

Yixuan Dong  
Shijiazhuang Foreign Language School  
Shijiazhuang, Hebei, China  
Japan; Aging of agricultural labor force

## **Japan: Aging of the Agricultural Labor Force and its Solutions**

### **Chapter 1. Introduction**

With the population aging due to the sub-replacement fertility rate and the large-scale transfer of agricultural labour force towards the cities, Japan's agricultural labour force has large structural defects. The problem is twofold, the lack of new young people and the aging of the agricultural workforce. As a result of long-term accumulation, the disease of aging of Japanese agriculture has emerged, threatening the sustainability of Japanese agriculture and even the overall economic development. At the same time, the aging of the agricultural labour force is also causing worldwide concern. Many developed and developing countries are or will soon face the test of aging agricultural labour force. This paper takes Japan as an example to deeply discuss the causes, impact and measures taken by the government to deal with the aging of the agricultural labour force in Japan, and at the same time provide Suggestions for the impact of aging on agriculture in other countries.

### **Chapter 2. Background Information**

#### **2.1 Overview of Japanese agriculture**

Japan is an island country consisting of Hokkaido, Honshu, Shikoku, Kyushu and about 3900 small islands. With a total land area of 37.78 square kilometers and a population of 125.2 million, it is the ninth biggest agricultural producer in the world.<sup>[1]</sup> Japanese agriculture is a typical miniature agricultural structure, which realizes agricultural modernization on the basis of decentralized and small-scale peasant household management.

Though Japan is a global powerhouse across many industries, the agricultural sector has been an exception. Agriculture, farming and fishing form the primary sector of economic industry in Japan, but they account for only 1.2% of its national product.<sup>[2]</sup> The number of agricultural operators is 1.4 million. Among them, the number of organizational entities was 36,000, and the number of legal entities engaged in agricultural production was 233,400. <sup>[3]</sup> The shortage of arable land and the lack of agricultural labour force are the main factors that restrict the development of Japan's agriculture.

#### **2.2 Aging of Japan's agricultural labour force**

Japan has been experiencing the issue of population aging to an unprecedented degree. More than 20 percent of Japan's populations are over 65 years old, which becomes the highest proportion in the world.<sup>[4]</sup> Under this circumstance, Japan's agricultural labour force is also aging prominently.

From 1995 to 2010, the amount of labour force in the field of agriculture has dropped from 4.14 million to 2.39 million. Over the same period, the average age of this group has increased from 59.1 years old to 65.8 years old.<sup>[5]</sup> In 2010, the proportion of the backbone labour force above 60 years old is as high as 72.6%. The labour force above 70 years old is 45.5%, compared with 4.8% of the labour force under 39, what is more serious is that at the peak of retirement of elderly agricultural workers, young farmers are still losing their labour.<sup>[6]</sup> From 2006 to 2010, both in absolute numbers and in relative numbers, the agricultural labour force aged 70 or above has

increased, while the labour force of all other age groups decreased. Specifically, in 2006, the number of backbone agricultural labour force under the age of 49 was 266,000. However, in 2010, it dropped to 210,000. The number of key agricultural workers aged 70 or above increased from 844,000 in 2006 to 870,000 in 2010, representing an increase of 21%.<sup>[7]</sup> The data shows that Japan's agricultural labour force will confront a serious shortage in the future, especially lacking in young labour.

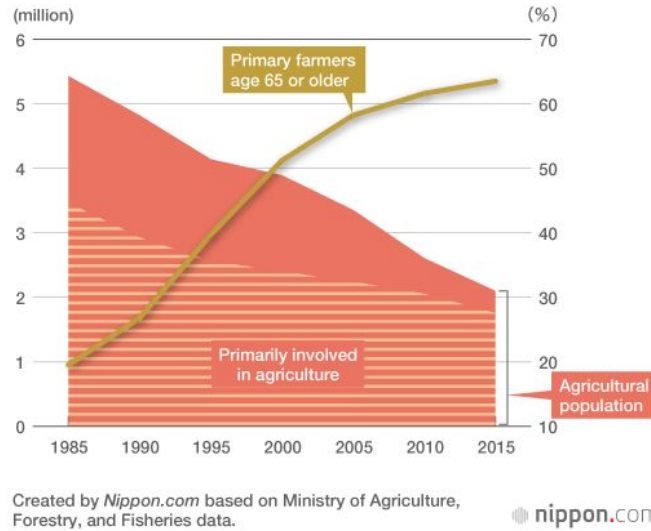


Figure 1 Japan's agricultural population and the proportion of farmers 65 and older.<sup>[8]</sup>

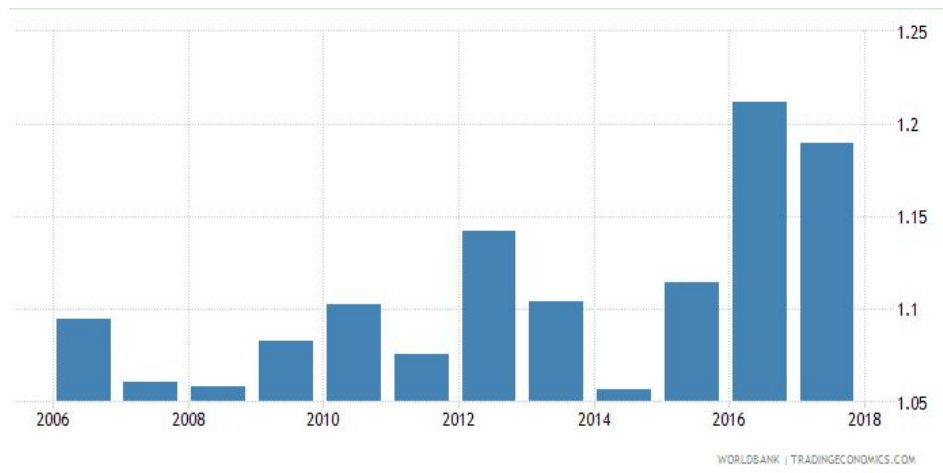


Figure 2: Agriculture value added to Japan's GDP.<sup>[9]</sup>

### Chapter 3. The Impact of Aging Agricultural Labor Force on Japan's Agriculture

#### 3.1 Decline in the Quality of the Labour Force

With the growth of age, the physical quality of the elderly labour force is declining, because they do not have the energy to efficiently complete the agricultural task of heavy physical labour. Older workers are slower to accept new knowledge, science and technology than their younger counterparts, and less able to adapt to emerging industries. New product development and technological innovation of enterprises are also affected. In the context of rapid development of science and technology, accelerated progress of knowledge and increasingly fierce competition, the aging of the labour population is more adverse to the improvement of labour productivity and economic growth.

### **3.2. The Negative Impact on the Insufficient Supply of Agricultural Products**

Aging leads to a single type of agricultural supply. Japan's disconnect between agricultural production and consumption is linked to an aging labour force. Rice was once Japan's staple food, what came with the postwar economic were but postwar economic progress brought a diversification of food composition, increased consumption of meat, eggs, refined flour and the "small variety" nature of agricultural consumption. However, due to the lack of participation of young family labour force, the backbone of agricultural labour force is mainly "two-person farming" of elderly couples and the "one-person farming" of widowed elderly people. <sup>[10]</sup> Influenced by traditional ideas, the elderly are in short of market sensitivity which includes the timely information about price, tendency of the customers' demand. They rely on the plantings of rice production than other crops, grains or vegetables. The land utilization rate was reduced, the production structure was not as fluid, the agricultural management in Japan was lifeless, and the production structure could not adapt to the change in market demand.

### **3.3 The Impact of High Social Security Investment on the Decrease of Investment in**

#### **Agricultural Development**

The Japanese government's fiscal problems have always been serious, so funding is very important. Because of the population aging, the cost of social security relationship fees increases ever year, reaching 31,532,600 million yen in 2018, which took up 33.1% of the total expenditure. The high cost of social security limits the funding available for other investments such as agriculture. In 2018, the government's invested capital on food security was 1,028,200 million yen, just 1.1% of the total expenditure. <sup>[11]</sup> The lack of investment will have a negative impact on the stable food supply, the improvement of rural environment and the sustainable development of agriculture in Japan.

## **Chapter 4. Causes of Agricultural Aging in Japan**

### **4.1 Overall Aging of the Society**

Population reproduction is the basis of labour force reproduction, agricultural labour force is inevitably limited by the total population structure. Japan's demographic situation is "Sub-replacement fertility", that is, life expectancy is longer, the population is older, and the birth rate is low. According to demographic data released in 2011, 23% of Japan's population is over 65. <sup>[12]</sup> In the long run, Japan's working-age population is small, the supply of labour is tight, and the competition between agricultural and non-agricultural sectors for young and middle-aged labour is intensified. It is very difficult to improve the rural population structure. At present, in some undeveloped areas, not only is there the "empty nest" of farmers, but even whole villages lack working-age labour force. There are obstacles in the reproduction of agricultural labour force, and it is not enough to make up for the gap of successors. In order to alleviate the agricultural succession crisis, the government intends to include the young urban labour force into the agricultural reserve labour force. However, there are many practical difficulties in guiding the urban population to start business in the countryside. They have no land and lack experience. At the same time there is a learning curve to overcome. Although agricultural enterprises are their ideal agricultural channels, but there are some institutional barriers of inherit system, so the progress is slow.

## **4.2 The Siphon Effect of the City**

The urban siphon effect in Japan is remarkable. Every year, big cities like Tokyo and Osaka are attracting young labour from rural areas. Japan has experienced negative growth for nine consecutive years, while the population of Tokyo has grown for 22 years continuously, with the number of migrants exceeding 100,000 for nearly four years. In many other places the number of young people has plummeted.<sup>[13]</sup> Some regions have even introduced policies to attract the return of young people in order to retain agricultural labour, but with little effect.

## **4.3. Productivity, Low Income from the Industry**

In recent years, superficially, farmers' income has grown rapidly, but this is mainly due to the growth of non-agricultural income, while agricultural income growth is slow. Due to the improvement of living conditions, farmers' consumption demand has expanded. In order to meet the ever-expanding household expenses, they have to look for employment opportunities in non-agricultural industries. Low agricultural income is inseparable from small scale agricultural management. Japan has less cultivated land and more mountainous areas, and small-scale peasant economy has long dominated agriculture. Although the economic growth after World War II led to the large-scale transfer of agricultural labour force, the decentralized, small-scale agricultural management pattern has not fundamentally changed. Due to the limitation of cultivated area, the agricultural efficiency in Japan has been hovering at a low level for a long time. Low efficiency of agriculture investment slowed the increase of agricultural income which is even lower when accounting for the increase in the cost of agricultural management. Agricultural net income actually is declining in addition to the government's agricultural subsidy policy has not well bridged the income gap between the farm workers and farmers. Favorable policies have tended to be egalitarian. There is a tendency of equalitarianism to enjoy the preferential policies for the full-time farmers and those who take farming as a side task. There is a tendency of equalitarianism to enjoy the preferential policies for the full-time farmers and those who take farming as a side task. Although to a certain extent, it increased the overall income of the farmers, it does little to improve the income of full-time farmers. This discourages the enthusiasm of farmers in the main industry and accelerates the outflow of agricultural talents.

## **4.4 Aversion to Agriculture from the Young Generation**

With the development of economy, the comfort level of life has increased. At the same time, the idea of being afraid of hardships and work spreads among young people. Agriculture is regarded as the representative of dirty, bitter and tiring. Under the influence of urban lifestyle, although rural adolescents live in the countryside, it is not recognized by them to keep the rural lifestyle. In 1977, a questionnaire survey of 4,536 rural middle school students conducted by the Institute of Agriculture in Hokkaido and the counties of Northeast China showed that only 12.8% of the respondents were interested in agriculture and had plans to return to their hometown for farming.<sup>[14]</sup> In the 1960s, Japan focused on building a number of agricultural high schools as a training base for agricultural successors, but most of them have had to close as students dwindled.

# **Chapter 5. The Japanese Government's Response**

## **5.1 Implementing the Land Banking System**

In response to an aging rural population and a shrinking agricultural labour force, the government's new program is once again focusing on a group of farmers known as

"commercial farmers".<sup>[15]</sup> Commercial farmers refer to those who adopt or prepare to adopt efficient and stable agricultural management. In 2011, a special fund was set up to provide subsidies to farmers transferring land from non-farmers to farmers. The government has stipulated the establishment of semi-public land Banks under local governments in the prefectures of Dudaο.<sup>[15]</sup> Land bank is the practice of farmers leasing the land to a bank who will then rent it to farmers.

## **5.2 Raising the Income of Agricultural Labour Force**

First, the government introduced farmer income insurance system and agricultural disaster compensation system. The starting point of the system design is to include all the farmers' income into the scope of protection, including the income loss caused by the fall in the price of agricultural products.

Second, Japan promoted the transfer and settlement of urban residents to rural areas. To this end, the government established a system to encourage urban residents to live in the countryside on a trial basis. The living mode was also advocated the government that urban residents own both urban and rural housing. The government improved the consultation and training mechanism to provide necessary guidance, training and other necessary services for urban residents to integrate into rural communities and carry out agricultural operations. This is an inevitable measure taken by the Japanese government to alleviate the aging of rural labour force and promote the development of rural areas.

Since 1990, with the bursting of Japan's bubble economy, the number of new farmers began to increase year by year, and reached a peak of 81.1 thousand in 2004. After 2004, the total number of new farmers showed a gradual shock and decline trend. However, in terms of age structure, the number of new farmers over 40 years old fluctuates greatly under the influence of economic environment, while the number of young farmers under 39 years old has increased from 63 thousand to 13.4 thousand, with an average annual growth rate of more than 8%.

According to the statistics of Japan's Ministry of Agriculture, Forestry and Fisheries, by 2013, the number of farmers who have truly settled down in rural areas and engaged in stable agricultural operations has reached about 10,000. In 2013, the Japanese new farmers consultation center has carried on the investigation about the state of the new farmers farming, the investigation of time engaged in agriculture for 10 years of the new farmers as the object, the results of the survey show that is running time for the following 2 years, 3 to 4 years and 5 years of farmers, agricultural income is greater than the proportion of basic expenses respectively 13.7%, 31.7% and 50%. With the passage of time, the new farmers operating efficiency is getting better and better.

Although the policies implemented by Japan did not greatly increase the employment of agricultural population, nor did they effectively curb the aging trend of agriculture, they attracted a group of young people to participate in agricultural production and management, bringing hope for the development of Japanese agriculture.<sup>[16]</sup>

## **5.3 Develop Intelligent Agriculture**

### **5.3.1 Vertical Agriculture**

Vertical agriculture refers to the agricultural production mode in which the multi-storey building physically simulates the agricultural environment, produces agricultural and sideline products through the vertical farm's self-circulation system, and provides the residents with fresh food nearby. A solution to the shortage of arable land in Japan is provided by vertical agriculture, which effectively solves the labour shortage caused by aging due to its high automation. At the same time, the interest of science and technology research and development in vertical farms, such as large enterprises, facilitates the entry of young and highly educated labour into agricultural production. Japan's artificial light plant plants has grown rapidly since 2009, with 168 plants in 2014 and an increase of about 200 in 2015 alone. Since 2014, vegetables from some plant factories have been exported to countries such as Singapore, Mongolia and Russia. (Toyoki Kozai)

### **5.3.2 Using Unmanned Aerial Vehicles (UAVs)**

Japanese agriculture is faced with the challenges of aging working population and high agricultural production cost. With the progress of science and technology, Japan began to develop unmanned agriculture. Intelligent equipment such as small unmanned aerial vehicles, unmanned agricultural machines and small agricultural robots are gradually replacing traditional human farming methods.

Small drones can be used for operations such as pesticide spraying. By the end of 2018, the number of small UAVs registered with the Japan Association of Agriculture, Forestry, Fisheries and Aviation had reached about 1,500, and the number of skilled operators was nearly 5,000.

In order to promote the further popularization and safe use of UAVs, Japan's Ministry of Agriculture, Forestry and Fisheries recently formulated a plan for the popularization of small UAVs in agriculture for the first time, including expanding the use of small UAVs in production status analysis, pesticide and fertilizer spraying, bird and animal damage prevention and other fields. The plan says drones will be able to spray pesticides on 1 million hectares by 2022, up from 20,000 currently.<sup>[17]</sup> In addition, Japan has set up a joint meeting of government and private representatives to further popularize small drones.

Although Japan is mountainous, farmland is scattered, but Japan has realized agricultural mechanization well. On the one hand, begin from 1965, Japan began to implement the 40 years of land reclamation planning, restructuring and redraw for land, the original small and scattered land not suitable for mechanized operation, Japan has set a 100 meters long and 30 meters wide of paddy field specifications, at the same time to build and perfect the paddy field irrigation and drainage facilities, construction of farmland path, all these measures to create conditions for agricultural mechanization.

On the other hand, considering the cultivated land area is small and relatively scattered, Japan is the main promotion of small agricultural machinery, agricultural machinery from the sixties and seventies of the last century began to research to the present, the agricultural planting to harvest each link has a corresponding agricultural machinery, these devices farmers in Japan have been equipped in the home, at the same time, the Japanese have specialized enterprise, the small agricultural machinery for cleaning and maintenance. In this way, the use of Japanese agricultural machinery is no longer restricted by all aspects.<sup>[18]</sup>

## **5.4 Support for the Transfer of Labour from Non-agricultural Industries to Agriculture**

Before new agricultural workers engage in agricultural production, agricultural training centers in each prefecture and Daoxian county carry out targeted consulting services based on the actual conditions of these non-agricultural workers to increase their interest in agricultural production. In addition, the agricultural preparatory schools, county agricultural schools and other relevant training institutions help new agricultural personnel to work out the corresponding agricultural research and development. The agricultural commissions, agricultural bureaus and other institutions of each county will provide training and guidance to the new agricultural personnel in agricultural technology, production and management, and issue them with financial subsidies for improving production conditions.

The Japanese government specially established the "New Agricultural Support Financial System" in 2006, which stipulated that new agricultural personnel aged 18-55 could get long-term interest-free and unsecured loans to improve production conditions and personal living expenses. In 2012, the system further stipulated that new farmers under the age of 45 who had been engaged in agricultural production for more than one year would receive a subsidy of 2 million yen per year for the next five years.<sup>[19]</sup> Through the introduction of these new measures, increase the transfer of non-agricultural personnel to the agricultural field, and the new agricultural personnel has become an important labour resource in Japanese agricultural production.

## **Chapter 6. Further Actions to Address Aging of Agricultural Labour force**

### **6.1 Support the Development of Tourism Agriculture**

"Tourism agriculture" is an agricultural form that develops and makes full use of rural space and agricultural products as sight-seeing resources in order to produce new value besides agricultural production. Tourism agriculture, as a new industry, can not only promote the transformation from traditional agriculture to modern agriculture, solve some problems of agricultural development, but also provide a large number of employment opportunities. It can also drive the development of rural education, health, transportation, change the rural landscape. The representative of this kind of sightseeing farm is Xiaoijing Farm. Its natural scenery, pastoral life, cow grazing and handmade crafts attract a large number of tourists, receiving about 790,000 visits every year. Although the sightseeing farm covers only 0.12% of the whole farm, it generates 60% of the income of the whole farm. But they are also facing problems, for example, the high cost of renting land and the weak management. Legislative bodies need to strengthen legislation on agricultural tourism. The government has issued policies to provide land rent relief for tourist farms. Local enterprises and farmers attach great importance to the reception of foreign tourists.

My hometown, Hebei Province is rich in natural and human resources. From the 1980s, farmers in Zhangshiyuan, Yansan Slope and other places began to engage in agricultural tourism.

Up to now, there have been nearly a thousand villages offering rural tourism in Hebei Province, forming different development situations of natural landscape, cultural landscape, modern agricultural sightseeing and leisure agricultural tourism, absorbing nearly 400,000 farmers' employment. The income from agricultural tourism contributes more than 1% to the total income, and in some areas it is as high as 34%. At the same time, new roads and 4G networks have been built in villages, and more villagers are opening restaurants or hotels. Local produce is also coarsely or finely processed into representative delicacies, boosting farmers' income.

## 6.2 Importing International Labour Force

The Nihon Keizai Shimbun pointed out that the Japanese government has not made a clear policy on foreign labour, and Japanese enterprises can only hire foreign labour under the names of "trainees" and "overseas students". This underhand approach not only encourages illegal operations by Japanese companies, but also fails to improve Japan's productivity. Compared with other developed countries, Japan seems to have a lot of room to expand its migrant labour force, the Labour Policy Research Institute report said. In most developed countries, the share of foreign workers in the labour force is much higher such as nearly 20% in America, around 10% in Britain and Germany, yet only 4% in Japan.<sup>[20]</sup>

In the past, Japan's policy of accepting foreigners has been limited to foreigners with advanced professional knowledge out of consideration for security and other aspects. In essence, the pure manual labour field only accepts about 70 vocational interns, which are strictly distinguished from other job qualifications. According to the skills practice system, interns can study for up to five years, but must return to their home countries after the study period. There are grumbles from companies struggling with Labour shortages.

First, the government need to cultivate an exchange network of Japan-friendly foreigners, and at the same time to publicize Japan and spread Japanese culture to the world, which will help to build a network of contacts and promote the introduction of more excellent foreign labour force to Japan .Moreover, improve the foreign labour management agency to give foreign workers more relaxed management policies, help them find jobs in Japan, value the advanced agricultural technology they bring, and promote it in the whole industry.



## Chapter7. Enlightenment

With the development of society, various countries in the world are now facing aging of agricultural labour force, which causes problems such as insufficient food supply and the shrinking of agriculture. As one of them, Japan set an example. For developed countries, they should follow Japan's experiences and lessons, using their advantages of capital and technology to support agriculture. They also need to attach importance to the significance that a well-developed agriculture has to the whole country, and take measures to find the balance between second and third industries. For developing countries, early arrangements should be made to encourage the rational flow of rural population, increase agricultural income, create an environment conducive to women's farming and other agricultural activities, adjust target groups for agricultural subsidies, and give full play to the guiding role of policies. Technology and equipment should be appropriately introduced, financial and intellectual input should be increased, domestic research systems and transnational research should be improved, and attention should be paid to crop improvement and environmental protection in combination with their own economic development status and natural conditions. The government should cooperate with relevant enterprises to test the technology on a small scale first, and promote it on a large scale after achievements have been made.

### References

- [1] 隋鹏飞、吴宏耀、淡妮娜等。“日本农业考察报告”，2001.
- [2] United States Department of Agriculture. *Trip Report- Japan Agriculture, 2012.*
- [3] Ministry of Agriculture, Forestry and Fisheries(MAFF), “The Statistical Yearbook of MAFF The 93<sup>rd</sup>.”eHow, <https://www.maff.go.jp/e/data/stat/index.html>
- [4] Simran W.. How Does Japan's Aging Society Affect Its Economy. *Journal of The Diplomat*,(3),11-13.
- [5] 农业部对外经济合作中心。“日本农业发展的困境及政策调整”，2018
- [6] MAFF. “Survey on Employment in New Agriculture of 2020”[https://www.maff.go.jp/j/tokei/kouhyou/sinki\\_jyoutai/index.html](https://www.maff.go.jp/j/tokei/kouhyou/sinki_jyoutai/index.html) Accessed 17<sup>th</sup> June,2020
- [7] MAFF. “Summary of the result of the 2015 Agroforestry population census”<https://www.maff.go.jp/j/tokei/kouhyou/noucen/index.html> Accessed 14<sup>th</sup> June, 2020
- [8] Nippon. “Japan's agricultural population and the proportion of farmers 65 and older.”[www.nippon.com](http://www.nippon.com) Accessed 13<sup>th</sup> June, 2020
- [9] World Bank. “Agriculture value added to Japan's GDP” [www.Tradingeconomics.com](http://www.Tradingeconomics.com) Accessed 13<sup>th</sup> June,2020
- [10] 李鑫。“对日本农业劳动力老龄化的一种解释”。北京中央民族大学。
- [11] The Government of Japan, “Financial Budget Report of 2019”<https://www.japan.go.jp/directory/> Accessed 12<sup>th</sup> June,2020
- [12] Ministry of Health, “Labour and Welfare, Annual trends in census of 2011”
- [13] Tokyo Metropolitan Government “Tokyo Population Report”<https://www.metro.tokyo.lg.jp/english/> Accessed 17<sup>th</sup> June,2020
- [14] 熊利郎、陆少游。“日本农业人工智能发展与趋势”。2019。
- [15] [日]神田嘉延。《现代农村与社会教育》。高文堂出版社。1976。
- [16] 日本扶植新农民政策及其效果分析，李凤荣，2017。
- [17] 农业部对外经济合作中心。“日本农业发展的困境及政策调整”。2018。
- [18] 神鸟知讯息<https://baijiahao.baidu.com/s?id=1650626975794129790&wfr=spider&for=pc> Accessed 26<sup>th</sup> August,2020
- [19] MAFF, “Number of identified farmers of 2018”<https://www.maff.go.jp/j/tokei/kouhyou/nintei/index.html> Accessed 12<sup>th</sup> June, 2020
- [20] 姚永龙。“浅议日本农业接班人危机”，中国农村经济2012-4

