yunnan agriculture, excavate its potential advantages and characteristics, which could provide references for agricultural development in Yunnan and other plateau regions.

2 Index selection of comparative advantage for plateau characteristic agriculture in Yunnan Province

2.1 Qualitative indexes (i) Selection of qualitative indexes. Qualitative analysis takes Sichuan, Chongqing, Guizhou and

Guangxi adjacent to Yunnan and 4 Southeast Asian countries (Vietnam, Burma, Thailand and Laos) as reference objects, and it is contrasted by 4 kinds of indexes: agricultural natural resources (sunshine condition, heat, precipitation, land resource) and location climate zones (tropical zone, temperate zone, cold zone), agricultural social resources (labor resource, agricultural science and technology), agricultural industry resources (agricultural crops scale, yields of major agricultural products, yield rate of agricultural crops), foreign trade of agricultural products (general situation of foreign trade, major import and export markets for agricultural products). (ii) Data source. Analysis data of qualitative indexes are from the *Yunnan Statistical Yearbook* (2008 – 2013), *Yunnan Economic Yearbook* (2008 – 2013), *Statistical Bulletin of Yunnan National Economy and Social Development in 2013*, database of world bank, official website of the National Bureau of Statistics, national statistical database, database of Prospective Network-industry economy, database of Food and Agriculture Organization of the United Nations, *Situation in 2012* and *Economic and Social Development Goals in 2013* by Vietnam Planning and Investment Department, Yunnan News Network and related national or regional network station.

2.2 Quantitative indexes Quantitative analysis uses comparative advantage coefficient to measure. Taking 32 provinces of whole country except Hongkong and Macao as reference objects, and selecting 44 items of specific coefficient indexes from 6 major categories (agricultural resource condition, agricultural industry foundation, market benefit of agricultural product, agricultural innovation ability, agricultural labor capital and agricultural sustainable development), integrated evaluation index system of comparative advantage for plateau characteristic agriculture in Yunnan is established. The evaluation methods are as below. (i) Calculation for comparative advantage of single index. Comparative advantage of single index indicates the advantage of single agriculture index in provincial region when compared with the same index in whole country, including agricultural output value, agricultural land, yield of agricultural product and agricultural labor resource. The calculation formula is:

$$X = \frac{\gamma_i / \gamma}{\lambda_i / \lambda} \quad (1)$$

where, X is comparative advantage coefficient of single index; γ_i is numerical value of one index in provincial region; γ is total value of one upper index for the index in provincial region; λ_i is the numerical value of the index in whole country; λ is total value of one upper index for the index in whole country. If X is more than 1, it shows the index has comparative advantage in whole country, and vice versa. (ii) Calculation for comparative advantage of similar index. Comparative advantage of provincial agriculture involves 6 major categories: agricultural resource condition, agricultural in-

dustry foundation, market benefit of agricultural product, agricultural innovation ability, agricultural labor capital and agricultural sustainable development. The calculation formula is:

$$Y = \sum_{i=1}^n WX_i \times X_i \quad (2)$$

where, Y is comparative advantage coefficient of similar index; WX_i is the weight for comparative advantage coefficient of the i^{th} single index; X_i is comparative advantage coefficient of the i^{th} single index, and $i = 1, 2, \dots, n$. If Y is more than 1, it shows such kind of index has comparative advantage in whole country, and vice versa. The determination for weight of comparative advantage coefficient for the single index could use Analytic Hierarchy Process (AHP). (iii) Integrated evaluation of agricultural comparative advantage. By weighted summing of each kind of index, integrated comparative advantage of provincial agriculture could be obtained, which shows the advantage and its size of the province in national agricultural development. The calculation formula is:

$$Z = \sum_{i=1}^n WY_i \times Y_i \quad (3)$$

where, Z is integrated comparative advantage coefficient of provincial agriculture; WY_i is the weight of comparative advantage coefficient for the i^{th} index; Y_i is comparative advantage coefficient of the i^{th} index, and $i = 1, 2, \dots, n$. If Z is more than 1, it shows agriculture in the province has comparative advantage in whole country, and vice versa. The determination for weight of comparative advantage coefficient for single index also could use AHP method. (iv) Data source. Quantitative index analysis data are from *Statistical Yearbook of Yunnan Province* (2013), *China Rural Statistical Yearbook* (2013), *China Statistical Yearbook of Science and Technology* (2013), *China Labor Statistical Yearbook* (2013), *China Statistical Yearbook* (2013), *Main Data Bulletin for the Second National Science Research and Test Development (R&D) Resource Inventory* and *Main Data Bulletin for the Second National Science Research and Test Development (R&D) Resource Inventory in Yunnan Province*.

3 Integrated evaluation on comparative advantage of plateau characteristic agriculture in Yunnan Province

3.1 Qualitative analysis results (i) Agricultural natural resources. By contrasting the indexes of agricultural natural resources (sunshine condition, heat, precipitation and land resource) and location climate zones (tropical zone, temperate zone and cold zone), comparative advantages of Yunnan are all higher than that of reference objects at sunshine, heat and location climate zone. Total solar radiation of Yunnan in whole year is between 3620.32 and 6681.71 MJ/m², and sunshine hours in whole year is between 2100 and 2300 h in most of areas. Sunshine time is longer than that in other 4 provinces, and sunshine hours has advantage in 4 Southeast Asian countries and adjacent provinces.

Annual average temperature in Yunnan Province changes from 47 °C (Deqin) to 23.8 °C (Yuanjiang), and temperature in vast majority area is between 12 and 20 °C. Compared with reference objects, the temperature advantage of Yunnan is obvious. Yunnan belongs to low-latitude plateau monsoon climate. Due to complex terrain and large vertical height difference, various kinds of agricultural products could be planted in many regions. Compared with reference objects, it has very large potential for implementing multi-season production by using natural climate, and agricultural crops relatively have a safer living environment. (ii) Agricultural social resources. By contrasting agricultural social resource indexes, comparative advantages of Yunnan are higher than that of reference objects at agricultural personnel allocation, science and technology contribution rate and fund input. Seen from institution and personnel, agricultural technology promotion agency linking province, prefecture, county and township is formed, and scientific and technical staff is about 50 thousand. Seen from fund input, the input on agricultural research institution, agricultural science and technology personnel, agricultural technician and agricultural fund is larger, while the input on agricultural technology and development level of new science and technology are uneven. (iii) Agricultural industry resources. By contrasting the indexes of agricultural industry resources, comparative advantages of forestry, animal husbandry and agricultural product rich in plateau characteristic in Yunnan are higher than that of reference objects. Seen from agricultural internal industry, forestry and animal husbandry are dominant in Yunnan agriculture, and comparative advantages of their output values, yields and scales are all higher than that of reference objects and even whole country. (iv) Foreign trade of agricultural products. By contrasting foreign trade indexes of agricultural products, comparative advantages of agricultural product export volume, export of agricultural product rich in plateau characteristic and location condition in Yunnan are higher than that of reference objects. Seen from export volume of agricultural product and main exported agricultural products, total export volume of Yunnan maintains the first in western provinces, and main exported agricultural products are all characteristic agricultural products of Yunnan Plateau, such as tea, flower, mushroom and coffee. When compared with reference provinces, they have the advantages of large quantity, good quality and high popularity. Seen from location, Yunnan has long country boundary line, borders Burma, Laos and Vietnam, and owns 13 national class-one ports and 7 class-two ports, which is "bridgehead" between inner southwest China and outer southwest, and its location condition of foreign trade is superior.

3.2 Quantitative analysis results (i) Agricultural resources. Comparative advantage coefficient of agricultural resource condi-

tion in Yunnan is 1.37, showing agricultural resource condition of Yunnan has comparative advantage in whole country. If further subdividing cultivated land resources, dry land resources have comparative advantage (1.33), while paddy field resources (0.97) and irrigated land resources (0.07) do not have national comparative advantage. (ii) Agricultural industry foundation. Comparative advantage coefficients of agricultural industry foundation, total output value of agriculture, forestry, animal husbandry and fishery, and agricultural added value are all more than 1 in Yunnan, showing that agricultural industry foundation of Yunnan is relatively better and has certain comparative advantage in whole country. (iii) Market benefit of agricultural products. Comparative advantage coefficient for market benefit of agricultural products in Yunnan Province is 0.93, showing that market benefit of agricultural products in Yunnan does not have comparative advantage when compared with whole country, but market benefit of some agricultural products still has comparative advantage. (iv) Agricultural innovation ability. Integrated comparative advantage coefficient of agricultural innovation ability in Yunnan is 3.82, showing it has quite obvious comparative advantage at national layer. Seen from agency and personnel, full-time equivalent comparative advantage coefficient of agriculture, forestry, animal husbandry and fishery R&D personnel is 7.47, while comparative advantage coefficients of agricultural science and technology personnel number, agricultural research institution and agricultural technician are respectively 4.66, 1.97 and 1.85. Seen from fund input, comparative advantage coefficients of agriculture, forestry, animal husbandry and fishery R&D fund, agriculture, forestry, animal husbandry and fishery development item fund are respectively 5.22 and 1.52. It shows that Yunnan Province not only values agriculture development but also cultivation and support of agricultural science and the related development projects. (v) Agricultural labor capital. Comparative advantage coefficient of agricultural labor capital in Yunnan is 1.01, which is only slightly more than 1. It shows that overall comparative advantage of agricultural labor capital in Yunnan Province is not obvious. Comparative advantage coefficients of agriculture, animal husbandry and fishery employments are lower, while comparative advantage coefficients of forestry and service industry for agriculture, forestry, animal husbandry and fishery are far higher than 1, and they are 1.38 and 2.62 respectively. (vi) Agricultural sustainable development. Comparative advantage coefficient for sustainable development of Yunnan agriculture is 0.98. The batch qualified rate of agricultural product, agricultural expenditure, agriculture, forestry, animal husbandry and fishery using foreign tradesman for direct investment still have comparative advantage, while agricultural insurance and farmland water conservancy have insignificant

comparative advantage. (vii) Agricultural integrated comparative advantage. Overall, integrated comparative advantage coefficient of plateau characteristic agriculture in Yunnan Province is 1.55, in which agricultural resource condition and agricultural innovation ability have quite obvious comparative advantages at national level.

It illustrates that although agriculture development in Yunnan is restricted by plateau mountainous region, it still could sufficiently use distinct geographical advantages, unique climate advantages, obvious species advantages and huge opening advantages (Table1 – Table 7).

Table 1 Comparative advantage results for agricultural resource condition and each sub-index in Yunnan Province

Items	A1 Agricultural water resources	A2 Agricultural land resources	A3 Cultivated land resources	A4 Forest land resources	A5 Pasture resources	A6 Average cultivated land resources	A7 Average mountain resources	A8 Average garden resources	A9 Multiple cropping index	A Agricultural resource condition
Weight	0.12	0.11	0.11	0.11	0.10	0.11	0.11	0.11	0.12	1.00
Coefficient	1.08	1.18	0.84	2.34	0.07	0.68	2.67	2.20	1.22	1.37
Advantage	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes

Table 2 Comparative advantage results for agricultural industry foundation and each sub-index in Yunnan Province

Item	B1 Total output value of agriculture, forestry, animal husbandry and fishery	B2 Agriculture output value	B3 Forestry output value	B4 Output value of animal husbandry	B5 Fishery output value	B6 Output- value of agricultural service industry	B7 Agricultural added value	B8 Farming	B9 Grain yield per unit area	B10 Cotton yield per unit area	B11 Oilyield per unit area	B12 Hemp yield per unit area	B13 Tobacco yield per unit area	B14 Sugary- ield per unit area	B Agricultural industry foundation
Weight	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	1.00
Coefficient	1.59	0.99	2.16	1.12	0.24	0.85	1.59	0.99	0.75	1.13	0.74	1.27	0.99	0.93	1.12
Advantage	Yes	No	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes	No	No	Yes

Table 3 Comparative advantage results for market benefit of agricultural product and each sub-index in Yunnan Province

Item	C1 Grain and other crops	C2 Vegetable gardening	C3 Fruit, nut, drinkable and spice crop	C4 Forestry- cultivation and plantation	C5 Bamboo and wood harvest- ing and transportation	C6 Forest product	C7 Livestock rearing	C8 Pig rearing	C9 Poultry rearing	C10 Hunting animals	C11 Other animal husbandry	C12 Inland aquatic products	C Market benefit of agricultural products
Weight	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.08	0.08	0.07	0.08	0.09	1.00
Coefficient	1.17	0.61	1.06	0.61	1.21	1.26	0.72	1.52	0.45	0.10	0.32	1.85	0.93
Advantage	Yes	No	Yes	No	Yes	Yes	No	Yes	No	No	No	Yes	No

Table 4 Comparative advantage results for agricultural innovation ability and each sub-index in Yunnan Province

Item	D1 Agricultural research institute	D2 Number of agricultural science and technology personnel	D3 Agricultural technician	D4 Full-time equivalent personnel of agriculture, forestry, animal husbandry and fishery R&D	D5 Fund for agriculture, forestry, animal husbandry and fishery R&D	D6 Fund for development project of agriculture, forestry, animal husbandry and fishery	D Agricultural innovation ability
Weight	0.16	0.17	0.16	0.17	0.17	0.17	1.00
Coefficient	1.97	4.66	1.85	7.47	5.22	1.52	3.82
Advantage	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4 Conclusions and discussion

By selecting 4 kinds of qualitative indexes and 6 kinds of quantitative indexes containing 44 specific indexes, integrated evaluation on comparative advantage of plateau characteristic agriculture in Yun-

nan Province is conducted. Results show that comparative advantage coefficient of plateau characteristic agriculture in Yunnan Province is 1.55. Whether compared with neighboring provinces and neighboring Southeast Asian countries or whole country, plateau characteris-

tic agriculture of Yunnan has integrated comparative advantage. Overall, even if Yunnan is plateau region, and agricultural development is restricted by terrain, it still could sufficiently use distinctive geographical advantage, unique climate advantage, obvious species advantage and huge opening advantage to create a road of agricultural modernization with the characteristics of Yunnan Plateau. There is some shortage in this paper. Due to large three dimensional climate difference in Yunnan Province and down to the same city (district)

and county, and different landforms, seasons, soil types and management manners of major crop growth regions, adding the influences of the selected evaluation indexes and data availability, it brings uncertainty on research result at certain degree. In view of complex characteristics of agricultural production system in Yunnan Province, current research result is contrasted at the macro level of the whole province, and does not extend to the city, which needs further research at micro level in the future.

Table 5 Comparative advantage results for agricultural labor capital and each sub-index in Yunnan Province

Item	E1 Agricultural population	E2 Studentswith agricultural registered permanent residence	E3 Agricultural employment	E4 Forestry employment	E5 Animal husbandry employment	E6 Fishery employment	E7 Employment of service industry for agriculture, forestry, animal husbandry and fishery	E8 Per capita grain output	E Agricultura- l labor capital
Weight	0.14	0.13	0.12	0.12	0.12	0.12	0.12	0.13	1.00
Coefficient	1.27	1.21	0.54	1.38	0.07	0.05	2.62	0.86	1.01
Advantage	Yes	Yes	No	Yes	No	No	Yes	No	Yes

Table 6 Comparative advantage results for agricultural sustainable development and each sub-index in Yunnan Province

Item	F1 Batch qualified rate of agricultural product	F2 Fixed asset investment of agriculture, forestry, animal husbandry and fishery	F3 Agricultural expenditure	F4 Agriculture, forestry, animal husbandry and fishery using foreign tradesman for direct investment	F5 Farmland water conservancy	F6 Total energy consumption amount of agriculture, forestry, animal husbandry and fishery	F7 Agricultural insurance	F8 Agricultural investment of rural household	F Agricultural sustainable development
Weight	0.13	0.12	0.13	0.13	0.12	0.12	0.12	0.13	1.00
Coefficient	1.08	0.89	1.28	1.40	0.81	0.91	0.36	1.00	0.98
Advantage	Yes	No	No	Yes	No	No	No	–	No

Table 7 Integrated evaluation on comparative advantage of plateau characteristic agriculture in Yunnan Province

Item	A Agricultural resource condition	B Agriculturalindustry foundation	C Market benefit of agricultural product	D Agriculturalinnovation ability	E Agriculturallabor capital	F Agricultural sustainable development	Z Comprehensive agriculture
Weight	0.17	0.17	0.17	0.17	0.16	0.16	1.00
Coefficient	1.37	1.12	0.93	3.82	1.01	0.98	1.55
Advantage	Yes	Yes	No	Yes	Yes	No	Yes

5 Suggestions

5.1 Excavating development space potential of agricultural natural resources Agricultural land of Yunnan Province only accounts for 15.4% of land use area, and utilization rate of land is not high. Arable land scatters, and reserve land resources are adequate. On this basis, it could realize agricultural land resource complementing with Southeast Asian countries. In four Southeast Asian countries, agricultural land and farmland area in Thailand account for 71.8%, and various kinds of land resources are applied widely, with higher utilization rate. In Vietnam, Laos and Burma, there are still lots of land available for development, in which farmland area in Laos is 8 million hm²,

and land area is 2368 million km², and farmland area accounts for 33.8%. Moreover, these lands mostly have rich water source and fertile soil; farmland resource in Burma is 125580 km², land area is 676581 km², farmland area accounts for 18.6%, and per capita arable land area is 0.21 hm²; per capita arable land area in Thailand reaches 0.24 hm², which is the highest, and followed by Laos and Vietnam.

5.2 Excavating development space potential of agricultural social resources Seen from agricultural labor capital, taking adjacent provinces as reference objects, it has labor advantage to develop plateau characteristic agriculture of Yunnan, and labor is cheap. But taking whole country and Southeast Asian countries as

reference objects, comparative advantage of agricultural labor capital is insignificant in Yunnan Province. Seen from agricultural science and technology and innovation, development space of Yunnan plateau characteristic agriculture could be enlarged in the form of cooperation and advantage complementation with neighboring provinces or Southeast Asian countries. It includes (a) Thailand: cyclic agriculture and organic farming; (b) Laos: agricultural science and technology training; (c) Vietnam: agricultural extension, such as freshwater washing saline-alkali soil, planting high-quality high-yield paddy resisting plant diseases and insect pests, and rationally using phosphate fertilizer; (d) Burma: rice production cooperation.

5.3 Excavating development space potential of agricultural industry resources

(i) Advantage complementation with adjacent provinces. At fishery, it could learn and refer paddy-fish rotation and characteristic cultivation of small water body in Sichuan; cage ecological farming technology and mode in Guizhou; cultivation technology of dominant variety and industrialization development experience in Guangxi. At agricultural product aspect, Yunnan Province could learn Guangxi's experience on planting technology, variety development and brand marketing; cooperate with Guizhou at the aspect of new fine variety cultivation; learn the ways to cultivate brand of traditional export foreign-exchange-earning commodity, such as frozen meat, sausage casing and vegetable, and the advanced experience and mode of leading enterprise development. (ii) Advantage complementation with Southeast Asian countries. At the aspect of main agricultural products, firstly, Yunnan Province could directly introduce Vietnam's products for realizing advantage complementation, such as rice, cashew, aquatic products, rubber, coffee, wood and its products; secondly, Yunnan could directly introduce Burma's products for realizing advantage complementation, such as sesame, peanut, sunflower, rubber, aquatic products and wood; thirdly, Yunnan could directly introduce Thailand's products for realizing advantage complementation, such as cane, rubber and oil crops; fourthly, yields of agricultural crops and economic crops in Laos are obviously lower than that in other countries, and only tobacco yield is slightly higher. Yunnan Province could play advantage to directly introduce the products or cooperate with it at the aspects of technology development, prevention and treatment of diseases and insect pests, and variety breeding. At fruit aspect, Yunnan could cooperate with the Association of Southeast Asian Nations at technology promotion and variety breeding or directly introduce seasonal fruit.

5.4 Excavating development space potential for foreign trade of agricultural products

Yunnan Province cooperates with adjacent provinces and ASEAN countries by directly introducing agricultural products with obvious foreign trade advantage and characteristic, or at the aspects of cultivation techniques, pest control and brand cultivation, thereby realizing advantage complementation in foreign trade. For example, vegetable, edible fungi, tobacco, coffee, rosin, perfume oil, fresh cut flowers and tea in Yunnan, beans, rice, rubber, fruit, corn, aquatic products and wood in Burma, coffee, rubber, rice, tea, cashew nuts, pepper, fruits and vegetables, cassava, aquatic products and timber in Vietnam, fruits, vegetables and medicinal material in Guangxi, me-

dicinal material, tobacco and tea in Guizhou, medicinal material, vegetables and dairy in Sichuan, these agricultural products with obvious foreign trade advantage could realize advantage complementation and development via the above forms.

References

- [1] Yunnan Bureau of Statistics, National Bureau of Investigation Corps of Yunnan. Yunnan 2014 national economic and social development statistics bulletin [EB/OL]. http://www.yndaily.com/html/2015/yaowenyunnan_0517/19439_2.html, 2015-05-17/2015-11-16. (in Chinese).
- [2] LI XL. Seize the opportunity to promote agricultural restructuring and development of the plateau region [N]. Study Times, 2014-04-14 (10). (in Chinese).
- [3] BALASSA. Trade liberalisation and 'revealed' comparative advantage [J]. The Manchester School of Economic and Social Studies Journal, 1965 (2): 99-123.
- [4] World Bank. China: Long term development issues and options [J]. Baltimore, Maryland, US: John Hopkins University Press, 1985.
- [5] ANDERSON K. Changing comparative advantage in China: Effects on food, feed and fibre markets [Z]. DECD, 1990.
- [6] CHEN W. Comparative advantage and agricultural economic internationalization of China [M]. Beijing: Renmin University of China Press, 1997: 126-133. (in Chinese).
- [7] PEARSON SR. Net profitability, domestic resource costs, and effective rate of production [Z]. Food Research Institute, Stanford University, Monograph, 1973.
- [8] PEARSON SR, MAYER PK. Comparative advantage among African coffee producer [J]. American Journal of Agricultural Economics, 1974, 56 (2): 310-313.
- [9] CHEN XH. Economic liberalization and adjustment of rice policy [J]. Taipei: Agriculture and Economy, 1993 (14): 22-24. (in Chinese).
- [10] LI CG, GUO YH. Analysis on the comparative advantages of rice and oil in China [J]. Chinese Rural Economy, 1998 (6): 27-32. (in Chinese).
- [11] LI XH. An empirical analysis of Chinese grain comparative advantage [J]. Rural Social Economy, 1998 (1): 35-43. (in Chinese).
- [12] PEN YJ, CHEN GQ. Chinese agricultural domestic resource estimate costs [J]. China Rural Survey, 1999 (1): 20-28. (in Chinese).
- [13] XU ZG. Comparative advantage and China's agricultural production structure adjustment [D]. Nanjing: Nanjing Agricultural University, 2010. (in Chinese).
- [14] ZHAO W, ZHOU YH. Use of domestic resources cost considerations trade interests-A case study of Australian wool trade [J]. International Trade Issues, 2006 (8): 24-27. (in Chinese).
- [15] WILLIAM ML. Comparative advantage in Russian agriculture [J]. American Journal of Agricultural Economics, 2002 (84): 762-769.
- [16] HU YJ. Distribution of planting structure adjustment in Shanxi Province and Region [D]. Beijing: China Agricultural University, 2003. (in Chinese).
- [17] ZHANG WX. Strategy of Lianyungang agricultural industrial structure adjustment [D]. Nanjing: Nanjing Agricultural University Rural Development, 2004. (in Chinese).
- [18] YE CH. Comparative advantage and China planting industry production structure adjustment [D]. Nanjing: Nanjing Agricultural University, School of Economics and Management, 2004. (in Chinese).
- [19] ZUO P. Agricultural comparative advantage and Chongqing agriculture industry structure adjustment [D]. Chongqing: Chongqing Technology and Business University, 2013. (in Chinese).
- [20] CHENG F, JOHN B. Self-sufficiency, comparative advantage, and agricultural trade: A policy analysis matrix for Chinese agriculture [Z]. San Francisco, California, 1999.
- [21] CARTER CA, ZHONG F. Will market prices enhance Chinese agriculture A test of regional comparative advantage [J]. Western Journal of Agricultural Economics, 1991, 16 (2): 417-426.