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## Sustenance of Agriculture in Japan



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### ABSTRACT

Agriculture is the practice of using land (soil) to grow useful plants and rear animals to obtain crops for food. In Japan, many workers have chosen to engage in agriculture thus far; however, agriculture in Japan faces many problems today, causing difficulty in survival. Thus, the current situation involves the consideration of continuing farming or working in other fields. This paper summarizes the current problems in agriculture and presents measures for the improvement and sustenance of agriculture.



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## INTRODUCTION

Agriculture is a practice that utilizes land (soil) to grow useful plants and rear animals to obtain products (such as crops for consumption). Agriculture is traditionally classified as a primary industry such as forestry and fisheries<sup>1)</sup>. Primary industries operate in the natural world to grow and collect crops; they are considered a fundamental field related to food to sustain human life. In addition to primary industries, secondary and tertiary industries also exist. A secondary industry utilizes and processes commodities obtained from the natural world, involving processes such as manufacturing, construction, and mining. Tertiary industries include commerce, finance, transportation, information and communications, and services<sup>1)</sup>.

Currently, agriculture faces issues in Japan, making survival difficult. The impact is shown numerically as the food self-sufficiency rate. As of 2007, one-third of the total working population in Japan was engaged in the primary industry, mainly agriculture. Conversely, the population engaged in the tertiary industry exceeds that of the primary industry globally. Many workers in Japan who previously engaged in agriculture are now uncertain between choosing other fields or continuing to farm. In this paper, we systematically present the issues in agriculture and propose measures to resolve them.

### *Problems in current agriculture*

An overview is shown in Table 1. Many farmers struggle to manage their farms as they are usually unprofitable; hence, more people quit farming and focus on other sources of livelihood<sup>2)</sup>. Despite their parents being farmers, several individuals become civil servants or desk job employees, rejecting the farming career. Experienced farmers do not wish for their children to assume farming because it is unprofitable and physically demanding. With aging of the overall Japanese population, the average age of people involved in agriculture is naturally rising. Advancing age and disease impairs body movement; as a result of inadequate utilization of farmland, many people sell or use it for other purposes. This study explains the difficulties faced by aspiring farmers subsequently; however, people have continued to abandon farming for many years. Thus, the overall number of farmers continues to decline.

Starting agriculture inexperienced involves several challenging hurdles<sup>2)</sup>. Securing and utilizing farmland without consultation is difficult. Water access is an additional challenge; despite the availability of farmland, a large quantity of water is required for crop irrigation. In addition, the introduction of farm tools and agricultural machines is inconvenient, because they are expensive and new farmers may be unacquainted with them unless they have been previously borrowed. Moreover, farming does not generate income immediately. Crop growth and harvests take time; revenue cannot be earned unless a sales route for harvested crops is established. Agriculture requires various expenses. In addition to seeds and seedlings, the costs of pesticides, fertilizers, and the utility costs of greenhouses, depending on the farming method, need to be considered.

Abandoned land is defined as land not planned to be planted in for more than one year or not been planted in for few years, as answered by farmers subjectively<sup>3)</sup>. The Ministry of Agriculture, Forestry and Fisheries' survey on the Occurrence and Resolution of Degraded Farmland use the term 'dilapidated farmland' to refer to agricultural land that has been objectively judged by municipalities and agricultural committees to be ruined and uncultivable in its current state. Although differently defined, both terms refer to degraded land that does not produce much of the same crop. The increase in abandoned farmland and dilapidated farmland is also a serious problem that has been previously recognized without any improvement.

The food self-sufficiency rate is an index that indicates the extent of domestic food consumption covered by domestic ingredients<sup>2)</sup>. The food self-sufficiency rate has a calorie base converted using calorific value, and a production value base converted using production value; however, both values have continued to decline over a long term in Japan (Fig. 1)<sup>4)</sup>. The shortage of food is covered via imports. Imports may be delayed due to increased fuel costs and wars. The procedures and standards of food safety checks vary according to the country, and they may not be conducted on par with the standards of Japan. The decline in food self-sufficiency rate is accompanied with unease due to the possible lack of imports and distrust in the safety of foreign food.

The Trans-Pacific Partnership (TPP) consists of countries surrounding the Pacific Ocean<sup>3)</sup>. The TPP agreement is a framework to liberalize trade via elimination of tariffs between participating countries<sup>2)</sup>. Among several other issues, the abolition of tariffs is a major concern for farmers.

Tariffs protect Japanese farmers from cheap foreign products. The elimination of tariffs provides a price advantage to foreign products with low labor costs while domestic crops will be disadvantaged. The difficulty in management of domestic farmers is expected and more people leaving the farming industry is concerning. The crops of Japan, with the exception of some branded crops, do not heavily focus on exports and their international competitiveness remains low. While some consumers may welcome cheaper foreign-produced food, the adverse effects on agriculture are more likely to be outweighed. The stable supply and quality of imports need to be considered.

***Functions and limitations of Japan Agricultural Cooperatives (JA) and protection of domestic agriculture by the government***

The functions and limitations of JA serve as guides to prevent the decline of agriculture. The response of the government was considered partially responsible for the decline. The outline of JA is explained as follows: JA is a private organization operated by farmers who are members. The roles under JA include<sup>5)</sup>: guidance to aid farmers in resolving various issues including problems related to farming, such as the growth and sale of their crops; sales, where crops produced by farmers are collected and sold to markets; purchase, where JA systematically purchases fertilizers, pesticides, and other items necessary for daily life and sells them to farmers and locals; credit, which operates similar to a bank, allowing farmers and locals withdraw or lend money when required; mutual aid, where an insurance-like system is created in which everyone contributes money to be used in the event of an illness, accident, or disaster; processing for crops; welfare, to protect the health of local people; welfare for older adults, to support the lives of older adults; tourism, etc. Recently, the operation of guidance, sales, and purchase has been found unsatisfactory and may require modification<sup>6)</sup>. Regarding guidance, crops are considered difficult to sell unless it is a crop of a specific size, shape, or type (JA has such guidelines). Educating new farmers about the basics of agriculture is useful; however, they may only be taught methods that are ordinary and convenient for JA. Currently, crops that meet the standards set by the JA are likely to be purchased at a high price, whereas those that do not are cheap or even of no value. Items that are differently colored, excessively large or small, and items with a sugar content varying from the specified values are considered non-standard and cannot be expected to generate much revenue. In the case of purchase, farmers are forced to purchase

products that JA has stocked in advance, such as pesticides; hence, selecting cheaper alternatives and high-quality fertilizers becomes difficult.

The government (Ministry of Agriculture, Forestry and Fisheries) has established a stable supply of food, development of cooperative organizations, protection of general consumer interests, and assurance of food safety in the agricultural field thus far. These approaches are assumed to prevent the decline of agriculture; however, price reductions due to production volume adjustments and tariff elimination, as represented via acreage reduction policies, may also cause agricultural decline. The acreage reduction policy is a mechanism to adjust production to prevent the price of overproduced crops such as rice from collapsing, or to maintain a constant storage quantity. Farmers are instructed to limit crop production and the government provides subsidies to compensate for unused fields, thus maintaining production; however, farmers consequently spend less time farming and are able to make ends meet without having to work as much. This may result in a loss of dignity and pride to the farmers and may also affect the decline of agricultural technology and training of inexperienced farmers.

The reduction or elimination of tariffs by the TPP will result in a significant price gap between foreign and domestically produced crops. Consumers will be more inclined to obtain cheap crops imported from overseas, and domestically produced crops that were in an appropriate distribution volume until now, will be in surplus. Thus, solely relying on agriculture may be a risk to farmers.

### ***Possible solutions***

An overview is shown in Table 2. One solution is to facilitate the growth of crops to improve the current difficult circumstances of farmers; hence, more people will want to start farming, and some people may become farmers. Mechanization and automation are indispensable crops that grow easily. Crops may be grown using minimal labor. Expanding the scale of operations may lower the production costs of crops.

The value of crops can be increased and differentiated from others via production of special varieties of crops (for example, those with good taste or cultivated without pesticides) or value-

added crops. Vegetables may be differentiated from cheap, imported vegetables from overseas, and consumers may be convinced to buy them despite the high price.

Mechanisms can be devised to grow crops as before. Depending on the year and season, there are time periods of excessive crop production; to prevent price collapse, such vegetables have traditionally not been sold and instead thrown away. Many crops have seasons of high-quality and large harvests; however, crops are consumed, shipped, and sold outside of these seasons. Development of crop preservation methods and novel ways to manufacture processed products may prevent the price collapse of crops, generating more income. From an expansive perspective, additional uses of crops other than consumption will result in their sale in other fields, increasing the significance of crop production. Household goods such as lampshades or stationery items such as paper can be made from crops. Crops can also be produced based on the requirements of each consumer. For example, situations wherein restaurants including Japanese-style restaurants create excess food which is thrown away can be avoided via partnering with them to match the types and quantities of food required on their daily menus. Local production for local consumption is generally believed; however, due to consumption in the immediate vicinity of its place of production, transportation costs are reduced, which may enhance the appeal of local specialties and increase consumption. The store may also purchase after confirming the person growing the crops, thus creating a sense of trust with the farmers. In the past, this was difficult to achieve because of JA; however, individual farmers are now accomplishing this on their own, for example, by conducting online sales.

Furthermore, we believe that much can be expected from JA. Government measures and several attempts are being made to increase the number of new farmers. This includes efforts to make farmland accessible. Farming is considered difficult to start all together; hence, we expect JA to provide a guide on navigating these issues. In addition to teaching crop growth, JA may also act as an intermediary to rent out agricultural machinery, as machines can be used jointly. We may also provide guidance on opening new markets. Agriculture may become more attractive when the restrictions tied to JA are reduced. JA provides advice; however, more people will be interested to work in agriculture when coercion is reduced.

## CONCLUSION

We have studied and summarized information in this article from the perspective of consumers. Crops are related to food, which is a necessity, such as clothing and shelter for people to sustain life and stay healthy. We consider food to be particularly important as we require and obtain it on a daily basis. A stable supply of high-quality foodstuffs is necessary, and the continuation of domestic agriculture is essential. Obtaining food via imports is unsatisfactory and self-sufficiency in food is crucial. From a farmer's perspective, earning a respectable income via agriculture is essential; hence, measures to ensure this must be considered. Visualization of current issues through a consumer's perspective will adversely impact the agriculture of Japan. Agricultural support by JA and other agricultural-related organizations may be of major significance.

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**Table 1 Issues for agricultural survival**

Item	Sub-classification	Description
Decrease in agricultural workers	Aging of current workers	Growing crops is usually hard work and requires detailed expertise.
	Insufficient successors	
	High hurdles for new farmers	There are few people who can endure and learn them.
	Increase in abandoned farmland	The government has subsidized the suspension or reduction of farming to adjust the over-harvesting of crops, such as the acreage reduction policy.
Declining food self-sufficiency rate	Domestic production is rare	The proportion of Japanese crops grown in Japan is low.
	Import becomes impossible	Imports are expected to make up for the shortfall and during unforeseen circumstances, a shortage of supplies may occur.
	Doubts on food safety	Concerns about the safety of foreign crops produced using different production methods.
Food loss	Excess domestic food supply	A large quantity food is supplied domestically. Because of the pursuit of convenience, supermarkets maintain a large selection of products. many products in a store may not be bought and may be wasted. Poor families cannot buy much food.
	Food is not distributed according to the quantity needed	
	Expensive rarity	Unusual ingredients are expensive, and few people can or want to buy them.
	Perishable food disposal	Even if perishable food is cheap and excessively distributed, its usage cannot be significantly increased.



TPP	Trade liberalization (elimination and reduction of tariffs)	Imported foods are subject to tariffs; if the tariffs are low, they are cheaper than domestic products.
	Preferential purchase of cheap food	As a consumer, if there is no discernable difference between the products, cheap products will be preferred.

Based on references 2), 3), 4), and 7).

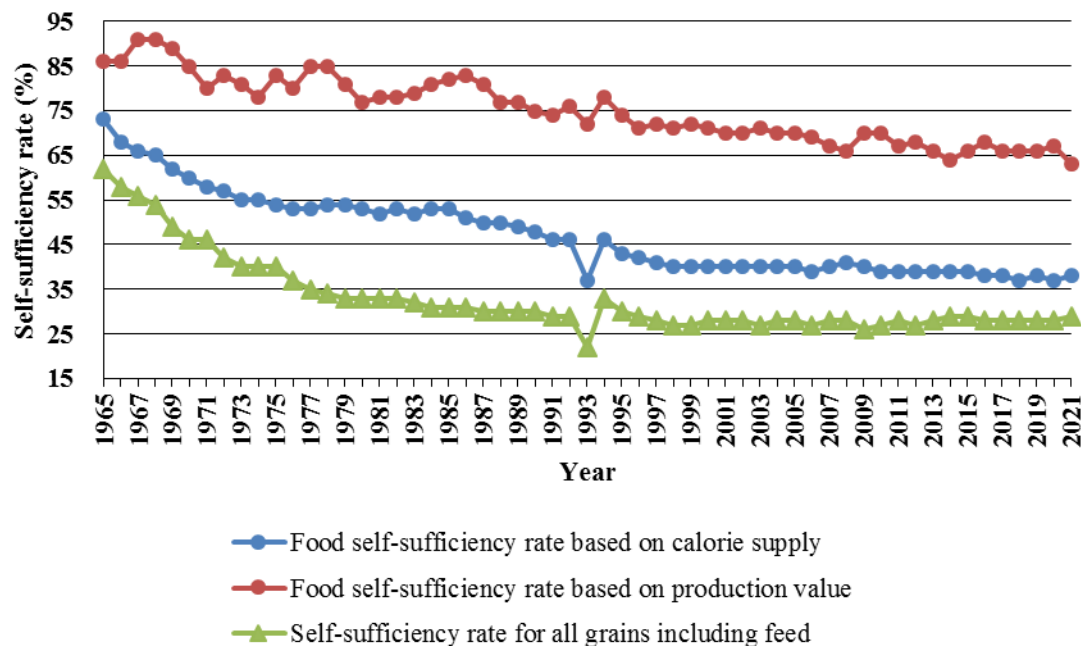


**Table 2 Improvements to sustain agriculture**

Item	Sub-classification	Description
Grow crops easily	Smart agriculture, mechanization of crop growth and maintenance (Internet of Plants, etc.)	Reduce manpower. Facilitate crop growth and help new farmers stabilize their farms.
Larger farmland and management	Consolidation of farmland and enlargement of management bodies Introduction of large machinery and management systems (close to Internet of Plants) Community farming	Significantly increases the quantity of crops produced per worker. This requires a large sum of money; if not by a single farmer, the entire village or multiple farms may work together to farm.
Higher prices of crops	Increase the value of crops (e.g., produce organic vegetables).	To obtain a high income even with a small quantity of crops. This will enable even small and medium-plot farmers to make a living.
Do not throw away excess crops	Manufacture of processed products (preventing surplus from being wasted; selling at any time and increasing shelf life, such as canned and dried products)	To prevent the price of agricultural products from collapsing, adjust the shipment volume and discard agricultural products that are not shipped. To be used to manufacture processed products, such as canned food and juice, aiming for high value and stable income.
Be a part-time farmer	Diversified management (growing crops, manufacturing, and selling processed products).  Cover part of the living expenses with other work such as desk jobs	In addition to farming, they also work in the manufacturing industry, which provides a stable income and allows consumers to obtain cheap food.  Shift to a lifestyle that does not rely on agriculture alone. Farmers can also try to create rare species such as vegetables that they do not know if they will not sell.

	Not to rely on JA	By not involving JA, farmers can sell all the products they produce. Crops with low production can also be sold.
Exploring the possibilities of new crops	Promoting consumption via creation of new dishes Use of crops for non-food purposes (e.g., conversion to paper or biofuels)	Proposing the consumption of scarce crops and exploring ways to further increase the consumption of crops that are already in general use.
Distribution of appropriate quantity of crops	Instead of overgrowing one type of crop, growing multiple crops gradually  Local production for local consumption.	People can reduce waste and eliminate food loss.  By consuming produce near the production area, transportation costs can be reduced, and consumers can obtain fresh produce quickly and inexpensively.

Based on the contents of references 3) and 8).



**Fig. 1 Food self-sufficiency rate in Japan**

The legal target values for 2028 are 45% and 75% for the total food self-sufficiency rate based on the amount of heat supplied and the total food self-sufficiency rate based on production value, respectively.

Based on the data in reference 9).

