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Current Status and Possible Future Directions of China-Japan Technical Cooperation

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Abstract: As the global economy continues to develop, the cooperation in the field of various technology between China and Japan has kept deepening. However, there are still some problems that must be tackled and there is still large space for cooperation. Therefore, this text aims to analyze the current situation as well as the existing problems of the collaborations between the two countries and their trend of development in the future are also prospected, via analysing the status quo of China-Japan technical cooperation in the field of environment, science and some new areas. The article lock the scope in the field of environment, science and some emerging fields. Finally, the passage will give some suggestions on the existing problems and discuss the possible direction of how future technology develops, in order to boost the technical collaboration between China and Japan and then deepen the relationship between them.

Keywords: China-Japan relations, environmental field, science and technology field, technological development

1. Introduction

1.1. Research Background

Since the normalization of diplomatic relations between China and Japan in the 1970s, exchanges between China and Japan have become more and more intensive and frequent in various aspects. In the 1980s, after China's reform and opening up, its economic and social development gradually embarked on a fast track, China and Japan also started more and more in-depth cooperation in economic and trade, technology, and diplomacy after this period. Among them, China-Japan cooperation in technology is an important part of the many cooperation. Since the 1980s, Japan's ODA assistance to China, technical cooperation, and assistance helped China to train a lot of technical talents and specialists in the early stage of reform and opening up. The technical cooperation between China and Japan covers many fields, such as the environment, industry, agriculture, etc. The exchanges and cooperation from the technical level of both countries have brought significant income to the economies of both countries while promoting the development and progress of scientific

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research, and they also have a certain reflection and reference value for the direction of China-Japan relations.

1.2. Literature Review

Studies in the field of technical cooperation between China and Japan have now been relatively comprehensive in the academic community, encompassing and covering various aspects. By analyzing the existing literature, this paper summarizes the characteristics of the two countries in the current state of technological cooperation. In a related study by Deng Meiwei, a general summary of China-Japan cooperation in the field of science and technology is made, namely, the cooperation between China and Japan in the field of science and technology has a long history, covering several specific areas, and has been widely cooperated from the official to the private sector [1]. The cooperation between China and Japan has been characterized by a comprehensive cooperation mechanism, great potential for cooperation, and mutual benefit. In a study by Deng Meiwei and Zhang Jifeng, it was suggested that after years of development, bilateral cooperation between China and Japan has formed a perfect mechanism, but with the intensification of the international situation and the game of great powers, the cooperation between China and Japan in the traditional technology field may be affected to a certain extent [2]. In recent years, with the continuous development of China's economy and science and technology, China has, to a certain extent, overtaken Japan and even become a "leader" in certain technologies. Therefore, future cooperation between China and Japan will focus more on emerging technologies. As a result, the future cooperation between China and Japan in the field of emerging technologies may have more space than traditional technology cooperation.

According to Gao Ying, a study on China-Japan cooperation in the environmental field found that both countries are facing environmental problems such as acid rain, sandstorm, dust storms, and marine pollution, which is one of the major opportunities for cooperation between the two sides, and the cooperation has achieved certain results [3]. Cheng, Na, in her study on China-Japan cooperation in environment and energy, pointed out that China and Japan share common interests and determination to govern in the field of environment, which is also the premise of their cooperation in the field of environment and energy [4]. Thus, it can be seen that the cooperation between China and Japan in the environmental field has been carried out from many angles and has achieved certain results, and both sides have certain cooperation bases and interest premises. As the global environment has been facing new challenges in recent years, the cooperation between China and Japan in the environmental field will be deepened in the future.

1.3. Research Significance

Although there have been many comprehensive studies on China-Japan technological cooperation, there are still few studies that summarize the current situation of China-Japan technological cooperation, and there are relatively few studies on the future technological cooperation between China and Japan, especially on the possible development direction of emerging technological cooperation. Therefore, this paper hopes to summarize the current situation of technological cooperation between China and Japan by studying the relevant literature, data, and to make an analysis and prediction on the possible development direction of technological cooperation between the two countries based on the summary, which can also serve as a reference for subsequent studies and analysis of the relationship between the two countries.

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2. China-Japan Cooperation in Related Fields

2.1. China-Japan Cooperation in the Environmental Field

2.1.1. Origin of China-Japan Cooperation in Environmental Field

China and Japan, as neighbors in East Asia, have close ties on regional environmental issues, especially at a time when global warming, oil pollution, nuclear waste water leakage and other environmental problems are becoming increasingly serious, the need for technological cooperation between the two countries is necessary. Since the normalization of diplomatic relations between China and Japan in 1972, the two countries have been cooperating extensively and intensively in various fields such as politics and economy. Among them, the cooperation and communication between the two countries on the important issue of environmental protection, especially low-carbon and new energy-related technologies, are regarded as one of successful examples.

The low carbon technology exchange between China and Japan can be traced back to 1992 when China joined Japan's "Green Assistance Program". During the program, China introduced a series of advanced technologies and related environmental protection experience from Japan, including clean coal technology. According to statistics, China sent more than 1,600 technicians to Japan for training and education. Since 1996, Japan's ODA assistance to China has been shifting to environmental protection, and the fourth loan from 1996 to 2000 involved environmental protection projects in 19 Chinese provinces and regions, including more than 20 projects with a total investment of 360 billion yen.

However, as Liang Xiaoling pointed out, due to a series of reasons such as the ambiguous attitude of the Japanese side on the transfer of core technologies and the weak awareness of cooperation among local governments and enterprises on the Chinese side, the exchanges between China and Japan during this period were only limited to the transfer of low-carbon technology and equipment, and technical cooperation in many fields did not start [5].

In 2007, in order to further strengthen technology exchanges between the two countries and promote cooperation in the field of environment and energy, China and Japan issued the Joint Communique on Promoting Cooperation in the Field of Environment and Energy [6]. The communique emphasized the important role of technology in addressing climate change, energy conservation, emission reduction and environmental protection, and expressed the hope that the two countries would further deepen their exchanges and cooperation, covering various industries such as steel, cement and thermal power generation [7]. Based on the guidelines of the communique, in May 2008, China and Japan announced an in-depth cooperation on carbon capture and storage and enhanced oil recovery technologies [8]. The first investment in two coal-fired power plants in two Chinese oil fields in Daqing was tested and the technology was upgraded to achieve a 2 to 1 ratio of CO2 to oil recovery, greatly improving energy use efficiency and saving losses. This success is a new milestone in the environmental technology cooperation between China and Japan [9].

2.1.2. Current Situation of China-Japan Cooperation in the Environmental Field

With the deepening development of environmental technology exchanges between China and Japan, the focus of cooperation between the two countries has also expanded to a number of emerging areas such as circular economy, new energy vehicles and clean energy. Since 2006, China-Japan Energy Conservation and Environmental Protection Comprehensive Forum has been successfully held for 15 sessions, with a total of 413 cooperation projects signed. 26 cooperation projects were signed at the 9th Forum in 2015 in the fields of energy conservation, environmental protection, circular economy, new energy, green city and green manufacturing, etc. The 12th Forum in 2018 covered 24 cooperation projects in the fields of energy conservation and new energy development, pollution prevention and

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control, circular economy, climate change, smart city and third-party market. The 12th Forum in 2018 covered 24 cooperation projects in the fields of energy saving and new energy development, pollution prevention and control, circular economy, climate change response, smart city, third-party market, etc. At the 15th China-Japan Energy Conservation and Environmental Protection Comprehensive Forum, which ended in December 2021, China and Japan discussed and reached consensus on four topics: energy efficiency improvement, electrification and intelligence of automobiles, hydrogen energy and clean power, and long-term trade between China and Japan, and signed 11 cooperation projects. At a time when the new crown epidemic is severe, this fully demonstrates the firm willingness of China and Japan to cooperate and the consensus to deal with climate change.

It is easy to learn from history that China-Japan technological cooperation in the field of environmental protection has gone through a process from unilateral technology export to bilateral cooperation that complements each other. Especially in recent years, China has emerged as a leading partner in a series of high technology projects, such as new energy vehicles and nuclear energy, which reflects China's growing comprehensive national power and technological advancement. It is foreseeable that as China's scientific and technological strength further increases, China will surpass Japan in environmental technologies and the Chinese side will take the initiative in technological cooperation between China and Japan. At the same time, as global warming and Fukushima nuclear radiation worsen, the technical cooperation between China and Japan will further develop into a broader and deeper field. At that time, the focus of cooperation between the two sides will not only be limited to traditional environmental management and clean energy, but also higher technology fields and broader social aspects.

2.2. China-Japan Cooperation in the Field of Science and Technology

2.2.1. General Overview of China-Japan Cooperation in Science and Technology

In addition to China-Japan technological cooperation in the environmental field, there is also extensive and in-depth cooperation between China and Japan in science and technology-related fields. The earliest technological cooperation between the two countries dates back to the 1960s when China entered into a technological cooperation agreement with Japan to import vinylon equipment. After the normalization of diplomatic relations between China and Japan, science and technology cooperation at the governmental level gradually began. With the implementation of China's reform and opening-up policy, China and Japan started extensive and in-depth cooperation in agriculture, industry, steam and electricity technology, etc. After the 1990s, the domestic economy and infrastructure development developed rapidly, and more than half of the major Japanese technology companies established their overseas R&D centers mainly in mainland China, and the number and percentage of foreign science and technology professionals working and studying in Japan are the first from China. In addition, agricultural experts dispatched from Japan to cooperate with China in agricultural technology have helped the Chinese government and private sector to reap lucrative profits and rewards. Since the 21st century, with China's strong economic rise, it has also equaled or even partially surpassed Japan in science and technology development to some extent. As a result, China-Japan cooperation in science and technology remains mainly at the level of traditional technologies rather than emerging technology industries. The cooperation projects between China and Japan in recent years are still mainly focused on energy, environment, and biology, while cooperation in cutting-edge technologies such as artificial intelligence, quantum science, and big data is still relatively scarce.

After decades of science and technology cooperation between China and Japan, the characteristics that have been formed are also very distinct: it is the mechanism of science and technology cooperation between the two countries has been improved over the years, and more levels and

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diversified cooperation mechanisms have been set up as well as joined [2]. China and Japan have developed strong complementarities at the science and technology level, as China's vast population and market can complement and combine with Japan's advanced technologies and ideas. China needs to learn from Japan's mature technologies in chemicals, pharmaceuticals, and semiconductors, while Japan's talent gap in related fields can be alleviated by importing talents from China and foreign students due to the phenomenon of "the aging population". Finally, the cooperation between the two countries in science and technology has led to the development and benefits of the two countries at different levels. The technological cooperation between China and Japan over the years has helped China to make technological progress and improve its technological level, while Japan has also gained huge profits through the Chinese market, the scientific and technological cooperation between the two sides has also contributed to the upgrading of the industrial structure, with China being able to move to a higher level of industrialization and Japan gaining capital through profits to invest in upgrading its industries.

2.2.2. China-Japan Cooperation in Agricultural Technology

China-Japan cooperation in agricultural technology focuses mainly on agricultural facilities as well as agricultural products. Since the 1990s, China and Japan have cooperated extensively in irrigation and drainage technology. Advanced Japanese experience and technologies were introduced at that time, mainly the modern management concept of irrigation areas and the modification and upgrading of hardware according to the automated management model, which allowed China to have a leading level of the irrigation monitoring system at that time around the world. In addition, the China-Japan cooperation in irrigation and drainage technology also provided the Chinese side with the basis for training materials and literature on water engineering technology, and many industry experts and talents were adequately trained. It is worth mentioning that the cooperation on irrigation and drainage technology at that time also innovatively carried out a "comprehensive water conservation demonstration project", introducing advanced pipeline technology from the Japanese side, while also taking into account the protection of the rural environment and designing a reasonable layout of the project site [10]. This concept coincides with the ecological and environmental protection concept of "green water and green mountains are golden mountains" proposed by General Secretary Xi Jinping in recent years [11]. This innovative initiative was even more visionary in the context of the rapid economic development at the time. The results of these China-Japan technological collaborations were later applied to a wide range of rural water conservation projects in China.

The history of technological cooperation between China and Japan on agricultural products is even longer. As early as the 1980s, China introduced Japanese agricultural production technologies to improve its agricultural productivity. Since the 1990s, China and Japan have started a series of technical cooperation on crop yield and crop variety, processing, and related climatic and environmental conditions and market analysis. China began to introduce mature Japanese rice varieties for trial planting and expanded the scale of cultivation within a few years; Japan also introduced Indica rice varieties from some southern regions of China to enrich its rice varieties, thus realizing the exchange, reciprocity, and mutual sharing of resources between the two countries regarding agricultural products. The two countries have also cooperated and exchanged rice cultivation techniques, and China has been able to promote and apply advanced rice technology from Japan. Chinese and Japanese agronomists have also worked together to select and breed high-quality varieties in northern China and promote them on a large scale. This technology exchange has led to an increase in the average yield of rice cultivation in China, which has generated significant economic and social benefits for this country.

The cooperation between China and Japan on green onion technology has also achieved great results. As the aging population of Japanese society accelerates, the aging of the Japanese agricultural

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population is becoming more and more serious, so the self-sufficiency rate of agricultural products in Japan is decreasing year by year, and the supply of agricultural products is also insufficient. In this context, China and Japan started cooperation on green onion cultivation, with the Japanese side providing the seeds, fertilizers, and production technology needed for onion cultivation, and the Japanese experts guiding the whole cultivation process, while China provides the site, labor, and order management of the products. Thus, Japanese agricultural technology and Chinese land resources are well combined, making a win-win situation for both sides [12]. Under this model of cooperation, the Japanese side obtains urgently needed domestic agricultural products, thus alleviating the shortage of agricultural products. The Chinese side introduced Japanese green onion varieties through technical cooperation and explored a set of high-quality, high-yielding cultivation techniques. This has not only brought considerable economic benefits to China, but also promoted the advancement of agricultural cultivation technology, further enriched the variety of products, improved the quality and self-sufficiency of agricultural products, and fundamentally enabled China's agricultural technology to be in line with the world's advanced agricultural technology.

To sum up, the scientific and technological cooperation between China and Japan in agriculture has been widely focused on agricultural products and agricultural technology. At the early stage of China's reform and opening-up development, the introduction of advanced technology and ideas from Japan enabled the rapid development and progress of related industries and industry workers in China, as well as learning and mastering the advanced technology in the world at that time. This also facilitated the development of China's modernization on the other hand and also brought greater economic benefits to China. The Japanese side, through technical cooperation with China, expanded its agricultural products, increased the variety of agricultural products, and also received economic profits from China’s huge market, using Chinese labor and land to alleviate various problems caused by the aging population in their own country.

2.2.3. China-Japan Cooperation in Industrial Technology

The industrial cooperation between China and Japan is mainly focused on traditional industrial fields, such as the chemical industry and automobile industry. The China-Japan technical cooperation on high sulfur coal desulfurization in the 1990s was representative of cooperation between China and Japan in the field of chemical industry technology. The high sulfur coal desulfurization technology was a key research project for environmental protection in China's industrial sector, and it was also an important cooperation program between Japan and developing countries at that time. The cooperation between the China and Japan project consisted of the Chinese side providing the site and other auxiliary facilities, and the Japanese side providing the installation contract for the civil works [13]. The project achieved great progress and certain results with continuous improvement and joint efforts of personnel from both sides, contributing to the industrial development of China at that time as well as to the environmental protection field.

The technical cooperation between China and Japan in the automobile industry is even deeper and more extensive. In the late 1970s, China’s First Auto works (FAW) cooperated with Japanese technicians to improve the production line of "Jiefang" trucks, and the Japanese side provided technical guidance and production equipment [14]. After the 1980s, the cooperation between the two sides was mainly based on the introduction of truck technology from the Chinese side. At this stage, the Chinese side acquired the relevant advanced technology of Japanese trucks at that time, and some Japanese vehicle companies also seized the opportunity to enter the Chinese market. After the 1990s, the cooperation between the two sides became more in-depth and frequent, and some large Japanese car companies entered the Chinese market, and the cooperation between the two sides began to gradually move from truck technology to bus technology. In the 21st century, after China acceded to

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the WTO, China and Japan then launched a comprehensive car technology cooperation, and more China-Japan joint ventures and joint projects have been created.

Throughout the cooperation between China and Japan in the field of industrial technology, in the chemical industry, the cooperation between China and Japan promoted China's chemical technology which was developing at that time, and at the same time allowed China to develop its economy and industry at a high speed while taking into account the protection of the environment. In the automobile industry, from the beginning of the 1970s to the present, China and Japan have had extensive experience in cooperation and a mature joint venture automobile market. The technical cooperation between China and Japan in the automotive industry has also been upgraded and the areas of technical cooperation have become more and more extensive. The cooperation between the two countries in industrial technology has not only brought a lot of benefits to both Chinese and Japanese enterprises and countries, but also promoted the positive development of the relationship between China and Japan on an objective level, and laid a solid foundation for mutual benefit and the win-win situation between China and Japan.

3. Current Status of Development of Emerging Technology Fields in China and Japan

3.1. The Present Situation of China's Emerging Areas

3.1.1. The Developing Process of China's Emerging Areas

The development of China's emerging policies has experienced four stages, including germination, initiation, development, and growth [15]. In the 1990s, relevant department of the state have formulated relevant emerging policies, made it clear that by following the requirements of the socialist market economy, the development and industrial construction of new and renewable energy should be accelerated, and started to support and promote the investment and operation of renewable energy. At the beginning of 21 century, The Department of Resource Conservation and Comprehensive Utilization of State Economic and Trade Commission of China (SETC) has issued relevant development plans, systematically analyzed the development expectations and limited factors in the field of new energy and divided the development of new energy into three stages. Stepping into the development stage, new energy is applied to a wider range of fields, the government issued more scientific and detailed policies, what's more, it also has a rational use of resources advantages and disadvantages as well as adjusting the energy structure. Nowadays, China's commitment to vigorously promote the development and use of new energy has basically matured but has not formed a complete legal system of energy.

3.1.2. Problems and Suggestions in China's Energy Industry

In the field of new energy, China has applied new energy technology to many industries, including photovoltaic power generation, biomass power generation, shale gas industry, etc., but there are still many problems worth paying attention to in the development of new energy in China. First, China's new energy development system is not perfect, therefore, there is a lack of long-term and operable energy strategy, and the number and quality of relevant industrial organizations also need to be improved. In addition, the development of China's new energy field is also faced with the dilemma of insufficient innovation ability. Some of the existing technologies are poor, and the ability to research and discover newly available energy is poor, which has become a huge obstacle to the development of China's new energy [15].

To tackle the problems mentioned above, here are some possible solutions. Firstly, the future development of China's new energy area needs to pay more attention to the revision and improvement of the relevant legal system. The reason is that China is a country under the rule of law, and the

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development of any field cannot be without the guidance of legal literature. Therefore, having perfect and strict legal literature can undoubtedly promote the development of new energy technology in China. Besides, it is necessary that the government must help to establish and organize high-quality talents to form a professional team. Relevant enterprises and research institutions should actively cooperate with universities to develop new scientific research achievements, making full use of the professional knowledge of university students and the improvement of equipment of relevant scientific research institutions so that they can make active contributions to the development of the field of new energy. What is more, the government is supposed to adjust the balance between supply and demand, meanwhile, publicize the concept of sustainable development and promote its implementation. While exploring more possibilities in the field of new energy, the researchers should also pay attention to the protection of the environment and the timely changing market demand. Finally, professionals in this field ought to stick to their strengths and take good use of the nation's energy advantages, such as the use of solar power generation.

3.2. The Present Situation of Japan's Artificial Intelligence Areas

3.2.1. The Developing Process of Japan's Artificial Intelligence Areas

In the 1950s and 1960s, Japan started its initial research into artificial intelligence (AI). In the 1980s, Japan expanded its research on AI to more aspects and achieved many achievements. Meanwhile, Japan also implemented a series of projects closely related to AI. Since the 21st century, Japan has not only intensified the basic research on artificial intelligence but also made artificial intelligence technology applied in some fields through its unique technology co-promotion system of ""industry, government, and university". In 2013, the "Japan Re-emergence Strategy" was put forward, indicating that the development of artificial intelligence in Japan has been further improved. In March 2017, the "Artificial Intelligence Technology Strategy" and "Artificial Intelligence Research and Development Objectives and Industrialization Roadmap" were put forward, indicating that Japan has fully launched the overall deployment in the stage of artificial intelligence acceleration and strategic upgrading [16].

3.2.2. Problems and Suggestions in Japan's Artificial Intelligence Areas

The basic conditions for the development of AI in Japan are relatively weak, and there are many limiting factors in the field of AI, such as the number of papers and researchers in related technical fields is relatively small, and the business model innovation lags that of the United States and European countries. These days, many Japanese companies are in an awkward situation where their internal research and development is limited to the improvement of old products rather than the ability to keep pace with The Times and meet the needs of consumers. In addition, Japan still has a long way to go to overcome barriers in the data market and balance privacy protection with data use [17].

To deal with those problems, there are some effective methods. First, the government should pay more attention to research in the field of AI to increase the number of research results and papers in related fields. Besides, relevant institutions should also cooperate with relevant universities to recruit talents to increase the number of talents in related fields and provide reliable professional knowledge guarantee for scientific research. Additionally, those institutions ought to enhance innovation ability, try to keep pace with times and understand the market demand. They also need to improve business innovation models, adjust industrial structure, and learn from countries with advanced technologies and models in the field of artificial intelligence. What is more, organizations must protect users' privacy. Last but not least, both the nation and the professionals are supposed to attach importance to international cooperation in the field of artificial intelligence and jointly promote the development of artificial intelligence technology to promote social progress [18].

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4. Conclusions

4.1. Key Findings

This paper has been inspired by reading the literature on China-Japan technological cooperation by scholars in recent years. In the process of research, this paper finds that the technological cooperation between China and Japan in the fields of environment, science and technology dates back to the last century and has had a profound impact on the social life, industrial and agricultural production of the two countries, and the two countries intend to further deepen cooperation in these traditional fields in the future. At the same time, the two countries also have their own unique advantages in new energy, artificial intelligence and other emerging technology fields, and there is huge space and unlimited potential for cooperation between the two countries. With the deepening of globalization, the destinies of China and Japan will be closely linked, and the technological cooperation between China and Japan will be extended to a broader area. Therefore, the methods and paths for further deepening cooperation and strengthening exchanges between the two countries in the future are undoubtedly major issues worthy of in-depth discussion by policymakers.

However, it is easy to see from practice that there are still certain problems in China-Japan technical cooperation so far. First of all, the information exchange between the two countries is not sufficient, especially the exchange of relevant policy information still has a certain lag. This has a negative impact on the implementation of projects. Secondly, technology exchanges between the two countries are mostly government-led. Although this type of method is stable and reliable, it has insufficient flexibility to cope with the changing environment. Finally, technology exchanges between the two countries are mostly limited to some more mature fields, and there is a lack of awareness of the emerging Internet technology-related fields (e.g., blockchain, bitcoin).

4.2. Suggestion

To sum up, this paper puts forward the following suggestions for future technical cooperation between China and Japan. On the one hand, the communication and dialogue mechanism can be strengthened to solidify the foundation of cooperation. China and Japan are both geographically neighboring countries and culturally share the same roots, and there are long-term common interests between the two countries. However, due to different national conditions, the two countries have different understandings of specific issues. Therefore, establishing a stable and solid communication and dialogue system can help decision makers to dock policies, share information, better grasp the situation of both sides, and deepen exchanges and cooperation. On the other hand, the role of local enterprises in technology exchange is emphasized. It is easy to see from history that most of the past China-Japan technical cooperation was led by the governments of both sides. This kind of technical cooperation certainly has a stable and reliable first-mover advantage, but it is inevitable that it will be unsuitable in practice. Therefore, the government should pay more attention to the important role of enterprises in technical cooperation, give full play to the advantages of flexibility and operability, and encourage more unofficial groups and individuals to participate in the future. Lastly, people should seize new opportunities and seize the wind of the times, as the 20th century has witnessed unprecedented changes in human society, with new technologies and industries flourishing and new things springing up. China and Japan should also break the shackles of the old and cooperate on a broader range of new technologies. Especially at this time when digitization and networking are expanding, it is important to encourage the combination of traditional industries with the Internet and to carry out relevant technical exchanges with a new attitude and perspective to achieve win-win cooperation.

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China and Japan are neighbors in the same boat, and for more than 2000 years, peace and friendship have been the main theme in the hearts of the two peoples, who have learned from each other and promoted their respective development and also made important contributions to the progress of human civilization. In the near future, the Chinese and Japanese governments, enterprises and individuals will cooperate sincerely in a wider range of fields and write a beautiful chapter of the community of human destiny together.

References

[1] *Deng, Meiwei. (2022). New changes and challenges of China-Japan science and technology cooperation in the context of "triple change". Science and Technology Management Research (08), 42-51.*

[2] *Deng, M.W. & Zhang, J.F.. (2022). China-Japan cooperation in science and technology: Evolutionary history, new challenges and paths to break. Modern Japanese Economy (01), 13-26. doi:10.16123/j.cnki.issn.1000-355x.2022.01.002.*

[3] *Gao, Ying. (2008). Research on China-Japan Environmental Cooperation (Master's thesis, Qingdao University). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD2009&filename=2009011944.nh*

[4] *Cheng Na. (2017). China-Japan energy and environmental cooperation in the context of developing green economy. Journal of Seeking Knowledge (01), 68-76.*

[5] *Liang Xiaoling.(2013).The Analysis of the Low-Carbon Cooperation and Its Economic Benefit between China and Japan(Master's degree thesis,Ocean University Of China).https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201401&filename=1013368455.nh*

[6] *Jing YueJun & Du peng.(2011).Discussion on the Current Situation and Prospects of Low Carbon Technology Cooperation between China and Japan. Contemporary Economy of Japan(03),35-40.*

[7] *Liu ChangLi.(2012).Current Situation, Problems and Countermeasures of China-Japan Environmental Cooperation. Japan Studies(03),3-9. doi:10.16496/j.cnki.rbyj.2012.03.008.*

[8] *Beng Yue & Li Xia.(2010).Implications of China-Japan Environmental Cooperation for China's Environment and Development Business. Environment and Sustainable Development(03),1-4. doi:10.19758/j.cnki.issn1673-288x.2010.03.001.*

[9] *Yuji Sakai (2022) Environmental Technology Cooperation between Japan and China Research on Environmental Issues between Japan and China https://www.esri.cao.go.jp/jp/esri/prj/int_prj/2010/prj2010_01_05.pdf*

[10] *Yang Min.(2011).Analysis of China-Japan Environmental Protection Cooperation Mechanism. Science & Technology Association Forum(04),124-125.*

[11] *Yao, X., & Jing, Y.. (2017, June 5). Xi Jinping draws "green water and green mountains are golden mountains": drawing ecological red lines to promote green development. China Communist Party News.*

[12] *Sun Tao. (2010). Research on China-Japan agricultural technology cooperation (Master's thesis, Yanbian University). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD2010&filename=2010132984.nh*

[13] *Zhao, Taiping, and Wang, Shouzeng. (1995). Sino-Japanese Cooperation on Desulfurization Technology for High Sulfur Coal Testing. North China Power Technology (07). doi:10.16308/j.cnki.issn1003-9171.1995.07.014.*

[14] *Wang, Jun & Lee, S.-J. (2009). (2009). A study of technical cooperation in China-Japan automobile joint ventures. Modern Property (Midterm) (11), 46-48.*

[15] *Zhang,H.L,(2014). Research on New Energy Development in China(Doctoral Dissertation, Jilin University).https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2015&filename=1015504180.nh*

[16] *Zhen,Z.J.et al.(2018). Research on Artificial Intelligence Development in Japan.Global Science, Technology and Economy Outlook(03),60-68.*

[17] *Deng,M.W.(2022). The Strategic Evolution and Development Vision of Artificial Intelligence in Japan and Its Enlightenment. Studies on Japan(02),11-21. doi:10.14156/j.cnki.rbwtyj.2022.02.002.*

[18] *Kikkawa, Takeo & Yang,X.T. (2014). Die Möglichkeit einer chinesisch-japanischen Zusammenarbeit im Energiebereich. Journal of Northeast Asian Studies (03), 23-27. doi:10.19498/j.cnki.dbyxk.2014.03.005.*