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Mechanism and Path of Deepening the Marine Economic Cooperation between Guangdong and ASEAN in the Context of the 21st Century Maritime Silk Road Construction

Bo YAN[1,2], Jun DU[1,2*], Ruimin FENG[1]

1. Management School of Guangdong Ocean University, Zhanjiang 524088, China; 2. ASEAN Research Institute of Guangdong Ocean University, Zhanjiang 524088, China

Abstract The strategy of 21st Century Maritime Silk Road provides favorable policy environment for deepening the economic cooperation between Guangdong and ASEAN, actively promoting the transformation and upgrading of the marine economic structure, and establishing win-win marine economic cooperative development platform. For deepening the marine cooperation with ASEAN, Guangdong has significant advantages in geographical location, humanistic foundation, marine resources and economic strength. Based on interest demands of Guangdong and ASEAN, Guangdong should build the marine economic cooperation mode and mechanism from the overall mechanism and sub-mechanism, establish a three-dimensional marine economic cooperation path with characteristics of Guangdong and ASEAN from top design, to specific cooperation level, then to implementation of supporting facilities, and expand fields of the marine economic cooperation between Guangdong and ASEAN, to promote strategic construction of 21st Century Maritime Silk Road.

Key words 21st Century Maritime Silk Road, Marine Economy, Cooperation mechanism, Development path

1 Introduction

As an essential pivot of the Belt and Road Initiative in geographical space, ASEAN has excellent trade contacts with Guangdong. In 2014, Guangdong's trade volume with ASEAN exceeded 100 billion USD, accounting for about 11% of Guangdong's total foreign trade turnover. There are enormous potential and common benefits in marine economic cooperation, thus deepening the marine economic cooperation has become an important breakthrough between Guangdong and ASEAN in expanding and deepening the cooperation space. The proposal of the 21st Century Maritime Silk Road strategy provides an excellent policy opportunity for marine economic cooperation between Guangdong and ASEAN. Guangdong is an important province in the construction of the 21st Century Maritime Silk Road. How to grasp this opportunity and integrate into the construction of 21st Century Maritime Silk Road and the Belt and Road Initiative for Guangdong Province has become a hot issue of scholars. In the context of 21st Century Maritime Silk Road, domestic and foreign research findings of marine economic cooperation are mainly concentrated on the following 4 aspects. (i) Cooperation in marine resources. First, at the level of cooperation mechanism, marine resource is essential carrier for smooth Sino-ASEAN cooperation. Li Yan built a long-term cooperation mechanism from government, intermediaries, and enterprises, to realize effective sharing of marine resources[1]. Li Mengyu applied deep ecology theory to fields of marine resource development and cooperation mechanism, to provide a new idea for sustainable development and utilization of marine resources[2]. Second, at the level of development and cooperation mechanism of fishery resources, it is feasible to build the dialogue and coordination mechanism for common development of fishery resources for China and countries along the line, especially in South Sea area, to promote smooth implementation of the Maritime Silk Road[3-4]. (ii) Cooperation in marine industry. First, in the structural adjustment of marine industry, Wang Weiyi[5] and Wei Min[6] studied how to strengthen connections between China and countries along the line, promote transformation and upgrading of the marine industry structure, and serve the Belt and Road Initiative, so as to realize the objective of strengthening the province and the whole country through marine industry. Second, practical policy recommendations were put forward for specific marine industry. Wei Youzhou *et al.*[7] analyzed shortage of China's pelagic fishery at the level of 21st Century Maritime Silk Road and came up with recommendations for promoting the construction of 21st Century Maritime Silk Road from strategic positioning, strategic pivot, management and coordination. Third, the ecological niche theory was used to analyze current situations of ecological niche of China's marine industry, to provide strategies and recommendations for industrial cooperation between China and ASEAN coun-

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* Corresponding author. E-mail: dujun58@126.com

tries[8-9]. Besides, some scholars explored the mechanism of cooperation between China and ASEAN in tourism industry[10-11]. (iii) Marine regional economic cooperation. First, strategic policies and recommendations were put forward from the perspective of economics. Chen Wanling and He Chuantian[12], taking the economic cooperation mechanism as support, proposed accelerating building the economic cooperation network for port cities along the line; some scholars studied how heterogeneity and externalities influence international and regional economic cooperation and which cooperation mechanism can effectively coordinate economic cooperation of heterogeneous participants[13-14]. Second, policy and recommendations were put forward from a diversified perspective of economic cooperation. For example, Li Xiangyang[15] stressed the construction of a diversified marine cooperation mechanism. Third, Dang Queanh[16] and Liang Jingwei *et al.* [17] studied the spatial economic connections of cities in free trade zone, to provide new ideas for the construction of wide-ranging, deep-seated and all-round economic cooperation mechanism. (iv) Cooperation in marine science and technology. First, policy recommendations were put forward for cooperation in key fields and platform construction. For example, Lu Xiurong and Chen Wei[18] proposed establishing a linked mechanism for marine science and technology work, setting up international cooperation network platform, building regional intergovernmental scientific and technological cooperation platform, and strengthening marine science and technology research and development cooperation between China and countries along the line, to provide technical support for realizing the goal of powerful marine country[19]. Second, Xiang Jianhai[20], Wang Zeyu[21], and Zhai Renxiang[22] put forward recommendations for strengthening the cooperation of regional marine science and technology from cultivation of scientific and technological personnel, investment in scientific research funds, integration of government, industry, and university, to provide a certain theoretical guidance for Sino-ASEAN marine scientific and technological cooperation. Third, some scholars assessed factors influencing cross-regional marine science and technology research and development cooperation, mainly involving different proximity factors, geographical proximity and technological proximity[23-25]. In sum, findings of the above scholars offer us theoretical guidance for further study about the economic cooperation mechanism and path between Guangdong and ASEAN. However, they still need further improvement. Most scholars made study mainly from the macroscopic level, such as the strategy of strengthening country through marine industry and the Belt and Road Initiative, while few scholars touched upon the cooperation mechanism in a specific field between a region and countries along the line, and there is still no specific and systematic cooperation mechanism. In this situation, taking Guangdong Province as the starting point, we studied the mechanism and path for marine economic cooperation between Guangdong Province and ASEAN countries, so as to provide feasible and practical cooperation mode for Guangdong participating in the construction of 21st Century Maritime Silk Road Construction and deepening the regional marine economic cooperation between Guangdong and ASEAN countries, and to provide theoretical guidance and experience reference for other coastal provinces strengthening international marine economic cooperation.

2 Advantages

2.1 Superior geographical location Relying on the maritime transportation, Guangdong can carry out economic exchanges, trade cooperation and technology co-development between Guangdong, other coastal provinces, and coastal countries. Guangdong, adjacent to China Hong Kong, Macao, and Taiwan, is a mainland region closest to China Taiwan. The business between Guangdong and China Hong Kong has positive factors. There is not only complementation in resources and man power, but also potential benefits in overall trade. Through strengthening cooperation and exchanges between international economic organizations of China Hong Kong, Macao and Taiwan or international economic organizations, to promote economic development of Guangdong and provide favorable conditions for marine economic cooperation between Guangdong and ASEAN.

2.2 Deep humanistic foundation In recent years, the number of overseas Chinese of Guangdong Province has increased to 30 million and takes up 2/3 of the total overseas Chinese in China. The advantages of overseas Chinese entrepreneurs are incomparable and Guangdong is reputed as the largest hometown of overseas Chinese. Since the reform and opening up, in direct investment to Guangdong Province, near 950 billion yuan came from overseas Chinese and compatriots from Hong Kong and Macao, 4000 enterprises absorbed about 70% of foreign capitals, and the donations from overseas Chinese reached 40 billion yuan. With the requirements of economic development and opening up, the economic and culture contacts between overseas Chinese and Guangdong become close and close, which has become an essential element for trade contacts and civilized exchange between China and the region where overseas Chinese live, and has become an important support force for raising the soft power of Guangdong Province.

2.3 Rich marine port resources Guangdong Province has rich port resources and port resource is a big advantage for trade contacts between Guangdong and other regions. Apart from abundant coastline resources, waterway develops rapidly and Guangdong has the largest number of ports along the coast. Guangdong Province has 14 coastal cities, 5 ports with 500 million ton capacity, and in 2013, the throughput of ports above scale was near 1.5 billion tons[26]. In 2013, imported and exported container of Guangzhou Port and ASEAN ports exceeded 610000, the cargo throughput of Zhanjiang Port and south Asian areas exceeded 25 million tons, and the growth of throughput of import and export between Zhanjiang Port and ASEAN countries is obviously accelerating[27]. In Guangdong Province, there are 200 harbors suitable for construction of ports, 61 harbors can be built into large ports and have gradually become an international container transport system for exchange, mutual cooperation and development with

Port of Hong Kong and Shenzhen Port[28].

2.4 Large economic scale and powerful marine overall strength The total output value of marine economy of Guangdong Province always keeps the highest record. As shown in Table 1, after actively implementing the "South China Sea Strategy" in 2010, Guangdong Province realized the increase of total marine output value from 666.1 billion yuan in 2009 to 1128.3 billion yuan in 2013, and the percentage of total marine output value to GDP of Guangdong Province rose from 16.87% to 18.15%, showing rapid growth. The percentage of total marine output value of Guangdong Province to the total marine output value of the whole country kept about 20%, indicating that the growth of marine economic growth of Guangdong Province is faster than the GDP growth of Guangdong Province.

Table 1 Comparison of total marine output value Unit: 10^8 yuan, %

Year	Total marine output value of Guangdong	GDP of Guangdong	Percentage of total marine output value of Guangdong to GDP of Guangdong	Total marine output value of the whole country	Percentage of total marine output value of Guangdong to total marine output of the whole country
2009	6661.0	39482.56	16.87	32277.6	20.64
2010	8253.7	46013.06	17.94	39572.7	20.86
2011	9191.1	53210.28	17.27	45496.0	20.20
2012	10506.6	57067.92	18.41	50045.2	20.99
2013	11283.6	62163.97	18.15	54313.2	20.78

3 Mechanism

3.1 Cooperation ideas The marine economic cooperation between Guangdong Province and ASEAN is an essential part of the construction of the 21st Century Maritime Silk Road. In the cooperation of two parties, there should be clear cooperation ideas as follows:

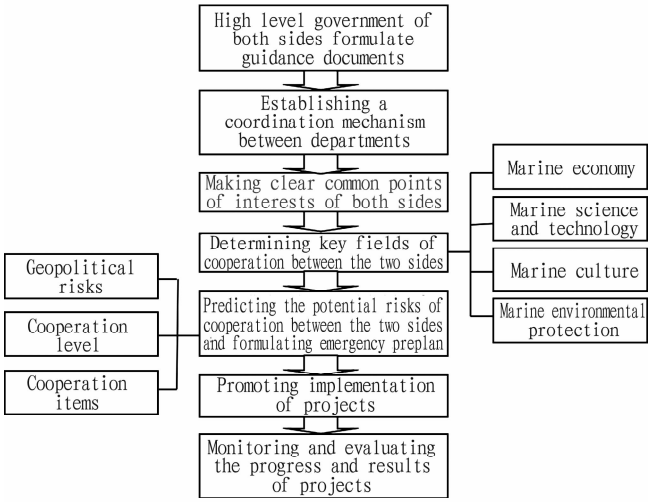

Fig. 1 Framework for marine cooperation between Guangdong and ASEAN

3.1.1 Formulating high-level government guidance documents. Formulating high-level government guidance documents is the precondition and institutional guarantee for the cooperation between Guangdong and ASEAN. At present, China and ASEAN have signed Sino-ASEAN Marine Cooperation Program and have also set up the Sino-ASEAN Maritime Cooperation Fund. The marine cooperation between Guangdong and ASEAN should be based on Sino-ASEAN Marine Cooperation Program, formulate more detailed cooperation plans and programs to regulate acts of both sides.

3.1.2 Establishing a coordination mechanism between two sides. The marine cooperation between Guangdong and ASEAN is mainly government-leading. Under the guidance of the government, it is required to highlight the subject position of enterprises, and carry out marine cooperation through market operation. Establishing a coordination mechanism between two sides is to solve series of problems in the process of marine cooperation, to make the cooperation smoother.

3.1.3 Making clear the common interests of two sides. It is clear that the common interests of both sides are the basis of cooperation between Guangdong and ASEAN. This guarantees the stability and long term of marine cooperation between two sides. On the whole, nine of the 10 ASEAN countries are littoral countries, and ASEAN belongs to a developing area, and the development of the marine economy has great potential. There are many common interests in the cooperation between Guangdong and ASEAN, and the cooperation between the two sides can achieve the objective of mutual benefit and win-win.

3.1.4 Determining key projects of cooperation between two sides. Ten ASEAN countries have different economic development basis, and every country has different level of marine development. Considering the benefits and efficiency, it is impossible to realize overall marine cooperation between Guangdong Province and ASEAN in the current situation. However, on the basis of related fields of cooperation, it is feasible to accelerate the cooperation of key projects. Now, the marine cooperation between Guangdong and ASEAN should focus on marine economic cooperation, marine environmental protection cooperation, and marine fishery cooperation.

3.1.5 Predicting the potential risks of cooperation between the two sides and formulating emergency preplan. The risks to be considered by both sides come from three aspects: one is geopolitical risk. The South China Sea issue and political turmoil in some ASEAN countries are the primary factors. Next is the cooperation level of both sides. Final is the cooperation items. In the process of cooperation, there may be the situation that one party is active while the other party is inactive. This is not favorable for the promotion of bilateral marine cooperation. In view of the above possible risks, it is required to formulate pertinent emergency preplan, to prevent occurrence of potential risks.

3.1.6 Promoting implementation of cooperation projects. After completion of the above items, it is required to promote the implementation of the project. Preliminary work should be prepared carefully. Besides, it is required to monitor the process of the project. After completion of the project, evaluation should be made, to ensure the smooth progress of cooperation between the two sides.

3.1.7 Monitoring and evaluating the progress and results of cooperation project. In the process of the project, it is required to monitor the process and benefits of the project, including: whether the project funds are put in place, the use of funds, and whether the desired results are achieved. After completion of the project, it is required to evaluate the project results, to find problems in the project, accumulated experience, and future development prospect, to provide precious experience for the next cooperation.

3.2 Cooperation mechanism The mechanism for marine cooperation between Guangdong and ASEAN mainly includes three mechanisms: driving mechanism, benefit mechanism and coordination mechanism[32]. These three mechanisms are indispensable for marine cooperation of two sides. Driving mechanism is the prerequisite and basis of cooperation, the benefit mechanism is the goal of cooperation, and the coordination mechanism is the booster of mutual cooperation. Only through improving these three mechanisms, can we ensure the smooth progress of bilateral cooperation.

3.2.1 Driving mechanism. Marine cooperation between Guangdong and ASEAN is driven by certain external factors. The driving mechanism mainly includes spatial driving force, policy driving force, and market driving force. The spatial driving force comes from the fact that Guangdong Province and ASEAN countries face each other across the sea, both belong to developing areas, and have resource complementation. Policy driving force mainly comes from the 21st Century Maritime Silk Road strategy of China, and also from Guangdong Province actively building a strong marine province. Under the guidance of these policies, more and more enterprises cast their eyes over the foreign countries. For the market driving force, due to the impact of regional economic integration, through establishing regional common market, it is able to accelerate flow of capital and other elements, to ensure optimal allocation of resources and benefit sharing.

3.2.2 Benefit mechanism. The marine cooperation between China and ASEAN is a cooperative system consisted of different entities, and each of the entity joins in the cooperation after considering respective maximal benefits. Different entities have different goals, government should care more about political influence, enterprises care more about the economic benefits of cooperation, industrial associations care about development of a certain industry, and scientific research personnel focus on breakthrough in certain technology. Only through establishing a perfect incentive mechanism, can we arouse enthusiasm of cooperation entities, realize maximum benefits of various resources in the process of cooperation, and ultimately realize most reasonable allocation of gross income.

3.2.3 Coordination mechanism. The government plays a leading role in the marine cooperation between Guangdong and ASEAN. Without government support and related binding cooperation agreement, the cooperation of both sides lack necessary support and conditions. The coordination mechanism of the government mainly includes: formulating encouragement policies, regulating cooperative market order, and establishing the security system. Formulating encouragement policies is to maximally bring into play functions of marine enterprises in marine cooperation, and formulate some preferential policies to encourage marine enterprises to go out. On this basis, the government should play a role of regulator, regulate the partnership between two sides, and achieve healthy and sustainable partnership.

3.3 Cooperation process At present, marine cooperation between Guangdong and ASEAN involves marine economy, marine science and technology, marine management, marine environmental protection and other fields. There are certain differences of the marine cooperation in cooperation subjects, cooperation mechanism, and cooperation mode, but the basic cooperation process is similar. The cooperation basically consists of five modules: formulation of cooperation strategy, establishment of cooperation agreement, determination of cooperation project, selection of cooperation mode, and implementation of cooperation project. The specific cooperation process is shown in Fig. 2.

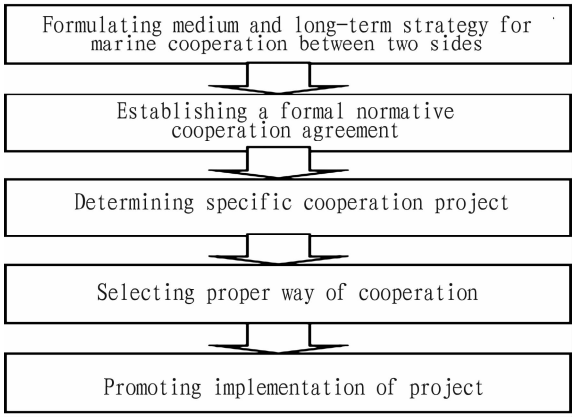

Fig. 2 Process of marine cooperation between Guangdong and ASEAN

4 Recommendations

4.1 Focusing on the top-down design and strengthening system encouragement of mutual cooperation

4.1.1 Formulating cooperation plan and action plan, and drawing up the development blueprint. The marine economic cooperation between Guangdong and ASEAN is a broad, comprehensive and systematic project involving many subjects and elements. Thus, it is necessary to have the overall and long-term view and give consideration to sustainability of cooperation. The key point for these lies in the system design for mutual cooperation. Before taking cooperative actions, both sides certainly have action guideline. In other words, both sides need formulating long-term cooperation plan and practical and feasible action plan, to make clear the road map of mutual cooperation. Generally speaking, action plan is the specific implementation plan stressing the enforceability. The marine economic cooperation between Guangdong and ASEAN conforms to benefit demands. Especially in the new situation, both sides insert the action plan into the Belt and Road Initi-

ative, and give prominence to the vitality of marine development. Both sides should improve the overall plan and local plan for marine economic cooperation. On this basis, both sides make detailed action implementation plan, and make clear the expected implementation effect, to ensure implementation of action plans through mutual communication.

4.1.2 Building a high level interactive platform and strengthening the relevant policy communication. The marine economic cooperation between Guangdong and ASEAN should implement the cooperation with specific countries in ASEAN. Since it involves many subjects, multiple benefit structure will be inserted, which may bring about difficulty in level of benefit coordination, and finally bring about benefit conflict and affect the cooperation effect. The process of cooperation between Guangdong and ASEAN is also the process of accumulating trust and building a close partnership. For such large-scale cooperation, the communication of high level leaders of both sides is very important. Excellent interaction of both sides no doubt plays a role of stabilizer in cultivation of mutual trusting relationship. Naturally, the formation of effective communication between the two sides needs a good communication platform as a support. It is necessary to encourage mutual communication and build more formal bilateral communication mechanism, and hold more subjects. Based on this, it is feasible to build two communication mechanisms: one is the 21st Century Maritime Silk Road Guangdong-ASEAN Forum based on the Belt and Silk Road Initiative and stressing the communication at policy level, and the other is building Guangdong-ASEAN Ocean Exposition at economic level.

4.2 Implementing specific marine economic cooperation of the two sides and building new pattern of multi-level cooperation

4.2.1 Deepening the marine cooperation between the two sides and jointly building industrial projects and industrial clusters. Both Guangdong and ASEAN are developed relying on the ocean. Three major marine industries have realized development and progress in varying degrees. However, there is great difference in development of marine industries at different levels. Various elements input in the marine industry are different, which ultimately manifested as strengths and weaknesses of respective development. Yet, such differences provide foundation for mutual complement for both sides in the marine industry. The total output value of marine industry of Guangdong Province has exceeded 1000 billion USD. Besides, Guangdong has also advantages in talents, technologies, and funds. At the same time, Guangdong is faced with the pressure of increasing labor cost and land cost. However, ASEAN countries have rich labor resources, and the labor supply cost is very low, and the land rent is also relatively low. Based on the complement of marine industry, both sides can strengthen cooperation, especially in the form of project cooperation, jointly build industrial projects, and cultivate port industry clusters relying on ports.

4.2.2 Deepening the cooperation between the two sides in development of marine resources, to jointly maximize development benefits. Rich marine resources of Guangdong and ASEAN come from vast maritime area of both sides. Guangdong and ASEAN have excellent conditions for cooperation in development of marine resources: geographical location close to each other; both sides have rich marine resources; both sides have experience in development of marine resources and the development meets benefit demands of both sides. Generally, both sides can make efforts in the following fields: (i) seeking cooperation in the development of pelagic fishery resources, both sides can cooperate in purchase and building of the large-size fishing vessels, encouraging pelagic fishing enterprises to make joint development, and formulate appropriate allocation system. (ii) Seek cooperation in development of island resources. Actually, Guangdong lags behind the ASEAN in commercial development of island resources. Although Guangdong is rich in island resources, the development is weak and commercial value is not brought into full play. In this point, Guangdong should seek cooperation with ASEAN and learn from strengths of ASEAN to vitalize the stock.

4.2.3 Deepening the cooperation between Guangdong and ASEAN in marine science and technology, to jointly promote economic development. The innovation and progress of marine science and technology are of great significance for the transformation and upgrading of marine industry in Guangdong and ASEAN and the sustainable growth of marine economy. For how to undertake cooperation between Guangdong and ASEAN, it is firstly necessary to consider various factors influencing the development of marine science and technology, mainly manifested in policy environment, capital, talent and application prospects. On this basis, following efforts should be made. (i) Providing excellent policy environment for cooperation of both sides in marine science and technology, especially, providing policy support for the cooperation of enterprises of both sides. (ii) Setting up special fund for marine science and development and jointly establishing incubator and research and development base. (iii) Jointly cultivating marine science and technology research talents, attaching great importance to the function of both sides in cooperation of higher education, and encouraging research colleges and universities to undertake cooperation. (iv) Government of both sides should provide support for application prospects of marine science and technology achievements, and hold sci-tech achievement exhibition, to absorb attention and interests of market entities.

4.2.4 Deepening the cooperation between the two sides in the marine tourism, to jointly build regional cultural brand. For marine tourism cooperation, Guangdong and ASEAN have various favorable conditions. Obviously, Guangdong and ASEAN have a big cooperation space in marine tourism. On the whole, Guangdong and ASEAN can undertake cooperation in the following fields: (i) cooperation in the development of marine tourism resources, particularly in coastal tourism resources and island tourism resources; (ii) cooperation in market sharing and expanding third party market (Guangdong and ASEAN should provide convenience in market sharing, both sides should provide convenience for tourists and reduce obstacles, and both sides should cooperate in third party

expansion); (iii) cooperation in tourism product building, especially, it is recommended to jointly develop marine culture brands with regional characteristics relying on the maritime silk road culture, build the maritime silk road tourism culture route, and carry out liner tour.

4.3 Improving the cooperation in marine economy and raising the mutual communication level

4.3.1 Improving the cooperation in facilities connectivity and reducing maritime transportation cost of both sides. The road quality and accessibility of a place is quite important for the contribution to its economic development and welfare improvement. The marine economic cooperation between Guangdong and ASEAN to a great extent relies on two-way flow of various elements brought by maritime transportation. Thus, the cooperation in construction and improvement of marine infrastructure is of great significance for reducing the maritime transportation costs. As for how to undertake cooperation, it is recommended to consider following points: (i) interconnection and intercommunication of ports, and building Guangdong-ASEAN port network, to realize data sharing of ports of both sides. (ii) Cooperation in maritime transport service facilities. Under the premises of limited land traffic, both sides can cooperate in building seaborne supply station and provide assistance for lighthouse and failure maintenance. (iii) Cooperation in the construction of maritime means of transport. Both sides can build large oceanic vessels in the form of joint venture and cooperate in building maritime aircraft for transport of cargo or passengers.

4.3.2 Improving the smooth trade cooperation and reducing the cost of bilateral trade cooperation. The economic and trade cooperation between Guangdong and ASEAN is close, and the trade volume of both sides in 2013 exceeded 100 billion US dollars in 2013, showing better trade trend. At the same time, both sides also are faced with slow global economic recovery and increasing risks, as well as actual interference brought about by speed reduction of economic development. Both sides should take active trade policy and carry out more cooperation projects in smooth bilateral trade, to continuously reduce cooperation costs and realize win-win objective. For this, both sides may make efforts in following aspects. (i) Sticking to the non-discrimination principle and applying carefully the trade protection tools. Both sides should stick to the principle of equal trade and do not discriminate against action of either side, carefully use anti-dumping investigation tool, and properly treat the trade disputes, to avoid occurrence of trade war. (ii) Providing more convenience in customs clearance to raise the efficiency of customs clearance. For customs clearance of goods, both sides should take technical means, and provide special identification and special customs clearance inspection passage for both sides, to realize seamless connection of customs clearance of goods of both sides. (iii) Innovating upon the trade cooperation and payment methods and encouraging cross-border e-commerce cooperation. In the new situation, the trend of developing "Internet + trade" is inevitable, and traditional trade cooperation and payment settlement are faced with reform, and the cross-border e-commerce and electronic money settlement are emerging quietly.

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4 Conclusions

In conclusion, the utilization of sustainable energy should be highly encouraged in rural areas since it has presented enormous advantages, including ameliorating adverse impacts on environment, boosting economic development and improving farmers' living standards and so on. Sustainable energy dissemination is obstructed by financial, political and technical barriers. Therefore, in order to minimize the obstacles and support the development of sustainable energy in rural areas, it is required to provide guide of rural household energy sustainability improvement in northern China from aspects of energy efficient improvement, renewable energy use and improving equitable distribution, affordability and accessibility of sustainable energy. Specifically, local governments can do with investing in researching and distributing highly developed energy-saving facilities. Also, research and development funding for sustainable energy technologies needs to be applied by authorities, especially granting for low-income households, expert advice and training. Indeed, improving public awareness, acceptability and participation is also indispensable for popularizing sustainable energy. Accordingly, the most critical factor is raising farmers' awareness of using this form of energy. Overall, if the measures above can be performed effectively, the sustainable energy may contribute to sustainable development of rural areas and balancing socio-economic development between rural and urban areas in China. It then directs the whole society towards the environmental, economic social benefits.

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