Comparative Advantages of Cross-strait Aquatic Products Trade and Zhoushan Countermeasures

ZHANG Yan-ru*

Xiaoshan Science & Technology College, Zhejiang Ocean University, Hangzhou 311258, China

Abstract In the initial stage, the status quo of aquatic products industry in Taiwan and Zhoushan is analyzed. The aquatic products industry in Taiwan is characterized by high input, high output, advanced fishery import and export trade, refined and specialized fishery organizations and the dominant role played by the government. However, in Zhoushan, there are many problems in the development of aquatic products industry, featuring weak brand consciousness, inadequate famous brand and pillar industries, frequently restricted by green trade barrier and disordered competition of aquatic products market. The comparative advantages of aquatic products at both sides of Taiwan Strait are measured by using revealed comparative advantage index (RCA) and trade specialized index (TSC), the results show that the aquatic products in both the mainland and Taiwan have certain market share and competitiveness. The revealed comparative advantage index (RCA) of Taiwan' aquatic products is higher that that in the mainland, while the RCA indices in the mainland and Taiwan all show descending trend; the trade specialized index(TSC) cross straits is positive, which indicates specialized export, but this specialization also shows descending trend. Taiwan has advanced aquaculture technology and the mainland owns cheap labor cost and low price, but due to the limited resources in the Taiwan Island and the backward processing technology of aquatic products in the mainland, the comparativeness of aquatic products in the mainland and Taiwan has slid slightly. Therefore, I probe into the cooperation modality between Zhoushan and Taiwan in terms of mutual investment in aquatic industry, exchange and training for personnel cross straits and establishing experimental point of aquatic industry of the Zhoushan Island and Taiwan Island. Besides, countermeasures for enhancing the international comparativeness of aquatic industry in Zhoushan Island are put forward.

Key words Comparative advantage, Aquatic products trade, Cooperation modality, International comparativeness, China

The mainland China and Taiwan Strait, with short distance, mutual culture and the same ancestor, have had long history of trade and culture exchange. Since 1979, with the positive economic and trade policies toward Taiwan enacted by the mainland China and the recovery and development of cross-strait trade relations, the integration trend of economies at the both sides has been enforced consciously. The cross-strait agricultural products are complementary not only in their products but also in the industry chain. Related to aquatic products trade among them, Zhoushan and Taiwan are all islands, belonging to island-based economy. They possess distinctive marine resources, which are the excellent natural regions for developing aquaculture industry. Furthermore, Zhoushan and Taiwan has greater space in terms of cooperation in aquaculture industry.

In agricultural exchange terms, scholars from the mainland China and Taiwan have studied the history, the status quo of cross-strait agricultural exchange or from the perspective of both sides' entrance to WTO to research them. Among them, one of the typical researches is conducted by HUANG Ji-hun, who studied the impact of entering to WTO on the mainland China and discussed the problems of cooperation between the two sides[1]; LIN Yi-fu analyzed the agricultural cooperation directions from the perspectives of economic development and entering WTO[2]. The cross-strait agricultural cooperation researches conducted by Taiwan scholars mainly focused on the future agricultural cooperation modality.

For example, QIU Yi and some other scholars have analyzed the future agricultural exchange modality of the aquatic products trade[3]. However, the theory research on cross-strait cooperation form the perspective of aquatic products trade is rare. In view of this, from the perspective of researching the comparative advantages of cross-strait aquatic products trade, the status quo and the existing problems of aquaculture of the mainland and Taiwan are analyzed. The researches on the cooperation modality of aquaculture between the mainland and Taiwan enrich the theory on cross-strait agricultural economy cooperation; furthermore, the countermeasures for enhancing the competitiveness of aquaculture industry in Zhoushan are put forward.

1 The status quo of the aquaculture of the two sides across the Taiwan Straits

1.1 The status quo and features of aquaculture in Taiwan

1.1.1 The status quo of aquaculture in Taiwan. Taiwan is surrounded by sea and its coastline surpasses 1 600 km. In addition, with rich water resources, fishery in Taiwan has occupied a vital place for a long time. After the war, fishery in Taiwan has developed rapidly. From 1980s to 1990s, fishery in Taiwan maintained 21% to 28% share of the total agricultural output of Taiwan, which is an important section second to crop farming in Taiwan' agriculture and is an important support for the agricultural development of Taiwan[4]. Taiwan, with mild

Received: May 31, 2010 Accepted: July 17, 2010

Funded by the Special Items of the Research Institute of Hong Kong and Taiwan Chinese of Zhoushan of Zhejiang Province Concerning Taiwan Affairs.

* Corresponding author. E-mail: zyruu@163.com

climate and rich fishery resources, has been a famous fishing ground since ancient times, however, the waters for developing aquaculture is limited by the poor land resources, water resources, mountains and dense population. During the past 20 years, Taiwan has formed the family-style aquaculture based on the unit of individual peasant household and the labors are predominately farm owners and family members. In addition, some temporary workers are hired and the independent operation model by each household is applied. After several years' development, a group of labor-intensive and technology-intensive fishery industrialized entities of small-scale peasant economies are formed. The annual turnover of many family-owned aquaculture farms has surpassed 0.1 billion yuan. Many high-tech companies aimed at developing aquaculture are established, and their technology of aquatic breeding leads the world.

1.1.2 The features of aquaculture in Taiwan

1.1.2.1 High input and output. The input of fishery in Taiwafn is high not only in the infrastructure construction and machine equipment, but also in fodder and fish medicine. For example, in southern Taiwan the farms are built and managed according to the industrialized fishery model of Denmark. Each farm in southern Taiwan covers an area of 1 000 m^2 with 30 t annual fishery output. The recyclable water is completely closed and the aquatic species are stocked with high density. The fishery process collects automation and bio-engineering technology as a whole, and manual or automatic control will be conducted on the water quality, water temperature, bait, epidemic prevention, pollution absorption, sorting, harvesting during the production process, so as to make the species to achieve the fastest production speed under the best environment and to attain the highest output per unit area. The period of this kind of high-input and high-output model is short and easy to operate; besides, it is land-saving, water-saving, labor-saving, and effective and its products are much more in line with the hygienic standard. In addition, Taiwan lays much stress on selecting high quality aquatic species and applying machines and high-tech aquaculture management measures. High input creates huge economic benefits for Taiwan by using the limited fishery grounds. It fully presents the features of using capitals to replace lands and the features of developing efficient and intensive fishery.

1.1.2.2 The advanced export of fishery. The aquatic products in Taiwan not only can meet the demands of domestic market consumption, but also can export to the rest of the world numerously, especially the ornamental fish, shrimp, tilapia, grouper and other species are famous in Southeast Asia, Mainland china, Hong Kong and Macao. Taiwan produces 20 000 t live grouper per year, among which 15 000 t are shipped to the Mainland China. With the opening of cross-strait direct shipping, the live groupers can be shipped to the seaports of the Mainland China within the shortest time directly. Thus the procedures for changing the ships and water and for declaration and transshipment can be avoided; furthermore, the survival ratio of live groupers can be improved as well. In addition, the price will be good so fishermen can get more benefits. It is reported that the export volume and export value of fishery in Taiwan account for one third of the total agricultural export.

1.1.2.3 The delicate and specialized fishery associations[5]. There are a variety of fishery organizations in Taiwan, such as, Aquatic Larvae Association, Breeding Adult Association, Aquatic Products Processing Association, and Aquaculture Fodder Association and so on. These associations are perfect and have high autonomy, and they practice domestic selection and management. In Taiwan, most of the fishermen are members of associations, and they book fries, fodder, and fish medicine through the associations; besides, they ship and sale their products by the associations and work together to advance the aquaculture technology. Through the associations, fishermen not only have improved their quality and aquaculture ability, but also have raised their political status and the capability of protecting their rights. The fishery associations integrate the scattered peasant households into a whole, and then enter the market together to sell products with a unified brand and unified production standard. This way of marketing is beneficial to reducing costs and improving quality, as well as ensuring the production safety. In Taiwan, fishery associations are the core of farmers, as well as the important assistants for the government to carry out the rural and fishery policies. Fishery associations play an important role is coordinating and connecting the government and fishermen. The fishery associations are entrusted by the government to promote their policies, to establish various kinds of schools to train the fishermen, to collect suggestions timely and to reflect the willfulness of fishermen and then provide references for the government; fishery associations should frequently coordinate the relations between fishermen and the government, so as to smooth the differences and misunderstanding among them and to promote unity and understanding.

1.1.2.4 The government plays a dominant role in the fishery industrialization. Taiwan lays much stress on training, researching and promotion of fishery and it has established perfect science and education system of training, researching and promoting, and the department who takes charge of the system is called "Fishery Department of Agricultural Committee". In order to ensure the successful popularization and promotion of research result, Taiwan has established a set of completed fishery research system and the functions of each research institutions are clearly defined. In addition, Taiwan government has planed the long-term and middle-term projects for fishery so as to encourage large-scale investment and refinement, as well as to establish specialized region for fishery. The "Fishery Department of Agricultural Committee" has stipulated the outlines of science development in the fishery of Taiwan and it invested huge amount of capitals in supporting the scientific research of fishery in Taiwan, building the fishery brand, planning and constructing specialized region of fishery, evaluating the technology of scientific results in fishery and improving the competitiveness efficiency of fishery in Taiwan. The department rewards

the fishery units who are in line with the plan in the determined year; encourages the personnel to undertake the high-technology and high efficiency fishery, and breeding sanitary, safe, high-quality and environment protection aquaculture products. In addition, the department should encourage the personnel involved to reduce the damages to the environment caused by the fishery production, protect the environment of aquaculture and maintain the natural ecological environment.

1.2 Analysis of the status quo of aquaculture development in Zhoushan Since the reform and opening up, marine economy of Zhoushan has developed rapidly. Fishery is an important component of marine economy in Zhoushan and the aquaculture is regarded as the pillar industry of Zhoushan. In 2004, the proportion of marine economy in Zhoushan is the highest comparing with the rest cities in China, among which the export of aquatic products accounted for 75.8% of the total amount of export in the whole city, so the aquatic products own the absolutely dominant role. However, the development of aquaculture in Zhoushan still has the following problems.

1.2.1 The brand awareness is weak and the famous brand and pillar enterprises are rare. Trademark is the logo of the products and it represents the company image. Prestigious brand can promote business sales and expand market share[6]. At present, although Zhoushan owns several traditional brands such as "Mingzhu", "Xingye", "Gangming", "Hailisheng" and the like, and their products have been sold to domestic and overseas markets, they have not formed strong brand advantages and the strength on protecting trademark is not enough. In addition, some small and medium-sized enterprises in Zhoushan lack the brand awareness; some do not have their brands; some do not have the registered trademark or some enterprises do not pay attention to the packaging. Especially for some export-oriented enterprises, they just process the ordered products according to the samples, use other enterprises' brands and can not effectively open their market. It is evident that the weak brand strategy awareness of aquatic products has grave impact on the enhancement of future export efficiency and the expansion of international market share.

1.2.2 The aquatic products are frequently limited by green trade barriers For a long time, China' aquatic products markets are relatively concentrated, although concentration of exports in recent years has decreased, this phenomenon has not been fundamentally changed[7]. The major export countries of Zhoushan, including America, Japan, South Korea and some other countries, increasingly elevate the demands on the exported aquatic products. They increase the test items and some harsh demands, which greatly add the test cost and export risks of export-oriented enterprises of Zhoushan. Taking South America white shrimp as an example, in 2006, the testing fee for export of enterprises in Zhoushan was 3 000 to 4 000 yuan per container, while in the first half of 2008, the fee has been elevated to 30 000 yuan per container. According to the statistics from Zhoushan City Economic and Trade Commission, the average testing fee of aquatic products throughout the city has increased by about 60% against the same period of the previous years. Affected by many factors, the production of export-oriented enterprises of aquatic products in Zhoushan has dropped continuously. Survey shows that in the first half of 2008, part of aquatic enterprises in Zhoushan had to shrink their production scale for reducing losses, some even had to give up foreign trade orders. What's worse, a handful of enterprises could not support themselves and had to choose shutdown or bankruptcy.

1.2.3 The market competition of aquatic products is chaotic. There are many processing enterprises in Zhoushan, which are characterized by "low, scattered, small". In order to win customers, the enterprises with the same business often compete with each other by reducing the profits. In order to export their products, some even sell their products with no profits, and then their behaviors not only cause the tendency of dumping, but also have bad impact on the profits of the whole industry and the orderly development of the whole export-oriented enterprises of aquatic products. Therefore, it is of great importance for the associations of aquaculture to normalize the management on aquaculture and strengthen the service of aquaculture.

2 The measures and analysis of the comparative advantages of aquatic products of the two sides across Taiwan Strait.

2.1 Data source and research method

2.1.1 Data source. The data mainly come from *Yearbook of Agricultural Products Trade of the Republic of China* from 1988 to 2003, the *Statistical Yearbook of China* from 1988 to 2007 and the *Yearbook of International Trade Statistics of* 2007[8].

2.1.2 Research method. Relative to the calculation of comparative advantages, the frequently used indices are revealed comparative advantage index (*RCA*) and trade specialization index (*TSC*).

2.1.2.1 Revealed comparative advantage index (*RCA*). *RCA* refers to the ratio obtained by dividing the share taken by a certain product in the total sum of its export value by the export share of the same kind of the product in the world export market. The index shows the position of a certain country' exported products in the international market. Its expression is as follows:

$$RCA = X_{ij} \Big/ \frac{\sum_i X_{ij}}{\sum_i \sum_j X_{ij}} \quad (1)$$

In the expression, X_{ij} means the total export value of *i* product in *j* country.

2.1.2.2 The trade specialization index (*TSC*). *TSC* shows whether a country is the net import country of the certain kind of product or the net export country of the certain kind of product, and the relative scale of net import and net export. The index is defined as follows:

$$TSC = (E_i - I_i) / (E_i + I_i) \quad (2)$$

In the formula, E_i is the total export value of *i* products; I_i is the total import value of *i* product.

2.2 Results and analysis According to the relevant original data and by using the expressions(1) and(2), the *RCA* index

and *TSC* index of aquatic products of the two sides cross Taiwan Strait can be calculated. According to the results the changing trend figure of *RCA* index (Fig. 1) and the changing trend figure of *TSC* index (Fig. 2) of aquatic products cross the Taiwan Strait can be drawn.

It can be seen from Fig. 1 that the indices of aquatic products both in Mainland China and in Taiwan are all bigger than 1, which indicates that the market share is high and the products have certain competitiveness, among them Taiwan' competitiveness is much more obvious. The *RCA* index of aquatic products in Taiwan attained 9.79 in 1988. But in the long run, the *RCA* indices of aquatic products in Mainland China and in Taiwan all show the descending trend. For example, in 1988, the *RCA* index of aquatic products in Mainland China was 4.30, while in 2003, the index in Mainland China was 1.36, and the index in Taiwan was 4.71, which demonstrated that the share taken by the Mainland China and Taiwan in the international market all has decreased. The results is in consistent with the efforts made by other developing countries to export their aquatic products, the market share occupied by these developing countries by using low prices and the limited fishery resources in Taiwan.

It can be seen from Fig. 2 that the *TSC* indices of aquatic products in Mainland China and Taiwan are all bigger than 0, which indicates that in aquatic products terms, Mainland China and Taiwan belong to the specialized and net export areas, and they all have strong competitiveness. However, from the long term trend, the *TSC* indices of Mainland China and Taiwan decrease annually, which illustrates that the products' net import value has decreased to some extent and their competitiveness has certain reduction.

Through combining Fig. 1 and Fig. 2, it can be concluded that the *RCA* indices of aquatic products of the two sides of the Taiwan Straits are all higher than 2 and all have relatively higher market share, by comparison, the *RCA* index of aquatic products in Taiwan is higher than that in Mainland China. Meanwhile, the *RCA* index of aquatic products both in Mainland China and in Taiwan all shows descending trend, among which, the index of the Mainland China has dropped from 4.30 in 1988 to 1.36 in 2003 and that of Taiwan has dropped from 9.79 in 1988 to 4.71 in 2003, the market share has dropped. The *TSC* index of aquatic products in the two sides of Taiwan Straits is positive, which indicates that the two areas are all specialized export area, but in general terms, the *TSC* index has declined, for example, in Mainland China , the index has dropped from 0.82 in 1988 to 0.35 in 2003, while in Taiwan, the index has dropped from 0.82 in 1988 to 0.45 in 2003. Besides, the degree of specialization has declined and the competiveness partly relies on low prices and the processing needs improving. These problems are more serious in Mainland China.

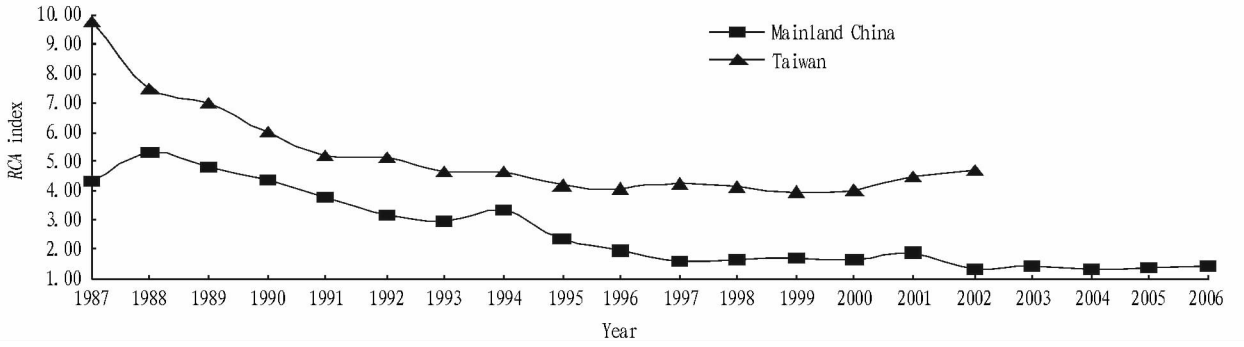

Fig. 1 The changing trend of the *RCA* index of the aquatic products in the two sides of Taiwan Straits from 1988 to 2007

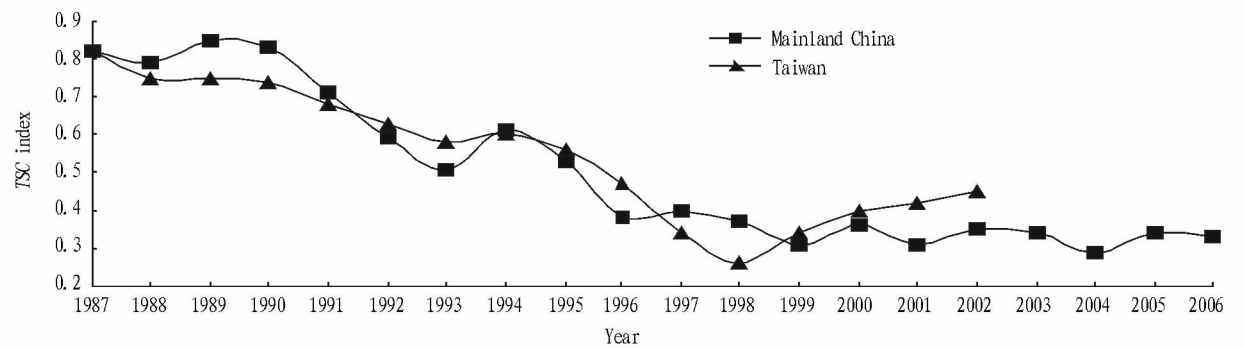

Fig. 2 The changing trend of the *TSC* index of the aquatic products in the two sides of Taiwan Straits from 1988 to 2007

2.3 Conclusions Though the analysis above, we can draw the following conclusions: the aquatic products in Mainland China and Taiwan all haves certain market share and certain competitiveness, the *RCA* index of Taiwan is higher than that in Mainland China, at the same time, the *RCA* index of the two sides shows descending trend; the *TSC* index of aquatic products in the two sides is positive, so these area belong to export specialized area, but the trend is dwindling. Taiwan has ad-

vanced technology and the Mainland China has cheap labors and low prices, but the resources in Taiwan Island is limited and the deep processing of aquatic products is needed in Mainland China, which lead to the decline of competitiveness of aquatic products. According to the *RCA* standard stipulated by Japan External Trade Organization and the *TSC* index, in aquatic products terms, the comparative interests status of Mainland China and Taiwan is Mainland China has relatively weak comparative advantage and Taiwan has strong comparative advantages. The research provides theoretical basis for cooperation of cross-strait aquaculture and aquaculture of the two islands.

3 Countermeasures and suggestions

3.1 The cooperation modes of aquaculture in Taiwan Island and Zhoushan Island

3.1.1 The investment cooperation of aquaculture. There is a certain gap between Mainland China and Taiwan in the species of aquatic products and in the production technology and management. Through the investment and cooperation of businessmen from Taiwan, the improved varieties of Taiwan Island will be introduced into Zhoushan. In the production process, the production technology will be guided to improve the varieties of Zhoushan and to enhance their production technology. Taking the agricultural cooperation between Fujian Province and Taiwan as an example, Fujian has introduced about 150 improved varieties from Taiwan, including food, potatoes, fruits, vegetables, flowers and aquatic products, which account for over 60% of the total amount of improved varieties across the whole province and greatly improved the varieties and quality of agricultural products in Mainland China. Meanwhile, through the cooperation with Taiwan' agricultural enterprises, the Mainland enterprises can learn the advanced management and marketing from Taiwan. According to the statistics, what the Mainland China has introduced from Taiwan-invested enterprises is management, marketing, improved varieties, and production technology successively. The investment cooperation mode of businessmen from Taiwan to the aquaculture in Zhoushan is helpful for Zhoushan to introduce advanced management and marketing, and then pushing forward the development of aquaculture in Zhoushan.

3.1.2 Training and exchange visit of personnel from the aquaculture in the two islands. There has been a long time for the training and exchange visit of talents from various aspects, for example, the exchange visit and academic exchange between agricultural economists. Through exchanging the agricultural technology and agricultural management, both sides can benefit from the exchange. At present, this kind of cooperation mode is only limited in the colleges and universities and research units cross the strait, but the cooperation in recent years develops rapidly and with great potential from long-term view. On the strength of the exchange, the technology and management level of personnel involved in aquaculture of the two islands can be improved by exchange visit and academic exchange. The activity of " The training programs for personal of constructing the marine city to go to Taiwan to study" should be carried out. The training on personnel in enterprises should be enforced, for example, selecting the excellent young entrepreneurs in Zhoushan to participate the " Tsinghua University workshops of the cross-strait business summit" to study with the entrepreneurs form the two sides of Taiwan straits. The communication between the vocational training institutions in Taiwan and the vocational schools in Zhoushan should be promoted, and the exchange visits and professional communications among teachers should be launched.

3.1.3 Establishing the experimental points of cooperation of aquaculture in the two islands. Through the mode of establishing experimental points, the cooperation and communication of modern aquaculture of the two islands could be strengthened. The government should launch the assistance project for the deep processing of aquatic products in Zhoushan and the association for advancing the development of enterprises in two sides of Taiwan Straits should assign relevant technical staff to guide the technology upgrading, new products development, packing improvement and marketing of the aquatic products processing in Zhoushan. The two islands work together to create the delicate brand of aquatic products in Zhoushan. In addition, the association for advancing the development of enterprises in two sides of Taiwan Straits invites relevant Taiwan businessmen to participate the Zhoushan International Fisheries and Seafood Expo to enhance mutual understanding and exchange opportunities. Furthermore, it can encourage the establishment of friendly relations between fishing towns in Zhoushan and the developed fishing towns in Taiwan and conducts various forms of activities for mutual aids.

3.2 Countermeasures for enhancing the competitiveness of aquaculture in Zhoushan

3.2.1 The government should focus on supporting the pillar enterprises and implement brand strategy. The government should focus on the pillar industry of aquaculture and positively guide and promote the work of quality authentication and brand creation. Enterprises can start from the following aspects when implementing brand strategy. Firstly, right marketing idea should be established and the quantity-oriented traditional market idea should be changed. Secondly, the improved aquatic products with comparative advantages and distinctive features should be given priority to and good brand reputation and image should be built from all-around aspects, such as trademark registration, advertising, packing and marketing. Thirdly, these enterprises should attend the product exposition both at home and abroad and seize every chance to promote their products and improve the popularity of their brands.

3.2.2 Zhoushan should break through the green trade barrier and establish high standard and strict requirements for quality of aquaculture products so as to create famous brand and develop diversified markets. In government terms, it should stipulate the quality standard system and ecological technology standard according to the international standard for aquaculture products, and enforce the quality test work of export aquatic products. For one thing, establishing the quality standard system and ecological technology standard of aquatic products is

the overall trend of walking in line with the international trend and realizing the mutual recognition of the environmental labeling products among different countries; for another thing, in aquaculture terms, on the condition of trying to improve the quality of aquatic products and establishing the production and processing system which is in line with the international market, the green trade barriers should be broken by taking a variety of methods.

3.2.3 Zhoushan should increase the science and technology investment in aquaculture and encourage the technological innovation. Zhoushan should increase the investment in science and technology research, focus on the deep processing of aquatic products and improve the added value of agricultural products[9]. At present, the aquatic products exported in Zhoushan are nearly the same without distinctive features. The enterprises copy each other in producing products and their products are single and dominated by frozen fish, single frozen shrimp and other frozen aquatic products. The added value of these products is low and their prices are significantly lower than the prices of the same kinds of products in South Korea and Thailand in international market. The aquaculture in Zhoushan should combine its aquatic features, raw material resources and the status quo of product processing with the experience of Taiwan aquaculture; increase its investment in technical development; speed up the deep processing of aquatic products, so as to through enhancing the added value of export aquatic products to elevate its competitiveness of the export products.

3.2.4 Zhoushan should foster, expand and specifically classify the fishery cooperatives. Zhoushan should mirror the experience of Taiwan' classification of fishery associations and further display the positive functions of fishery associations. In April, 2004, Zhoushan established the guild of exporting aquatic products and after the establishment of the guild, Zhoushan focuses on the management, cooperation, coordination, self-discipline, services and other ways to try to improve the quality of export enterprises of aquatic products, which plays a positive role in building famous brand. Based on its local conditions, Zhoushan further clarify its associations to cooperatives, so as to provide more improved services for aquatic enterprises.

3.2.5 Zhoushan will continuously support the development of leisure fishery and push forward the diversified operation of aquaculture. Zhoushan boasts the excellent natural conditions for developing island and marine leisure fishery[10]. Although Zhoushan has attained some achievements in developing leisure fishery, there are still some problems and shortages in further developing tourism and improving tourism industry. Besides continuing to seek to the support from the government, Zhoushan should highlight the local features, encourage the diversified operation of aquatic enterprises and create the famous brand of Zhoushan leisure fishery.

3.2.6 Zhoushan should make full use of the soft resources of the two islands and implement the strategy of "prospering fishery by applying technology". Through the academic cooperation of the two islands, the training on technical talents and the technological level of aquaculture should be elevated. At the beginning of 2010, in order to further enforce the cooperation and communication of colleges and universities of the two sides, Zhenjiang Ocean University and National Taiwan Ocean University have achieved many substantial terms of cooperation, such as holding the schoolmasters' forum for presidents from ocean colleges and universities, constructing the cooperation and communication platform in the field of biology for Zhenjiang Ocean University and National Taiwan Ocean University, preparing to construct the research center of aquatic biology of the two sides of the Taiwan Straits.

3.2.7 Further applying electronic commerce and improving the core competitiveness of enterprises. In recent years, with the rapid and stable development of fishery economy, modern fishery logistics and network information, the aquaculture enterprises try to discover new ways for industrialized and informative operation of fishery in Zhoushan, Zhejiang Province. The e-commerce should be effectively opened and applied to boost the prosperous of aquaculture economy in Zhenjiang and even the economic development of Zhejiang Province.

4 Conclusions

The aquacultures in the two sides of the Taiwan Straits are highly complementary in terms of resources, technology and management. Through the cooperation of the two islands and the continuous discovery on the cooperation mode of the two sides, the cooperation and communication of aquacultures of the sides can be further promoted. Meanwhile, the government should take the aquaculture economy of Zhoushan as a starting point to further promote the cooperation and communication of aquaculture in Zhejiang Province and Taiwan, which is of great importance in strengthening the ocean economy in Zhejiang, supporting the transition of Zhejiang Province from a big ocean province to a strong ocean province, fully displaying the low-carbon advantages of marine economy, developing low-carbon economy and promoting the upgrading of aquaculture in Zhoushan, Zhejiang Province. In addition, the cooperation and communication between the two sides will further enhance the international competiveness of Zhoushan aquaculture.

References

[1] HUANG JH. Reassess the impact of entering to WTO on the mainland China's agriculture: on the cross-strait agricultural cooperation [C]//Symposium on Entering to WTO and Enhancement of the Competitiveness of Agriculture. Beijing: China Agriculture Press, 2002: 53-64. (in Chinese).

[2] LIN YF. WTO and development of the agricultural economy and the agricultural cooperation between mainland and Taiwan[C]//Symposium on Entering to WTO and Enhancement of the Competitiveness of Agriculture. Beijing: China Agriculture Press, 2002: 29-39. (in Chinese).

[3] QIU Y, DUAN Q. Discussion on the modality for future agricultural exchange between mainland and Taiwan [M]. Beijing: China Renmin University Press, 1993:379-384. (in Chinese).

[4] ZHAO YR. On the capacity of Taiwan fishery and the cooporation between the two banks of Taiwan Strait [J]. Taiwan Research Quarterly, 2007(4):33-40. (in Chinese).

(To page 29)

tract relation in rural areas, implement land systems conducive to the rational flow of rural labor, and remove the worries of farmers transferred. At the same time, we should carry out experimental work of national overall planning of urban and rural employment, speed up the construction of urban and rural labor force market, improve resource information bank of labor force, offer unified services and service standards, make employment plan for urban-rural integration, establish both employment and unemployment registration, and solve the problems in employment and social security of rural labor forces and landless farmers.

References

[1] RANIS G, FEI JCH. Theory of economic development[J]. The American Economic Review, 1961, 51(4):533-558.

[2] LEWIS WA. Economic development with unlimited supplies of labour [C]. Beijing: The Commercial Press, 1984. (in Chinese).

[3] JORGENSON DW. The development of a dual economy[J]. The Economy Journal, 1961, 71(283):309-334.

[4] HARRIS JR, TODARO MP. Migration, unemployment and development:a two-sector analysis[J]. The Economy Journal, 1970, 60 (1): 126-142.

[5] CAI F. The political economy of labor migration[M]. Shanghai: Shanghai People's Publishing House, 2003. (in Chinese).

[6] LU XH, ZHU SF, ZHANG ZH. A positive study on the magnitude of rural-urban migration in China[J]. Chinese Rural Economy, 2006 (11):35-41. (in Chinese).

[7] DE BRAUW A, HUANG JK, ROZELLE S, *et al*. The evolution of China's rural labor markets during the reforms[J]. Journal of Comparative Economics, 2002, 30(2): 329-353.

[8] CHEN WP. The implications of privatizing rural propert rights on labor migration in China[J]. China Economic Quarterly, 2004(10): 163-190. (in Chinese).

[9] DU Y, BAI NS. Out of the villages: an empirical study of rural labor flow in China[M]. Beijing: Economic Science Press, 1997. (in Chinese).

[10] DE BRAUW A, ROZELLE S. Migration and household investment in rural China[C]//China labor economics. Beijing: China Labor and Social Security Publishing House, 2005. (in Chinese).

[11] WANG XW. Migration of rural labor and equilibrium analysis on agricultural production[J]. Seeker, 2007(8):31-32, 181. (in Chinese).

[12] ZHANG SJ, WU RM. Influence of flow of rural labour on agricultural development[J]. Social Sciences in Yunnan, 2002(1):36-39. (in Chinese).

[13] ZHOU PH. Discussing the impact of labor force transferring on development of China's rural economy[J]. Technology Economics, 2007(3):71-75. (in Chinese).

[14] SHENG LY. The economic impact of rural labor flow[J]. Statistical Research, 2007(10):15-19. (in Chinese).

[15] CUI CB, WANG KS. Migration of rural labor and scale operation of agriculture[J]. Issues in Agricultural Economy, 2008(4):48-51. (in Chinese).

[16] TAN RS. Village labor-force flow and chinese economy growth——the substantial evidence study according to the angle of manpower capital[J]. Inquiry into Economic Issues, 2007(4):80-84. (in Chinese).

[17] WU X. Economic situation scanning and forecast at the 15th National Congress of the CPC[J]. China Non-Governmental Science Technology and Economy, 1997(S2):58-75. (in Chinese).

[18] LIU J. The hot issues in the rural reform and development at present[J]. Chinese Cadres Tribune, 1995(9): 6-9. (in Chinese).

[19] LU L, ZHAO CX. Main variables of labor employment in next ten years[J]. Dong Yue Trbune, 1998(4):33-38. (in Chinese).

[20] LI BK. Rural surplus labor force transfer and small town development in China[J]. Urban Problems, 1997(3):11-14. (in Chinese).

[21] GUO ST. Rural labor force differentiation and social structure in China[J]. Contemporary China History Studies, 1998(6):79-88. (in Chinese).

[22] WEI YD. Guidance to policy[J]. Newsletter About Work in Rural Areas, 2004(2):1-4. (in Chinese).

[23] HOU L. Problems in transformation of rural labor force in China and the countermeasures[J]. Population Journal, 2004(6):30-34. (in Chinese).

[24] BAI ZW. Relationship and consideration of socialist new countryside construction and urbanization[J]. Money China, 2006(9):18-21. (in Chinese).

[25] CHEN XW. The problems about agriculture, rural areas and farmers in modern China[J]. Productivity Research, 2005(10):185-191. (in Chinese).

[26] HU JB. Macroeconomics of rural-urban migration in China[J]. Social Science Journal, 2009(9):5-46. (in Chinese).

[27] HE SY. Applied time series analysis[M]. Beijing: Beijing University Press, 2003:55-100. (in Chinese).

[28] ZHANG L. The experience and inspire of foreign surplus labor transfer[J]. Economic Review, 2007(2):56-58. (in Chinese).

[29] WANG DP, PENG JQ, YAN Z. Employment and transfer status of female labor force in rural China[J]. Asian Agricultural Research, 2009, 1(6):4-9.

[30] ZHU WW. Economic analysis on transfer of rural labor force[J]. Journal of Anhui Agricultural Sciences, 2007, 35(25):279-280. (in Chinese).

[31] GUO XH, GE DQ. Characteristics of price fluctuation of agricultural products in China[J]. Asian Agricultural Research, 2009, 1(3): 45-48, 52.

[32] WANG Y. Some advice of prompting the development of agriculture product circulation[J]. China Forestry Economy, 2005(4):50-51. (in Chinese).

[33] LIN YF. New Thoughts in need: A Comment on World Bank's "reaching the rural poor: strategy for rural development"[J]. Journal of Peking University: Philosophy and Social Sciences, 2002, 39 (5):5-8. (in Chinese).

(From page 24)

[5] ZHAO YR. On the feasible matching-cooperation model alternatives of the farmer cooperative economic organizations between Fujian and Taiwan[J]. Taiwan Research Quarterly, 2009(4):34-43. (in Chinese).

[6] QI RH, YANG XH. Study on status and countermeasures of aquatic product export of Zhoushan City[J]. Fisheries Economy Research, 2005(3): 13-18. (in Chinese).

[7] HU QG, HUO XX. Structural analysis of aquatic products trade: based on the comparative advantages[J]. Issues in Agricultural Economy, 2007(12):20-26. (in Chinese).

[8] National Bureau of Statistics of China. China statistical yearbook [M]. Beijing:China Statistics Press, 1988-2007. (in Chinese).

[9] ZHU Y. The effect of ecological barrier on the export of Zhoushan's fishery products and its countermeasures[J]. Economic Tribune, 2006(10): 21-22. (in Chinese).

[10] YU CD, SHANG H. The discussion about development of Zhoushan's recreational fishery[J]. Journal of Zhejiang Ocean University: Nature Science, 2002(1): 9-12. (in Chinese).