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-- Japanese agriculture: towards a sustainable, trade-oriented future --

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Japanese agriculture: towards a sustainable, trade-oriented future

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Abstract

Despite its image as a sector in chronic decline, there have been several positive developments in Japan's agriculture sector recently, such as the growing activities of firms on the farm, from conventional production to IT-based services and plant factories. With a particular focus on the Kansai region, this report analyses recent innovations in Japanese agriculture, including the establishment of an agricultural special zone in Yabu City in Hyogo prefecture, intended as a model to revive semi-mountainous districts across the country. We also present preliminary results of a survey of consumer attitudes towards agriculture and protection, and begin to chart a course towards policy proposals aimed at creating a competitive, profitable agricultural sector than can be more open to trade and sustainable in the long-term without ongoing government assistance.

Keywords

Agriculture, innovation, corporations, plant factories, Yabu, consumer attitudes

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Executive Summary

This interim report details the findings of the first two stages of the APIR research project "Japanese agriculture: towards a sustainable, trade-oriented future", covering four substantive areas: recent developments in agriculture, the increased activities of corporations in agriculture, the National Strategic Special Zone for agriculture in Yabu City in Hyogo prefecture, and an online survey of consumer attitudes towards agriculture and protectionism. The main findings of the preliminary research are as follows.

In terms of recent developments in agriculture, there are some positive trends emerging in the sector, led by the activities of firms, which contrast to the pessimistic view of agriculture frequently observed in the domestic and international media and at trade negotiations. The sector still has a long list of structural problems, as well as the factor endowment "meta-problem" of agricultural policy being long focused on crops in which Japan lacks comparative advantage. However, if Japanese food products characterized by quality and safety can be successfully marketed to high-income consumers in rapidly developing Asian nations, it may be possible to boost Japan's food exports and "normalize" the lop-sided structure of Japan's agricultural trade balance.

Regarding corporations and agriculture, there has been a noticeable increase in the activities of firms on the farm since the 2009, following the easing of restrictions on corporate involvement in agriculture in place since the 1950s. Some firms have begun production of rice and vegetables on larger-scale farms, while a number of IT firms have developed data-responsive "agricultural cloud" services to monitor field conditions and permit remote farm management via computers and tablets. The number of "plant factories" producing leaf vegetables and other vegetables and fruits in controlled environments has grown fourfold in three years, and this development offers the prospect

of stable production close to consumption centres, immune to weather events, and less reliant on environmentally harmful pesticides.

Looking at the National Strategic Special Zone, Yabu City in Hyogo prefecture can be seen as a microcosm for the problems of rural Japan, with depopulation, a rapidly growing senior population, abandoned farmland, and a farm successor shortage among the major problems the municipality is facing. Led by a business-friendly mayor and a business-experienced deputy mayor, some initial regulation easing has already taken place in relation to board members of agricultural production companies, with further decisions due soon in relation to corporate decision-making by non-farming board members and the requirement that companies involved in agriculture make farming their main business. More than a dozen companies have already established or announced operations in Yabu, including several large firms. The speed of progress remains modest, but the national and international attention the zone is attracting, as well as the enthusiasm of the municipal leadership and the cooperation of large firms, may contribute to a successful outcome.

The results of an online survey we conducted suggest that the general public in Japan clearly see agriculture as a "sector apart", and two-thirds of respondents desired that it be given special protection in trade negotiations. There is strong support for all five "holy ground" (*seiiki*) categories of agricultural products (rice, wheat, beef and pork, dairy, sugar), while traditional rural village scenery is treasured almost as highly as rice production. The most commonly cited reasons for supporting agricultural protection are concerns about health, national security (including food self-sufficiency), and food safety, implying that firms interested in entering the agriculture market should focus on producing healthy products that consumers can trust.

In conclusion, the preliminary stages of the research have provided a solid basis for the three remaining stages of the research project, to be undertaken in fiscal 2015. Stage 3 will examine "Lessons for exports", by looking at the successful reforms of the Common Agricultural Policy,

which have turned the European Union's agriculture sector into a net exporter. Stage 4 will study "Lessons for imports", to see whether the manufacturing production networks models developed by Japanese MNCs in Asia could provide lessons for developing stable food trade relations with neighbouring countries. Finally, Stage 5 will draw together the findings of all previous stages of the research to develop agricultural policy proposals that balance the complex interplay of interests in the sector, and voter and consumer sentiment towards agriculture, with the need to development more efficient and profitable farming in order to ensure a sustainable future as an independent sector not reliant on endless government handouts. These proposals will be presented in the final report of the research project, due in March 2016.

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Chapter 1: Introduction and outline of research project

1.1 Introduction

The agricultural sector in Japan faces many internal problems, including small scale size, an ageing workforce, and a shortage of successors. In addition, it faces a challenging external environment, including a domestic food market that is declining as population falls, very low export levels, and foreign pressure for reform at free trade agreement negotiations. So far, attempts at policy reform have failed to revitalize the sector, and it continues to rely heavily on tariff protection measures and subsidies.

At the same time, Japan's agricultural products have great inherent potential. These include high quality, taste, and safety and traceability. Such factors make Japanese food products desirable not just in the domestic market but also to high-income consumers in other parts of Asia and beyond. Recently, there have been a number of potentially positive developments in the internal and external environments. These include IT-based innovations in farming, growing business involvement in the sector following regulation easing, and growth in the world food market, and in particular, in the number of high-income consumers in Asia.

The aim of this research project is two-fold. First, this research will explore the potential for a more trade-oriented agricultural sector in Japan that is integrated into the Asia Pacific in mutually beneficial ways. Second, the research will seek to find pathways to a reformed and more sustainable sector, which can survive without government subsidies and become a net contributor to the national finances.

The project began in July 2014, and will run until March 2016. Stages (1) and (2) were implemented during fiscal 2014, and the provisional findings are presented in this interim report. Stages (3), (4), and (5) will be implemented in fiscal 2015, and a final report is scheduled for March 2016.

1.2 Structure of the research project

The research project is structured in five stages, as follows.

(1) *Current situation and recent trends in agriculture*: this stage will focus on establishing the current situation and recent trends in the domestic agriculture, with particular focus on innovations. The aim is to gather data and information as a basis for further stages of research. Research activities will include field trips to agriculture-related businesses in Kansai (such as plant factories), to the National Strategic Special Zone (*tokku*) for agriculture in Yabu City in Hyogo prefecture, and interviews with agriculture policy specialists in Kansai and Tokyo.

(2) *Consumer attitudes online survey*: this stage of the research will further examine the current situation in agriculture by undertaking a survey of consumer attitudes to agriculture, to investigate attitudes towards farming, protectionism, liberalization, and trade agreements. The aim is to create a "map" of the "reform space" of what consumers/voters are willing to accept, in terms of the future shape of the agriculture sector.

(3) *Lessons for exports*: taking as a background the successful policy reforms to the European Union's "Common Agricultural Policy" (CAP), which have transformed the EU into a net agricultural exporter since 2010, this stage will investigate the current policy regime in Europe. The aim is to uncover which reforms were most successful and why, and to see if lessons may be applied to Japan's case. Research activities will include interviews with EU officials and data analysis.

(4) *Lessons for imports*: taking as a background consumer preferences regarding food safety and supply stability, this stage will investigate whether the structure of imports may be changed in a way that increases stability in light of uncertainties in the global food market.

Specifically, the activities of Japanese MNCs in establishing manufacturing production networks in Asia will be examined, to consider whether there may be lessons for establishing "agricultural production networks" overseas for export to Japan. Research activities will include site visits to Kansai firms with experience of production networks.

(5) *Trade-oriented pathways*: this stage will draw together the data and information gathered in Stages (1) to (4), in order to create policy proposals for establishing a more trade-oriented agriculture sector that will be financially independent of government assistance, and hence sustainable in the long-term. Particular attention will be paid to the complex set of interests and preferences that exist in the agriculture sector, the underlying structural problems, and issues arising in relation to external pressure (*gaiatsu*) at the Trans Pacific Partnership negotiations.

1.3 Structure of the interim report

This interim report is structured as follows. Chapter 2 discusses recent developments in agriculture, including problems and potential, provides an overview of Kansai agriculture, and considers the challenges facing the sector. Chapter 3 investigates one area of innovation in detail: the National Strategic Special Zone for agriculture in Yabu. Chapter 4 examines the growing activities of corporations in agriculture, including plant factories. Chapter 5 offers preliminary analysis of findings from an online survey of consumer attitudes. Chapter 6 offers a summary of the preliminary research findings and outlines the next stages of the project.

Chapter 2: Recent developments in agriculture

2.1 Emerging innovation

The standard account of Japanese agriculture abroad is typically bleak, painting a picture of a sector beset by structural problems, with elderly, part-farmers on tiny plots, producing high-cost rice and other produce for a captive domestic market, benefitting from tariff barriers and government subsidies, with the agricultural cooperative conglomerate JA lobbying intensely to preserve a privileged position for farmers and itself, irrespective of consumer costs or lost growth potential through investment diversion or foregone trade agreements.

Within Japan, however, some positive trends are emerging that offer a different vision of agriculture. One of these is the increasingly active role of firms in various aspects of agricultural production and related services. While operational scale remains small for now, such activities are developing forms of agricultural production that better suit Japan's factor endowments, thus offering potential for competitive advantage in global food markets. With domestic population and food demand expected to shrink, many new entrants to the sector are also motivated by the prospect of exporting products, technology, and management know-how to a global food market that the agriculture ministry forecasts will double in size to USD 7.2 trillion between 2009 and 2020.

Within this national trend, the Kansai region is a leading player. Somewhat uniquely among Japanese regions, Kansai has a concentration of major firms in the Osaka-Kyoto-Kobe conurbation, extensive agricultural hinterlands with diverse production, and a large local consumer market of over 20 million people. Companies from fields including manufacturing, IT, real estate, transportation, and general trading have entered the local agricultural sector recently, and some have already begun operations overseas, with the aim of taking advantage of Kansai's Asia-oriented trade posture and the expected growth in the high-value segment of the Asian food market.

2.2 Problems and potential — balancing agricultural trade

Japanese agriculture has many structural problems, such as farm scale, an average age of farmers of almost 70, lack of full-time farmers, a successor shortage, and increasing levels of abandoned land have each contributed to a long-term decline in employment and production levels in the sector. More problematically, there is the 'meta-problem' of relative land scarcity, set against abundance in capital and skilled labour. These factor endowments give rise to a lac of comparative advantage in land-intensive (i.e. crop-extensive) production. Thus, even if the various structural problems were solved, Japan would remain at a disadvantage to other countries in terms of relative production cost for land-intensive agricultural goods, such as rice, wheat, and soybeans. Even so, agricultural policy has long been and remains largely focused on such crops, in part out of concern for "food self-sufficiency" (calculated to be 39% by the agricultural ministry), as well as for reasons of history, culture, and public sentiment favouring rice.

One problem that arises from prioritising land-intensive agriculture in a land-scarce country is the impact on the agricultural trade balance, which sums the value of food imports and exports. Japan has run a large agricultural trade deficit for decades, and though this may be politically problematic, it is an entirely normal state of affairs in economic terms, given factor endowments.

Figure 2-1 shows Japan's food imports and exports from 2004 until 2013. During this period, exports grew at average rate of 6.1% per year, from USD 2.62 billion in 2004 to USD 4.48 billion in 2013, according to JETRO[1]. In relative terms, exports performed better than imports, which averaged a 3.3% annual increase in the same period, but in absolute terms, imports rose from 50.0 billion USD in 2004 to 66.8 billion in 2013. Food exports accounted for 0.6% of all exports in 2013, while food imports represented 8.0% of all exports in the same year.

[1] JETRO, "Japan's International Trade in Goods, Yearly". http://www.jetro.go.jp/en/reports/statistics/.

Seen in international comparison in Figure 2-2, Japan is by no means the largest importer in gross terms, but its very low level of food exports means that it is the largest importer in gross terms.

Figure 2-1 Japan's agricultural trade balance, 2004-2013 (Source: JETRO website)

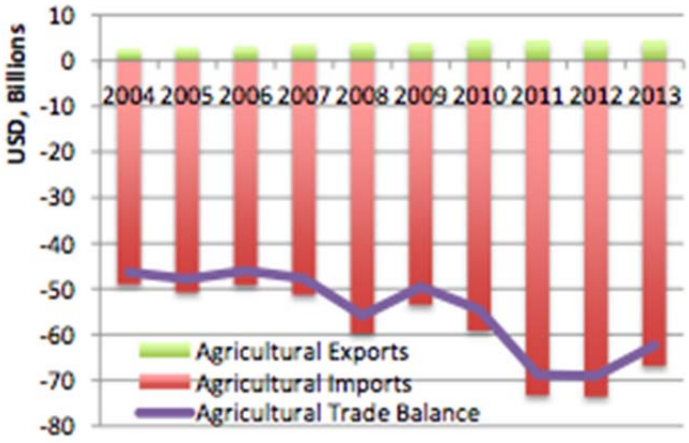
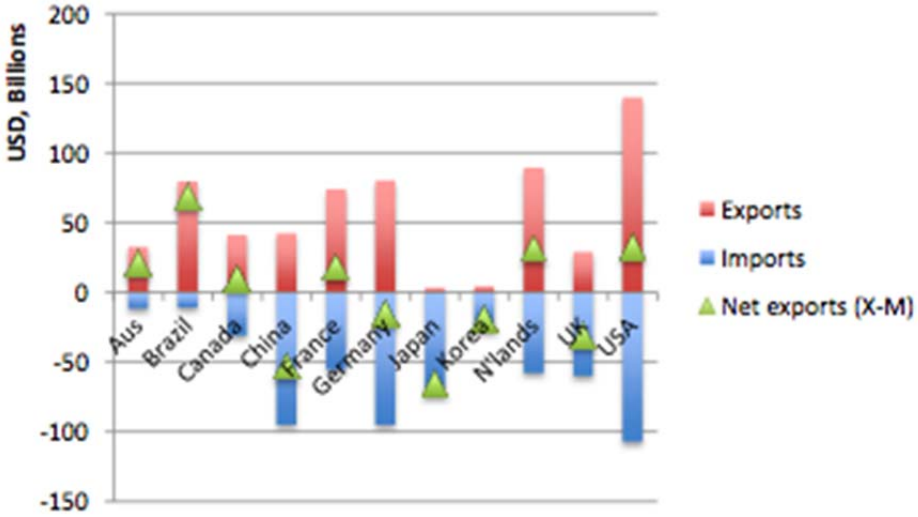


Figure 2-2 Agricultural trade balances in international comparison (Source: FAOSTAT website)



2.3 Background: Kansai agriculture

Agriculture in Kansai is characterised by production diversity and high-value output, with a focus on fruit. Kansai has 295,000 agricultural households, which represents 11.7% of the national total, and has 6.1% of total cultivated land. In value terms, agriculture in Kansai is above the national average, with agricultural output worth 578.3 billion yen (USD 4.82 billion) in 2012, or 6.9% of the national total.

Considering output by category (Figure 2-3), rice and vegetables each account for around one quarter of output. The share of fruit in Kansai's output (18%) is double the national level, while the share of livestock is below the national level. By prefecture, major production items include rice, livestock, and rice in Hyogo, rice in Shiga and Fukui, and vegetables in Osaka and Kyoto, and fruits in Wakayama (Figure 2-4).

Figure 2-3 Agricultural output by category for Kansai and Japan (Source: MAFF)

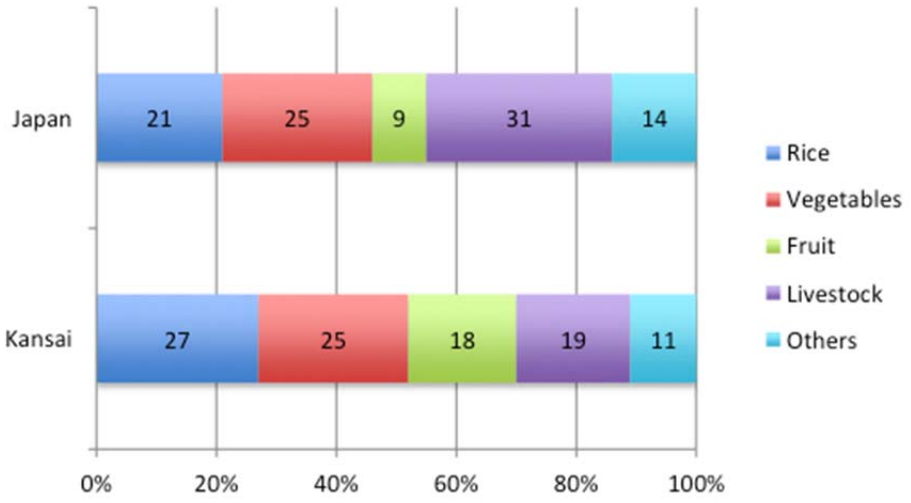
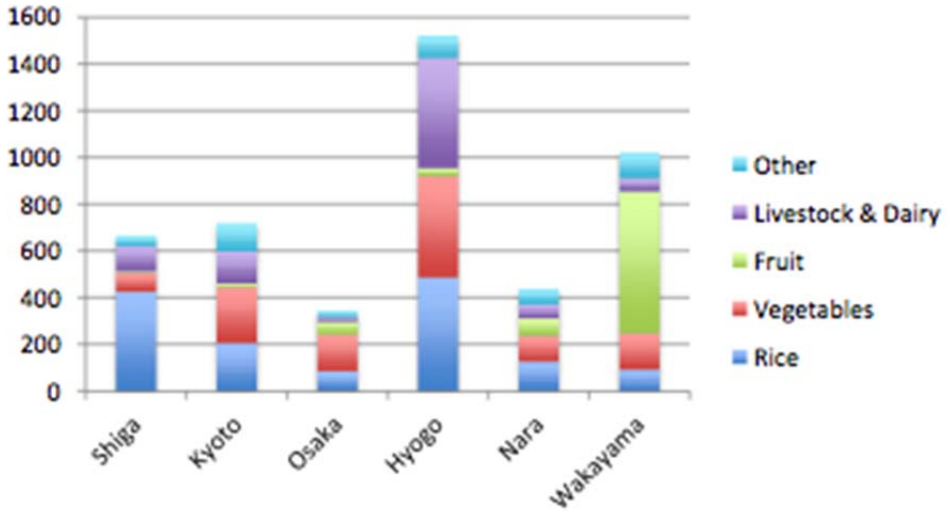


Figure 2-4 Main agricultural products by prefecture (Source: MAFF[2])



2.4 Challenges for the agriculture sector

The agriculture sector must find solutions to the structural problems outlines above, such as small scale and an elderly workforce. However, solving these problems are only stepping stones towards making the sector sufficiently profitable that it can survive in the long-term without ongoing government assistance. To do so, it will be necessary to pay greater attention to the nation's factor endowment levels, which imply that capital-intensive farming, rather than land-intensive farming, is better suited to the contemporary economy.

To be sure, production of rice and certain other goods is almost certain to be continued because of their cultural and historical importance, and because of their role in environmental preservation (see also Chapter 5 of this report). In these areas, it may not be possible to "break

[2] Source: MAFF (2013), Heisei 24 nendo nōgyō seisangaku oyobi seisan nōgyō shotoku (todoufukenbetsu)

even", particularly in semi-mountainous rural areas where production costs are higher, but there can still be some opportunities for improvements in scale and management practices, to assist for-profit producers and reduce the levels of government support needed for producers in less favourable areas.

At the same time, there is room to cultivate agricultural enterprises that employ information technology and advanced production techniques to produce more output using less land than traditional techniques. Just as IT-based "driverless cars" could fundamentally transform the nature of personal travel, so too may IT-based agriculture fundamentally transform aspects of agricultural production, to allow standardized production of food close to urban centres of consumption, using few or no environmentally-harmful chemicals.

The challenge for the agricultural sector and policymakers, then, is to secure the livelihoods of existing farmers as much as possible, while utilizing the prospects for a new agricultural revolution promising by technological advance. In this context, corporations may be able to make a positive contribution to the sector, in a way that they have not been permitted to previously.

Chapter 3: Corporations and agriculture

3.1 Easing historical restrictions

The trend towards a more endowment-appropriate form of agriculture has been led by corporations, who have until recently been largely absent from the agriculture sector. Due in part to the legacy of the politically powerful landlord class and frequent tenant disputes in the prewar decades, the postwar agricultural system was organised around a "cultivator principle" (*kōsakusha shugi*). Postwar land reforms facilitated the transfer of land ownership to former tenants at low prices, restricted land ownership rights to those who worked the land themselves, and also set limits on maximum holdings. While undoubtedly beneficial in improving the situation of millions of poor tenant farming families, the reforms also had the effect of obstructing large-scale production and corporate involvement.

The failure of policy to create a prosperous sector in the subsequent decades provided the context for the first move to permit joint-stock companies to enter agriculture in the late 1990s. The 1999 Food, Agriculture, and Rural Areas Basic Law allowed joint-stock firms to invest up to 25% of capital in farmer-led 'agricultural production companies' (*nōgyō seisan hōjin*), while the revised Agricultural Land Law of 2009 permitted private firms to rent (but not own) farmland. Since then, the number of agricultural production corporations has risen by 29.5%, reaching 14,333 in 2014.

Most recently, as one aspect of the so-called 'third-arrow' regulatory reforms, the current Abe administration is raising the capital investment limit to about 50%, and reducing the minimum number of farmers required to sit on an agricultural production company board, from 50% to one member. In February 2015, the administration announced significant reforms to JA-Zenchū, a peak body in the JA structure, to increase the financial and management autonomy of local cooperatives, allowing them to pursue their own business strategies. If implemented, such reforms may also add to the increasing business orientation and farm-firm linkages in the sector.

3.2 Firms on the farm

Paradoxically, despite being the oldest sector in one of the world's most advanced economies, agriculture in Japan is sometimes spoken of today as a "blue ocean" by businesspeople. Barriers still remain, but regulatory easing towards firms, together with the JA reforms, is creating space in the food production market into which new participants can enter. Despite expected demand shrinkage, the domestic market offers growth opportunities to producers who cater more closely to changing consumer tastes than has been the case until now, as well as producers who utilise new technologies to raise productivity.

In addition, many new market entrants are also motivated by opportunities in growing overseas food markets. One aspect of this is demand for safe, high-quality produce from high-income consumers in Asia, a market segment that Japanese products like *wagyū* beef and luxury fruits could cater for. Another aspect will be the export of technology and operational know-how developed in Japan in order to facilitate local production for local consumption in other countries, as well as income from after-sales maintenance contracts, as already exists for Japanese companies exporting machinery to Southeast Asia.

Firms from a range of business sectors have entered agriculture in recent years in two main ways: production, and IT-based agriculture services. Concerning production, firms are using the new regulatory framework to establish operations on larger scales, generally for sales through the firm's own retail channels. A farming subsidiary of the supermarket retailer AEON that was established in 2009 now operates 15 fruit and vegetable farms on about 300 acres, and is scheduled to harvest its first rice crop this autumn. Two large convenience store chains have also entered the market. As of 2014, Lawson operated more than a dozen farms, while Seven and I Holdings operated ten.

Within the field of IT agriculture, the concept of the "agricultural cloud" is a major area of innovation. Cloud-based data services collect and analyse data from on-farm sensors, compare it with an existing database, and give feedback to farmers to increase efficiency and boost production.

Accessing data through smartphones and tablets also allows for the possibility of remote cultivation management. Fujitsu, NEC, Hitachi, Toshiba, NTT, and Toyota are among the companies active in this area.

Combining technologies from various divisions including industrial systems and housing systems, Panasonic has developed high-technology greenhouses that allow for the production of spinach and other leaf vegetables all year round. It is also trialing a plant factory in Singapore, which could provide a platform for selling such systems across Southeast Asia. The next section considers plant factories in detail.

3.3 Plant factories

Plant factories are facilities for the intensive production of vegetables or flowers in a controlled environment, using artificial light (fluorescent or LED), natural light, or both. Plants grown this way tend to grow more quickly than normal, and can be cultivated to have higher nutritional content, improved taste, or lower chemical content to meet dietary requirements of patients with certain medical conditions. Plant factories have the potential to offer environmental and societal benefits, as well as having economic and business logic.

In terms of environmental benefits, plants are typically grown in a hydroponic solution, requiring fewer or no pesticides, and consume only 1-2% of the water required in a field or greenhouse. Wastage of outer leaves is also much lower, with up to 95% of the weight of the plant being consumed, compared with around 60% for standard techniques.

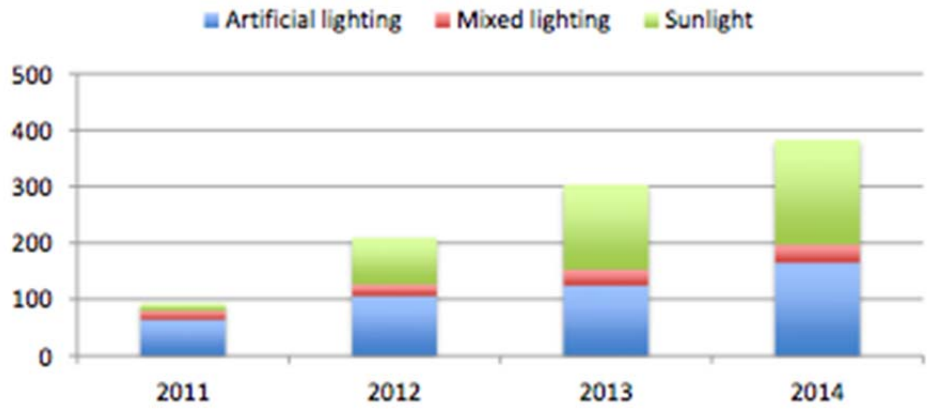
In societal terms, utilization of shelving allows production to take place on relatively small areas of land, so plant farms can be situated in urban or suburban areas, adjacent to retail sites, or in disused buildings. In the Kansai region, for example, the Hanshin Dentetsu and Kintetsu railway companies are experimenting with plant factories built under some of the raised railway lines that traverse much of the region, while the real estate firm Orix Fudōsan is operating a plant factory from a disused rural elementary school in Yabu City. The standardisation of the growth process

makes cultivation relatively straightforward and less physically demanding, opening cultivation work to elderly or disabled workers.

In terms of economic and business logic, as noted above, using little land and high technology, plant factories are well-suited to Japan's factor endowment. Since plant factory land is (so far) not being designated as 'agricultural land', firms do not face land ownership constraints. Moreover, plant factories can produce multiple crops annually, even outside the natural growing season, allowing for increased production levels. Also, indoor production prevents crop damage from severe weather or storms, ensuring a stable supply. On the other hand, plant factory operators must deal with high start-up and energy costs, and the range of factory-suitable plant types remains limited.

As seen in Figure 3-1, the total number of plant factories is growing, rising from 93 in 2011 to 383 in 2014, of which 43% were artificial-only lighting, 9% mixed lighting, and 48% sunlight-only type, according to the Japan Greenhouse Horticultural Association (JGHA)[3]. The value of the consumer market for plant factory produce is also expected to grow, with one market research firm forecasting that the total value of the domestic market for artificial and mixed (artificial and natural) lighting would rise from ¥23 billion in 2013 to ¥150 billion by 2025.[4]

Figure 3-1 Plant factories by type, 2011-2014 (Source: JGHA)



[3] http://www.jgha.com/shiryou.html
[4] Source: Yano Research Institute (2014), *Plant Factories Market in Japan: Key Research Findings 2013*.

Chapter 4: The National Strategic Special Zone in Yabu

4.1 A model for rural Japan

Although the smallest and perhaps the most surprising of the six municipalities and regions chosen in March 2014 to host one of Prime Minister Shinzo Abe's National Strategic Special Zones, rural Yabu City in northern Hyogo prefecture may prove to be one of the most important. If it can successfully develop innovative policies to help revitalise the local agricultural sector, it could become an important model for the rest of the country's many semi-moribund "semi-mountainous agricultural areas".

As part of this research project, developments in Yabu are being monitored. Through site visits and interviews, we will gather insight into the actual conditions of this case study of agricultural innovation in Kansai. This chapter examines Yabu's background and nomination as an SEZ, initial developments, and some of the prospects and challenges that it will face during what is expected to be at least a two-year project.

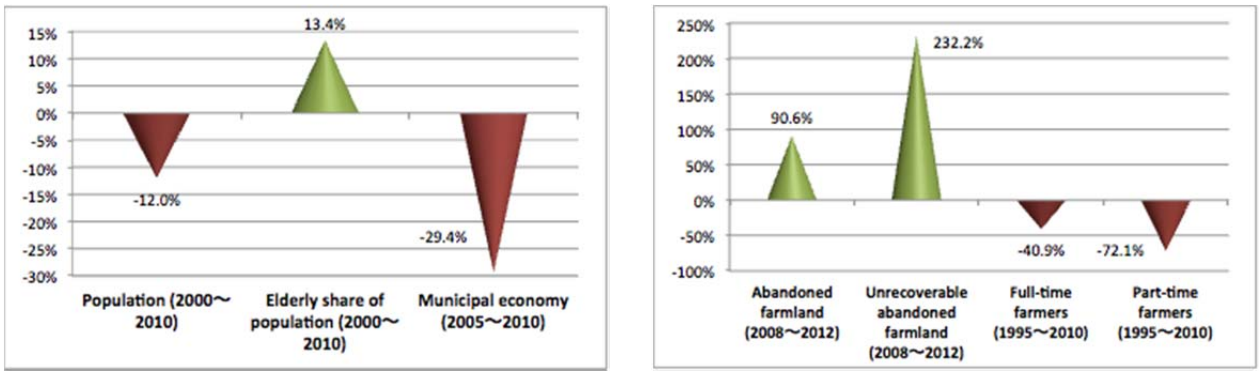
4.2 Yabu: a microcosm of rural problems

Within Kansai agriculture, Hyogo is the leading producer, and within Hyogo prefecture, the most noteworthy district at present is Yabu City. Yabu is a rural municipality with a population of around 26,000, situated in an area encompassing several valleys in northern Hyogo prefecture, covering 423km^2, of which 84% is mountains and/or forest. Lying roughly equidistant to each of Kobe, Osaka, and Kyoto, each 2 to 3 hours by road or train, Yabu is relatively

isolated from major population centres. Topographically, Yabu is semi-mountainous, with much of the land covered by forests, and much sloped cultivation land, characteristics it shares with around 40% of Japan's national land. In terms of climate, annual rainfall is high, and heavy snowfalls in winter on the northern side of the mountains of central Honshu mean that farming activities largely cease in Yabu between December and March, while snow allows the operation of ski resorts on the Hachibuse plateau during winter months.

Yabu was formerly a significant centre for sericulture from the nineteenth century, and for tin mining in the twentieth century in the Akenobe area until 1987. The municipality's population peaked at 49,000 in 1955, but has since declined steadily due to urban migration and a falling birth rate. As other employment sectors have declined, the relative importance of the agricultural sector has increased, with rice and Tajima beef (which includes the "Kobe beef" brand) among the major products.

Figure 4-1 : Socio-economic and agricultural trends in Yabu (Source: Yabu City Hall)



Yabu's decline is a microcosm for the situation in much of rural Japan, with depopulation, ageing, economic decline, abandoned farmland, and falling numbers of farm households among the major structural problems (Figure 4-1). According to Yabu City Office data, between 2000 and 2010, population fell 12% to 26,500 (with 9,600 households), while the share of the population aged 65 or over from 29% to 33% of the total, a 13% rise. Between 2005 and 2010, the total value of the municipal economy fell by 29%, to 67 billion yen.

Of Yabu's 2673 hectares of agricultural land, 4.4% had been abandoned for cultivation in 2008, of which 93 hectares could not be returned to agricultural use. By 2012, the amount of cultivation-abandoned land had risen to 8.5% of the total, and 141 hectares could not be returned to agricultural use. Full-time farmer numbers fell by 41% to 295 between 1995 and 2010, while part-time farmer numbers fell by 72% to 878 in the same period. Given the mountainous nature of the land, there is a relatively large share of small rice terraces, which are unsuited to large-scale cultivation and thus place natural limits on productivity.

Other problems in Yabu are also typical of the rest of rural Japan, including the high average age of farmers (over 70), the lack of successors willing to inherent the family farm, and an illiquid market for farmland due to an inefficient land-sales committee system. Depopulation has also resulted in some public infrastructure becoming redundant, including five disused elementary schools.

Box 1: Locally-grown Yabu produce	
Rice-terrace rice	Yoka soybeans
Todoroki daikon (radish)	Nectarines, winter persimmons
Asakura sansho pepper	Spinach
Tajima beef, Yoka pork	Green peppers

At the same time, farmers in Yabu produce a diverse range of products, many with "brand" characteristics that could play a role in revitalizing the local agricultural sector (Box 1). Yabu is one centre of production of Tajima beef, a category that includes Kobe beef as a subset. *Asakura sansho*, an aromatic peppercorn, is grown there, along with local radishes, pork, soybeans, and other vegetables and fruits. Considering the popularity such local specialties in the domestic market, these products could offer a platform for developing a Yabu food "brand".

4.3 Establishment of the National Strategic Special Zone

Yabu's economic decline has been gradual, and previous attempts have been made to address the situation, including a 5-year plan to promote a self-sustaining local economy in light of depopulation. With few other industries remaining, the current municipal administration has chosen to focus on agriculture and tourism in order to improve the local economy and community. The

mayor of Yabu, Sakae Hirose, ran for a second term of office on slogans of "fostering a new life in the region"[5] and "cultivating industry, cultivating people"[6].

Mayor Hirose has sought to encourage private companies to help with regional regeneration. One of his first initiatives was the appointment of Deputy Mayor Mino Shoji, formerly of the travel firm HIS, who was involved with the regeneration of the Huis ten Bosch theme park in Nagasaki prefecture. Subsequently, the municipal government invested 6 million yen in May 2013 to establish "Yabu Partners", a firm with the deputy mayor as president, to help foster agriculture-related enterprises.

Yabu City applied for consideration as a National Strategic Special Zone under plans announced by the Abe administration in 2013. Along with Niigata, Yabu was selected as one of two agricultural specials zones in March 2014, with Tokyo, Kansai, and Fukuoka among the other cities and regions chosen. Yabu's NSSZ plan was confirmed in July 2014. Within the special zone framework, the municipal government in Yabu is permitted to undertake some of the following reforms:

(1) Reform of the agricultural committee system, to allow the mayor to oversee land transactions, with the aim of improving the efficient use of land
(2) Easing of restrictions on agricultural businesses, to allow more diverse agricultural business management (including greater private sector involvement)
(3) Changes to regulations relating to restaurants selling agricultural goods, to promote the use of local farm produce
(4) Changes to regulations relating to Small Business Credit Guarantee System, to permit agricultural enterprises to utilize this system.

[5] 地域にあらたな命を育む
[6] 産業を育み、人を育む

Other changes included easing working time restrictions on the local "Silver Centre", which employs many healthy, active over-65s.

Through these reforms, the local government is seeking to promote a vision of Yabu's future as a place in which firms participate in the agricultural economy, where farmland is utilized efficiently, where farmers participate in "Sixth Sector Industrialisation" (by engaging in processing, distribution and/or sales of their products to increase income), and where young people can find employment in the district. In turn, the central government hopes that the special zones will help promote structural reform and increased competitiveness locally, and that innovations in such zones can be applied to the national economy as a whole. In this respect, Yabu is a model for 40% of Japan's cultivation land that lies in semi-mountainous areas.

4.4 Initial developments: regulation easing and new business operations

As of Spring 2015, regulations regarding board membership for agricultural production companies had been approved. Previously, over half of board members were required to be involved in regular production, sale, or processing of agricultural goods, and over half were required to grow crops. Under the reforms, a minimum of only one member must be growing crops.

Other reform measures remain under deliberation. One issue involves changing the requirement that no more than one-quarter of stockholders involved in decision-making can be non-farmers, to allow more than half to be non-farmers. A second issue involves lifting the requirement that companies involved in agriculture should make agriculture their main business (i.e. that over 50% of profits must be from agriculture), to remove any minimum requirement. It is expected that decisions will be made on these issues in the coming months.

More than 12 new agri-businesses related to the special zone have begun operations, or have announced plans to start business in Yabu. As seen in Table 4, they include firms involved in the

production of rice and vegetables, food processing and sales, agri-tourism, and biomass power generation. Companies with headquarters in the Tokyo and Nagoya regions, as well as several from elsewhere in Kansai, are establishing operations in Yabu. It should be noted that production, for now, remains on a small scale, although some firms have plans for operations of up to 40 hectares in future.

Table 4 – New agri-businesses in the Yabu special zone

	Firm	HQ	Business	Scale (ha)
1	My Honey	Yabu	Flower cultivation and honey processing	Up to 0.5
2	Kinki Kubota	Amagasaki	1. Direct seeded rice fortified with iron 2. Local produce 3. Farm tourism and recruitment support	Up to 40 (now: 2)
3	Tōyō Energy Farm	Fukushima Prefecture	1. Biomass power generation 2. Plant factory 3. Processed vegetable plant	3
4	Shinsengumi	Aichi prefecture	1. Local dishes and local produce 2. Farmers' restaurant	10
5	Nouentai	Shimane Prefecture	1. Tomatoes with high sugar content 2. Processing plants	0.5
6	AEON Agri	Chiba prefecture	1. Rice, cabbage, green onion 2. Farmers' restaurant 3. Processed wood products 4. Agri tourism	7
7	Yoshii Construction	Hyogo prefecture	1. Habanero peppers, beans 2. Processing vegetables	Up to 1
8	Yabu Partners / ORIX	Yabu / Tokyo	1. Cultivating Green pepper, onion and soy beans 2. Processing vegetables	4
9	Yanmar Agri Innovation	Osaka	Garlic cultivation	Up to 18 (now: 5)
10	Himeji Flower Auction	Himeji	Cultivating the Japanese gentian in Cool highlands	Up to 3
11	Sanyo Amnak	Hyogo prefecture	Cultivating rice for *sake* production	10

Table 4 – New agri-businesses in the Yabu special zone				
	Firm	**HQ**	**Business**	**Scale (ha)**
12	Yoka Tekko	Yabu	Tomatoes with high sugar content	Undecided
13	Agri Innovators	Yabu	Utilization of abandoned farmland	Up to 8

4.5 First research trip

Our first research trip to Yabu was undertaken in October 2014. During this trip, we conducted interviews with city officials and businesspeople, made a site visit to an agricultural business operation, and spoke with local farmers about their situation and the impact of the special zone. During the research trip, the following points were observed, some of which were in contrast with common images of farmers in media reports about Japan's agriculture sector:

- One view of part-time farmers is as "weekend farmers", who choose to engage in (highly standardised and mechanised) farming as a side-business in order to make "easy money" (through subsidies etc.) to supplement their other income. However, we found that many farmers in Yabu have no choice but to be part-time farmers, since the harsh winter climate prevents most agricultural activity from December to March. For such farmers, off-season employment in other sectors, such as in ski resorts, guesthouses, or snow clearing, is necessary to provide an income during winter months.
- In a similar way, elderly farmers are often seen as hanging on in order to make 'easy money' from government subsidies. We observed that in Yabu, elderly farmers lacking successors may continue working until advanced old age because the alternative is to abandon long-held paddy fields, which would become unusable within a number of years. In practice, farming remains physically challenging, despite mechanisation.
- For some farmers, the small scale of the average farm is in part a risk management strategy against extreme weather conditions, which can sometime result in entire crops being

damaged or destroyed. Farmers whose workforce consists of immediate family members can more easily reduce business and family expenditures to very low levels (using moral suasion), whereas larger scale farmers who employ outside workers face the burden of having to continue to pay wages even during crop failure episodes, which may not be viable.

The conclusion of the first research trip was that the topographical and meteorological conditions faced by farmers in Yabu were challenging, and the speed of progress for the National Strategic Special Zone was modest. However, the enthusiasm and business focus of the mayor and the business experience of the deputy mayor were noteworthy, as was the involvement of firms from across Japan, and the amount of domestic and international media coverage given to Yabu. These factors, as well as others like the potential for developing Yabu "brand" food, give some reasons for optimism about the success of the special zone project.

A follow-up research trip is scheduled for early summer 2015, to assess developments during the intervening period. In particular, we will investigate the following issues:

- Coordination efforts between municipal government and businesses investing in Yabu
- Issues relating to land reallocation, including local farmers leasing farmland to companies
- Response of Japan Agriculture to special zone-related developments

Chapter 5: Online survey of attitudes to agriculture—preliminary analysis

5.1 The importance of voters and consumers

In terms of finding pathways to viable agricultural policy reforms, in addition to developing forms of agriculture that are suited to Japan's factor endowments, it is also essential to pay close attention to the views of voters and consumers, who will ultimately determine the success of policies and agricultural business ventures, at the ballot box and the supermarket check-out. For this reason, one stage of this research project aims to create a detailed picture of the views of voters and consumers concerning agriculture, agricultural policy, and related trade issues, such as the TPP, using an online survey. Having a clear understanding of these views offers the prospect of creating a "map" of the "reform space" available in regard to agriculture, so that policymakers and agricultural business-entrants alike can tailor their activities to address the concerns of voters and consumers.

With this as a background, we conducted the online survey over two days in March 2015, using the Internet survey company Rakuten Research, which has around 2.3 million research panel members. The sample size was 500, half male and half female, equally divided into five age cohorts ranging from 20s to 60s[7]. Sampling was designed so that respondents were also broadly representative of Japanese society in terms of prefecture of residence. In addition to background questions relating to occupation, whether their job involved exports etc., respondents were asked to respond to a number of hypothetical scenarios involving economic or cultural "loss", give their views on agricultural protectionism, and give reasons for their views.

[7] Those aged under 24 were excluded from the survey, since several questions related to respondents' jobs, and many under-24s are university students.

The preliminary results and analysis are reported in this chapter. Detailed analysis is ongoing, and a full analysis will be published during fiscal 2015.

5.2 Survey results

The first question related to scenarios of "loss", relating to the domestic production of five agricultural and three manufacturing goods, as well as two culturally meaningful aspects of society. As Figure 5-1 shows, the percentage of respondents who reported that they would be *very* or *somewhat* disappointed to see a Japan that did not produce rice was 85%. The equivalent figure for pharmaceuticals production was 83%, 82% for *satoyama-no-fuukei* traditional village scenery (typically involving rice paddies and hills), 81% for beef or pork production, 80% for dairy production, 78% for paper production, 75% for wheat production, 71% for sugar production, 65% for semiconductor production, and 52% for the emperor system.

Figure 5-1: If Japan became one of the following scenarios, what would you think?

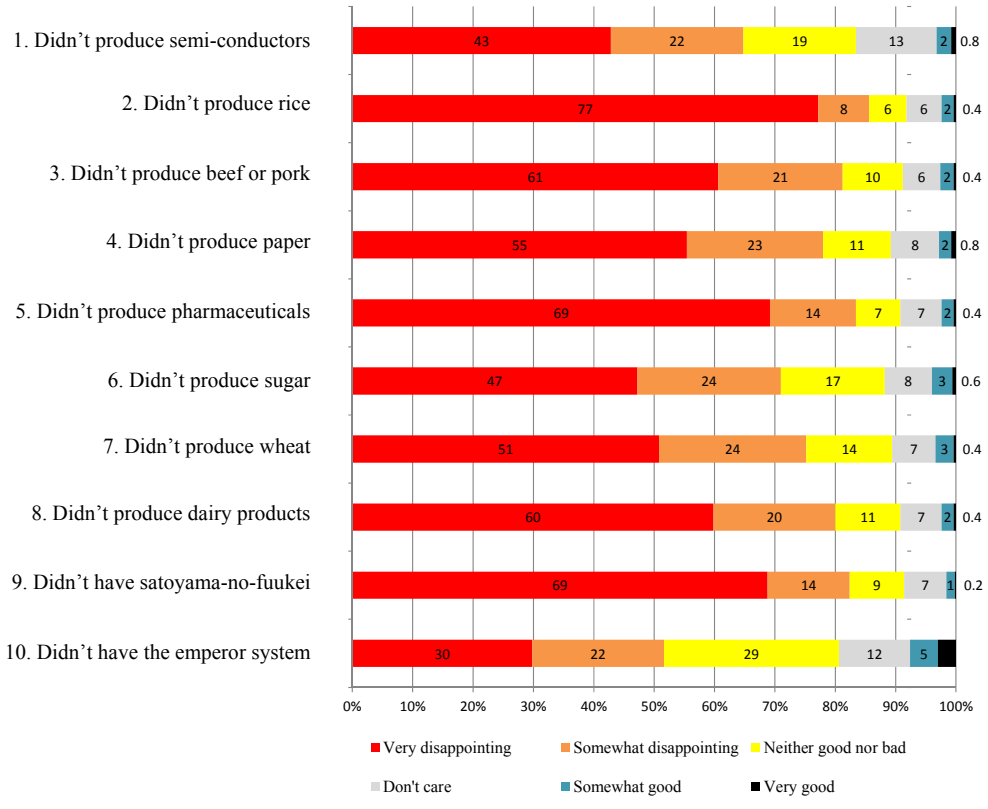
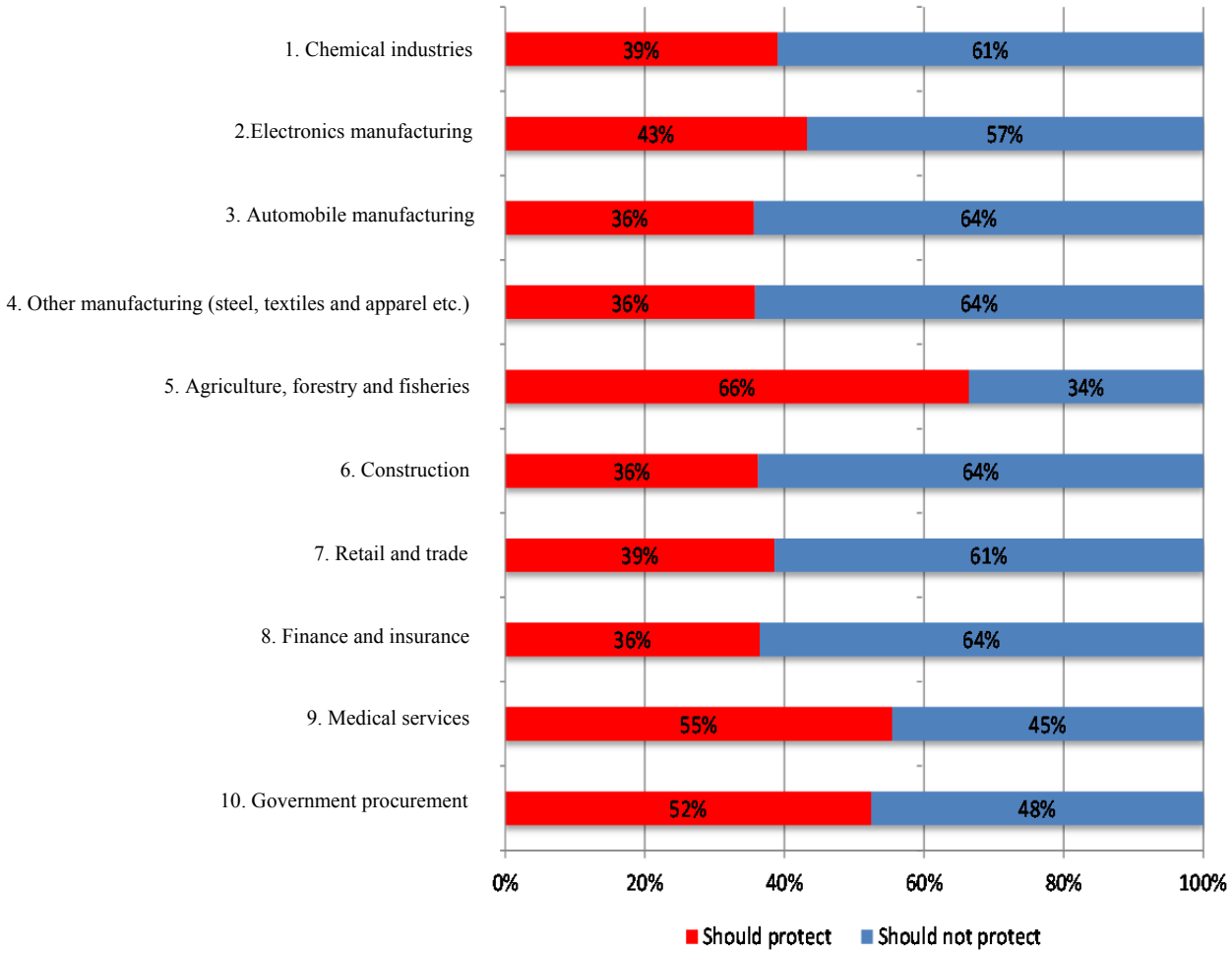


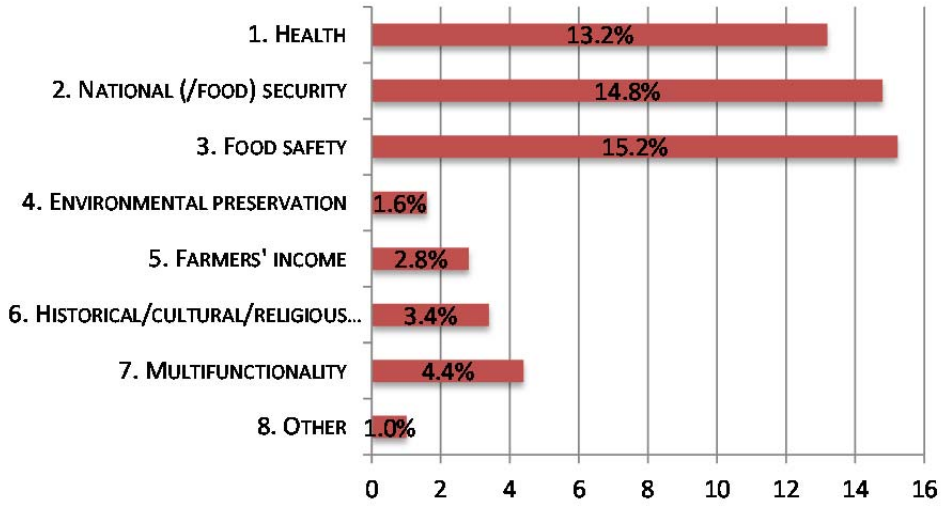
Figure 5-2: Which Sectors, if any, do you think the Japanese government should protect in trade negotiations?



The next question dealt with protectionism in international trade negotiations. Respondents were asked which sectors, if any, they thought that the Japanese government should protect. Figure 5-2 gives the results. Those who thought that agriculture, forestry, and fisheries should be protected totaled 66%. The figures for other sectors were 55% for medical services, 52% for government procurement, 43% for electronics manufacturing, and 39% for both chemical industries and retail and trade. The lowest-ranking sectors were finance and insurance, construction, other manufacturing, and automobile manufacturing, all scoring around 36%.

Those who responded in favour of protecting agriculture were then asked to give the reason for holding this view. Figure 5-3 gives their responses. The three most commonly cited reasons were food safety at 15%, national security (including food self sufficiency) at 15%, and health at 13%. The response rates for other reasons were the "multifunctionality" of agriculture[8] (4%), agriculture's historical/cultural/religious importance (3%), maintaining farmers' income (3%), and environmental preservation (2%).

Figure 5-3: Why do you think that agriculture should be excluded from liberalisation?



5.3 Preliminary analysis

Preliminary analysis of the results of the online survey provides evidence to support the view that agriculture is considered a "sector apart" in the minds of a majority of voters and consumers. Concerning the "loss" scenarios, rice production received the highest response rate for both *very* and *somewhat* disappointing, closely followed by *satoyama-no-fuukei* traditional village scenery. Other agricultural products, including the *seiiki* ("holy ground") products (beef and pork,

[8] Referring collective to the multiple roles that agriculture performs, such as landslide prevention, water resource management, soil erosion prevention etc.

wheat, dairy products, and sugar) that Japan's negotiators are attempting to exempt from liberalization in TPP negotiations, were all ranked higher than semi-conductors, which are much more important to Japan in economic terms. The strength of feeling for pharmaceuticals was also significant, and may be linked to the perceived national security importance of a country producing its own medicines. The lowest score of all was for the emperor system, the score for which implies that modern Japanese citizens may be more concerned about maintaining domestic rice production than maintaining the emperor system.

Regarding sectoral protection, it is seen again that agriculture, forestry, and fisheries enjoy by far the highest levels of public support in favour of protection in trade negotiations, with two-thirds of respondents advocating special treatment for these primary industries. Medical services, the next-highest ranking sector (also with a 'national security' element) was ranked more than 10 percentage points lower.

Finally, in relation to reasons given for wishing to see agricultural protectionism, three concerns dominated: food safety, national security (including food self-sufficiency), and health. This is consistent with the "governmentality" idea put forward by some political scientists[9] that modern citizens believe that it is a fundamental element of the role of modern states to provide a safe and secure supply of food to the nation.

Further analysis is ongoing, but these initial results have implications for policymakers and those interested in agricultural business operations. First, policymakers should note that strong sentiment towards protecting agriculture remains, and that voters are also highly concerned about maintaining traditional village scenery, and, presumably, the viability of the livelihoods of rural residents who live in such villages. Indeed, all five of the "holy ground" categories of agricultural

[9] See, for example, Barclay, Kate, and Charlotte Epstein (2013) 'Securing Fish for the Nation: food security and governmentality in Japan', *Asian Studies Review*, 37 (2): 215-233.

products at the heart of TPP negotiations attracted strong support. Thus, policymakers must balance popular sentiment towards the agriculture sector and maintaining rural villages against the need to promote more efficient forms of agriculture and external pressure for liberalization at trade negotiations. For Japan's negotiating partners in the TPP, these results underline the fact that agriculture is not seen as just another sector in Japan, nor valued primarily in terms of its economic contribution.

For those interested in agribusiness, the initial results are also of significance. Concerns about food safety and health are foremost in the minds of consumers, and there is also a strong "home preference" for domestically produced goods, related to national security concerns. This suggests that there will be an ongoing demand for domestically produced food, and that consumer preference is for healthy, safe, and trustworthy produce. New domestic producers that meet these expectations are likely to find a demand for such food products. Firms that wish to engage in food import operations into Japan may also benefit by stressing the healthy and trustworthy nature of their products to reassure consumers who are skeptical about foreign-sourced food.

Chapter 6: Preliminary conclusions and next stages of research

6.1 Summary of first stages of research project

This interim report has detailed the findings of the first two stages of the APIR research project "Japanese agriculture: towards a sustainable, trade-oriented future", covering four substantive areas: recent developments in agriculture, the increased activities of corporations in agriculture, the National Strategic Special Zone for agriculture in Yabu City in Hyogo prefecture, and an online survey of consumer attitudes towards agriculture and protectionism. The main findings of the preliminary research are as follows.

In terms of recent developments in agriculture, there are some positive trends emerging in the sector, led by the activities of firms, which contrasts to the pessimistic view of agriculture frequently observed in the domestic and international media and at trade negotiations. The sector still has a long list of structural problems, as well as the factor endowment "meta-problem" of agricultural policy being long focused on crops in which Japan lacks comparative advantage. However, if Japanese food products characterized by quality and safety can be successfully marketed to high-income consumers in rapidly developing Asian nations, it may be possible to boost Japan's food exports and "normalize" the lop-sided structure of Japan's agricultural trade balance.

Regarding corporations and agriculture, there has been a noticeable increase in the activities of firms on the farm since the 2009, following the easing of restrictions on corporate involvement in agriculture in place since the 1950s. Some firms have begun production of rice and vegetables on larger-scale farms, while a number of IT firms have developed data-responsive "agricultural cloud" services to monitor field conditions and permit remote farm management via computers and tablets. The number of "plant factories" producing leaf vegetables and other vegetables and fruits in controlled environments has grown fourfold in three years, and this development offers the prospect

of stable production close to consumption centres, immune to weather events, and less reliant on environmentally harmful pesticides.

Looking at the National Strategic Special Zone, Yabu City in Hyogo prefecture can be seen as a microcosm for the problems of rural Japan, with depopulation, a rapidly growing senior population, abandoned farmland, and a farm successor shortage among the major problems the municipality is facing. Led by a business-friendly mayor and a business-experienced deputy mayor, some initial regulation easing has already taken place in relation to board members of agricultural production companies, with further decisions due soon in relation to corporate decision-making by non-farming board members and the requirement that companies involved in agriculture make farming their main business. More than a dozen companies have already established or announced operations in Yabu, including several large firms. The speed of progress remains modest, but the national and international attention the zone is attracting, as well as the enthusiasm of the municipal leadership and the cooperation of large firms, may contribute to a successful outcome.

The preliminary results of an online survey we conducted suggest that the general public in Japan clearly see agriculture as a "sector apart", and two-thirds of respondents desired that it be given special protection in trade negotiations. There is strong support for all five "holy ground" (*seiiki*) categories of agricultural products (rice, wheat, beef and pork, dairy, sugar), while traditional rural village scenery is treasured almost as highly as rice production. The most commonly cited reasons for supporting agricultural protection are concerns about health, national security (including food self-sufficiency), and food safety, implying that firms interested in entering the agriculture market should focus on producing healthy products that consumers can trust.

6.2 Next stages of the research project

As outlined in Chapter 1, three more stages of the research project will be implemented in fiscal 2015. Stage 3 will consider "Lessons for exports", examining the successful reforms of the

European Union's Common Agricultural Policy for lessons as to how Japanese agriculture may be made more export-competitive. Stage 4 will examine "Lessons for imports", studying the manufacturing production network models of Japanese MNCs in Asia to see whether there are lessons for improving the stability and standards of food imports to Japan from neighbouring countries. Finally, Stage 5 will draw together the data and analysis from all four stages of the research project to develop agricultural policy proposals that balance the complex interplay of interests in the sector and voter and consumer sentiment towards agriculture with the need to development more efficient and profitable farming, in order to ensure a sustainable future for agriculture as an independent sector not reliant on endless government handouts. These proposals will be presented in the final report of this research project, due in March 2016.

Appendix I: major research activities

October 9-10, 2014: Research trip to Yabu City, Hyogo prefecture. Interviews with city officials. Site visit to Orix plant factory.

February 20, 2015: Site visit to SPREAD plant factory, Kameoka, Kyoto. Interview with company president.

March 25-26, 2015: Implementation of online survey of consumer attitudes, with Rakuten Research.

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