博士論文

Determinants of Obtaining JAS Organic Certification in Japan
（日本におけるJAS有機認証取得の決定要因）

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ACKNOWLEDGMENTS

I want to express my gratitude to my supervisor Professor Yamaji Eiji. Without his close guidance of my research and invaluable comments on my writing, this thesis would not have been finalized. His constant support, kind attention to my work, and patience turned the thesis writing process into an exciting journey and memorable experience.

I am very grateful to my committee members Associate Professor Onuki Motoharu, Associate Professor Tanaka Toshinori, Associate Professor Suzuki Aya, and Professor Kiminami Akira for their kind comments and advice during my pre-defense, defense, and writing.

The submission of this thesis would not be possible without the cooperation of farmers, officials of the Ministry of Agriculture, Forestry and Fisheries, and the certification centers, who agreed to respond to the questionnaires and interviews that provided valuable insights for this work. I want to thank all sustainability researchers and environmental activists in Japan and around the world for inspiring this research.

I am very grateful to the Ministry of Education, Culture, Sports, Science and Technology, The Graduate Program in Sustainability Science Global Leadership Initiative of the University of Tokyo, and Sompo Japan Nipponkoa Environment Foundation for providing the scholarship, research grant, academic and administrative support to this research, and giving me a chance to study in Japan.

I want to give a special mention to Doreen Allasiw, Eri Amasawa, Giles Sioen, Yuki Yoshida both for their advice and help on my research and friendly support. The submission of this thesis would not be possible without love and support from my parents and sister. I want to thank my grandfather, Vladimir Bolkhovskoi, who influenced my life choices in various ways and keeps on inspiring and challenging me in my academic and personal undertakings.

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CHAPTER 1. INTRODUCTION.

1.1. Environmental and Health Impacts of Agriculture

Agriculture is a practice that has been in place for several centuries, and people all over the globe depend on it as the primary source of food. The World Bank estimates that agriculture employed around 28.3% of the global population in 2018, with many developing countries having more than half of its population working in the agricultural sector (The World Bank, 2019). While the global population keeps growing, it is becoming a pressing issue to provide everyone with affordable and safe food. Conventional agriculture, which is sometimes also referred to as industrial agriculture, is relying on the input of chemical pesticides and fertilizers to maximize its production. It is currently prevalent in the world. Negative consequences of such an approach include various environmental impacts and may cause problems for human health.

Researchers point out the negative effect of fertilizers on air and water quality as they contain harmful elements such as nitrogen and phosphates (Rodriguez et al., 2004). Tilman (1999) estimates that further expansion of conventional farming in the world would lead to high levels of eutrophication of freshwater and marine ecosystems as well as biodiversity loss of critical natural ecosystems. From a health safety perspective, the use of pesticides is associated with increased levels of cancer, endocrine disruption, and reproductive dysfunction. These health issues may affect both producers and consumers of agricultural products (Horrigan et al., 2002). Against this backdrop, the demand for safer agricultural practices in the world has been increasing, and many alternative agricultural practices have developed. One of the most known alternatives to conventional farming is organic agriculture.

1.2. Organic Agriculture in the World

It is difficult to trace the roots of organic farming and attribute them to a particular country or region in the world. Encyclopedia Britannica, for example, mentions Sir Albert Howard, F.H. King, Rudolf Steiner, and others as central figures contributed to the development of organic farming in Europe in the early 1900s. Early organic practices used animal manures (often made into compost), cover crops, crop rotation, and biologically based pest controls (Adamchak).

The demand for organic food increased considerably in the 1960s following the publication of Silent Spring by Rachel Carson, a book shedding light on the negative environmental impacts of insecticides. According to the report by the Research Institute of Organic Agriculture (FiBL) in 2019, both the size of the farming area under organic agriculture and the number of organic farmers in the world keeps on increasing. The number of organic producers globally grew by 5% in 2017 (FiBL, 2019).

In Japan in the late 1990s, the government undertook attempts to promote environmentally friendly agriculture (*kankyō hozen gata nōgyō)*, which includes organic farming. The goal of this initiative is to alleviate the negative impacts of conventional agriculture. Chapter 2 of this thesis provides a more detailed overview of Japanese initiatives.

According to annual statistics report on organic agriculture in the world by FiBL and IFOAM, 1.4% of the farming land in the world is currently under organic agriculture. Oceania and EU countries demonstrate the highest share of organic agriculture. Organic farming area size growth is the fastest in Australia, China, Argentina, Russia, and India. When analyzed by the number of organic producers, the highest increase in the numbers of organic producers was reported in India, Uganda, and Mexico.

Climatic and soil conditions are considered not to have a significant impact on the growth rate of organic farming because many countries produce organically the crops that historically have been grown in those areas. An increase in consumer demands and global market changes, on the other hand, can be crucial drivers stimulating the growth of organic farming share. For example, the most prominent organic markets are considered to be the United States (44% of the global market) and EU (37%), followed by China (7%). The African region and South America do not have a large domestic organic market yet. Nevertheless, these regions demonstrate the rapid growth of the organic sector. The reasons for such growth is that a large share of these regions products, such as coffee, olives, nuts, cocoa, and oilseeds, is exported. In the Asian region, the market for organic products in China and India is rapidly growing. Moreover, national organic standards in China have been revised, which creates a favorable environment for further development of organic farming in the region (FiBL&IFOAM, 2019).

1.3. Eco-Labels for Organic Agricultural Products

Once organic products started appearing more often on the shelves of retail stores, the demand for proper labeling of such products has increased. Existing research literature recognizes eco-labels as valuable tools for providing information to consumers about how the product was grown (Janssen and Hamm, 2012). Globally, in 1999 FAO/WHO Codex Alimentarius Commission has established the Guidelines for Production, Processing, Labelling and Marketing of Organically Produced Foods to guide farmers. Following the introduction of this guideline, many countries have introduced their national standards (e.g., EU countries, Japan, Argentina, India, Tunisia, USA).

In 2000, Japan introduced its national certification scheme for organic agriculture called

"JAS Standards for Organic Plants" (JAS Organic). The certification aims to ensure that consumers receive trustworthy information about agricultural products. Chapter 2 presents a more detailed overview of agricultural eco-labels and certifications in Japan. Major national organic standards in the world are following three central principles for the production of organic crops. The three principles include 1) no use of GMO, 2) no use of synthetic fertilizers (as a rule), 3) no use of synthetic pesticides (as a rule). Regulations usually provide a detailed list of allowed (prohibited substances). Such a list is often included in or attached to the primary law. Permitted or banned substances may vary slightly from country to country.

Shmid et al. (2011) have analyzed the requirements of IFOAM Basic Standards, Codex Alimentarius Guidelines for Organically Produced Food, EU regulations on organic production of agricultural products, JAS Organic, and US National Organic Program Rule. The authors concluded that, in general, there is a broad consensus among the standards. However, the criteria for crop inputs, additives, and processing aids for organic production requires future effort for international harmonization.

Despite minor discrepancies among the regulations, certifications in the EU, the USA, Canada, Australia, New Zealand, and Argentina are compatible with JAS Organic certification. The regulations for organic farming in the counties above are at least as strict as those in Japan. Nevertheless, the share of certified organic land in these countries remains higher than in Japan. In many EU countries, the percentage of the organic area reaches more than 10% (see Table 1). Among the farmland certified as organic, Japan has a significantly lower share of permanent grasslands used for grazing of organic livestock, which can be one of the reasons for a relatively small percentage of total organic farmland in Japan (FiBL&IFOAM, 2019).

Table 1. Summary of Main Organic National Organic Standards in the World, Share of Organic Lands, Climatic Conditions and Main Crops (based on FiBL database, created by author)

Country	Certification Scheme	Share of Certified Land (2017)	Transition period	Compatibility with JAS	Climate/Crops (2017)
Japan	JAS Organic	0.22%	2 years	n/a	**1. Climate** - temperate climate with four distinct seasons; subarctic - in the north; subtropical - in the south. **2. Crops** Arable crops - 76% (rice, vegetables, root crops); Permanent crops -14% (fruits); Permanent grassland - 9% (MAFF)
EU	EU Organic	above 10% in 8 EU countries	2 years	yes	**1. Climate** - Temperate zone with Oceanic climate in Western Europe, Mediterranean climate in southern Europe, Continental climate in central-eastern Europe. **2.Crops** Arable crops - 5.5mill. ha (cereal, oilseeds, dry pulses, root crops, vegetables); Permanent crops 1.4 mill. ha - (berries, citrus fruit, temperate fruit, grapes, nuts, olives); Permanent grassland - 5.7mill. ha
USA	USDA Organic	0.59%	3 years	yes	North America: **1. Climate** - include every climatic zone, from subarctic in Canada to tropical climate in southern Florida **2. Crops** Arable Crops - 44% (cereals) Permanent crops - 2% (temperate fruits - apples, cherries, peaches; nuts; berries) Permanent grassland - 61%
Canada	Organic production systems	1.83%	3 years	yes	
Argentina	Standards by SENASA "Producto de agricultura orgánica" label	2.28%	n/a	yes	Latin America & Caribbean: **1. Climate** - 1) Argentina - range from subantarctic to subtropical zone with 11 climate types; 2) Uruguay - temperate zone, humid subtropical climate. **2. Crops** Arable crops 6% - (cereals, vegetables, sugarcane, oilseeds, medicinal plants); Permanent crops - 12% (coffee, cocoa, tropical/subtropical fruit, coconut, olives); Permanent grassland - 61%;
Uruguay	National regulations are not fully implemented (as of 2012)	13.03%	n/a	no	
Australia	Food Standards Australia New Zealand (FSANZ) Code National Organic Mark	8.77%	1 year	yes	**1. Climate** - south-east and south-wheat have temperate climate with fertile soil; large part of the continent is desert and semi-arid. **2. Crops** - Agricultural production - 28.9mill. ha (cereals - wheat, barley, oats; fruit; grapes, vegetables); Grazing land - 27.3mill. ha (beef, diary)
Samoa	National Standards are not developed. Certified by Australian/New Zealand certification bodies	37.60%	1 year	yes	Oceania (excl. Australia): 1. Climate - 1) Samoa - tropical equatorial; 2) New Zealand - temperate zone with oceanic climate and four distinct seasons. **2. Crops** Permanent crops are important - coconut for oil production and coffee.
New Zealand	Food Standards Australia New Zealand (FSANZ) Code	0.80%	1 year	yes	

1.4. Research Objectives

The share of farming land under the JAS Organic Certification in Japan is steadily growing. Nevertheless, despite the efforts to promote organic farming and the JAS Organic certification scheme, in 2018, this share still accounted for only 0.24% (MAFF, 2019a). Although the certification scheme was established almost two decades ago, a thorough analysis of the results of the JAS Organic certification introduction is still lacking.

A large body of research literature focuses on agri-environmental schemes, including organic certification, analyzing both successful cases and barriers to the implementation of such schemes. The existing literature demonstrates that certification schemes and consumer labels only function under certain conditions and cover a small share of the market (Waldman and Kerr, 2014).

Other studies identify the direct and indirect costs of agri-environmental schemes. Direct costs refer to monetary costs, including certification fees or expenses for new equipment. Indirect costs, on the other hand, are not as easily defined, quantified and measured. Indirect costs include the time and effort necessary for the policy uptake (Falconer, 2000). They are incurred by both government agencies introducing the scheme (public costs) and by the participants in the scheme, for example, farmers (private costs) (Falconer, 2000; Weber and Nuppenau, 2010).

A large portion of existing research on such costs in agri-environmental schemes is focusing on the public costs borne by governmental authorities (Coggan et al., 2010; Falconer, 2000; McCann et al., 2005; Mettepenningen et al., 2008; Whitten and Coggan, 2016). Public costs include 1) research and analysis associated with defining the problem; 2) cost of enabling new or modifying existing legislation; 3) policy design and implementation; 4) support and

administration; 5) contracting costs; 6) monitoring; 7) prosecution or conflict resolution in case of no compliance (Coggan et al., 2010; Falconer, 2000; McCann et al., 2005; Mettepenningen et al., 2008; Whitten and Coggan, 2016).

For any policy to be effective, its benefits have to overweight the costs (McCann et al., 2005). This statement is also true for agri-environmental schemes, including certification schemes, where the number of the costs borne by a government authority or by farmers define the success of the scheme (Waldman and Kerr, 2014; Weber and Nuppenau, 2010). Organic certification schemes are associated with particularly high direct and indirect costs borne by farmers, and not addressing them can result in reduced rates of participation (Falconer, 2000; Weber and Nuppenau, 2010).

The barriers for adoption of organic farming and other agri-environmental schemes at the farm level include technical issues (lack of information about the farming technique, changes in types of equipment needed); production concerns (unstable yields especially during transition period, pest problems, inputs); marketing concerns (availability of buyers and market, product price); scheme information (time spent learning about the rules, filling out applications, cultivation plans, and reports) (Constance and Choi, 2010; Falconer, 2000; MacInnis, 2004; Wätzold et al., 2006). Unbalanced direct and indirect costs borne by farmers and failure to address them can influence participation rates in the scheme. Therefore, it is essential to identify the factors that may reduce such costs and design the policy accordingly.

Existing research on agri-environmental schemes identifies several types of factors that influence both direct financial costs and indirect costs placed on farmers (Coggan et al., 2014; Dupraz et al., 2002; Ebeling and Yasue, 2009; Falconer, 2000; Rahayu et al., 2005; Waldman and Kerr, 2014; Wätzold et al., 2006). For example, there have been several attempts to measure

and quantify indirect costs to further integrate the results into the policy and reflect such quantified indirect costs into the payments and subsidies.

A study on water quality improvement programs for Australia's Great Barrier Reef has estimated that the average total indirect cost per farm of participating in the program was AU$8389 or 38% of provided funding (Coggan et al., 2014). Another case study from Germany quantified compensation costs necessary to encourage farmers to participate in butterfly-friendly mowing schemes, and the compensation for indirect costs was estimated at around 100€/ha per year (Wätzold et al., 2006).

The existing studies on various agri-environmental schemes, including GLOBALG.A.P. certification, comment on the farm scale, mentioning the disadvantaged position of small-scale farmers explaining that such farmers often do not have enough financial base and labor force to absorb direct financial costs and bear administrative costs of related paperwork (Dupraz et al., 2002; Falconer, 2000; Waldman and Kerr, 2014; Wätzold et al., 2006). Therefore, adequately calculated compensations and support policy measures targeting disadvantaged categories of farmers can be a key to reducing private indirect costs and increasing the rate of organic certification adoption.

The availability of information is another factor influencing private indirect costs. Necessary information includes the introduction of certification requirements and potential benefits, farming techniques, and information on how to access the relevant markets (Ebeling and Yasue, 2009; Rahayu et al., 2005). The information cost may be particularly high for first-time participants (Dupraz et al., 2002). The existing literature mentions that the social connectedness of a farmer is associated with higher rates of certification adoption. For example, connections with exporters or being a member of a farmers' association may positively impact

the decision to participate in G.A.P standard scheme for mongo growers in Peru and raspberry growers in Chile (Coggan et al., 2014; Handschuch et al., 2013; Lemeilleur, 2013).

Furthermore, farmers' attitudes and perceptions of the agri-environmental schemes also influence their decision to participate in the scheme (Coggan et al., 2014; Falconer, 2000). For example, farmers with a higher level of environmental concerns are more likely to adopt organic farming and less likely to exit it (Lapple, 2010).

Against this backdrop, the ultimate objective of this research is to identify the factors that influence the adoption rate of JAS Organic certification in Japan. The analysis is two-fold. The first part is focusing on the review of the policy for the promotion of JAS Organic certification. In Japan, prefectures establish the policy for JAS Organic certification promotion. Therefore, a policy review was conducted on the prefectural level. The results were compared with JAS Organic concentration rates by prefecture. Further, individual level (or farm-level) characteristics were analyzed, including farm scale, information access, and perceptions of participants towards the scheme. In line with the research objective, the three following research questions were established:

1) Are there any prefectural differences in concentration rates of certified JAS Organic farmers and farming lands? Is there any connection between these differences and the content of the prefectural promotion policies?

2) What are the possible factors influencing the adoption of JAS Organic certification on the individual level?

3) How can an understanding of prefectural differences and individual-level factors be integrated into the current policy to promote JAS Organic further?

The hypothesis is that the differences in prefectural policies (identified through Research

Questions 1) and individual-level factors (Research Question 2) influence the adoption of JAS Organic certification. Therefore, they are collectively referred to them as determinants in this research. The results of Research Question 1 and 2 inform the discussion for Research Question 3. This discussion helps to specify the type of producers and areas that should be targeted by organic farming promotion policies to facilitate further adoption of JAS Organic certification.

1.5. Research Framework and Thesis Structure

The thesis consists of six chapters. Chapter 2 follows Introduction (Chapter 1) and provides an overview of the types of alternative agriculture and eco-friendly certifications in Japan. For this research, a literature review was conducted. The results are presented in the "Previous Studies" section of Chapter 3 and Chapter 4. Chapter 3 addresses the first research question by analyzing geographic distribution and concentration of JAS Organic certified

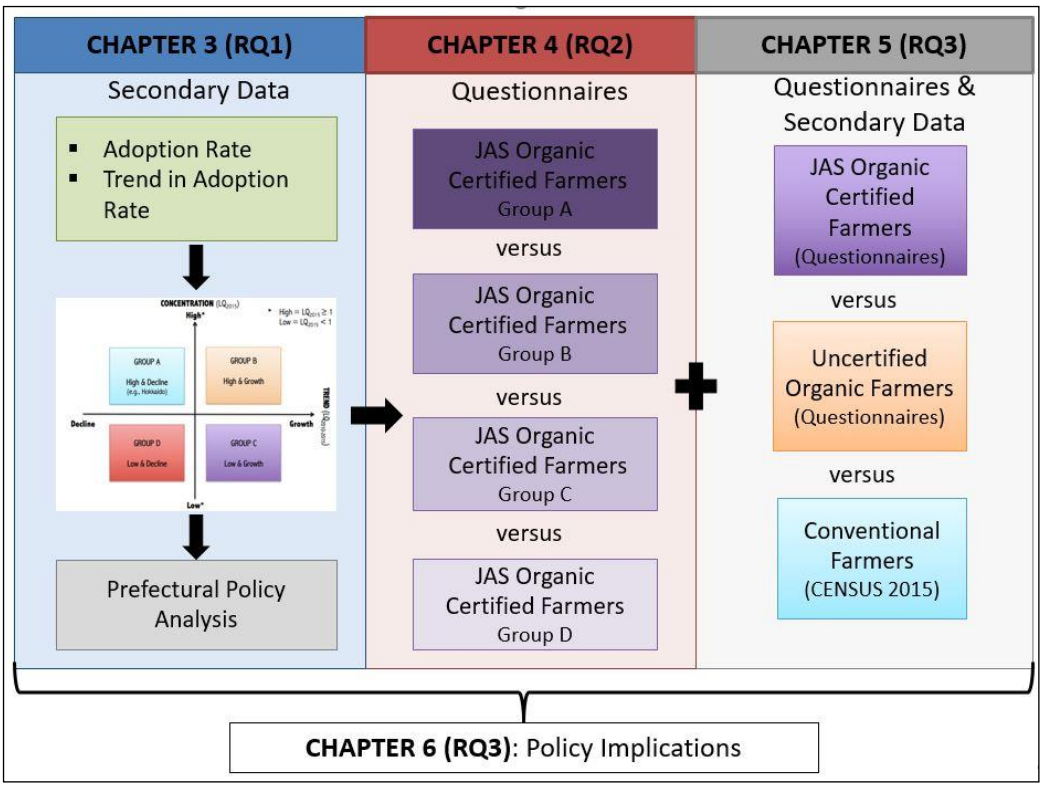


Figure 1. Research Framework

farmers and farming lands in 2010-2015 as well as reviewing prefectural promotion policy.

For this purpose, a methodology called Location Quotient (LQ) was utilized for calculating the concentration of certified organic farmers and farming areas in each prefecture. The calculations used the data by the Ministry of Agriculture, Forestry, and Fishery (MAFF) on 1) the number of certified JAS Organic farmers, 2) certified farming areas size, 3) the number of commercial farmers, 4) farming area size under the crop for sale. Further, the calculation results were mapped with ArcGIS. A prefectural typology was created to inform further policy review.

Chapter 4 is addressing the second and third research questions by summarizing the characteristics of JAS Organic farmers based on the information collected through the questionnaire survey. The results of questionnaires were analyzed using the prefectural typology developed in Chapter 3. The analysis is enhanced by comparing the questionnaire results of JAS Organic respondents with the relevant data on conventional farmers.

Chapter 5 is adding another layer of analysis by comparing the questionnaire results of JAS Organic certified with their uncertified counterparts. The findings of this comparison demonstrate that the decision-making process for obtaining JAS Organic certification can be separated into two steps. The two steps include the decision to practice organic farming and the decision to obtain JAS Organic certification.

Further, we conducted interviews with MAFF officials, certification centers, and JAS Organic certified farmers to enhance research findings. The meeting with MAFF officials from the Sustainable Agriculture Division of Agricultural Production Bureau and Food Manufacture Affairs Division (Standards and Conformity Assessment Policy Office) of Food Industry Affairs Bureau was held on July 24, 2019. The comments received during the interview were reflected

in the final discussion. The results of the interviews with four certification centers and JAS certified farmers from Saitama prefecture were collected in September-October 2019. The comments received from stakeholders are summarized in the discussion part of Chapters 2 to 5, respectively. Chapter 6 summarizes the main findings of the research, outlines policy recommendations, and suggests future research themes.

CHAPTER 2. ALTERNATIVE AGRICULTURE AND EC0-LABELS FOR AGRICULTURAL PRODUCTS IN JAPAN

2.1. Conventional versus Alternative Agriculture Paradigm

Beus and Dunlap underpinned the discussion on conventional versus alternative agricultural paradigm in 1990. Conventional agriculture, also referred to as modern, industrial, or intensive, is characterized by large-scale single crop production depending on the input of synthetic fertilizers and pesticides (Beus and Dunlap, 1990). Conventional agriculture, whose main aim is to maximize production, is currently prevalent in the world. Negative consequences of such an approach include environmental impacts such as soil degradation, groundwater pollution, and GHGs emissions. Along with environmental problems, the use of chemical pesticides and fertilizers in conventional agriculture may cause problems to human health, for both producers and consumers. Organic farming is often mentioned as an example of an agricultural practice alternative to conventional agriculture. However, organic farming is not the only type of agriculture that has the potential to alleviate the negative impacts of conventional agriculture on the natural environment and human health. In this chapter, these practices collectively referred to as alternative agriculture or eco-friendly agriculture. The state of such practices in Japan is investigated. The focus of this chapter is on agricultural practices and products. Animal husbandry and livestock products related data are not included in this analysis.

2.2. Alternative Agriculture and Relevant Legislation in Japan

To alleviate the negative impacts of conventional agriculture, the Japanese Government has undertaken attempts to promote alternative agriculture. The government introduced laws, guidelines, and certification schemes for the promotion of alternative agriculture in the late

1990s and early 2000s. The relevant regulations and documentation often use an umbrella term *kankyou hozengata nougyou* in Japanese, which is translated here as environmentally friendly agriculture.

The importance of considering environmental aspects during agricultural production was introduced in the Food, Agriculture and Rural Basic Act of 1999 and later elaborated in Environmental Norms for Agricultural Activities of 2005. Further, laws and guidelines were issued to introduce certification schemes and eco-labels to promote various types of alternative agriculture. Currently, there are three national-level certification schemes: JAS (Japanese Agricultural Standard) Organic, Eco-farmers certification, and Specially Cultivated Products certification. Certification schemes and eco-labels are known to be an effective instrument for providing information to consumers. Thus, such schemes have the potential to contribute to the protection of the environment, biodiversity, and help to promote local products (McCluskey and Loureiro, 2003). Therefore the focus of this chapter is on three certification schemes introduced by the Japanese government.

2.3. National Certification Schemes for Alternative Agriculture in Japan

The objective of the chapter is to explore national schemes for alternative agriculture certifications, namely JAS Organic, Eco-farmers certification, and Specially Cultivated Agricultural Products certification. Historical background, related legislation, level of penetration, and level of recognition by consumers was reviewed, identifying obstacles towards further dispersion of each certification scheme.

The review of three national certification schemes for alternative agriculture used secondary data. Research articles, book chapters, and government-issued documents and statistical databases served as a primary source of information.

Table 2. Primary Legislation for Alternative Agriculture in Japan

Year	Act/Law/Guideline
1999	Food, Agriculture and Rural Basic Act Law for Promoting the Introduction of Sustainable Agricultural Practices (Eco-farmers certification)
2000	JAS Organic Standard
2001	Specially Cultivated Agricultural Products Guideline
2005	Environmental Norms for Agricultural Activities
2006	Act on Promotion of Organic Agriculture Basic Policy for Promotion of Organic Farming
2011	Direct Support Measures for Alternative Agriculture
2014	Amendment of Basic Policy for Promotion of Organic Farming
2015	Basic Plan for Food, Agriculture and Rural Areas

2.3.1. Historical Background

The application of synthetic chemicals in agriculture has sharply increased after World War Two, which brought benefits of less labor demand and higher yields. On the other hand, the cases of farmers' poisoning by the chemicals also became widespread (Nishigaki et al., 2002). It was during and soon after the period of Rapid Economic Growth (1955-1961), when industrial pollution was proved to cause harm to human health (e.g., Minamata disease and Itai-Itai disease). As a result, public concerns towards the use of chemicals and environmental issues linked to chemical use started to grow. Although different types of alternative agriculture, such as natural farming, were developed by Mokichi Okada and Masanobu Fukuoka as early as the 1930-1940s (Kristiansen et al., 2006), it was not until the 1970s that a robust social movement to support alternative agriculture was formed.

During the period of rapid economic growth in Japan, environmental degradation and pollution started to harm human health, including, for example, Minamata disease or Itai-Itai disease. As a result, the public concern over environmental issues began to grow. Environmental movements addressing the lifestyle and consumption also began to emerge, for example, green consumerism and the organic farming movement. The organic farming movement in Japan appeared in the 1960s. The main concerns of the organic movement at that point included environmental degradation and health risks caused by the use of synthetic pesticides and chemical fertilizers in conventional agriculture (Funato, 2010). The Japan Organic Agriculture Association (JOAA) recognized the necessity of spreading awareness about food safety and eating habits among urban consumers (Minamida, 1995) and led the movement. In 1978, JOAA introduced the document 'Ten Principles of Co-partnership". Later this document evolved into the so-called TEIKEI (Minamida, 1995). TEIKEI is an alternative distribution system of agricultural products directly from a farmer to a consumer based on mutual understanding. The movement also was able to influence the policy and contributed to the shift to more sustainable agriculture, which led to the future introduction of a labeling scheme. Sections 2.3.2~2.3.4 discuss the three national labeling schemes in detail.

2.3.2. JAS Organic Certification

- *JAS Organic History and Requirements*

The first law addressing the organic agriculture labeling system was introduced in 2000 and referred to as JAS (Japanese Agricultural Standard) Organic ("JAS Yuki" in Japanese). Currently, JAS organic certification includes four types: organic plants, processed food (e.g., drinks, spices, flour, etc.), feed, and organic livestock products. The exclusion of organic livestock products from the scope of this research helps to make a comparison with other

agricultural certification types. Although the law is formulated at the national level, prefectural governments and municipal governments are in charge of establishing an organic farming promotion strategy and plan in their areas.

The Japanese Agricultural Standard for Organic plants summarizes the requirements for receiving certification. The requirements include a list of prohibited substances, such as different types of chemical pesticides and fertilizers. These substances are not allowed on the farm for at least two years before sowing or planting as well as during production. Also, the rules do not allow the use of DNA products and encourage the use of compost. Moreover, the standard requires necessary measures to prevent prohibited substances from drifting or flowing to the farm. The farmers have to comply with the rules below throughout all the production-related processes:

1) Regulations regarding cultivation sites, collection area, seeds or seedlings to be used in fields, fungus spawn, manuring practice in fields;
2) Cultivation management in cultivation sites;
3) Control of noxious animals and plants in the farming fields or cultivation sites;
4) General management;
5) Management of harvest, transportation, selection, processing, cleaning, storage, packaging, and other post-harvest processes.

– *Certification Process and Certification Centers*

The producers have to apply to private certification centers authorized by MAFF to receive a certification (see Figure 3). There were 55 registered certification centers within Japan as of July 2016. Sixteen certification centers among them certify producers from overseas along with domestic farmers. Most of the centers offer certifications for all three types of JAS Organic certifications. A few certification centers specialize in organic livestock products

Figure 2. Map of Certification Centers. (Based on the Certification Center List provided by MAFF. Created by Author)

certification. In 2019, the number of certification centers carrying out the certification for Organic Plants and Products was 51 (MAFF HPa). Figure 2 represents the map of these certification centers.

The certification centers are not evenly distributed across the country. For example, eleven out of 51 certification centers are concentrated in Tokyo. Hokkaido has four certification centers, but all of them are located in Sapporo city. There are three certification centers in Kanagawa prefecture. Yamagata, Gunma, Hyogo, and Shimane prefectures have two certification centers each. Moreover, activities of certification centers are not restricted by prefectural boundaries, which means that producers from a prefecture with no certification center of its own (fifteen prefectures do not have a certification center) can apply for the certification in a neighboring prefecture. Most of the certification centers can be classified as NPOs or public companies.

Once a producer has completed the certification process, they are allowed to use the JAS Organic label (see Table 4) on their products. Each certification center has a number, which is mentioned on the label. A unit of certification is a farm field, not crop type, which means that one certification can cover several crop types harvested from the same field.

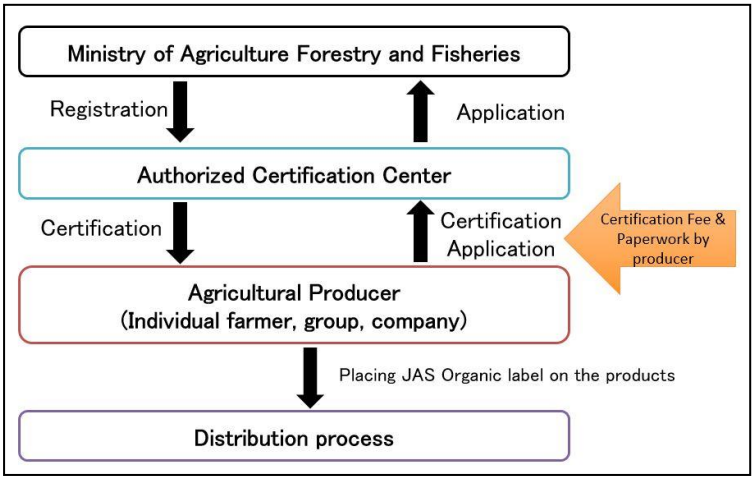


Figure 3. Summary of JAS Organic Certification Process. Adopted from MAFF.

The producers pay certification fees at the moment of initial first-time certification and then again annually to renew the certification. The certification fees are a sum of the application fees, inspection fees, inspector's travel, and accommodation expenses. Certification fees and inspection fees slightly differ for each certification center and depend on the type of applicant (individual or incorporated entity/group), size of the farm area to be inspected, and the number of members for an incorporated entity or a group of farmers.

For example, according to a price list published in 2017 on the website of Organic Certification Center located in Kobe city, the fees combine application fees and inspection fees for an individual farmer with a farmland 0.5~1.0ha can be as high as 55,000JPY without tax. For an incorporated entity with a farmland 1.0~1.5 ha, the same category of fees can reach 93,000JPY without tax. Also, the applicants are charged actual traveling expenses of inspectors and accommodation expenses up to 10,000JPY per night (Organic Certification Center HP, 2017).

Interviews with four certification centers in Tokyo have been conducted in October of 2019 to collect more details regarding the duties of certification centers, certification fees, and types of producers applying for JAS Organic certification. The location of interviewed certification centers was not considered to be an essential factor when choosing interviewees since the activity of most certification centers is not limited by administrative (e.g., prefectural) boundaries. Three of the four certification centers chosen provide certification services to producers all over the country.

For the interviews, the certification centers with relatively high numbers of certified entities were selected. Additionally, the variety in the organization type of the certification center (NPO or a company), the approximate amount of certification fees, and kind of certified entities (individual or incorporated; processing companies or importers) was considered when

selecting interviewees. General information about the interviewed certification centers is summarized in Table 3.

The findings indicate that certification centers vary in their scale, coverage area, and approach on whether they include certifications other than JAS Organic into their certification activities. Differences in the type and share of certified producers (e.g., individual farmers or companies; crop growers or processing/importing companies; domestic producers or from overseas). Such differences may reflect the differences in the certification fees as well as the overall philosophy and position of the certification centers regarding organic farming. For example, Certification Center 3 was functioning as an NPO and was started by the members of Japan Organic Agriculture, who initially were against the new law on JAS Organic certification, but still decided to support those farmers who choose to obtain the certification. Certification Center 3 (see Table 3) does not certify producers from overseas and does not certify for any other certifications with requirements less strict than JAS Organic (e.g., Tokubetsu Saibai). The reason is that, in their opinion, this would contradict their primary purpose and philosophy regarding the promotion of organic agriculture in Japan and supporting local producers.

On the other hand, certification fees of Certification Center 4 (see Table 3) are relatively high. The main target group of Center 4 consists of big companies, such as the largest producers of soy sauce or ketchup. There are no particular guidelines or rules by MAFF regarding certification fees. Therefore, certification centers are free to decide the fees on their own. For example, the head of Certification Center 1 (see Table 3) has mentioned that their approach to setting certification fees is to make sure that it does not increase 1% of the yearly profit of applying producer.

During the interviews, the certification center officials explained the details of the application process. It became clear that it takes, on average 2~2.5 months to complete the

application process and receive permission to label their products with JAS Organic label. Preparation of the necessary documentation and records by the producers takes up the most time during the application process. Such documentation includes, for example, creating the manual of the organic cultivation process at the farm of the applicant. Farmers themselves work directly on the paperwork without any help or support from local municipalities.

Table 3. Summary of the Interview Findings with four Certification Centers in the Tokyo area.

	Certification Center 1	**Certification Center 2**	**Certification Center 3**	**Certification Center 4**
Location	Tokyo, Minato Ward	Tokyo, Chuo Ward	Tokyo, Toshima Ward	Tokyo, Minato Ward
Establishment Date	2000	1993	2000	2000
Type	Limited liability Company (KK)	NPO	NPO	Limited liability Company (KK)
Number of certified producers (domestic) *excluding processed food and importing companies	Approx. 50 as of 2019 (mix of individual and incorporated farms)	Approx. 120 as of 2019 (mix of individual and incorporated farms)	Approx. 90 as of 2019 (mostly individual farmers)	Approx. 6 as of 2019 (mostly large scale companies) The rest (more than a 100) is processing companies, and companies importing organic goods
Coverage	Domestic Overseas	Domestic Overseas	Domestic only (25 prefectures)	Domestic Overseas
Approximate Fee for Producers (excluding inspector transpotation and accomodation fees) for the first year	109,200JPY~ (per household, cheaper if applying as a group)	220,000JPY~ (170,000JPY~ from the second year on)	64,000~140,000JPY (based on the area size)	270,000JPY~
Training Session Location	Tokyo Other location upon reguest (4 people up)	Tokyo, Osaka, Shizuoka pref., Kumamoto pref.	Tokyo, Yamagata pref., Shizuoka pref., Nagano pref., Kyoto	Tokyo Other location upon reguest
Inspectors Location	Tokyo	Tokyo, Kinki area	Tokyo, Kyoto, Shizuoka pref., Miyagi pref., Niigata pref., Nagano pref.	Tokyo and Kansai area
Certifications other than JAS	Tokubetsu saibai, original certification for golf-courses	Original Certification for organic cosmetics, sake, honey, marine products etc.	JAS Organic only	Original Certification for organic cosmetics, organic cotton, glof-courses etc.
Comment	Started as a consulting company for organic produce distribution and logistics	Started with original certification based on IFOAM Guidelines	Started by the memebers of Japanese organic movement	Local branch of a French company

- *JAS Organic Adoption trend and Uncertified Organic Farmers*

Despite the efforts to promote JAS organic certifications, the number of certified households has been on the decline since 2012. Nevertheless, the size of the farming area keeps

on increasing steadily (see Figure 4). Such an increase implies that the size of the farming area per certified household is growing, and once certified farming households can be converting and certifying more areas.

In 2016, a number of farming households certified as JAS Organic reached 3660 households. At the same time, the number of farmers practicing organic agriculture without obtaining JAS Organic certification is double of that – around 8000 households (MAFF, 2016a). Uncertified producers are not allowed to place the word "organic" on their products, which can negatively influence their sales. One of the hypotheses of this study is that the availability of a certification center close by can be one of the critical factors influencing farmers' decision to obtain certification. Moreover, high certification fees can be a bottleneck for small-scale farmers, as mention in the existing literature (Falconer, 2000; Weber and Nuppenau, 2010).

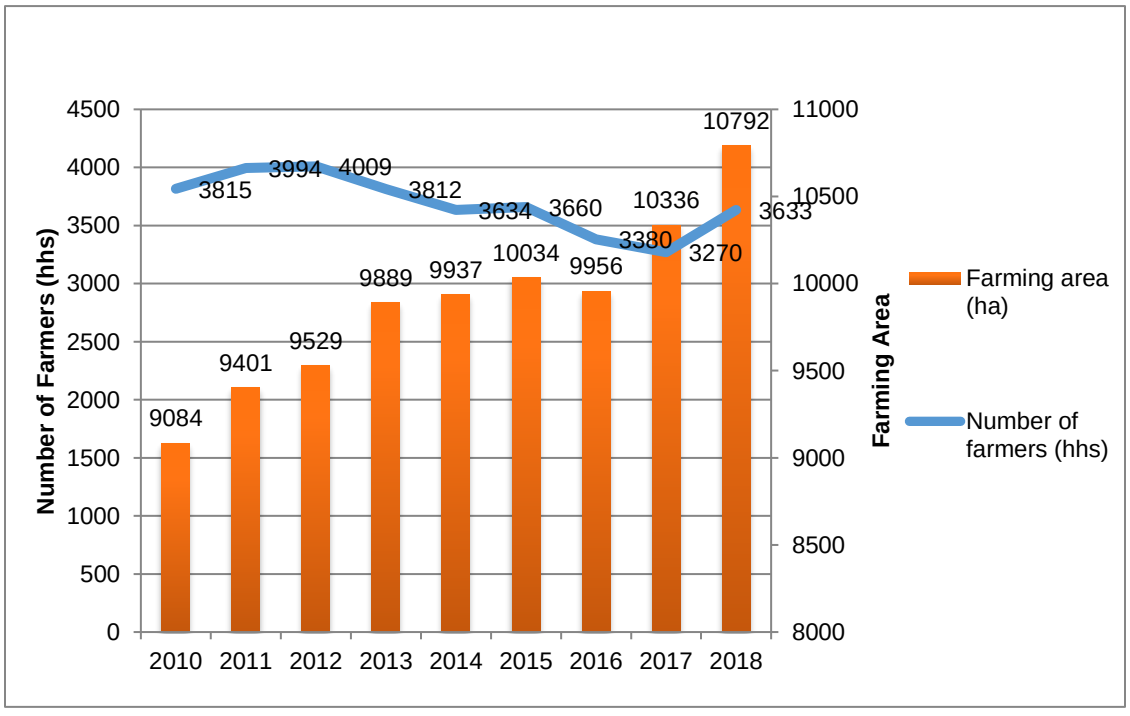


Figure 4. Number of farming households and farming area size for JAS Organic (2010-2018). Based on data from MAFF.

- *Consumers' Awareness of the Label*

According to the consumers' survey conducted by JOAA, more than 90% are familiar with the term 'organic farming.' However, 54% of respondents did not know about the JAS Organic label placed on the products (see Table 4), and only 5% were aware of the details of the JAS Organic certification process (JOAA, 2011). A survey conducted by MAFF in 2017 demonstrated that 18% of respondents were regularly buying organic products, and 65% were willing to start buying organic products in the future (MAFF, 2019b). Such responses indicate that there are substantial interest and demand from the consumer side.

A follow-up consumer survey was conducted again later and identified that 18% of respondents buy or eat organic products at least once a week or more often. Most of the respondents purchased organic vegetables (63%), followed by organic rice (49%). The absolute majority of respondents reported buying organic products in the supermarkets (88%), followed by direct selling shops – *chokubaijo* (35%) and Consumers' Co-operative (CO-OP) distribution system (34%), (MAFF, 2019b).

- *Policy for Promotion of JAS Organic Farming*

As mentioned earlier in this chapter (see Table 2), an Act on Promotion of Organic Agriculture and Basic Policy for Promotion of Organic Farming was established in 2006. In 2014, the Basic Policy for Promotion of Organic Farming was amended. The amended policy announced the following numeric targets for 2018:

1) Increase the share of the farmland under organic farming from 0.4% to 1% (this target includes both certified and uncertified organic areas);
2) Increase consumers' awareness about organic agriculture reaching at least 50% of consumers familiar with organic farming;

3) Establish a governance system for the promotion of organic agriculture on the municipal level for at least 50% of municipalities;

Basic Policy for Promotion of Organic Farming has not been updated since 2014. At the moment, it is difficult to conclude whether these targets have been reached. However, the data about the areas under organic farming collected and published by MAFF demonstrates that in 2017 has accounted for 0.5% (around 23,000ha) of all farming areas in Japan (MAFF, 2019a). These results imply that reaching the target within the announced period is highly unlikely. Moreover, MAFF officials interviewed for this study in July 2019 mentioned that there was no update to these targets, and discussion for the future amendment of the Basic Promotion Policy is currently underway.

Additionally, according to Article 7 of the Basic Policy for Promotion of Organic Farming, each prefecture has to establish its Plan for Promotion of Organic Farming. The Policy does not provide strict requirements regarding the content of prefectural Promotion Plans. Such flexibility allows for relative freedom in formulating such plans. A brief review of prefectural promotion plans has revealed that there is a wide variety in how prefectures approach the target setting of organic farming. Also, prefectural plans do not necessarily mention JAS Organic certification and often refer to organic agriculture in a broad sense, including uncertified farmers.

Moreover, the date of the plan establishment and amendment is different across prefectures. Such variety in structure, approach, and time of the establishment of prefectural Promotion Plans gives reasons for a hypothesis that the JAS Organic adoption rate can vary significantly from prefecture to prefecture. Chapter 3 summarizes a detailed analysis of the geographic distribution of certified JAS Organic farmers and farming lands, checking this

hypothesis. Additionally, the same chapter presents a more detailed analysis of prefectural Plans for the Promotion of Organic Farming.

2.3.3. Eco-farmers Certification

Eco-farmers certification was established in 1999 with the enacting of the Law for Promoting the Introduction of Sustainable Agricultural Practices. This certification scheme is encouraging producers to decrease the use of chemical pesticides and synthetic fertilizers on farms and promote the use of compost. To receive certification, the applicant has to submit a 5-year plan for reducing the input of chemicals. Unlike JAS Organic, agricultural producers obtain eco-farmers certification for each crop type, but not for a whole farm field. Prefectural governments often take charge of the certification process, and the governor approves the applications.

The certification is valid for five years. Produces have to renew the certification every five years. The average age of farmers rising (66.4 years old in 2015) and the share of farmers over 65 years old growing reaching 63.5% (MAFF, 2015). Aging is often the case that once certified farmers do not renew the certification after five years since their retirement is approaching.

After the farmers complete the certification process, they can place the eco-farmers label (see Table 4) on their products. The label design used to be universal for all prefectures until 2011. After that, only 11 of 47 prefectures have continued to use the same label. The rest of the prefectures have designed their own original label. Although unique label design promotes the local prefectural brand, lack of universal label design can also harm the level of recognition of the label by consumers. According to a survey conducted in 2005, only 42% of the consumers who demonstrated their interest in purchasing alternative agricultural products replied that they were familiar with the eco-farmers label (Mibu and Okubo, 2005).

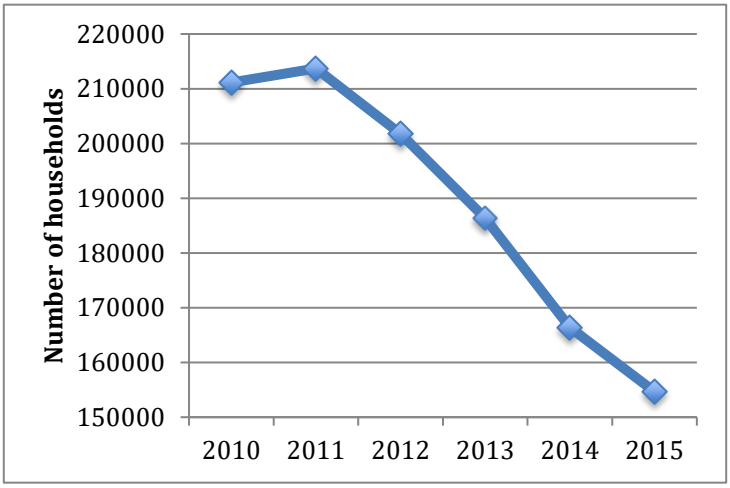


Figure 5. Number of Certified Eco-farmers (2010-2015). Based on data from MAFF.

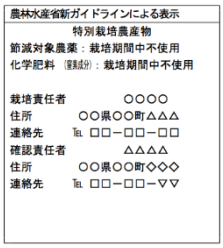
The number of issued eco-farmers certification increased sharply from 19 in 1999 and peaked in 2011, reaching 216,341. It has, however, then fallen to 154,669 in 2015 (MAFF HPb). One of the reasons is that the financial return is not balanced with the cost of transition and labor demand (MAFF, 2015). To reduce such costs, it was made possible for eco-farmers to receive support in the form of Direct Payments. The return period for the loans granted for the improvement of agricultural practices has also been extended.

2.3.4. Specially Cultivated Agricultural Products Certification

In terms of requirements towards the producers, Specially Cultivated Agricultural Products (*Tokubetsu Saibai Nousanbutsu* in Japanese) scheme lies in between JAS Organic and eco-farmers certifications. The guideline establishing the rules for the proper labeling of such products was introduced in 2001 and then amended in 2003. To use the label, the producers have to reduce the use of chemical fertilizers (by amount) and pesticides (by frequency) by 50% compared to the conventional level of the region.

Similar to eco-farmers, the design of the label varies in each prefecture, which potentially decreases the level of its recognition by the consumers. Mibu and Okubo (2005) argue that in comparison with JAS Organic, Specially Cultivated Agricultural product labels lack credibility, and thus, the market price of such products is less than those of JAS Organic. The inability to sell the products at a higher price again creates a situation in which the number of certified farmers becomes stagnant (around 45,000 households in 2015), as the financial benefits do not fully cover the cost of transition (MAFF, 2015).

Table 4. Alternative Agriculture Labels and Certification Requirements.

Certification title/ number of certified farmers (2016)	Label	Certification Requirements	Certificating authority
JAS Organic (3660 households)		No chemical fertilizers and pesticides No GMOs Use of compost	Authorized private certification centers (certified by field)
Specially Cultivated Agricultural Products (45000 households)	 *Design can be changed by each prefecture	50% decrease in the use of chemical fertilizers (by amount) and pesticides (by frequency) based on the conventional level of each prefecture	Authorized private certification centers (certified by crop type)
Eco-farmers (154669 households)	 *Design can be changed by each prefecture	Submission of a 5-year plan for the reduction of chemical fertilizers and pesticides use, and use of compost	Prefectural Governor (certified by crop type)

2.4. Discussion and Additional Findings from the Interviews with Stakeholders. Interview

After the introduction of alternative agriculture certification schemes in the late 1990s early 2000s, the number of farming households certified under each scheme increased sharply during the first years. However, in 2011-2012 after reaching a tipping point, both the number

of eco-farmers and JAS organic farmers started to decline. The number of households certified under the Specially Cultivated Agricultural products scheme is also stagnant lately.

The high cost of the transition and insufficient financial return, as well as aging and shrinking of the farming population, are among the factors that are hindering further dispersion of alternative agriculture certifications among farmers. The recognition level of the labels among consumers is low, and simplification of the current system can help in improving consumers' awareness and increase their willingness to purchase such products.

In the interviews, the certification centers' officials mentioned that although there were a certain number of new applicants for JAS Organic every year, the total number of certified farmers does not grow. The reason is that a lot of farmers are quitting the certification every year. Thus, the overall increase is only very slight if present at all. Among potential reasons for producers to quit certification are old age, the burden of paperwork, and imbalance between the costs of the certification (both direct and indirect) with the profit it brings. The situation is complicated with the limited demand for organic products due to low awareness levels of consumers.

CHAPTER 3. ANALYSIS OF GEOGRAPHIC DISTRIBUTION OF JAS ORGANIC FARMING IN JAPAN

3.1. Introduction

To track the progress of JAS Organic certification adoption, MAFF and certification centers regularly collect the information about certified organic farmers. For example, MAFF collects statistical data on the number of JAS Organic certified farmers and farming area size by prefecture. Moreover, in recent years an effort is made to compile a list of farmers and farming units that are holding JAS Organic certification. The list includes the names and addresses of the certification holders (individual farmers and farming units, such as companies or farming unions).

Using this data, we can analyze how the number of certified farmers and farming area size has been changing in the years since the certification introduction. For example, by looking at the available data, one can say that the number of "JAS Organic" farmers has peaked in 2012, farming area – in 2015, and since then has been decreasing slowly (see Figure 4). MAFF organizes the by prefecture, which allows identifying the prefectures with the highest numbers of certified organic farmers and the largest farming area size under the JAS Organic certification. Table 5 demonstrates that the number of organic farmers and farming area size does not necessarily correlate, at least, not in the top ten prefectures for each parameter.

At the same time, the raw data does not provide a representative picture regarding the degree of organic farming penetration in each prefecture and does not allow for a comprehensive comparison. Moreover, each prefecture has a different level of urbanization and different share of the rural regions. Thus, a comparison of raw data for the number of farmers

Table 5. Top 10 Prefectures for the Number of Organic Farmers and Organic Farming Area

Organic farmers (hhd)		Organic Area (ha)	
Hokkaido	299	Hokkaido	2502,01
Kumamoto	207	Akita	628,27
Niigata	194	Kumamoto	628.20
Kagoshima	181	Kagoshima	458,72
Yamagata	165	Chiba	443,26
Chiba	156	Aomori	349,76
Okayama	141	Miyagi	339,35
Fukushima	130	Miyazaki	310,12
Shizuoka	129	Niigata	308,62
Ibaraki	123	Yamagata	280,66

or farming area size would not present accurate results and would not provide insights on which prefecture is more advanced in terms of JAS Organic certification adoption. This study attempted to overcome these limitations by employing a methodology called Location Quotient, which helps to analyze the concentration of organic agriculture in each prefecture and allow a more accurate comparison between different areas.

The following sections of this chapter are summarizing previous studies on the spatial distribution of organic farming in different countries and explaining the methodology, and the data sets used. The Results section consists of four parts:

1) Introducing the results for the concentration of organic farming in 2015. The calculations were conducted for the concentration by two parameters – the number of farmers and area size;

2) Introducing the results of calculations of organic farming growth from 2010 to 2015;

3) Presenting a typology of prefectures based on results from 1) and 2);

4) Discussing prefecture-level policies for organic farming and linking their content with the results of geographic distribution analysis.

The calculations were conducted on the prefectural level. A section discussing the limitations of this approach concludes this chapter.

3.2. Previous Studies

To the best of the author's knowledge, only a limited number of studies analyzing the spatial distribution of JAS Organic certified farmers in Japan are available so far. The data on JAS Organic is still minimal. Therefore, researches made attempts to analyze the spatial distribution of farmers practicing other types of eco-friendly agriculture (*kankyou hozen gata nougyou*). Such analysis often used the agricultural CENSUS2000 data, which included questions on low-input agriculture practices into the questionnaire sheet.

In his study analyzing agricultural CENSUS2000 data, Fujie T. (2002) concludes that the municipalities with the most number of farmers practicing eco-friendly or low-input agriculture (categorized in four groups depending on the amount of chemical pesticides and fertilizers used) are located in low upland rural areas. Another study based on CENSUS2000 has narrowed down the subject of the research by focusing only on those farmers not using chemical pesticides and fertilizers and referring to them as organic. The study has found that pattern for the geographic distribution of organic farmers is different from those of eco-friendly (or low-input) agriculture. The municipalities where organic farming is practiced are located in mountainous areas, or on several islands. The number of urbanized municipalities with organic agriculture was found to be limited (Kohmoto, 2004). Later, the same author analyzed the geographic distribution of JAS Organic certified farmers. He suggested a typology composed of seven groups based on the landscape and crop produced (e.g., "urban-vegetable," "low-upland – green tea") (Kohmoto, 2014).

In the three domestic studies mentioned above, the analysis is conducted on the municipal level, which provides valuable insights into the types of areas where organic farming is practiced. At the same time, these studies does not explain the level of JAS Organic certification adoption in each area, which makes it impossible to evaluate relative levels of JAS Organic adoption. Such comparative analysis is necessary as it would provide grounds for further discussion on the success of the JAS Organic certification scheme in different areas.

Studies from Europe, on the other hand, are focusing on the concentration of organic farmers. They make a comparison between different areas trying to reveal critical drivers associated with high concentration rates. In studies from England, the geographic distribution of organic farmers is organized on the county-level and analyzed for five years. The findings suggest that the type of products, type of farming enterprise, and availability of a distribution channel influences the concentration rates (Ilbery et al., 1999; Ilbery and Maye, 2011). A study from Denmark conducts a similar type of analysis for Danish organic farmers on a county and parish level. The study concludes that regional specialization of the agriculture and favorable policy play a vital role in organic farming dispersion (Frederiksen and Langer, 2004).

This research attempts to apply research methods used in the above European studies to explore the situation in Japan. The research design allows calculating the concentration rate of organic farmers and organic farming area size for each prefecture. Further, a comparison between the prefectures is conducted. The analysis on the prefectural level is crucial since the policy for the promotion of organic farming is established and implemented on the prefectural level.

3.3. Data Sets and Analysis Method

- ***Methodology***

For the analysis, a methodology called 'Location Quotient' is borrowed from the European studies cited in the previous section. Location quotient (hereinafter, referred to as LQ) is a valuable way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. The formula below is used to perform calculations.

$$LQ = \frac{Norg(x) / Nall(x)}{Norg(nat) / Nall(nat)}$$

The following data is used to perform calculations:

1) N*all* = [number of farmers] OR [farming area];
2) N*org* = [number of organic farmers] OR [farming area];
3) *(x)* = specific region;
4) *(nat)* = total in Japan

This study is focusing on the concentration of organic farmers and organic farming areas in each prefecture. Therefore, *(x)* in the formula above represents one of 47 Japanese prefectures. The result of the calculations is a coefficient where LQ=1 represents the national average. When interpreting the results, it means that the prefectures with LQ<1 have the concentration of organic farmers/areas lower than the national average. On the contrary, prefectures with LQ>1 represent the areas where the concentration of organic farmers/areas is higher than the national average.

- ***Data***

This analysis employs the open-access data published on the MAFF website and its statistics portal. The data on the number of farming households and farming area size by prefecture was available. The data for JAS Organic certified farmers, as well as the overall commercial farmers for 2010-2015, was used.

Table 6. List of Data Sets Used for Geographic Distribution Analysis

Farmer Type	Data Type	Time Span	Source
JAS Organic	Number of certified farmers by prefecture (households)	2010-2016	MAFF
	Farming area size by prefecture (ha)	2010-2016	MAFF
All Commercial	Number of commercial farmers by prefecture (households)	2010-2015	MAFF
	Farming area size under the crops for sale by prefecture (ha)	2010-2015	MAFF

3.4. Results for Analysis of JAS Organic Geographic Distribution

- ***JAS Organic Concentration in 2015 (Farming Households & Farming Area)***

Firstly, LQ for the number of farmers and farming areas by a prefecture in 2015 was calculated. The results were mapped using ArcGIS software. On the map, the darkness of the color represents the degree of concentration of organic farmers (the darker the color – the higher the concentration). The color palette presents in six shades of green, in general, changing from lighter to darker with each 0.5 LQ interval. Additionally, Figures 9 and 10 demonstrate the distribution of prefectures within each interval.

The findings demonstrate that more than half of all prefectures have a concentration less than the national average for both the number of organic farmers (26 prefectures) and organic farming area (27 prefectures). Figure 6 illustrates these results. All 47 prefectures are plotted based on the two parameters – concentrations of the number of organic farmers

($LQ_{farmers}$) and concentration of organic farming area (LQ_{area}) for 2015. The majority of the prefectures (20 prefectures) are accumulated in the down-left quadrant of the graph. Such distribution means that the concentration (LQ) in these prefectures is lower than the national average for both parameters – the number of organic farmers and organic area size. At the same time, a large cluster of 15 prefectures is located in the top-right quadrant. This cluster, on the contrary, demonstrates LQ higher than the national average for both parameters.

The list of top 10 LQ prefectures (see Table 7) demonstrated that the concentration of organic farmers and organic farming area are not necessarily correlated. For example, only four out of ten prefectures belong to both categories ($LQ_{farmers}$ and LQ_{area}). These prefectures include Nara, Wakayama, Kumamoto, and Kagoshima. Such results can be explained by the differences

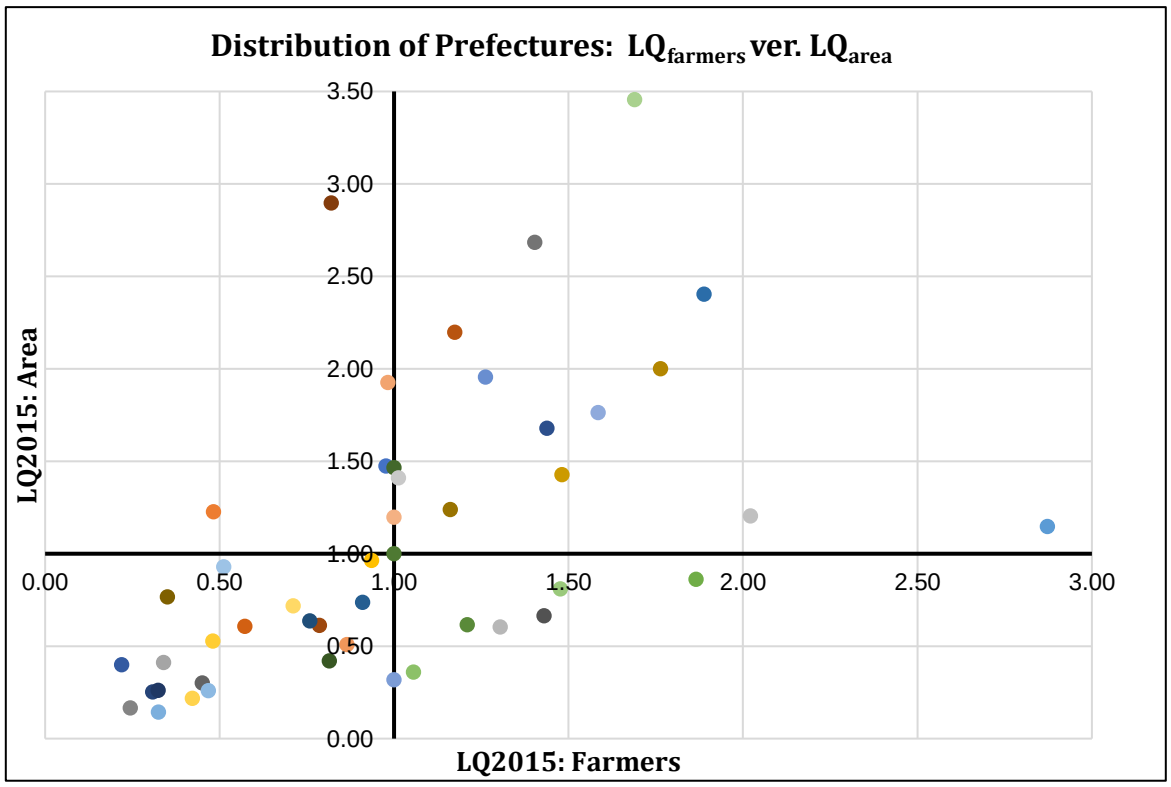


Figure 6. Distribution of Prefectures based on LQ

Table 7. Top 10 Prefectures Rated by LQ

Organic farmers		Organic Area	
Hokkaido	2,87	Yamanashi	6,55
Kochi	2,02	Wakayama	3,45
Kumamoto	1,89	Shimane	2,90
Yamagata	1,87	Miyazaki	2,68
Kagoshima	1,76	Kumamoto	2,40
Wakayama	1,69	Oita	2,20
Nara	1,58	Kagoshima	2,00
Shizuoka	1,48	Ishikawa	1,95
Nagasaki	1,48	Ehime	1,92
Okinawa	1,44	Nara	1,76

in the ratio of the average JAS Organic certified farming area size to of all commercial areas per farming household in each prefecture.

For example, Hokkaido has taken the top position in terms of concentration of JAS Organic certified farmers. However, it is not included in the top ten prefectures when rated by the concentration of JAS Organic certified area size. The reason is that the average farming area size per farming household in Hokkaido is almost 1.75 times larger among conventional farmers than for JAS Organic. On the contrary, prefectures, such as Yamanashi, Ishikawa, Shimane, and Oita, are not among the top ten in terms of the LQ calculated for the number of farmers. However, they demonstrate high LQ for the organic farming area, which means that the average farming area size per household for JAS Organic certified farms is larger than in other prefectures.

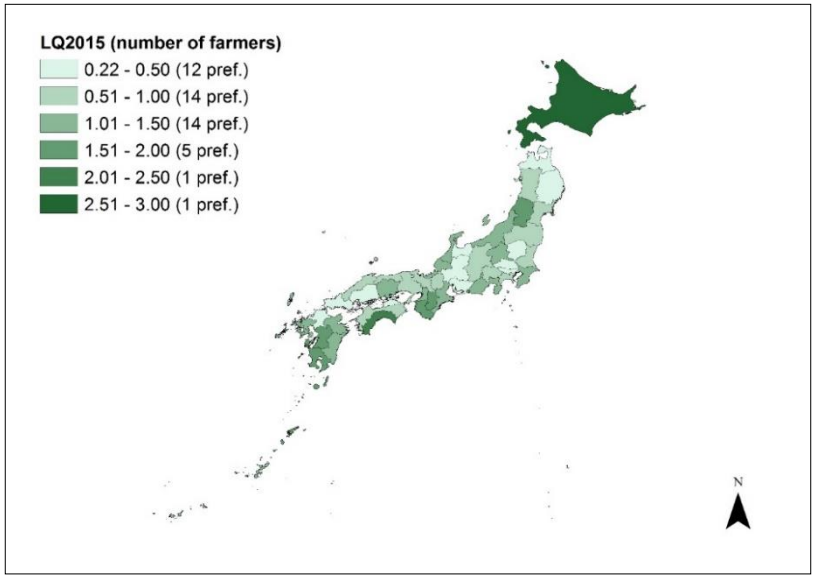


Figure 7. Map Demonstrating LQ based on Number of Farmers

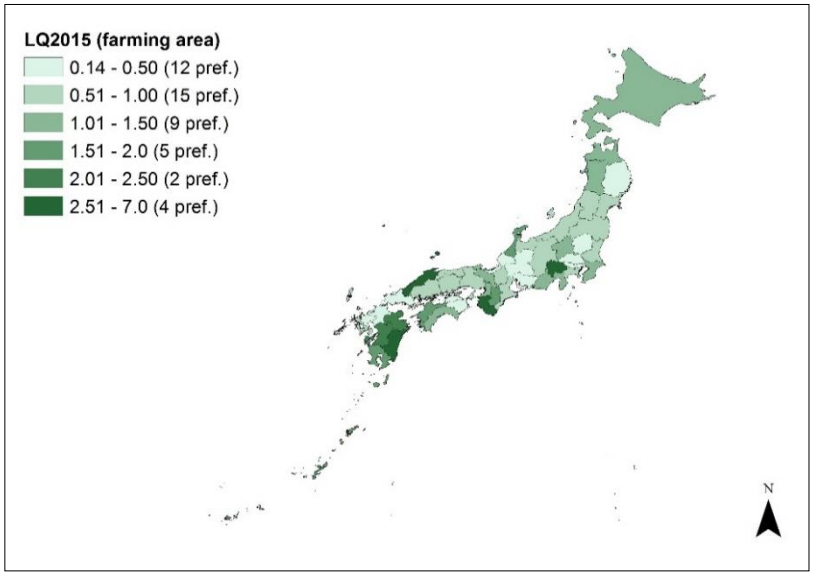


Figure 8. Map Demonstrating LQ based on Farming Area Size

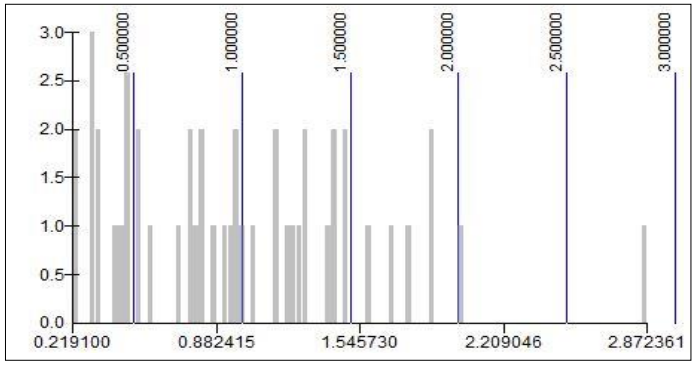


Figure 9. Distribution of Prefectures based on LQ for the number of farmers

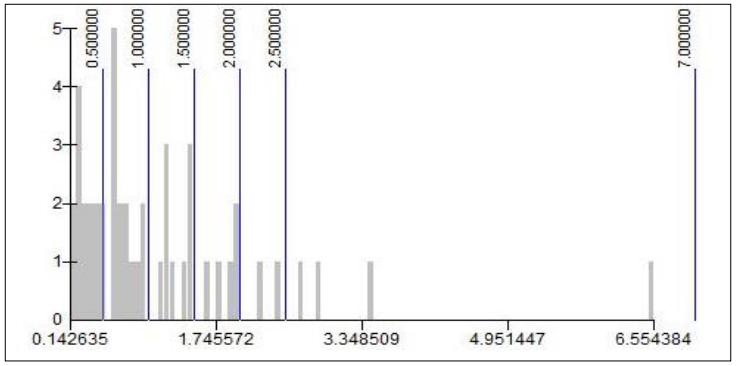


Figure 10. Distribution of Prefectures based on LQ for the farming area size

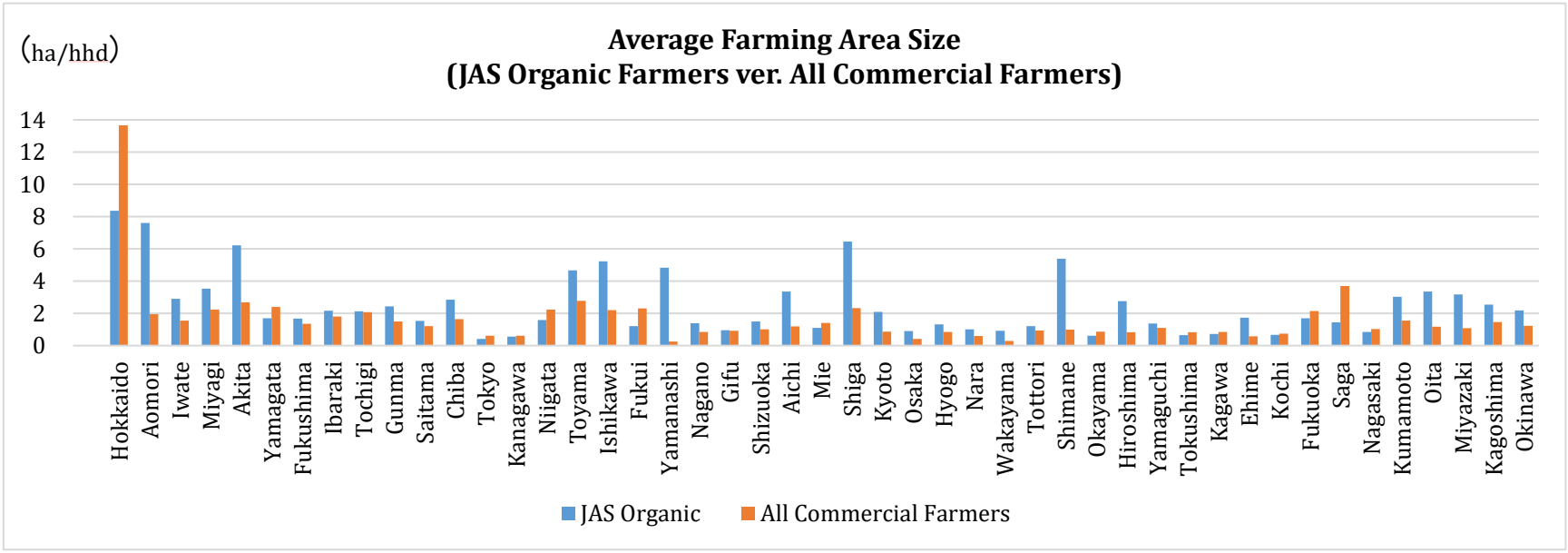


Figure 11. Average Farming Area Size per Household (hectares per household) for JAS Organic and Conventional Farmers.

– ***JAS Organic Concentration Dynamics (2010-2015)***

As a next step of the analysis, the same calculations were performed for each prefecture using the data that covers five years span from 2010 to 2016 for the number of farmers and from 2010 to 2015 for the farming area. The LQ for each year was calculated. Further, the change in LQ for each prefecture was found. The findings for $LQ_{farmers}$ were organized by region. The results demonstrate that the concentration of JAS Organic certified farmers either stayed the same or declined over time in all regions except for Kyushu and Okinawa.

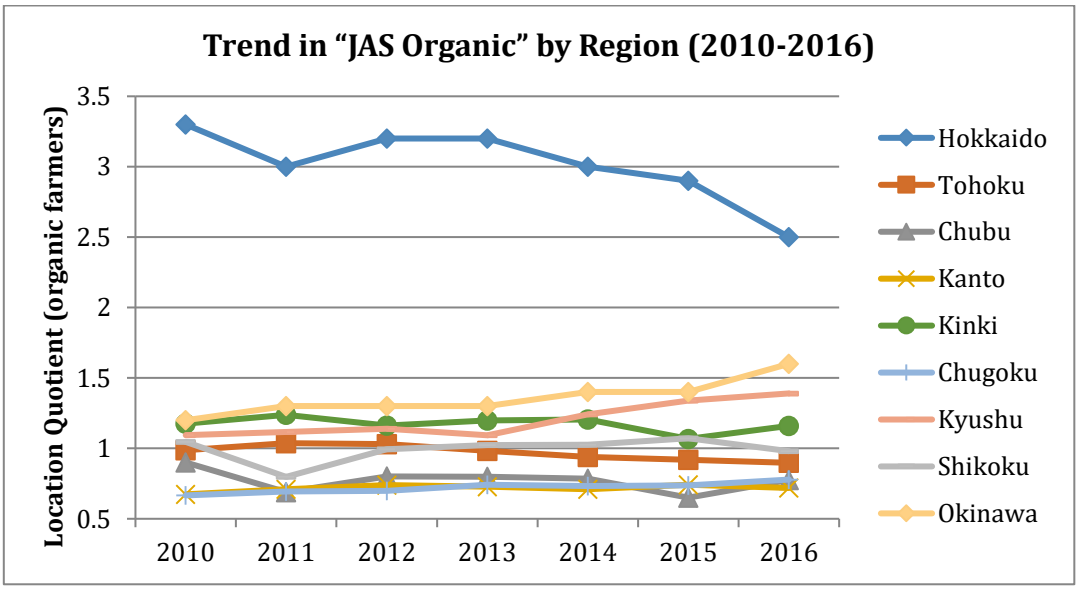


Figure 12. The trend in JAS Organic LQ (2010-2016) by Region.

The dynamics in each region was calculated as an aggregate of the coefficients of the prefectures composing this region. The trend in each prefecture does not necessarily match the overall dynamics of the region. However, in the case of Kyushu, the concentration increase in JAS Organic farmers, although steep, is happening in all prefectures.

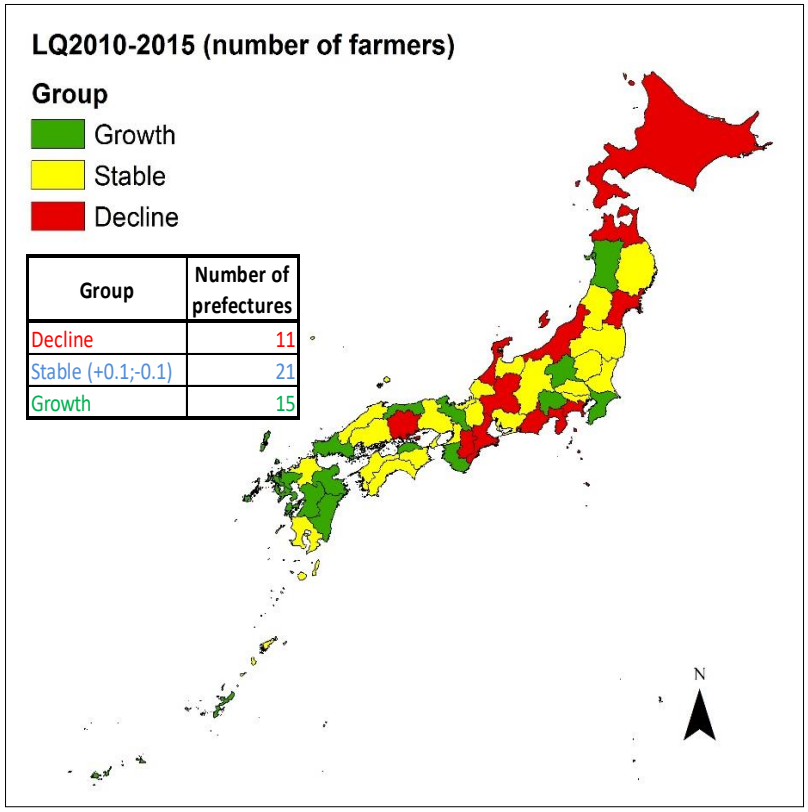


Figure 13. Trend in LQ (2010-2015) based on Number of Farmers.

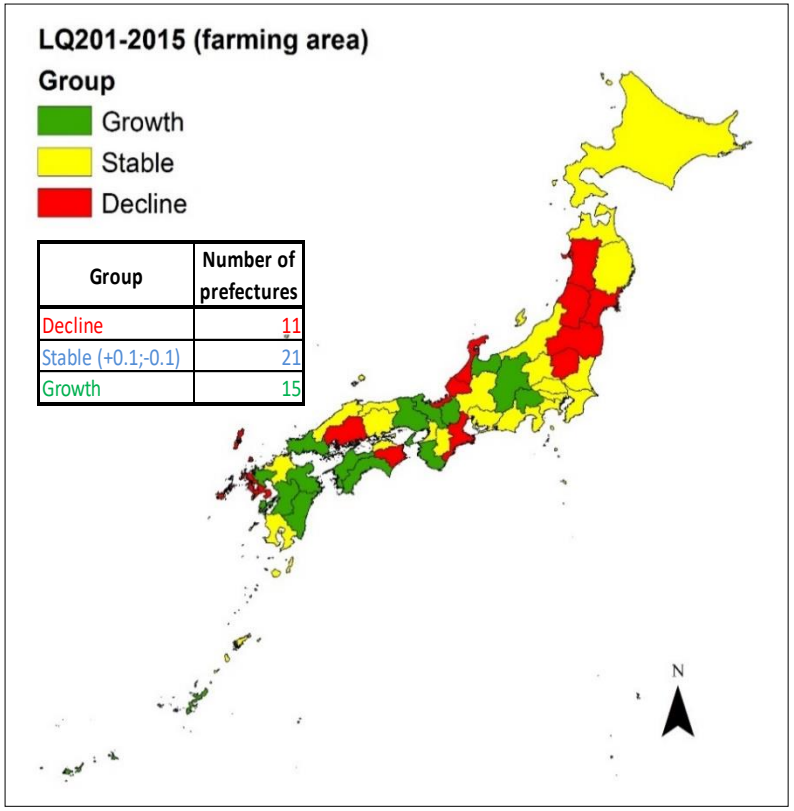


Figure 14. Trend in LQ (2010-2015) based on Farming Area Size

Further, the dynamics of change in $LQ_{farmers}$ and LQ_{area} for each prefecture were analyzed. The results were visualized by creating maps with GIS Software. In these maps, the prefectures with negative LQ growth are colored red, and those, showing positive growth, marked green. The prefectures demonstrating only minor growth or decline (LQ change within 0.1 range) were labeled stable (or stagnant). Stable prefectures represent the majority and account for 21 out of 47 prefectures. Interestingly, there are more prefectures (15 prefectures) demonstrating growth than prefectures demonstrating decline (11 prefectures) for both the concentration of the number of farmers and farming area size.

Nevertheless, dynamics patterns for $LQ_{farmers}$ and LQ_{area} are not correlated in the majority of prefectures. The dynamics pattern was visualized using color in distribution on the map (see Figure 13 and 14). There are, however, some exceptions. For example, most prefectures in Kyushu region have demonstrated growth for both parameters. They are presented in green color on both maps.

- ***LQ-based Prefectural Typology***

The LQ calculations were conducted for two parameters – the number of JAS Organic certified farmers and JAS Organic farming area size. Additionally, the LQ was calculated for the span of five years, from 2010 to 2015, to analyze the concentration change for each parameter. Based on the calculation results, a simple typology of prefectures was developed. This typology further informs the findings from the questionnaire surveys of JAS Organic presented in Chapter 4 of this thesis.

The primary purpose of this typology is to create a grouping, which will help to analyze the differences in farmers' characteristics and perceptions in areas with different levels of JAS

Organic concentration. Since the questionnaires target farming households, only $LQ_{farmers}$ calculated based on the data for the number of farming households, was utilized to build the typology. The LQ_{area} was omitted.

The prefectural typology was created using the findings from the two previous sections and plotted the prefectures along two axes (see Figure 15). The vertical axis represents $LQ_{farmers}$ calculated based on the data for 2015. The horizontal axis includes two sides – prefectures that demonstrate negative growth (Decline) in $LQ_{farmers}$ for 2010-2015 on the left side, and prefectures showing positive growth (Growth) in $LQ_{farmers}$ for 2010-2015 on the right. The typology is visualized with the four quadrants and consists of four groups:

- Group A (High&Decline);
- Group B (High&Growth);
- Group C (Low&Growth);
- Group D (Low&Decline).

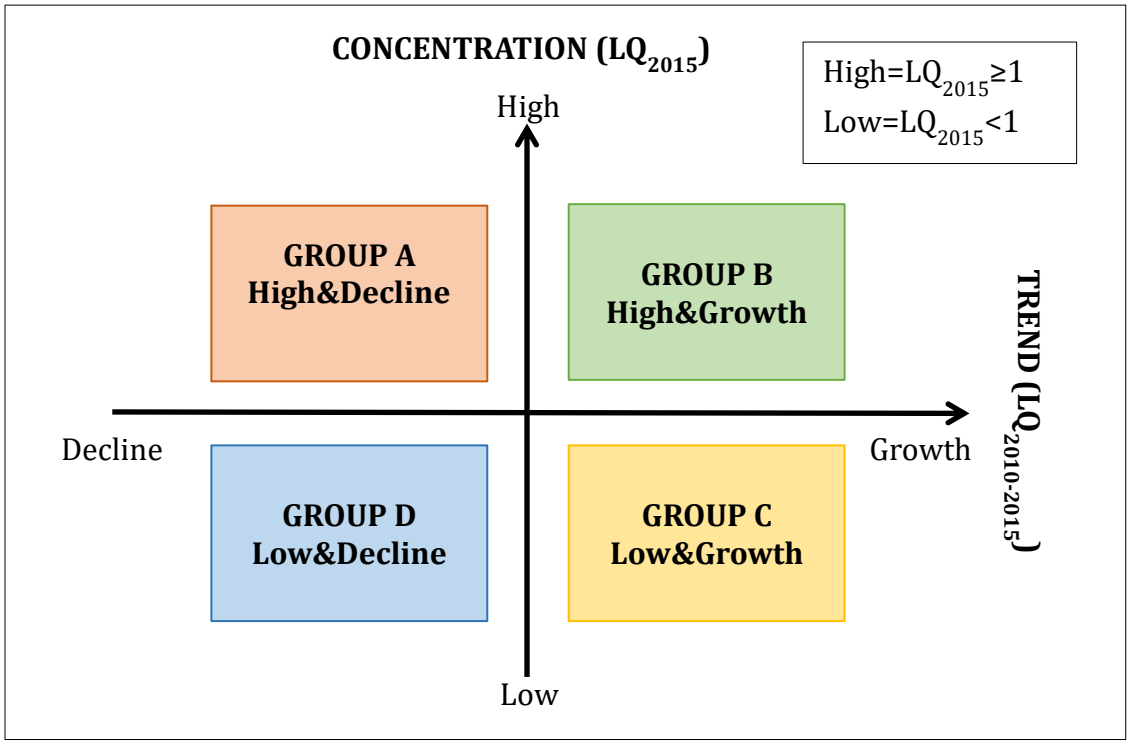


Figure 15. Prefectural Typology based on LQ for the Number of Farming Households.

In this typology, Group B (right top quadrant) is considered to be the most successful in terms of JAS Organic certification, because the concentration of JAS Organic farmers there is higher than the national average and demonstrates growth in the timespan 2010-2015. Group D, on the contrary, is the one falling behind since the concentration of JAS Organic certified farmers is lower than the national average and demonstrates continuous decline. The list of prefectures composing the four groups is summarized in Table 8.

Table 8. List of Prefectures for Each Group of LQ based Typology.

	Group A	Group B	Group C	Group D
1	Hokkaido	Yamagata	Iwate	Aomori
2	Niigata	Gunma	Akita	Miyagi
3	Ishikawa	Chiba	Ibaraki	Fukushima
4	Shizuoka	Fukui	Saitama	Tochigi
5	Mie	Osaka	Toyama	Tokyo
6	Nara	Wakayama	Yamanashi	Kanagawa
7	Okayama	Kochi	Nagano	Gifu
8	Kagoshima	Saga	Kyoto	Aichi
9	-	Nagasaki	Hyogo	Shiga
10	-	Kumamoto	Tottori	Hiroshima
11	-	Oita	Shimane	Tokushima
12	-	Miyazaki	Yamaguchi	Ehime
13	-	Okinawa	Kagawa	-
14	-	-	Fukuoka	-

3.5. Limitations of Location Quotient Methodology Approach

Location Quotient is a valuable method for quantifying the concentration of particular industry, demographic group, or occupation, in the case of this research – JAS Organic certified farmers. The result of the calculations (a coefficient) represents the concentration of each prefecture, which allows for a quick comparison among the prefectures and against the national average.

Calculating the LQ coefficient in multiple time points explains the certification adoption trend and dynamics change. However, the main limitation of this methodology is that it does not provide any insights or observations that could serve as an explanation of why the concentration varies (high/low or growing/declining) in each prefecture. Chapter 4 attempts to overcome these limitations. Chapter 4 summarizes the results of the questionnaire survey targeting JAS Organic certified farmers across the country. Further, the questionnaire results are compared across the four groups (ABCD) based on the prefectural typology established in the section above.

3.6. Analysis of prefectural Plans for Promotion of Organic Farming

- *Scope and Target of Prefectural Promotion Plans*

A hypothesis was made that the adoption rate of JAS Organic varies from prefecture to prefecture due to the differences in the content of prefectural promotion plans. The analysis of JAS Organic geographic distribution has indeed confirmed that there are prefectural differences in the concentration of both JAS Organic certified farmers and certified farmlands. To establish the links between geographic distribution differences and prefectural policies, the author reviewed the content of prefectural promotion plans.

Firstly, the promotion plans of prefectures in Group B (High&Growth) and Group D (Low&Declined) were analyzed. The analysis demonstrated that all prefectures in Group B mention JAS Organic in their promotion plans. For comparison, one-third of prefectures in Group D does not mention JAS Organic certification in their promotion plans.

Moreover, more than half of prefectures in Group B establish a numerical target for organic farming compared to one-third in Group D. Finally, one-fourth of prefectures in Group B set a numerical target for JAS Organic as well. In Group D, all the prefectures (except for

Fukushima prefecture, which is an exceptional case due to radiation contamination issue) do not have numerical targets for JAS Organic certification. Additionally, Group B demonstrated a higher number of prefectures setting numerical goals for municipalities establishing organic farming promotion support systems and raising consumers' awareness.

Concrete numerical targets in prefectures from Group B differ for each prefecture. For example, regarding organic agriculture area expansion, Kumamoto prefecture aimed to increase the area size of the organic area from 0.9% in 2015 to 1.4% in 2019 (Kumamoto Pref., 2018). Kochi prefecture set a less ambitious goal with an increase from 0.4% in 2014 to 1% in 2019 (Kochi Pref., 2014). Other prefectures, for example, Yamagata and Saga prefectures formulate their promotion target based on the number of households practicing organic farming or the number of hectares under organic farming (540ha in 2011 to 800ha in 2016 in Yamagata prefecture, 93 households in 2013 to 150 households in 2018 in Saga Prefecture) (Saga Pref., 2015; Yamagata Pref., 2013).

Other numerical targets refer to strengthening governance for organic farming promotion. Such initiatives include, for example, establishing organic agriculture consultation offices in more than 50% of municipalities in Kochi prefecture and 100% in Chiba prefecture by 2019 (Chiba Pref., 2015; Kochi Pref., 2014). For increasing consumers' awareness about organic farming, a target is usually set referring to a share of consumers understanding the definition and the concept of organic farming. For example, Chiba prefectures aims for 50% of consumers understanding organic farming by 2019 (Chiba Pref., 2015). Kumamoto prefecture with its original Green Agriculture Scheme formulates this target based on the number of people who signed up as Green Agriculture supporters (18,408 in 2015 to 30,000 in 2019). Kumamoto prefecture was the only one to establish a numerical target for the development of organic farming techniques. To reach this target, the prefecture aims to increase the number of

organic farming know-how invented within one year from two to ten within the related period (Kumamoto Pref., 2018).

Although most of the prefectural promotion plans in Group B refer JAS Organic certification scheme, only Yamagata, Fukui, Kochi, and Oita prefectures are establishing a numerical target for referring to the area size under JAS Organic certification (Fukui Pref., 2009; Kochi Pref., 2014; Oita Pref., 2017; Yamagata Pref., 2013).

A similar analysis of prefectural promotion plans for Group A and C was conducted. Group A and C have mixed levels of concentration and growth tendencies of organic farmers. Both groups demonstrated a smaller share of prefectures announcing numerical targets for JAS Organic. These findings, combined with the results of LQ geographic distribution, indicate that specifying JAS Organic certification within the scope of the promotion plan and further introduction of a numerical target (e.g., area size or the number of farmers) can potentially encourage more concrete promotion measures.

- *Initiatives for Promotion of Organic Farming and JAS Organic Certification*

Further, a brief analysis of the initiatives mentioned in the prefectural promotion plans was conducted. Most of the initiatives supporting organic farming target one or all of the following categories of farmers: existing organic farmers, new enterers, conventional farmers transitioning to organic.

Table 9. Summary of the content of the Plans for Promotion of Organic Farming in prefectures of Group B (High&Growth). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

GROUP B (High&Growth)																										
					Numerical Target						Non-numerical Target							Scope								
							Other																			
	Prefecture	Established	Revised	Mention JAS	Organic Farming	JAS	Org. Farming Training	Consumers Awareness	Municipal Level Promotion	Other	Organic Farming Training	Organic Farming Expansion	Technique Development &Systematization	Expansion of Sale Channels	Awareness Raising	Municipal Level Promotion	Other	Organic	JAS	GAP	Eco	Tokubetsu	Local Cert.
1	Yamagata	2009	2013	○	○ (# of farmers/ area size)	○ (area share)	×	×	○ (# & share of municipalities)	×	×	×	×	×	×	×	×		○				
2	Gunma	2010	2015	○	×	×	×	×	×	×	×	○	×	○	○	×	×	○	○					
3	Chiba	2010	2015	○	○ (area share)	×	×	○ (share of consumers understanding org. farming)	○ (share of municipalities)	×	○	×	○	×	×	×	×	○	○		○	○	○
4	Fukui	2009	-	○	×	○ (area size)	×	○ (share of consumers understanding Eco-farmers)	×	○ Eco-farmers Tokubetsu Saibai (area size)	×	×	×	○	×	×	×	○	○		○	○	
5	Osaka	2001	2016	○	×	×	×	×	×	×	×	×	×	×	×	×	×	○					○
6	Wakayama	2008	2014	○	×	×	×	×	×	×	○	○	×	○	○	×	×	○	○				
7	Kochi	2008	2015	○	○ (area size/share)	○ (area size/share)	×	×	○ (share of municipalities)	×	○	×	○	×	○	×	×	○	○				
8	Saga	2011	2014	○	○ (# of households)	×	×	×	×	×	×	×	○	×	○	×	×	○	○				
9	Nagasaki	2010	-	○	○ (farmers share)	×	×	○ (share of consumers understanding org. farming)	○ (share of municipalities)	○ Producers & Distributors Network (number)	×	×	×	×	×	×	×	○	○				
10	Kumamoto	2018	-	○	○ (area share)	×	×	○ (# of supporting consumers)	×	Org. Farming Technique Developed (number per year)	×	×	×	×	×	×	×	○	○				
11	Oita	2009	2017	○	×	○ (area size)	×	×	○ (share of municipalities)	×	×	×	×	×	×	×	×		○				
12	Miyazaki	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
13	Okinawa	2011	2016	○	○ (# of farmers)	×	×	×	×	×	×	×	×	×	×	×	×	○	○		○	○	

Table 10. Summary of the content of the Plans for Promotion of Organic Farming in prefectures of Group D (Low&Decline). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

GROUP D (Low&Decline)																									
					Numerical Target						Non-numerical Target							Scope							
							Other																		
	Prefecture	Established	Revised	Mention JAS	Organic Farming	JAS	Org. Farming Training	Consumers Awareness	Municipal Level Promotion	Other	Organic Farming Training	Organic Farming Expansion	Technique Development &Systematization	Expansion of Sale Channels	Awareness Raising	Municipal Level Promotion	Other	Organic	JAS	GAP	Eco	Tokubetsu	Local Cert.
1	Aomori	2012	2017	×	×	×	×	×	×	○ Eco-farmers Tokubetsu Saibai, Local Certification (area size/# of farmers)	×	×	×	×	×	×	×	○		○	○	○	○
2	Miyagi	2009	2015	○	×	×	×	×	×	×	×	×	×	×	×	×	×	○	○				
3	Fukushima	2010	2015	○	○ (area size)	○ (# of farmers/ area size)	×	×	○ (number of municipalities)	×	×	×	×	×	×	×	×	○	○				
4	Tochigi	2009	2015	○	○ (area size)	×	×	○ (share of consumers understanding org. farming)	○ (share of municipalities)	×	×	×	×	×	×	×	×	○			○		○
5	Tokyo	2009	-	○	×	×	×	×	×	×	×	×	×	×	×	×	×	○	○		○	○	
6	Kanagawa	2012	2018	×	×	×	×	×	×	×	×	×	×	×	×	×	×	○					
7	Gifu	2010	2015	○	×	×	×	×	×	×	×	○	○	×	○	×	×	○	○				
8	Aichi	2009	2015	×	×	×	×	○ (share of consumers understanding org. farming)	×	×	×	○	○	×	×	○	×	○					
9	Shiga	2010	2016	○	×	×	×	×	×	×	×	○	×	×	×	×	×	○	○				
10	Hiroshima	2010	2017	○	×	×	×	×	×	×	×	×	×	×	×	×	×	○		○	○	○	
11	Tokushima	2009	2015	○	○ (area size)	×	×	×	○ (number of municipalities)	×	×	×	×	×	×	×	×	○		○	○	○	
12	Ehime	2016	-	○	○ (area size)	×	×	○ (share of consumers understanding org. farming)	×	×	×	×	○	○	○	×	×	○	○	○			

Table 11. Summary of the content of the Plans for Promotion of Organic Farming in prefectures of Group A (High&Decline). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

Group A (High&Decline)																									
					Numerical Target							Non-numerical Target							Scope					
							Other																		
	Prefecture	Established	Revised	Mention JAS	Organic Farming	JAS	Org. Farming Training	Consumers Awareness	Municipal Level Promotion	Other		Organic Farming Training	Organic Farming Expansion	Technique Development &Systematization	Expansion of Sale Channels	Awareness Raising	Municipal Level Promotion	Other	Organic	JAS	GAP	Eco	Tokubetsu	Local Cert.
1	Hokkaido	2008	2013	○	○ (# of households)	×	×	×	×	×		×	×	○	○	○	×	×	○	○	×	×	×	○
2	Niigata	2008	-	○	×	×	×	×	×	×		×	×	○	×	○	×	×	○	○	×	×	×	×
3	Ishikawa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	×		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4	Shizuoka	2009	2014	○	○ (area size)	×	×	○	○ (share of municipalities)	×		○	×	○	×	×	×	×	○	×	×	×	×	○
5	Mie	2009	2014	×	×	×	×	×	×	×		○	×	×	×	×	×	×	○	×	○	×	×	○
6	Nara	2009	2015	○	×	×	×	×	×	×		×	○	×	○	×	×	×	○	○	×	○	×	○
7	Okayama	2001	2007	○	×	×	×	×	×	×		×	○	×	×	×		×	×	×	×	×	×	○
8	Kagoshima	2008	2014	○	○ (area size)	×	×	○	×	×		○	×	○	×	×	○	×	○	○	×	○	×	×

Table 12. Summary of the content of the Plans for Promotion of Organic Farming in prefectures of Group C (Low&Growth). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

Group C (Low&Growth)																								
					Numerical Target						Non-numerical Target							Scope					
							Other																	
	Prefecture	Established	Revised	Mention JAS	Organic Farming	JAS	Org. Farming Training	Consumers Awareness	Municipal Level Promotion	Other	Organic Farming Training	Organic Farming Expansion	Technique Development &Systematization	Expansion of Sale Channels	Awareness Raising	Municipal Level Promotion	Other	Organic	JAS	GAP	Eco	Tokubetsu	Local Cert.
1	Iwate	2013	2016	×	×	×	×	×	×	○ GAP/JGAP/Local Certification (share of land/households)	×	×	×	×	×	×	×	○	×	○	○	○	○
2	Akita	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	Ibaraki	2009	2015	○	○ (area size)	×	×	×	○ (number of municipalities)	×	×	×	×	×	×	×	×	○		○			
4	Saitama	2014	-	○	×	×	×	×	×	×	×	×	×	×	×	×	×	○			○	○	
5	Toyama	2010	2015	○	○ (area size)	×	×	×	○ (share of municipalities)	○ Eco-farmers (# of farmers) Tokubetsu saibai (area size)	×	×	×	×	×	×	×	○		○	○		
6	Yamanashi	2008	2016	○	○ (area size) *incl. region targets	×	×	×	×	×	○	×	○	○	○	×	×	○					
7	Nagano	2013	2018	○	○ (area size)	×	×	×	○ (number of municipalities)	×	×	×	×	×	×	×	×	○	○				
8	Kyoto	2010	-	○	○ (number of farmers)	×	×	×	×	○ Eco-farmers, Tokubetsusaibai, GAP, Local cert.	×	×	×	×	×	×	×	○			○	○	○
9	Hyogo	2009	2019	○	○ (area size)	×	×	×	×	○ Local agri-environmental farming technique (area size)	×	×	×	×	×	×	×	○					○
10	Tottori	2007	2012	×	○ (area size)	×	×	×	×	○ Tokubetsu saibai (area size)	×	×	×	×	×	×	×	○			○	○	
11	Shimane	2008	2013	○	×	×	×	×	×	×	×	×	×	×	×	×	×	○					
12	Yamaguchi	2008	2015	○	×	○ (area size)	×	×	×	○ Local certification (area size)	×	×	×	×	×	×	×		○				○
13	Kagawa	2016	-	○	×	×	×	×	×	×	×	○	○	○	○	○	×	○					
14	Fukuoka	2009	-	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Eco-friendly Agriculture					

The main supporting tools applicable to the three categories of farmers above include 1) developing, systematization and promotion of new organic farming techniques; 2) setting up of information and training offices in municipalities and other related organizations; 3) providing support with finding distribution channels (e.g., matching service, thematic websites, events); 4) raising awareness of consumers, producers, retailers, distributors.

Some of the prefectural promotion plans also mention subsidies for the promotion of organic farming. In general, these subsidies are introduced on the national level and further distributed to prefectures and municipalities. Table 13 summarizes the subsidies applicable to organic agriculture. These subsidies can be used for buying equipment and materials. However, most of these subsidies do not cover the certification fees.

In terms of promotion of JAS Organic certification, supporting initiatives often focus on awareness-raising among both consumers (e.g., PR) and producers (e.g., lectures about certification systems and guidance regarding application process) as well as helping producers to find new distribution channels. Similarly to numeric targets and mentioning of JAS Organic certification, Group B has the largest share of prefectures with the initiatives discussed above for JAS Organic.

Table 13. Summary of Main Subsidies for Organic Farming (*official title in English is not available, translation is suggested by the author).

Title*	Applicant Requirements	Appicability to JAS Organic Certification	Conditions
Direct Payments for Environmentally Friendly Agriculture 環境保全型農業直接支払交付金	- Agricultural Producers (individual and incorporated);	- Does not cover certification fees	Requirements on minimum farming area size for individual farmers
Investment Fund for Next Generations in Agriculture 農業次世代人材投資資金	- Producers of age under 50 years	Applicable to organic farming but does not cover certification fees	
Emergency Payments for Raclamation of Abandoned Farmlands 耕作放棄地再生利用緊急対策交付金	- Farmers Groups etc.	Applicable to organic farming but does not cover certification fees	
Investment for Youth in Agriculture 青年等就農資金	- New agriculture enterers of 18-45 years old	Applicable to organic farming but does not cover certification fees	
Support for Obtaining of International Certification 国際認証取得拡大緊急支援事業	- Agricultural Producers (individual and incorporated); - Proccessing Business;	- Covers fees of obtaining JAS Organic certification; - Does not cover subsequent renewal fees;	Certified Agricultural Produce is intended for export

Table 14. Summary of Promotion Initiatives in Prefectures of Group B (High&Growth). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

GROUP B (High&Growth)												
					Initiatives							
	Prefecture	Established	Revised	Mention JAS	Support of existing organic farming	Support to new enterers	Support for conversion from conventional to organic	Support to JAS Organic Certification	Technique Development &Systematization	Info Centers/ Info Exchange	Distribution Support	Surveys
1	Yamagata	2009	2013	○	×	○	×	○ (Support to Cert. Centers/Provide Info to producers	○	○	○	×
2	Gunma	2010	2015	○	○	○	○	○ (Raising awareness among producers)	○	○	×	×
3	Chiba	2010	2015	○	○	○	×	○ (Raising awareness among consumers/PR)	○	○	○	○
4	Fukui	2009	-	○	×	×	×	○ (Developing distribution channels)	○	○	○	×
5	Osaka	2001	2016	○	×	×	×	○ (Share products info on HP)	○	○	○	×
6	Wakayama	2008	2014	○	○	×	×	○ (Lectures)	○	○	○	×
7	Kochi	2008	2015	○	○	○	×	○ (Share info/encourage adoption)	○	○	×	○
8	Saga	2011	2014	○	×	○	○	×	○	○	○	×
9	Nagasaki	2010	-	○	×	×	×	○	○	○	○	×
10	Kumamoto	2018	-	○	○	○	×	○ (Subsidies)	○	○	○	×
11	Oita	2009	2017	○	○	○	×	○ (Raising awareness among consumers/ lectures to producers)	○	○	○	×
12	Miyazaki	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
13	Okinawa	2011	2016	○	×	×	×	×	○	×	○	×

Table 15. Summary of Promotion Initiatives in Prefectures of Group D (Low&Decline). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

GROUP D (Low&Decline)												
					Initiatives							
	Prefecture	Established	Revised	Mention JAS	Support of existing organic farming	Support to new enterers	Support for conversion from conventional to organic	Support to JAS Organic Certification	Technique Development &Systematization	Info Centers/ Info Exchange	Distribution Support	Surveys
1	Aomori	2012	2017	×	×	×	×	×	○	×	×	×
2	Miyagi	2009	2015	○	○	○		×	○	○	○	×
3	Fukushima	2010	2015	○	○	○	○	○ (PR)	○	○	○	×
4	Tochigi	2009	2015	○	○	○	○	○ (Raising awareness among producers and consumers)	○	○	○	×
5	Tokyo	2009	-	○	×	×	×	×	×	○	○	×
6	Kanagawa	2012	2018	×	×	×	○	×	○	○	×	×
7	Gifu	2010	2015	○	○	○	○	○ (Providing info to producers)	○	×	○	×
8	Aichi	2009	2015	×	○	○	×	×	○	○	○	×
9	Shiga	2010	2016	○	×	×	×	×	○	○	○	×
10	Hiroshima	2010	2017	○	×	×	×	×	○	×	○	×
11	Tokushima	2009	2015	○	○	○	×	○ (PR)	○	×	○	×
12	Ehime	2016	-	○	○	○	×	○ (PR)	○	×	○	×

Table 16. Summary of Promotion Initiatives in Prefectures of Group A (High&Decline). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

Group C (Low&Growth)												
					Initiatives							
	Prefecture	Established	Revised	Mention JAS	Support of existing organic	Support to new enterers	Support for conversion from conventional to organic	Support to JAS Organic Certification	Technique Development &Systematization	Info Centers/ Info Exchange	Distribution Support	Surveys
1	Iwate	2013	2016	×	×	×	×	×	○	○	○	×
2	Akita	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	Ibaraki	2009	2015	○	○	○	×	○ (encourage adoption)	○	○	○	○
4	Saitama	2014	-	○	○	×	×	○ (encourage adoption)	○	○	○	×
5	Toyama	2010	2015	○	○	×	×	×	○	○	○	×
6	Yamanashi	2008	2016	○	○	○	×	○ (encourage adoption)	○	○	○	×
7	Nagano	2013	2018	○	○	×	×	○ (provide info)	○	○	○	×
8	Kyoto	2010	-	○	×	○	×	×	○	○	×	×
9	Hyogo	2009	2019	○	×	×	×	×	○	○	○	×
10	Tottori	2007	2012	×	×	○	○	×	○	○	○	×
11	Shimane	2008	2013	○	○	○	○	○ (PR)	○	○	○	×
12	Yamaguchi	2008	2015	○	×	×	×	○ (encourage adoption)	○	○	○	×
13	Kagawa	2016	-	○	×	○	○	○ (provide info)	○	○	○	×
14	Fukuoka	2009	-	×	×	×	×	×	×	○	×	×

Table 17. Summary of Promotion Initiatives in Prefectures of Group C (Low&Growth). *Based on the prefectural plans for the promotion of organic agriculture (Listed in the 'Cited References' section).

Group A (High&Decline)												
					Initiatives							
	Prefecture	Established	Revised	Mention JAS	Support of existing organic	Support to new enterers	Support for conversion from conventional to organic	Support to JAS Organic Certification	Technique Development &Systematization	Info Centers/ Info Exchange	Distribution Support	Surveys
1	Hokkaido	2008	2013	○	○	○	○	○ (awareness raising)	○	×	○	×
2	Niigata	2008	-	○	×	×	×	×	○	○	○	○
3	Ishikawa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4	Shizuoka	2009	2014	○	○	○	○	○ (encourage adoption)	○	×	○	○
5	Mie	2009	2014	×	×	×	×	×	○	×	○	×
6	Nara	2009	2015	○	○	×	×	○ (lectures)	○	○	○	×
7	Okayama	2001	2007	○	×	×	×	×	×	○	○	×
8	Kagoshima	2008	2014	○	○	○	○	○	○	×	○	×

Concrete measures for the promotion of organic farming were examined in more detail in the prefectures of Group B. The measures supporting the development and promotion of organic farming techniques include the strengthening of the farming network. For example, in Gunma prefecture, this is done by creating a database of organic farmers willing to accept trainees and providing matching service to those willing to participate in the training (Gunma Pref., 2015). Kochi prefecture offers financial support for organizing lectures on organic farming, including transportation expenses of the lecturer and venue renting expenses (Kochi Pref., 2014). Fukui prefecture developed a manual for organic farming of rice and published on the official website of the prefecture (Fukui Pref., 2011). Wakayama prefecture and Nagasaki prefecture established a model organic farm and model organic town to help accumulate knowledge on organic farming techniques (Nagasaki Pref., 2010; Wakayama Pref., 2014).

To support the JAS Organic certification process, Yamagata prefecture provides support to local certification centers and organizes information sessions about the JAS Organic schemes (Yamagata Pref., 2013). Kumamoto, Saga, and Kochi prefecture explicitly mention that apart from participating in national level Direct Payments for Environmentally Friendly Agriculture applicable to organic farming, the prefectures provide financial support for covering JAS Organic certification fees (Kochi Pref., 2014; Kumamoto Pref., 2018; Saga Pref., 2015).

To facilitate distribution channels development, Wakayama prefecture encourages distributors and logistic business representatives to participate in information exchange events and initiatives (Wakayama Pref., 2014). Kochi prefecture provides financial support for participation in exhibitions and fairs that can lead to meeting potential buyers. This support includes covering transportation expenses, fair participation fees, expenses for PR related materials, and design (Kochi Pref., 2014). In Kumamoto prefecture, the measures are taken to help connect farmers with restaurants and supermarkets in urban areas through direct selling

points that accumulate products distributed in small amounts (Kumamoto Pref., 2018).

Raising of consumers' awareness about organic farming is usually tackled through the organizing of events where consumers have a chance to communicate with organic producers. Such events are supplemented by active disseminating of information though prefectural websites dedicated to organic farming or green agriculture as in Saga prefecture or Kumamoto prefecture (Kumamoto Pref., 2018; Saga Pref., 2015)

Despite a diverse variety of organic farming promotion measures listed in prefectural promotion plans, it is challenging to evaluate if all of them function to the fullest in practice. For example, an NPO for promotion of organic farming in Kumamoto prefecture submitted a letter to the prefecture in 2017 requiring to improve prefectural promotion plan and its implementation. The requirements were based on the results of a survey targeting organic farmers in Kumamoto prefecture. The survey results mentioned that more than 60% of JAS Organic certified farmers were not aware of the existence of the prefectural organic farming promotion plan, and less than 15% utilized support measures mentioned the promotion plan. In regards to Direct Payments for Environmentally Friendly Agriculture, the letter indicated that some municipalities declined applications of organic farmers for the reason that no additional expenses were anticipated since there no special equipment was required for organic farming (KOAA, 2017).

3.7. Discussion and Additional Findings from the Interviews with Stakeholders

The geographic distribution of JAS Organic in Japan was analyzed across 47 prefectures for five years from 2010-2015. It was found that the concentration of JAS Organic farmers either stayed the same or declined in most of the prefectures, except for Kyushu region, where the concentration demonstrated positive growth in all prefectures of the region. The concentration

analysis provided a basis for building prefectural typology composed of four groups (ABCD) and incorporated two parameters of the analysis (concentration level & concentration dynamics).

The analysis of prefectural level promotion plans for organic farming has revealed a high degree of variation in the content of the plans and the way the plans approach the promotion of JAS Organic certification. For example, the promotion plans of leading prefectures (Group B) explicitly mention the JAS Organic certification, setting concrete numeric targets and offering supporting initiatives to promote JAS Organic (e.g., guiding the certification process, raising awareness among both producers and consumers, assisting with finding new distribution channels). Kumamoto, Saga, and Kochi prefectures in Group B mentioned financial subsidies that cover the certification fees.

In the interviews with certification centers, some officials mentioned that organic farming legislation background in Japan is one of the potential reasons hindering the uptake of JAS Organic certification and expansion of organic farming in Japan. JAS Organic Law was introduced mainly as an act regulating the labeling of organic produce. It was introduced as a reaction to the growing number of complaints from consumers regarding false labeling. The law about the certification does not establish any targets for the promotion of organic farming itself. The Law for Promotion of Organic Farming was introduced only six years later. With the introduction of this law, the prefectures gradually started establishing their own targets.

According to the information obtained through the interview with MAFF officials, the establishing of promotion plans on the prefectural level is considered to be beneficial for organic farming promotion. The reasons are that prefectural policies and initiatives better reflect local climate and soil conditions as well as a variety of crops grown in the area. Local

policymakers also better understand the challenges local farmers are facing and provide adequate technical support and guidance.

On the other hand, one of certification center officials also commented that the way the subsidies for organic farming distributed can be different on prefecture and municipality levels. For example, for the payments to organic farmers under the subsidy scheme called "Direct Payments for Environmentally Friendly Agriculture," 50% is coming from the national budget and 50% from the prefectural and municipal budget. Therefore, the amount of budget available on the municipal level can affect how much of the subsidies reach the producers.

Moreover, a certification center official during the interview mentioned that one of the reasons hindering the promotion of organic farming was a contradiction between different ministries in Japan. The organic agriculture-related affairs are under the jurisdiction of MAFF, and its organic agriculture-related policy is not always in harmony with other areas that other ministries are in charge of.

CHAPTER 4. CHARACTERISTICS OF JAS ORGANIC CERTIFIED FARMERS AND PREFECTURAL DIFFERENCES

4.1. Previous studies

The number of research articles looking into characteristics of certified JAS Organic farmers in Japan is limited. For this reason, the overview of previous studies also includes the papers looking at farmers practicing other types of environmentally friendly agriculture. A study by Fujie (2002) analyzing 2000 CENSUS data on farmers practicing environmentally friendly farming (EFF) found that they tend to have larger-scale farms than average and use more labor than conventional farmers. Moreover, the researcher found that farmers having their own distribution channel, for example, selling directly to consumers or having contract-base regular sales to consumers, are more likely to practice environmentally friendly agriculture. The same study indicated that the fifty top municipalities where environmentally-friendly farming is practiced demonstrated the younger age of farmers. Thirty municipalities among the top ones were located in low upland farming areas.

A later study by the same author focused on farmers practicing the 'aigamo' duck method. The study found that the method spread from West to East of the country. The reasons for farmers to start 'aigamo' duck method included financial incentives, and willingness to reduce weeding burden for those who did not use chemical pesticides (Fujie et al., 2005).

A qualitative study focusing farmers in Hokkaido practicing environmentally-friendly agriculture mentioned a difference in motives of younger and older generations of farmers, mentioning that mature and elderly farmers are more often driven by economic reasons, whereas young farmers more often refer to the importance of natural environment protection. Moreover, elderly farmers practicing environmentally friendly agriculture stated external pressures as a reason to do so or having fewer risks because they have income sources other

than farming (Izcara Palacios, 2005).

A limited number of studies focusing on certified farmers mention that advanced JAS Organic farmers and Eco-farmers demonstrate continuous effort in developing their farming techniques and know-how without relying on practical guidance and advice from JA and other promotion authorities (Hu, 2005). The same study finds that there are more certified farmers in the areas with a high concentration of large scale farms. Another work by the same author suggests that there is a high correlation between JAS Organic and Eco-farmer certification holders, and having farming is a size larger than 3ha (Hu, 2007). The large farming area size is also mentioned in a study looking into characteristics of farmers certified under the original certification scheme of Shiga prefecture (Kurosawa, 2005).

Another research is analyzing the selling market for JAS certified organic products finding that farmers in North and East Japan mostly sell their products to the Greater Tokyo market. JAS Organic certified farmers in West Japan usually sell to markets in prefectural capitals or neighbor cities (Kohmoto, 2014). The same study suggests that the deployment of organic farming is strongly determined by the efforts of organic agricultural movement that has a community-supported agriculture concept at its core, and local policies as a part of regional promotion measures.

A questionnaire survey that was conducted for this study was designed in a way that incorporates the factors indicated in previous research summarized in Table 10 (age of farmers, farm-scale, distribution channels, reasons to obtain certification/practicing organic farming). At the same time, more questions were designed to collect additional information on farmers' characteristics (education, years of farming experience, number of crops, farm incorporation) as well as questions on JAS certification (benefits, problems, opinion) to inform further

recommendations on how to JAS Organic Certification can be improved.

Table 18. Summary of Main Studies on Organic Farmers' Characteristics and Perceptions

Country	Characteristics (Farmers/Farms)	Farming Type	Author	Year
Japan	Perception of risks	Kankyou hozen gata	Hu	2005
	Farm scale (larger) Own selling channel (a contract or selling directly to consumer)	Kankyou hozen gata	Fujie	2002
	Age (younger)	Kankyou hozen gata	Izcara	2005
	Information Channel Years of farming experience	Aigamo method	Fujie et al	2005
	Farm scale (larger)	Kankyou hozen gata	Hu	2007
UK	Sex, age, farm-scale (smaller)	Organic	Burton et al	1999
US	Farm scale, environmental concern	Organic	McCan	1997
Canada	Farm scale, years of farming experience, environmental concern	Organic	Egri	1999
Greece	Age, education, neighbors, farm scale	Agri-environmental	Damianos and Giannkopoulos	2002
Belgium	Age, education, neighbors, farm-scale, years of farming experience	Agri-environmental	Vanslembrouck et al	2002
Germany	Farmers' attitudes	Organic	Best	2008
Italy	Years of farming experience, perceived burden, income from farming	Agri-environmental	Defrancesco et al	2008
EU	Perception (risk & effort)	Agri-environmental	Ahnstrom et al.	2009
Switzerland	Farm scale	Organic	Mann and Gairing	2012

4.2. Survey Design and Sampling

- ***Population, Sample Response Rate***

The questionnaire survey has been chosen as a methodology to collect information about JAS-certified organic farmers' characteristics, their reasons for obtaining the

certifications, and other data, which can potentially contribute to a better understanding of which factors influence farmers' decision-making progress regarding the adoption of JAS certification. Printed questionnaires were sent out in September 2017, and responses were collected in October 2017, approximately three weeks after the questionnaires were sent out.

According to the MAFF open-access data, there were 3470 farming units certified as organic producers under the JAS Organic system. The address list of certified JAS Organic farmers was retrieved from the open-access on the MAFF website. The list was compiled of contact information of farmers and farming units certified as JAS Organic, which was provided by certification centers. However, the list remained incomplete since not all of the certification centers have submitted the information. The available list of JAS certified farmers and farming units was further filtered to eliminate foreign producers as well as business units that do not produce (namely, re-packaging business units).

Further, the cleanness of the data was checked only units that contained complete information including name (of company or farmer) and up-to-date address (according to a brief check conducted by the Internet search and Google map check) that would allow for the questionnaires to be safely received by post. This resulted in a shorter list of 1263 potential respondents to whom the questionnaires were later sent. Out of sent questionnaires, eleven have not reached their destination and were returned. Out of 1252 questionnaires delivered to their destination, 572 have been returned, which accounted for 45% response rate. This is considered to be a sufficient sample for the given population, as the sample required for a population of 3470 accounts for around 346 responses (when calculated with 95% confidence level and margin of error 5%).

Additionally, questionnaires were sent to farmers practicing organic farming without

undergoing the JAS Organic certification process. There is no official database for self-proclaimed organic farmers. The names and addresses of farmers published in "National Map of Organic Farmers. 4th Edition" (Zenkoku yuuki nougyousha mappu. Dai yon ban). It is a book published by the Japan Organic Agriculture Association in 2012 – an NPO dedicated to promoting organic farming. Questionnaires were sent to all 189 non-JAS organic farmers listed in the abovementioned book. Fourteen questionnaires were not delivered to the destination and were returned, which can be explained that the information in the book could have been slightly outdated. In three weeks, 62 responses have been collected, accounting for 33% response rate. The table below represents the breakdown of responses by the prefectures for both JAS certified and non-JAS organic farmers. The findings from the analysis of questionnaire survey results were tested for statistical significance using Z-test for two population proportions.

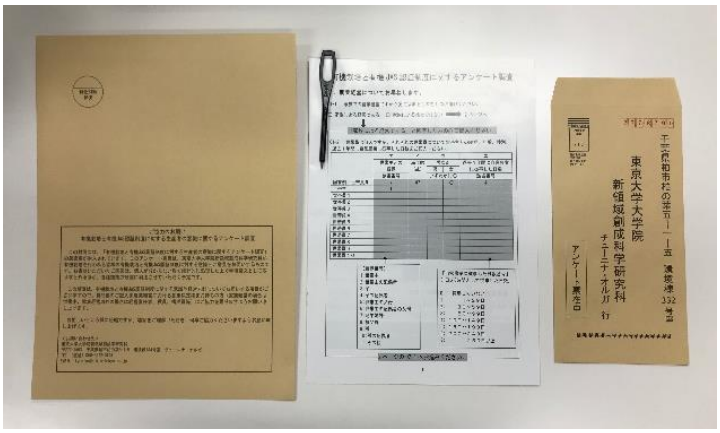
Table 19. Number of Questionnaires Sent and Response Rate by Prefecture.

		JAS Sent	non-JAS Sent	Total Sent	JAS Received	non-JAS Received	Total Received	JAS Response Rate	non-JAS Response Rate	Total Response Rate
1	Hokkaido	158	6	164	59	5	64	37%	83%	39%
2	Aomori	10	3	13	4	1	5	40%	33%	38%
3	Iwate	9	2	11	3	0	3	33%	0%	27%
4	Miyagi	37	1	38	20	0	20	54%	0%	53%
5	Akita	13	1	14	3	0	3	23%	0%	21%
6	Yamagata	29	5	34	16	3	19	55%	60%	56%
7	Fukushima	33	3	36	17	2	19	52%	67%	53%
8	Ibaraki	29	20	49	10	3	13	34%	15%	27%
9	Tochigi	19	10	29	11	4	15	58%	40%	52%
10	Gunma	39	3	42	20	1	21	51%	33%	50%
11	Saitama	10	15	25	5	2	7	50%	13%	28%
12	Chiba	30	14	44	15	6	21	50%	43%	48%
13	Tokyo	0	6	6	0	4	4	0%	67%	67%
14	Kanagawa	3	4	7	2	0	2	67%	0%	29%
15	Niigata	72	1	73	35	0	35	49%	0%	48%
16	Toyama	9	1	10	4	1	5	44%	100%	50%
17	Ishikawa	21	2	23	8	1	9	38%	50%	39%
18	Fukui	8	2	10	2	0	2	25%	0%	20%

19	Yamanashi	18	5	23	9	2	11	50%	40%	48%
20	Nagano	35	14	49	12	5	17	34%	36%	35%
21	Gifu	8	0	8	7	0	7	88%	-	88%
22	Shizuoka	37	9	46	15	5	19	41%	56%	41%
23	Aichi	12	2	14	7	1	8	58%	50%	57%
24	Mie	12	2	14	6	1	7	50%	50%	50%
25	Shiga	12	0	12	5	0	5	42%	-	42%
26	Kyoto	17	1	18	9	0	9	53%	0%	50%
27	Osaka	4	3	7	2	0	2	50%	0%	29%
28	Hyogo	40	8	48	19	1	20	48%	13%	42%
29	Nara	23	2	25	9	1	10	39%	50%	40%
30	Wakayama	10	7	17	4	2	6	40%	29%	35%
31	Tottori	11	2	13	4	2	6	36%	100%	46%
32	Shimane	20	6	26	11	1	11	55%	17%	42%
33	Okayama	12	1	13	9	1	10	75%	100%	77%
34	Hiroshima	14	4	18	9	0	9	64%	0%	50%
35	Yamaguchi	3	5	8	1	1	2	33%	20%	25%
36	Tokushima	9	1	10	5	1	6	56%	100%	60%
37	Kagawa	5	2	7	1	1	2	20%	50%	29%
38	Ehime	60	5	65	21	1	22	35%	20%	34%
39	Kochi	29	0	29	17	0	17	59%	-	59%
40	Fukuoka	7	4	11	5	0	5	71%	0%	45%
41	Saga	13	0	13	6	0	6	46%	-	46%
42	Nagasaki	7	2	9	4	1	5	57%	50%	56%
43	Kumamoto	62	3	65	27	1	29	44%	33%	45%
44	Oita	22	0	22	10	0	10	45%	-	45%
45	Miyazaki	41	0	41	14	0	14	34%	-	34%
46	Kagoshima	186	2	188	80	1	81	43%	50%	43%
47	Okinawa	5	0	5	1	0	1	20%	-	20%
48	Unknown			0	9		9			
	Total sent	1263	189	1452	572	62	633	45%	33%	44%
	Total delivered	1252	175	1427						
	Not delivered	11	14	25						

- ***Questionnaire Survey Design***

The questionnaire survey was designed in a way that would both incorporate factors mentioned in the existing studies (see Table 18) and attempt to reveal new insights. Questionnaires were sent out by post accompanied by a letter introducing the purpose of this study and explaining how obtained data would be treated, analyzed, and stored.



Picture 1. Questionnaire Sample (Envelope, Questionnaire Sheet, Return Envelope).

Picture 2. Questionnaire Responses.

4.3. Results

This section is summarizing the results from the questionnaire survey of JAS-certified organic farmers and farmers, who claim to practice organic farming but do not obtain JAS certifications (referred to as non-JAS organic farmers). Results section constitutes four subsections that analyze questionnaire responses from different perspectives.

Subsection "4.3.1. Characteristics of JAS Organic Certified Farmers" analyses the responses of JAS-certified organic farmers and compares them between the groups (ABCD), which were established through LQ analysis in Chapter 2, looking into the geographic distribution of JAS-certified organic farmers. Results for each questionnaire item are summarized in a way that first, the information for all JAS Organic respondents is presented, and further, it is divided into four (ABCD) groups and compared across them.

4.3.1. Characteristics of JAS Organic Certified Farmers

4.3.1.1. Respondents information

The last section of the questionnaire (Section 8, Questions 8-1 and 8-2) was designed to collect information about respondents and included questions about demographic

characteristics (sex, age, education) as well as basic questions regarding farming-related characteristics (farming as the main source of income, years of farming experience, farm succession). The answers to these questions are summarized in the next section. They include overall information about JAS-certified

– ***Demographic Characteristics of Respondents***

A) Overall

The questionnaire collected information on three main demographic factors, such as sex, age, and education of respondents. The results indicate that the absolute majority of respondents (90.9%) are male, with female respondents constituting only 7.6% of the total number of respondents.

In terms of age groups, the share of respondents in their 60s (36.9%) is the highest, followed by respondents in their 50s (20.5%). Interestingly, the number of younger respondents, for example, in their 20s (0.3%) and 30s (7.0%), is still two times lower than the

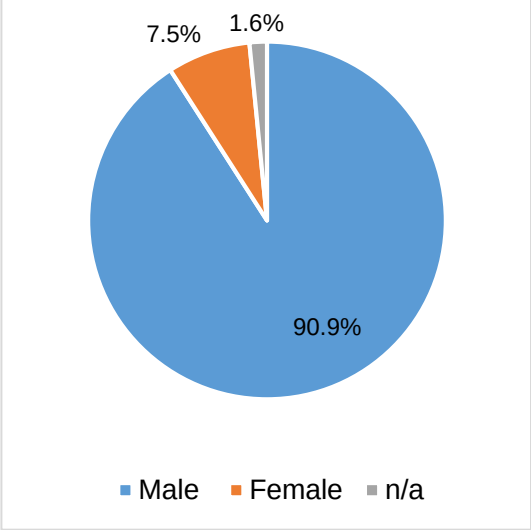


Figure 16. JAS Respondents Information - Sex Background

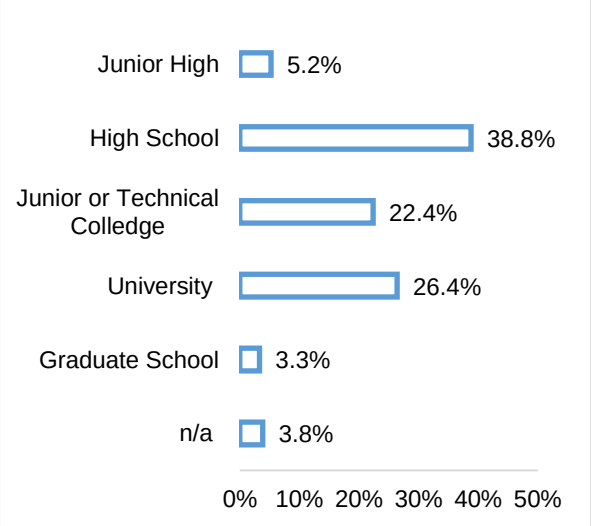


Figure 17. JAS Respondents Information – Academic

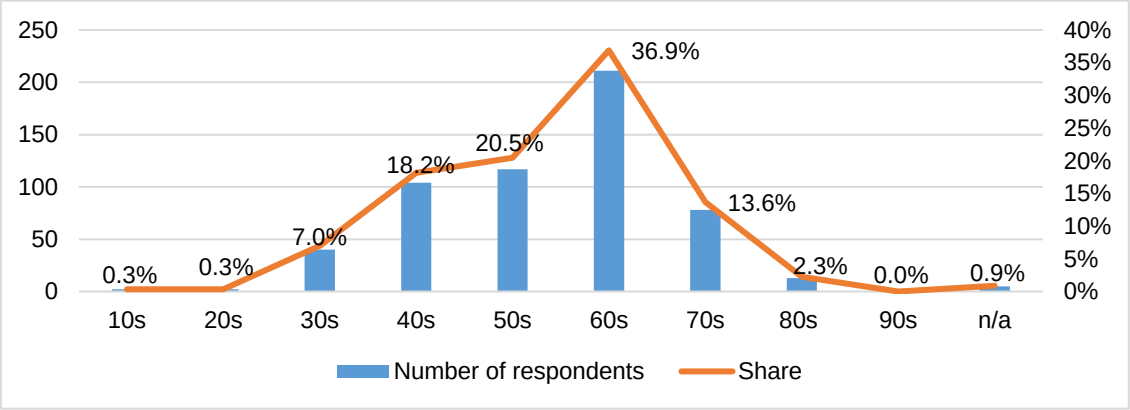


Figure 18. JAS Respondents Information - Age

number of older respondents (70s – 13.6%, 80s – 2.3%) combined.

When asked about their academic history, the majority of respondents (38.8%) have specified having had graduated from high school. University graduates account for 26.4% of respondents, followed by junior college/technical college graduates (22.4%)

B) ABCD Group Comparison

The sex distribution of respondents among the four groups was consistent with overall results for all JAS-certified respondents. However, Group A (High&Decline) and Group B (High&Growth) had a higher share of female respondents (9.5% and 8.7% respectively) compared to Group C (Low&Growth) and Group D (Low&Decline), where percentage of female respondents was lower than the average

Table 20. JAS Respondents Information - Sex (ABCD Comparison)

	Male	Female	n/a	Total
Group A	200	21	0	221
	90.5%	9.5%	0.0%	100%
Group B	123	12	3	138
	89.1%	8.7%	2.2%	100%
Group C	89	4	3	96
	92.7%	4.2%	3.1%	100%
Group D	102	5	1	108
	94.4%	4.6%	0.9%	100%

(4.2% and 4.6% respectively).

Age distribution of respondents has shown some variation among the four groups with Group D having the highest share of respondents in their 70s. For all the four groups, respondents in their 60s are the most represented age group (34~39%).

In terms of the academic history of respondents, an overall trend stayed the same over the four groups with minor discrepancies. For example, Group C demonstrates a lower share of High School graduates (32.3%) combined with an increased percentage of university graduates

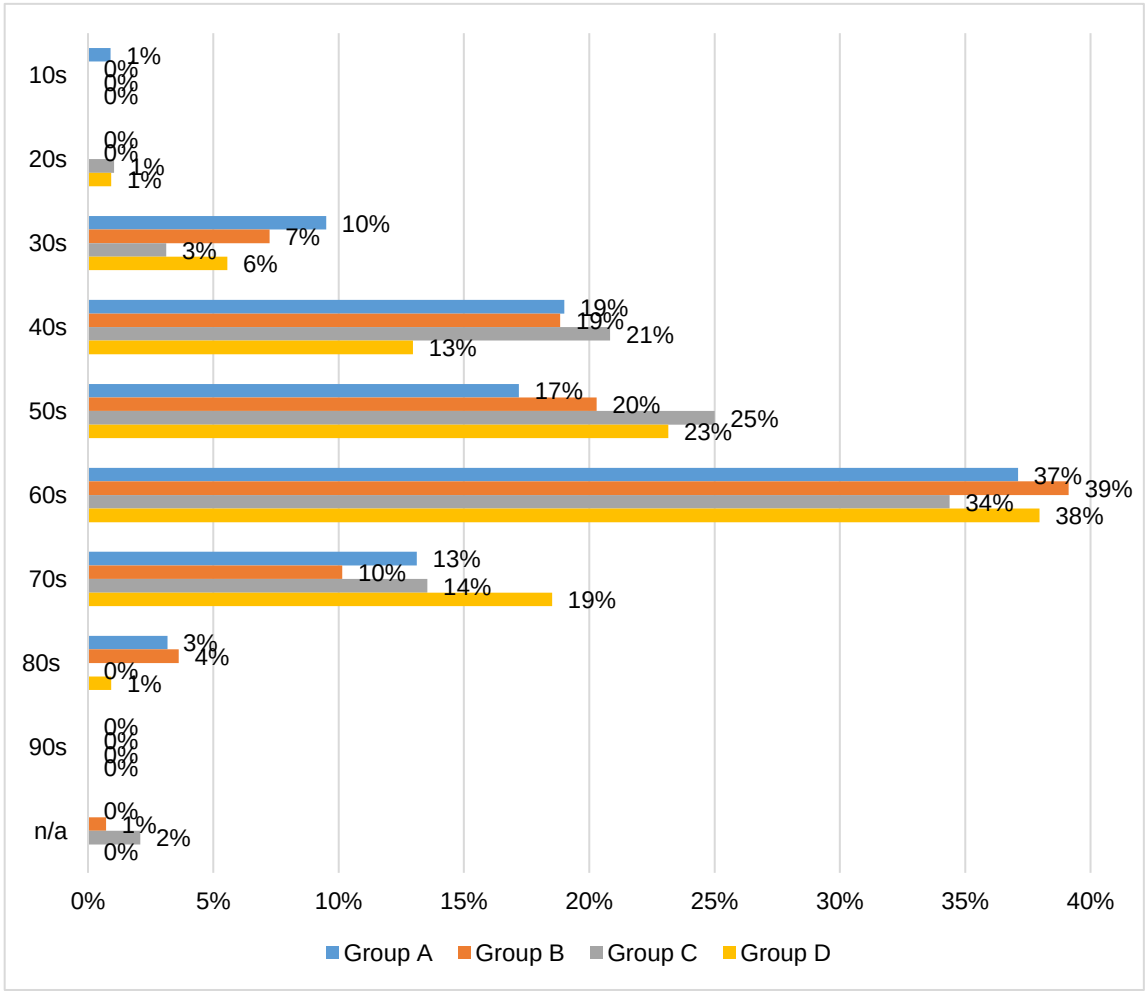


Figure 19. JAS Respondents Information - Age (ABCD Comparison)

(35.4%). Group B has the highest share of graduate school graduates (5.1%), whereas Group D, on the contrary, shows the lowest (1.9%).

Table 21. JAS Respondents Information - Academic Background (ABCD Comparison)

	Group A		Group B		Group C		Group D	
	# of resp	share	# of resp	share	# of resp	share	# of resp	share
Junior High	14	6.3%	7	5.1%	3	3.1%	5	4.6%
High School	92	41.6%	54	39.1%	31	32.3%	44	40.7%
Junior or Technical Colledge	47	21.3%	32	23.2%	22	22.9%	26	24.1%
University	54	24.4%	33	23.9%	34	35.4%	28	25.9%
Graduate School	7	3.2%	7	5.1%	3	3.1%	2	1.9%
n/a	7	3.2%	5	3.6%	3	3.1%	3	2.8%

– ***Farming Related Characteristics of Respondents***

A) Overall

Questions inquiring about primary income sources, years of farming experience, and farm succession were included in the section of the questionnaire designed to collect characteristics of the respondents. For more than 70% of respondents farming activities represent the primary income source, whereas 21.5% of respondents rely on other activities to sustain themselves economically. Share of respondents who have successors in their farming activities (44%) was nearly the same as those who said that they don't have a successor (49%), with the rest of the respondents have not answered this question (7%). The age distribution of the

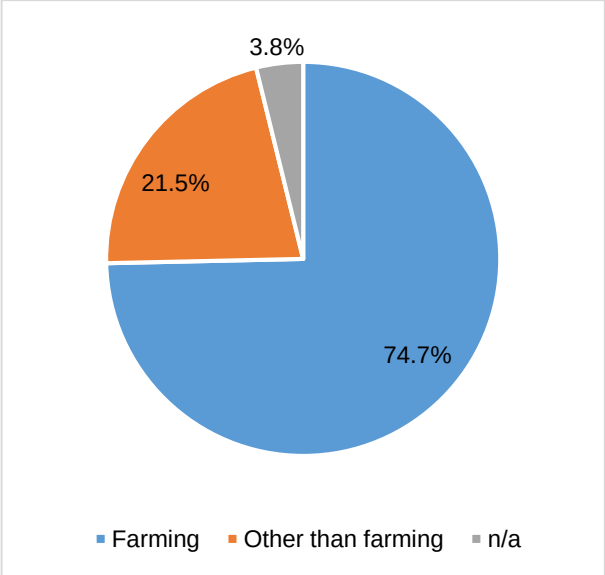


Figure 20. JAS Respondents Information - Main Income Source.

respondents can explain this – around 45% of respondents are in their 50s or younger, and may not be yet sure about their children's choice of profession due to their young age.

The question about the organic farming experience was divided into three subcategories: 1) the number of years of farming experience; 2) the number of years practicing organic farming; 3) the number of years since having obtained JAS certification. The number of years of experience decline across the three subcategories, showing that it takes on average around 12 years for a farmer to switch from conventional farming to organic, and then five more years to obtain JAS Organic Certification.

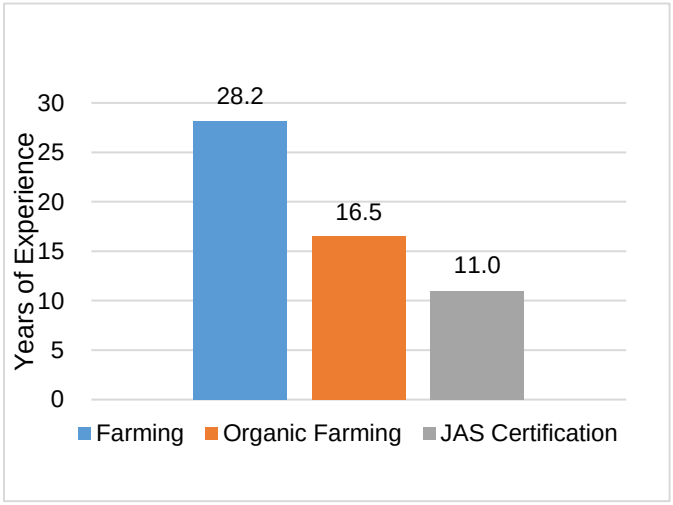


Figure 21. JAS Respondents Information - Years of Farming Experience.

B) ABCD Group Comparison

The overall trend for the farming-related characteristic of respondents stays the same across the four groups. However, Group D demonstrates the highest number of respondents for whom farming is not the primary income source. This can be explained by the fact that the share of respondents in their 70s and older is the highest in the Group D, and respondents in this group may be relying on the pension payments instead of the farming income. The same fact can serve as an explanation to the highest share of respondents with successors (45.4%) and the longest experience in farming on average (29 years).

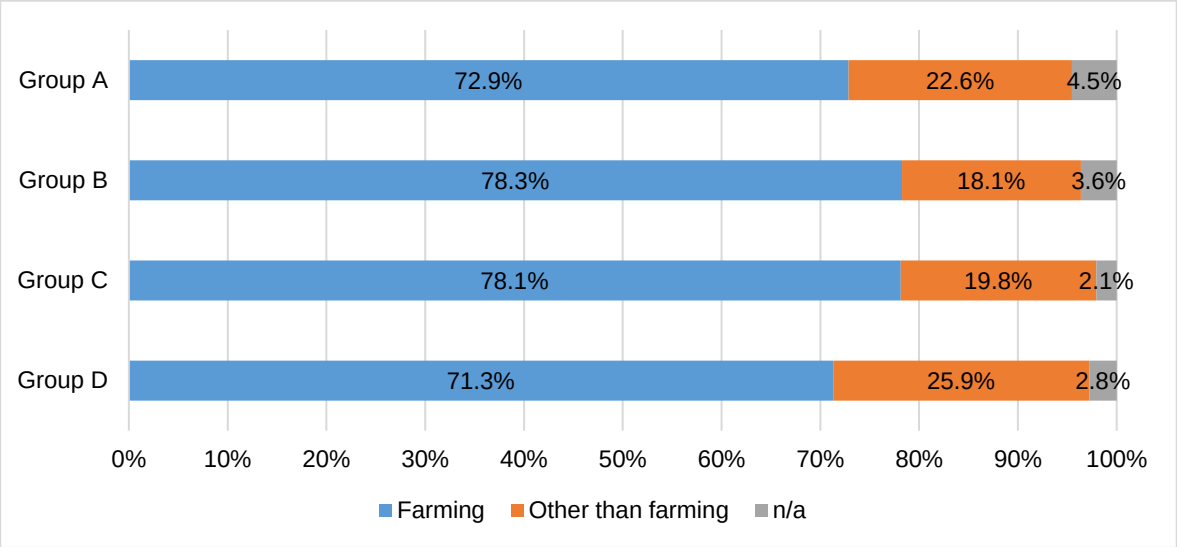


Figure 22. JAS Respondents Information - Main Source of Income (ABCD Comparison).

Table 22. JAS Respondents Information - Successor (ABCD)

	Have	Have not	n/a	Total
Group A	95	113	13	221
	43.0%	51.1%	5.9%	100.0%
Group B	62	69	7	138
	44.9%	50.0%	5.1%	100.0%
Group C	43	42	11	96
	44.8%	43.8%	11.5%	100.0%
Group D	49	52	7	108
	45.4%	48.1%	6.5%	100.0%

Table 23. JAS Respondents Information - Farming Experience (ABCD)

	Group A	Group B	Group C	Group D
Farming	28.37	29.35	24.64	29.37
Organic Farming	16.38	16.76	14.81	17.73
JAS Certification	10.95	11.68	9.93	11.28

4.3.1.2. Farm management

A) Overall

To collect the information regarding how the farms are managed, respondents were asked whether their families manage the farms or not, along with asking the respondents to identify whether the farms are incorporated, and specify incorporation type, if so.

The findings show that 64% of all respondents engage in farming activities at the farms

managed by families, and the rest 35% - at the farms managed in some other way, with 1% of respondents not answer the question.

In terms of incorporation level, 34% of respondents are engaging in the farming activities at the farms that are incorporated (61% - not incorporated, 5% - no answer). However, family management and incorporation do not necessarily correlate – for example; there are family-managed farms that are incorporated and vice versa. Two of the most popular incorporation types were identified, namely, joint-stock company (*kabushiki gaisha*, 42%) and limited company (*yugen gaisha*, 41%), followed by farmers union (10%). Other response options were found less relevant and have only been chosen by 1~2% of respondents.

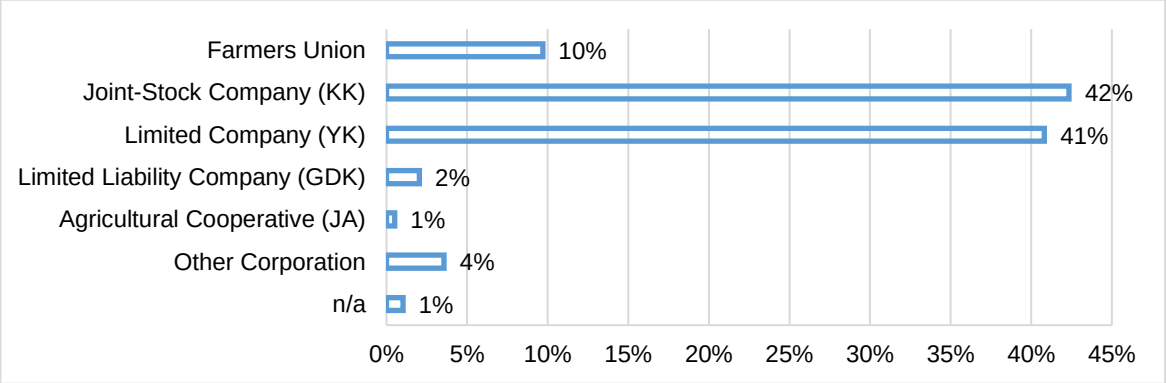


Figure 23. JAS - Incorporation Types.

B) ABCD Comparison

The share of respondents that are engaged in farming activities on family managed farms, or on incorporated farms followed a general trend across all four groups without demonstrating significant difference (fluctuation within 5~7% range). However, discrepancies across the four Groups were found among incorporation types – Group B has the highest share of joint-stock companies (50%), and Group C has the highest share of limited companies (51%). Interestingly, only Group D included respondents (3%) that identified their incorporation type as Agricultural Cooperative (JA).

Table 24. JAS - Family Management (ABCD)

	Group A		Group B		Group C		Group D	
	# of resp	Share	# of resp	Share	# of resp	Share	# of resp	Share
Managed by Family	149	67%	88	64%	58	60%	67	62%
Not Managed by Family	72	33%	50	36%	36	38%	40	37%
n/a	0	0%	0	0%	2	2%	1	1%
Total	221	100%	138	100%	96	100%	108	100%

Table 25. JAS - Incorporation Status (ABCD).

	Group A		Group B		Group C		Group D	
	# of resp	Share	# of resp	Share	# of resp	Share	# of resp	Share
Not Incorporated	133	60%	88	64%	55	57%	68	63%
Incorporated	80	36%	44	32%	35	36%	33	31%
n/a	8	4%	6	4%	6	6%	7	6%
Total	221	100%	138	100%	96	100%	108	100%

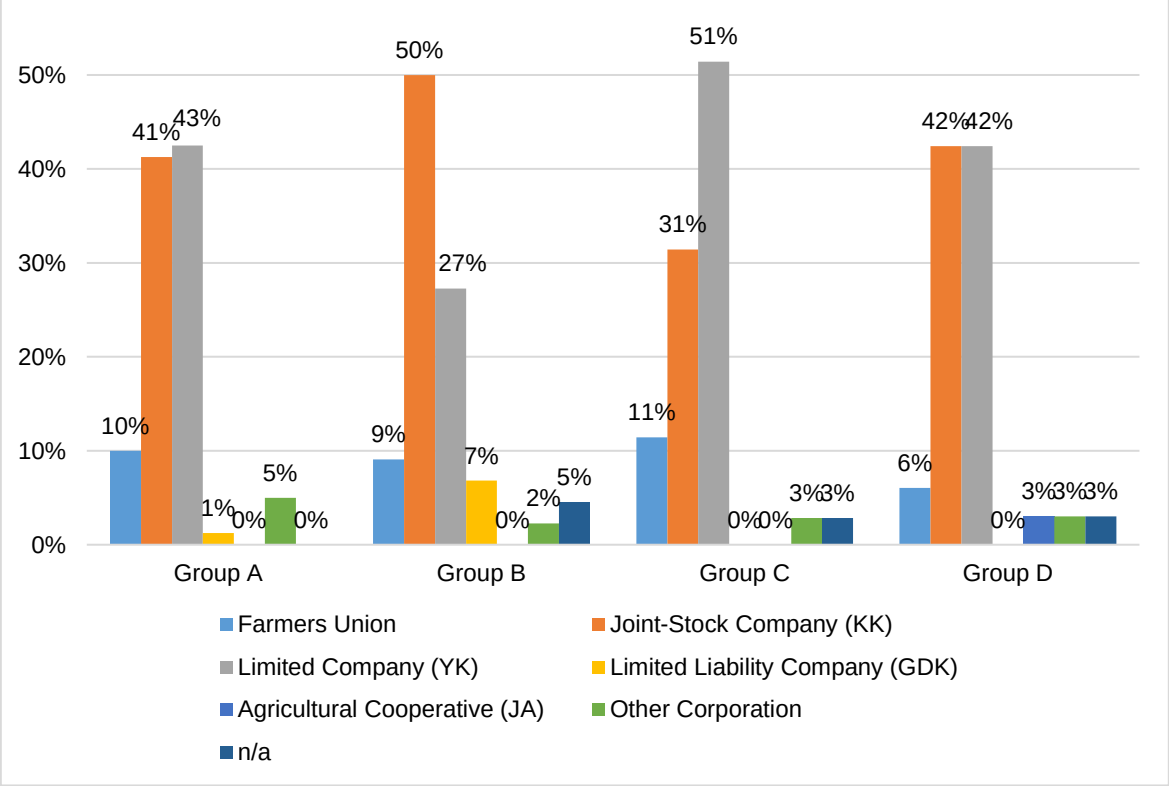


Figure 24. JAS - Incorporation Types (ABCD)

4.3.1.3. Farming Area and Crops

– ***Farming Area Types***

A) Overall

Questions in Section 4 of the questionnaire have been designed to collect information about the area size that was used for crop production within the last year. The information was collected about the size of the farming area divided into four types: rice paddies, vegetable fields, orchards, and pastures. The information also separately collected on the size of the farming land overall and the size of farming land certified under JAS Organic.

The findings show that most farmers only have part of their farming land certified under

JAS Organic and not all of it. On average, the share of land certified as JAS Organic was found to be the smallest for rice paddies accounting for 28%, followed by pasture lands (37%), vegetable fields (52%), and orchards (58%).

When the distribution of farming area types was compared for all farming area, and area under JAS Organic certification, it was found that on average the share of rice paddies was around 15% smaller for JAS certified areas, but showed 5% increase for orchards and 11% increase for vegetable fields. There was no change found for pasture lands, which accounted for 4% for both all farming area size as well as area certified as JAS Organic.

Table 26. JAS - Farming Area by Type

Farming area size		Min	Aver	Max
Area (Paddy)	ha	0	4.84	215.67
Area (Paddy JAS)	ha	0	1.34	40
Area (Orchards)	ha	0	1.20	57
Area (Orchards JAS)	ha	0	0.70	40
Area (Vegetable Field)	ha	0	3.85	311.5
Area (Vegetable Field JAS)	ha	0	2.00	80.44
Area (Pasture Land)	ha	0	0.47	97.8
Area (Pasture Land JAS)	ha	0	0.17	71

Table 27. JAS - Farming Area. Average Share under JAS Organic.

Average share of area under JAS Certification	Aver%
Paddy	28%
Orchards	58%
Vegetable Field	52%
Pasture Land	37%

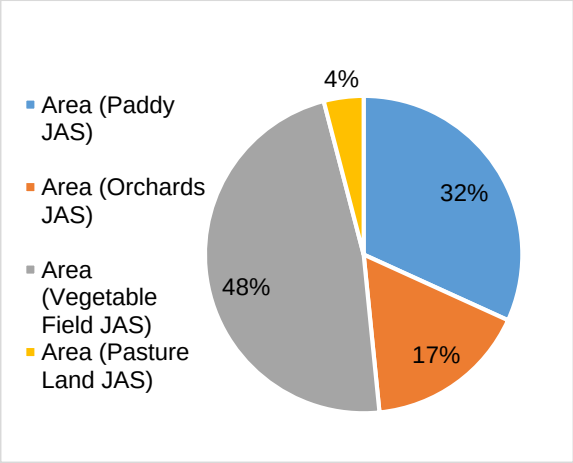


Figure 25. Farming Area Type Distribution under JAS Organic.

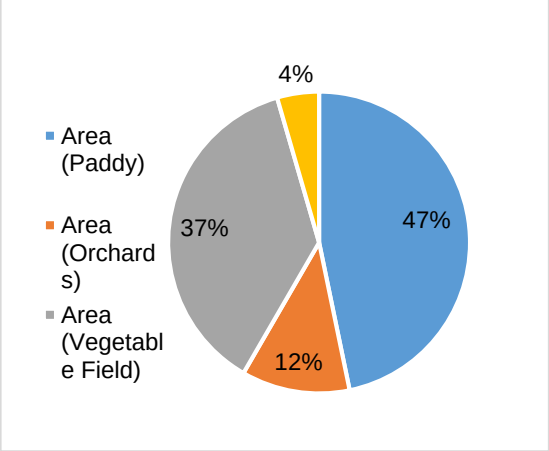


Figure 26. All Farming Area Type Distribution.

B) ABCD Comparison

The results on farming area size were compared among the four groups. The distribution of farming area types has shown some variation across the four groups. For example, Group D (Low & Decline) was found to have the highest share of pasture fields (13% for all pastures, and 15% for pastures certified under JAS Organic), as well as the highest share of JAS Organic Certified rice paddies. Group A has the highest share of JAS certified vegetable fields (60%), whereas Group B has demonstrated the highest share of orchards for both overall area (22%) and JAS Organic certified area (31%).

Table 28. Farming Area Size by Type (ABCD).

Farming Area Size		Group A			Group B			Group C			Group D		
		Min	Aver	Max	Min	Aver	Max	Min	Aver	Max	Min	Aver	Max
Area (Paddy)	ha	0	5.17	156.34	0	3.28	110	0	4.45	35.8	0	6.61	215.67
Area (Paddy JAS)	ha	0	0.89	21	0	0.84	5.3	0	1.91	35.6	0	2.32	40
Area (Orchards)	ha	0	1.20	57	0	1.54	33.51	0	0.43	8	0	0.84	15.3
Area (Orchards JAS)	ha	0	0.80	40	0	1.16	33.51	0	0.24	4.5	0	0.37	10
Area (Vegetable Field)	ha	0	5.04	150	0	2.07	26.5	0	2.95	42	0	4.71	311.5
Area (Vegetable Field JAS)	ha	0	2.69	80.44	0	1.72	26.5	0	1.86	25	0	1.15	22
Area (Pasture Land)	ha	0	0.26	14.2	0	0.06	7	0	0.05	5	0	1.81	97.8
Area (Pasture Land JAS)	ha	0	0.07	8.42	0	0.05	7	0	0	0	0	0.70	143

Table 29. Farming Area Share by Type (ABCD).

Average Share of Each Area Type				
	Group A	Group B	Group C	Group D
Area (Paddy)	43%	47%	56%	47%
Area (Paddy JAS)	20%	22%	48%	51%
Area (Orchards)	13%	22%	5%	6%
Area (Orchards JAS)	18%	31%	6%	8%
Area (Vegetable Field)	42%	30%	37%	34%
Area (Vegetable Field JAS)	60%	46%	46%	25%
Area (Pasture Land)	2%	1%	1%	13%
Area (Pasture Land JAS)	2%	1%	0%	15%

Share of are certified as JAS Organic for different types has shown variation within the four groups. For example, Group C did not include any certified pastures, whereas Group B has demonstrated the highest share of certified orchards. Overall, it has shown the highest JAS Organic certification rate of 54% in terms of area covered, with Group D having the lowest certification rate of 32%.

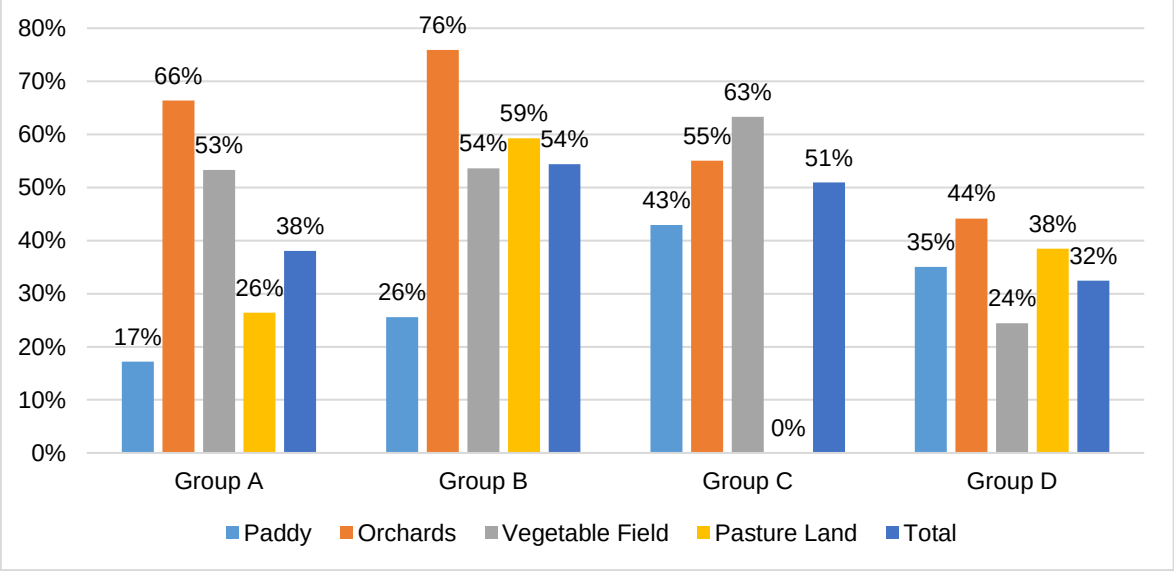


Figure 27. Average Share of Area under JAS Organic (ABCD).

– ***Number of Crops***

A) Overall

Section 5 of the questionnaires were designed to collect information about the number of crops grown in the past year, both overall, as well as number of JAS, certified crops. The findings have demonstrated the same tendency as in the case with farming areas – the number of crops certified as JAS organic is 1.4 points less than an overall number of crops grown within the last year. On average, the certification rate for the number of crops accounts for 74%.

Table 30. The number of Crops Grown Last Year.

	Min	Aver	Max
All crops	0	5.4	38
JAS certified crops only	0	4.0	38
Difference	0	1.4	0

B) ABCD Group

When compared across the four groups, Group C has demonstrated the highest variation of crops with an average of seven crop types grown on the farm overall, with 5.3 of them certified as JAS Organic. Both Group B and Group C have shown the highest rate of certification in terms of the number of crops – 76%, with Group D having the lowest rate of 71%.

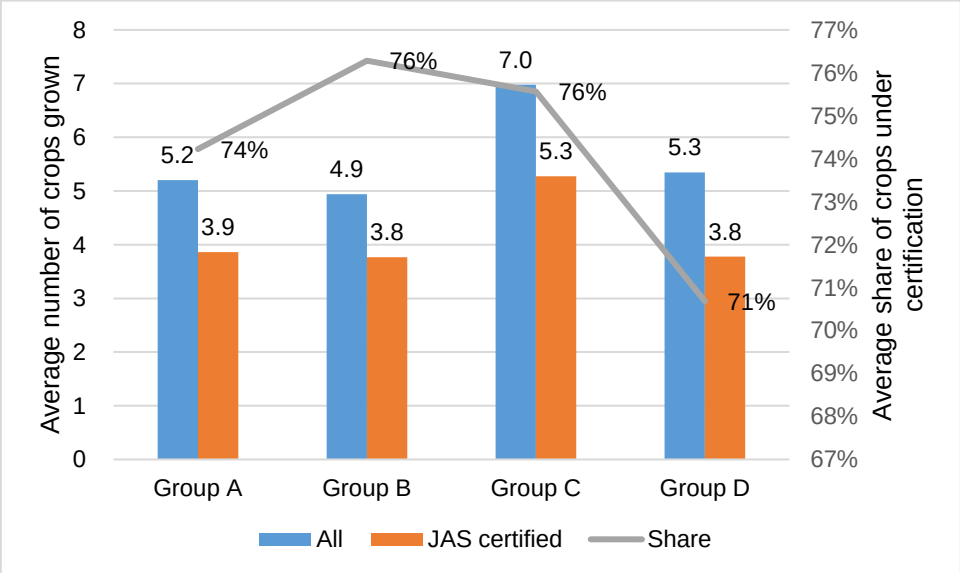


Figure 28. Average Number of Crops Grown Last Year (ABCD Group). Blue bar represents all crops grown on the farm; orange bar represents crops certified under JAS Organic.

4.3.1.4. Distribution of agricultural produce

- ***Types of distribution channels***

Selling organic agricultural products is one of the most important aspects because in order for organic farming to start bringing profit, agricultural products have to be sent to consumers first. This is not different from conventional farming. However, organic food can't always be sold through the same distribution channel as conventional agricultural produce as mixing it with conventional products will eliminate its value as safer products. The question in this section of the questionnaire was designed to find out the most widespread types of distribution channels used by JAS-certified organic farmers.

A) Overall

Multiple-choice options were given to respond to this question. The results demonstrated that selling directly to the consumer (which includes selling through the Internet, directly on the farm, or through selling point "*chokubaijo*") turned out to be the most popular option chosen by 65% of respondents. This was followed by selling to retail stores (e.g., supermarkets, etc.), which were chosen by 50% of respondents. JA and other distribution groups except JA accounted for 30% and 36%, respectively. Further, 27% of respondents have chosen the food industry and restaurants as a selling point of their organic produce, whereas the wholesale market accounted for 15%. Ten percent of respondents have chosen the option "Other" and then explained their choice in a section specifically designed for this purpose. Their answers have included selling their produce to dormitories of educational facilities, elderly homes, gift shops, as reward items for hometown tax donations, hotels, and souvenir shops, morning markets, having contracts directly with consumers, or selling directly through word of mouth. Larger incorporated farmers mentioned processing their produce directly at the

company factories or wineries. Several green tea producers have mentioned selling their products to wholesalers specializing in the selling of tea (ton'ya).

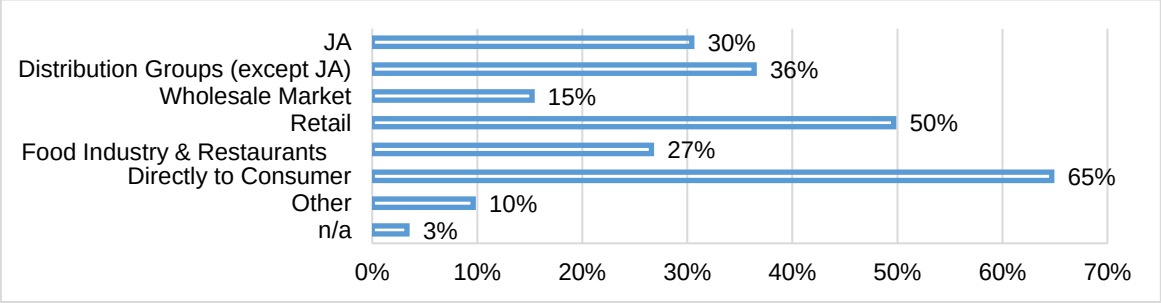


Figure 29. Distribution Channels for JAS Organic.

B) ABCD Group comparison

The trend has remained the same when compared across the four groups with insignificant variations among the groups. For example, Group D showed the lowest percentage for selling to retail among the four groups (31% against A – 34%, B – 39%, C – 31%).

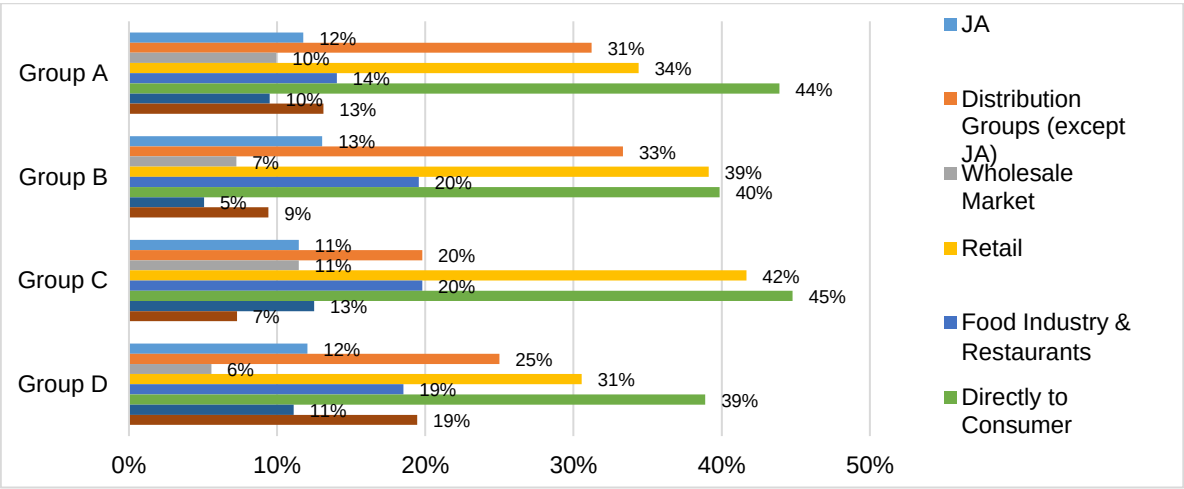


Figure 30. Distribution Channels for JAS Organic (ABCD).

- ***Main distribution channel***

A) Overall

Additional question was set and requested respondents to choose their main distribution in terms of profit for the past year among the same response options. In this question, the most popular option was distribution groups (except JA) – 22%, followed by retail – 21%, selling directly to consumers – 16%, JA – 13%, food industry & restaurants – 8%, and wholesale market – 4%.

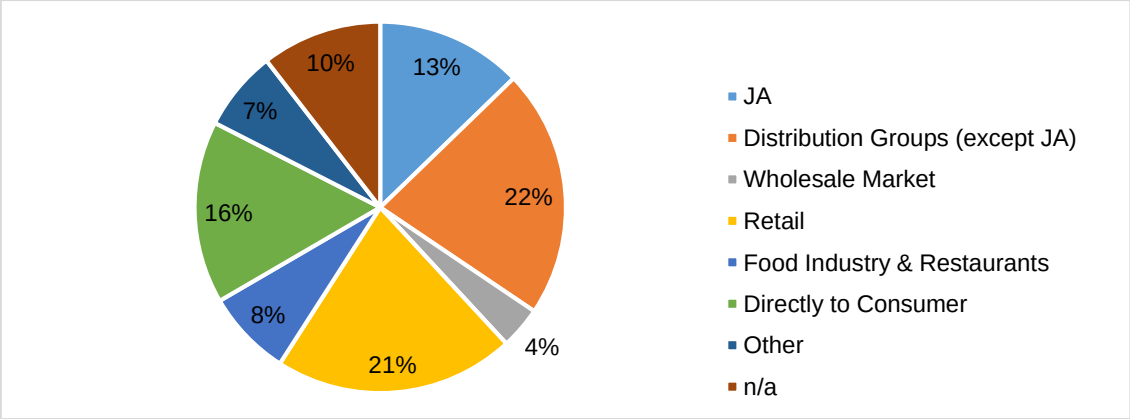


Figure 31. Main Distribution Channel for JAS Organic.

Respondents have also commented about shared their obstacles and difficulties in selling their produce by voicing their concerns using the free comment section. Several themes became apparent in those comment. For example, the some respondents have reveled their concerns about trustworthiness of retails and their level of concern towards the health of consumers:

- *Large retails shops (for example, supermarkets) do not take into considerations consumers' health (I have got this impression though conversation with buyers),* - Respondent from

Hokkaido;

- *Once I was approached by a retailer specializing in selling organic products. They told me that even if I use pesticides a little bit, they will still sell my produce. So is this how they understand "organic"?* – Respondent from Kumamoto prefecture.

Other respondents have commented than selling organic products requires a lot of effort from retail stores and many of them are hesitant to start selling or using organic products:

- *Certification requirements are too strict and it is difficult to supply produce to retail store. For example, it is now allowed to cut the product with a knife or place a tape on it. There are too many obstacles for the retailers*, - Respondent from Gunma prefecture;
- *When trying to sell fruits to sweets' maker, I was told that the other fruits they use are not organic and I was refused*, - Respondent from Ehime prefecture;

Moreover, having enough labor force was pointed out as a necessary condition for being able to establish new distribution channels and requested for more support:

- *In terms of distribution channels, there is a difference depending on the availability working force. It is desirable to have a distribution system for organic products established so that farmers can concentrate on farming activities*, - Respondent from Kumamoto prefecture;
- *There is no support on municipal, prefectural or national level for efficiently selling organic products online (for example, creating a website where local products of the prefecture are sold)*, - Respondent from Oita prefecture.

Finally, a difference between buying behavior of consumers in urban and rural area has been pointed out:

- *There is difference in consumers' awareness about JAS Organic certification between urban and rural area. In rural area, there is no difference in demand even if the product does not have JAS Organic label*. - Respondent from Nagano prefecture.

- *At direct sales stores (chokubaijo), JAS Organic Label does not make any difference. Elderly farmers who rely on their pension for living set the price very low, which results in the competition who sets the price the lowest. Consumers prefer cheaper products. Even if you put JAS Organic Label and set the price just a little higher, it will not sell. The tendency is "the cheaper, the better". Sometimes I don't really understand the meaning of having obtained JAS Organic certification*. – Respondent from Hyogo prefecture.

B) ABCD Group comparison

Similar trend was demonstrated among the four groups as revealed by the comparison in the graph below. However, selling to distribution groups (except JA) has shown more significance in Group A and Group B, whereas respondents in Group C and Group D have chosen retail as their main distribution channel.

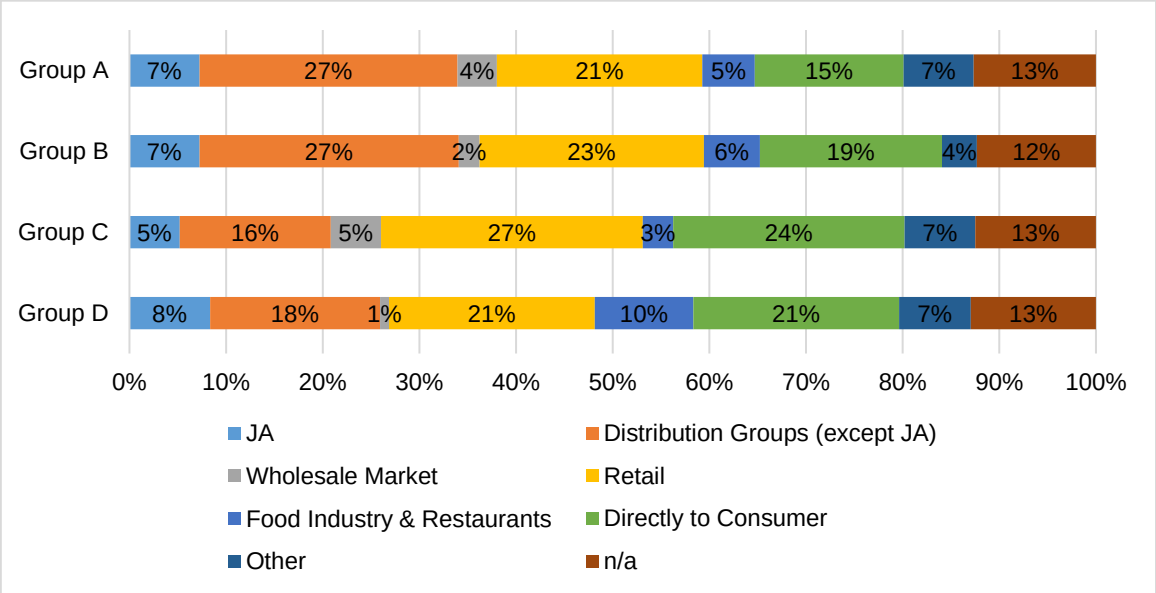


Figure 32. Main Distribution Channel for JAS Organic (ABCD).

4.3.1.5. Certification Center Location and Information Sources

– ***Certification Center Proximity***

A) Overall

Certification center is the main authority dealing with JAS Organic certification applications, thus proximity of the certification center can potentially play crucial role in farmers decision making on weather obtain JAS Organic certification or not. For this reason, a question was designed to find out if there is a certification center close by to the respondents. For this question the proximity of the certification center in concrete terms was not

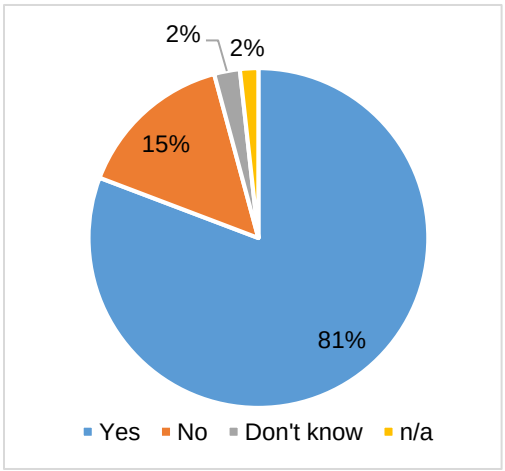


Figure 33. Availability of a Certification Center Close by.

specified and it was left to the perception of the respondents on what they consider as a "close" distance. When answering this question, 81% of respondents said that there is a certification center close by against 15% of respondents saying that there isn't one close to where they are living.

B) ABCD Group comparison

The trend stayed the same across the four groups with Group C demonstrating slightly less number of respondents saying that there is a certification center close by – 75%.

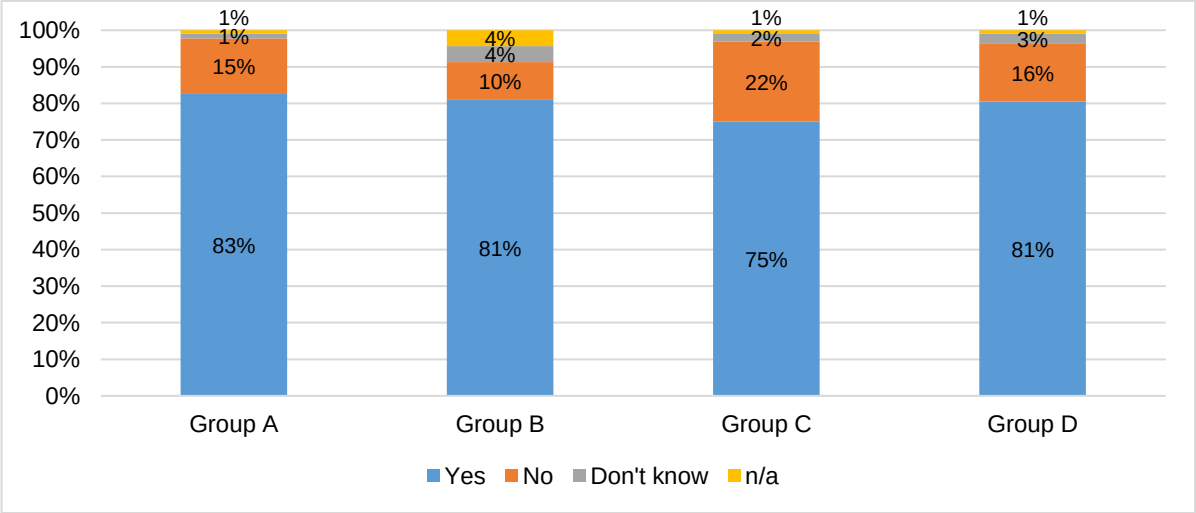


Figure 34. Availability of a Certification Center Close by (ABCD).

– ***Information sources on JAS certification***

A) Overall

Obtaining information on JAS Organic Certification itself, its types, requirement and application process is the first step on a way to making a decision to obtain the certification. Multiple of options was offered to respondents to pick as a source for obtaining information

about the JAS Organic Certification.

Certification Center was chosen as a source of information by an absolute majority of respondents – 79%. Less popular response option included obtaining information from other farmers – 21%, followed by the Internet (16%) and relevant books (15%). Other options, such as municipality (5%) or JA (3%) scored less than 5%. Respondents who ticked the option "other" have left explanation in a form of free comment. These "other options included obtaining information on JAS Organic Certification from retailers, especially those specializing on selling organic products, farmers groups practicing organic farming, organic farming promotion center, thematic exhibitions, prefectural governments, NPOs and studying on their own.

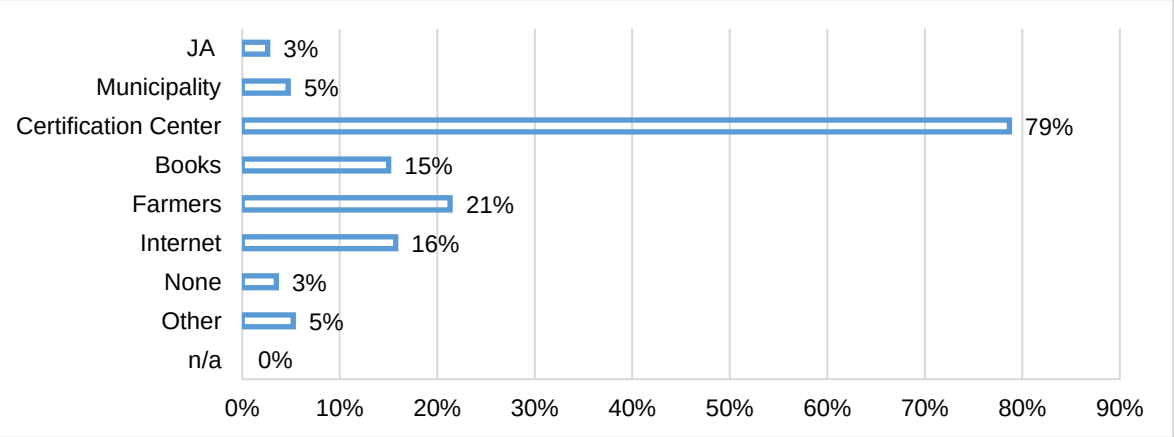


Figure 35. Information Source on JAS Organic Certification.

B) ABCD Group comparison

Comparison of the response results across the four groups showed that the tendency is the same across the groups with the certification center being the main source of information (74~82%). However, interestingly the option of obtaining information from other farmers was

2.5~3 times lower (10%) in Group D than in other groups (A – 23%, B – 24%, C – 28%). With Group D being the lowest in terms of JAS Organic certified farmers certification, with the concentration declining, these findings indicate that having a strong network of farmers supporting each other through the information exchange can leverage further JAS Organic certification.

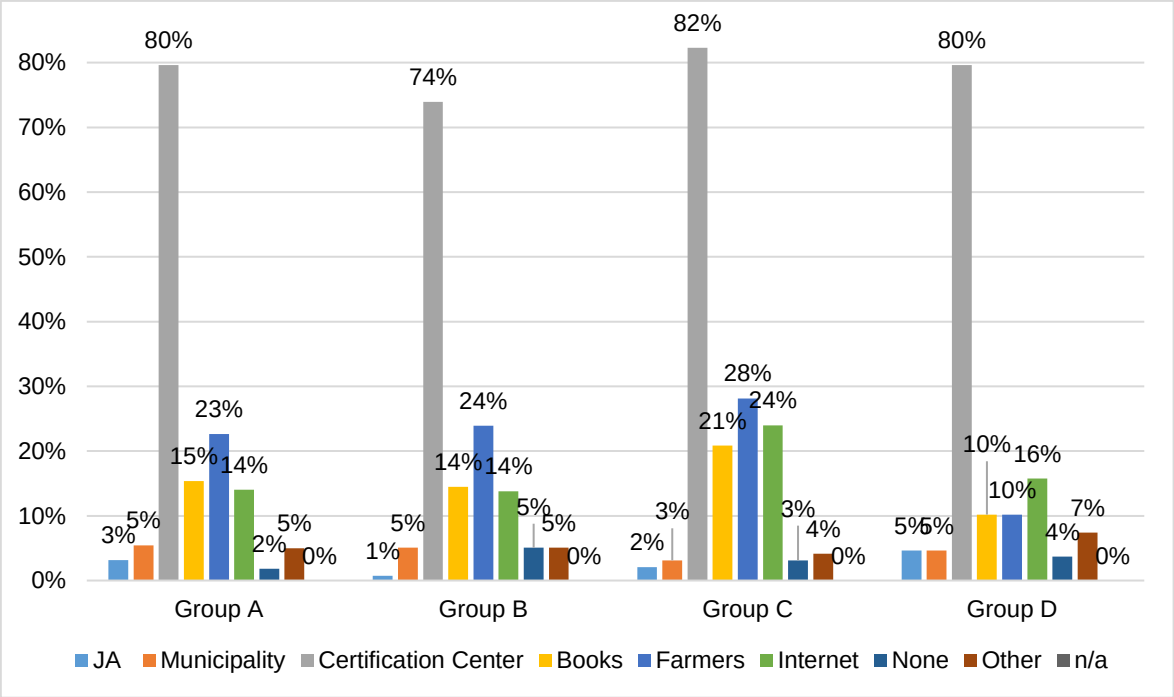


Figure 36. Information Source on JAS Organic Certification (ABCD).

– ***Information sources on organic farming***

A) Overall

Additionally, farmers who received questionnaires were asked about their information source about organic farming and were given the same multiple choice options as in the question regarding the information source about JAS Organic certification. The results showed

that in case of information about organic farming the certification centers are less prominent sources of information although they still continue to be the major source (59%, compared to 79% in case of JAS Organic certification). At the same time, the significance of books (28%, compared to 15% for JAS Organic certification), other farmers (33%, compared to 21% for JAS Organic certification) and the Internet (24%, compared to 16% for JAS Organic certification).

Additional responses from farmers included thematic seminars, farming equipment shops, fertilizer producers, and original method of the company, in addition to the sources listed as information sources on JAS Organic Certification (farmers groups, retailer, and self-education).

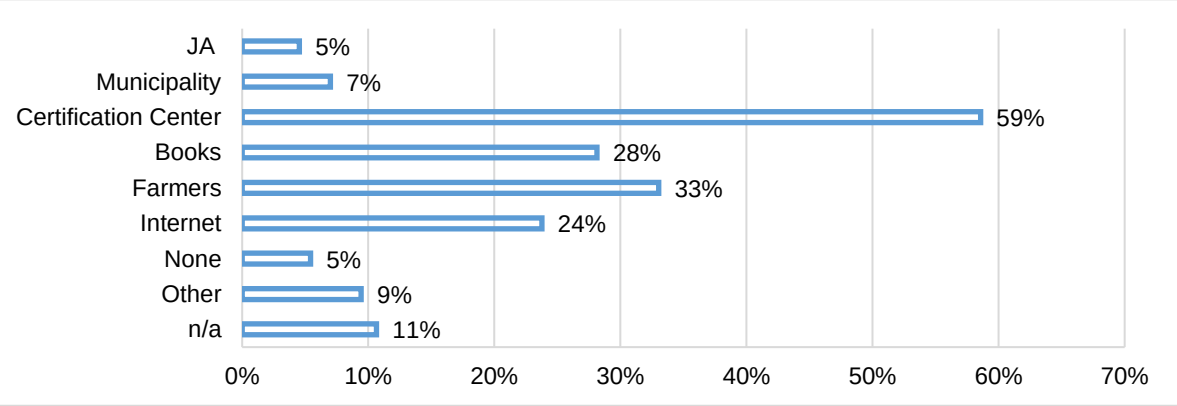


Figure 37. Information Sources on Organic Farming.

One of respondent has left a comment on the overall availability of the information on organic farming in the free comment section designed at the end of the questionnaire sheet, saying:

- *There is a lack of information about organic farming. We only have ourselves to rely on to establish farming areas as well as develop farming know-how and distribution channels*

through error and trial. – Respondent from Fukuoka prefecture.

B) ABCD Group comparison

Similar to the distribution of the responses regarding the information source on JAS Organic, the responses have shown similar tendency across the four groups. As in the case with the information source on JAS Organic Certification, the option of other farmers as information sources about organic farming scored lowed in Group D (25%) than in other groups (A – 36%, B – 32%, C – 39%).

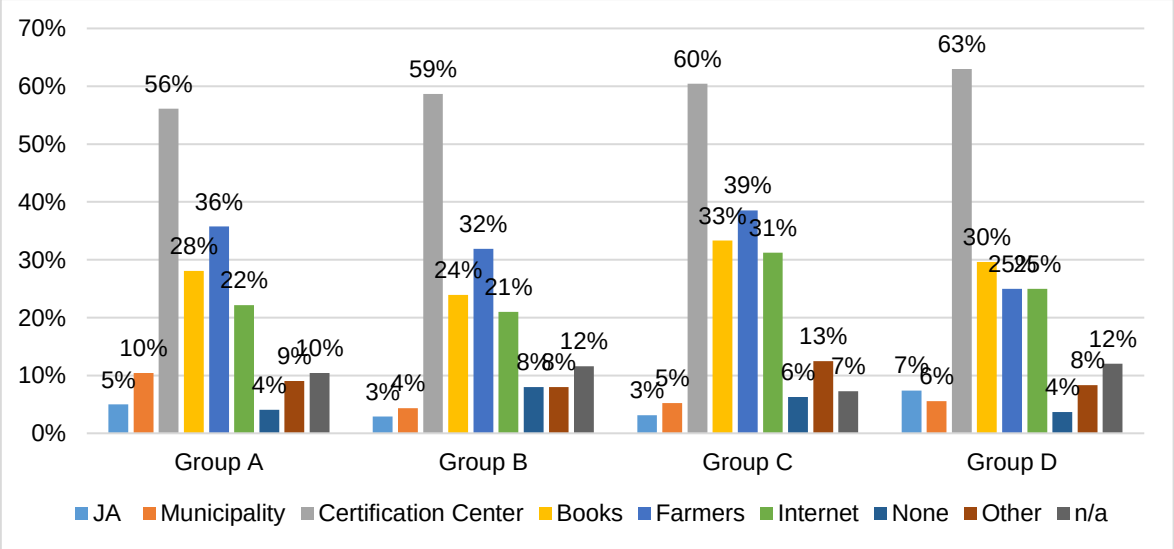


Figure 38. Information Sources on Organic Farming (ABCD).

4.3.1.6. Reasons for obtaining JAS Organic Certification and Certification Types held

– ***Reasons for obtaining of JAS Organic Certification***

A) Overall

To better understand the motives of farmers to obtain JAS Organic certification a

questions was asked regarding their reasons on to obtain the certifications and multiple choice answers were suggested. Three the most popular responses were to produce safe products (77%), to increase price (51%) and to protect environment (45%), which shows that it is a mix of health, economic and environmental motives. Benefits of organic farming to health (40%), strengthening the bond between producers and consumers (34%) and responding to retail requests (32%) also scored high. Extremely unpopular were three following options: being surrounded by a lot of organic farmers (5%), receiving subsidies (4%), and following municipal/JA policy (2%). These findings indicate that a number of organic farmers is still small and they may lack having strong community, as well as demonstrate that local policy as well subsidies lack power to act as a driving force to make farmers opt for obtaining JAS Organic certification.

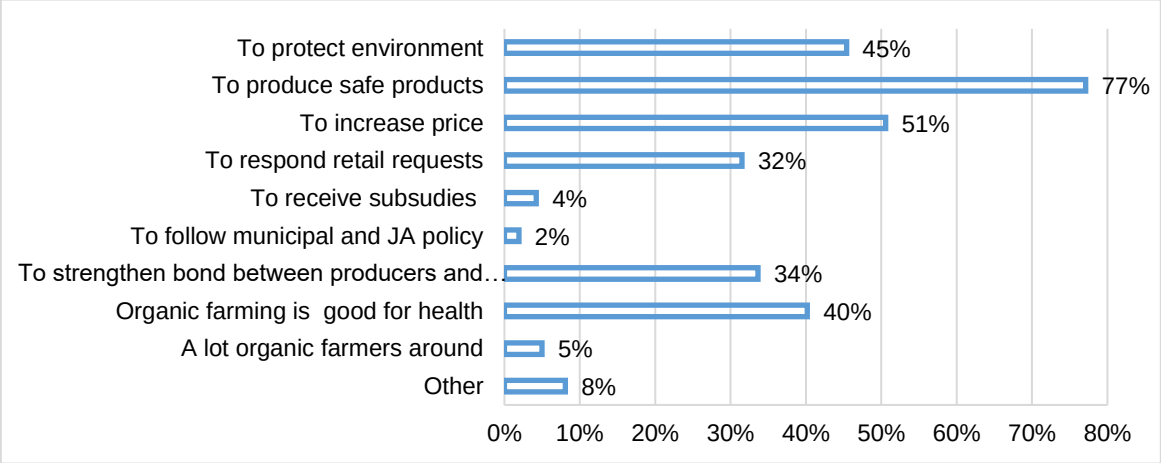


Figure 39. Reasons to Obtain JAS Organic Certification.

One of respondents has left a free comment about having strong reasons for starting organic farming and obtaining JAS Organic certification, but nevertheless still expressed his concerns about it saying:

- *It is been 40 years since I have started organic farming. I have started it out of need because of the pesticide poisoning, and still have problems with unstable yields and difficulties with distribution. Despite all of the long years of experience, I still find organic farming difficult and think that starting organic farming is a big risk for other farmers. There is lack of understanding from policy-makers, distributors and consumers. That is why I would not advise staring organic farming to others*. – Respondent from Kagoshima prefecture.

Still other reason for obtaining JAS Organic certification was that there is no other suitable certification scheme for type of farming technique practiced:

- *I practice natural farming (shizen nouhou), that does not use any pesticides or fertilizers. I have obtained JAS Organic certification to demonstrate that I do not use pesticides or fertilizers.* – Respondents from Kagoshima prefecture.

Municipal and JA policy was found to be the weakest driver for obtaining JAS Organic certification. In fact, some of respondents have left negative comments about the role of JA in the penetration of JAS Organic certification:

- *I think that organic farming will not become popular as long as JA keeps its influence*. – Respondent from Shizuoka prefecture.

- *There are offices for the promotion of organic farming in the government, but national government, prefectures and municipalities do not put enough effort into it. The efforts of JA are certainly close to zero.* – Respondent from Miyazaki prefecture.

Following the answer about municipal and JA policies, the next least popular answer was to receive subsidies, with some respondents commenting on this issue:

- *The follow up from the national and municipal government is extremely limited. They should provide a little more support, for example in a form of subsidies*. – Respondent from Hokkaido.

- *I am the only one in my village who has obtained JAS Organic certification and that is why I cannot apply for receiving subsidies. In mountainous regions farming are size for rice paddies is small and there are a lot of elderly farmers. This makes it impossible to create a group of five or more people as required for subsidy application.* – Respondent from Miyazaki prefecture.

B) ABCD Comparison

Comparison of findings show that the distribution of respondents stays more a less similar across the four groups. However, Group D has scored the lowest on choosing retail request as a reason (26%, compared to A – 30%, B – 34%, C – 31%). This result corresponds to the finding the retail was rated the lowest in Group D among the four Groups, when asked about the distribution channels. At the same time Group B, which has concentration of certified organic farmers higher than average and keeps on growing, scored the highest among the four groups on the four following response options: to produce safe products (78%), to increase price (52%), to respond to retail requests (34%), having a lot of organic farming around (8%). These findings indicate that there requests from retail that allow to sell for a higher price could be considered an important driving forces for farmers in obtaining JAS Organic certification.

Table 31. Reasons to Obtain JAS Organic Certification (ABCD).

	Group A		Group B		Group C		Group D	
	# of resp	share	# of resp	share	# of resp	share	# of resp	share
To protect environment	85	42%	53	40%	41	45%	51	49%
To produce safe products	146	73%	104	78%	68	75%	76	72%
To increase price	95	47%	69	52%	42	46%	52	50%
To respond retail requests	61	30%	45	34%	28	31%	27	26%
To receive subsudies	9	4%	4	3%	4	4%	5	5%
To follow municipal and JA policy	6	3%	2	2%	1	1%	1	1%
To strengthen bond between producers and consumers	62	31%	44	33%	33	36%	35	33%
Organic farming is good for health	78	39%	52	39%	33	36%	43	41%
A lot organic farmers around	5	2%	11	8%	6	7%	3	3%
Other	18	9%	7	5%	7	8%	10	10%

– ***JAS Organic Certification types held***

A) Overall

The questionnaire survey was designed to target the producers of organic agricultural products. For this purpose, the list of certified farmers and farming units was filtered to pick those certified under JAS Organic Plants certification type. Additionally, a question was set to see if those producers hold any other types of JAS certification. As preset by the survey design, all of the respondents (excluding 2% who did not reply this question) were holders of JAS Organic Plants certification. Additionally, some of the respondents were holding JAS Organic Processed Food Certification (17%) and JAS Organic Re-packing Certification (15%).

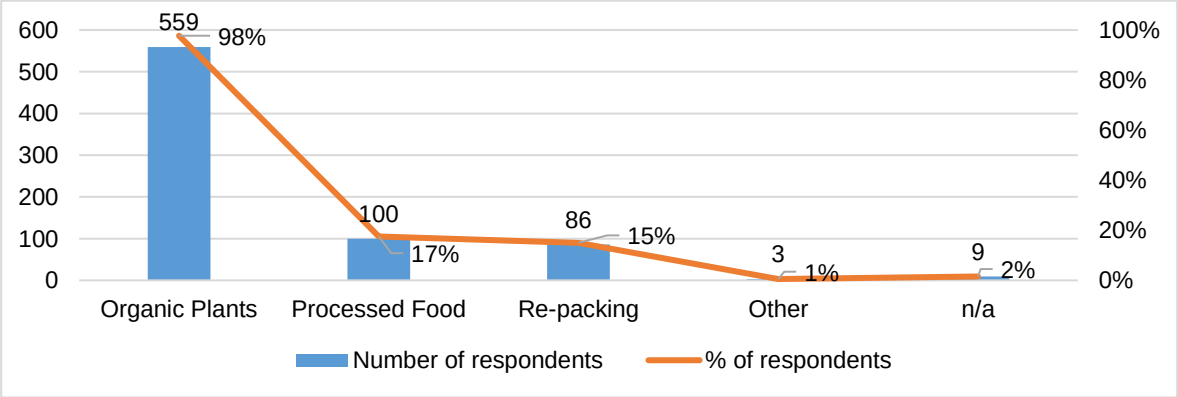


Figure 40. Types of JAS Organic Certification Held.

B) ABCD Comparison

The same trend became apparent when comparing the results across the four groups with Group A showing slightly higher share of respondents holding JAS Organic certifications other than Organic Plants type (Processed food – 22%, Re-packing – 17%). This difference can be explained by the type of crops produced in the prefectures that constitute each group.

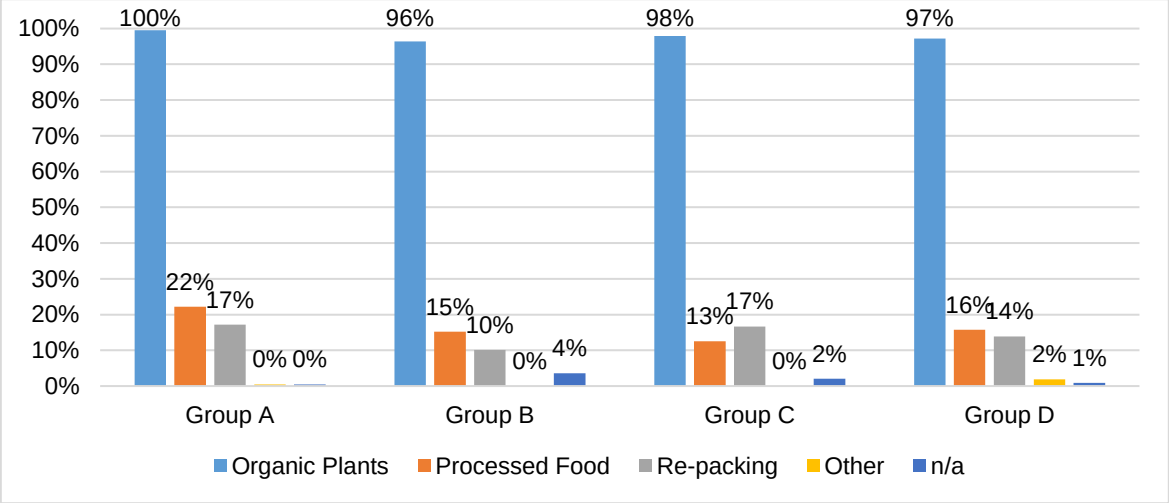


Figure 41. Types of JAS Organic Certification Held (ABCD).

– ***Certifications other than JAS Organic***

A) Overall

Apart from asking about JAS Organic Certification types, additional question was designed to find out whether there are other types of certification except from JAS Organic that respondent hold. The findings show that 40% of respondents have obtained certifications other than JAS Organic. Among them more than a half of respondents (60%) were found to be holders of "Eco-farmer" Certification, followed by Specially Cultivated ("Tokubetsu Saibai") Products Certification (33%) and various types of Good Agricultural Practice (GAP) certification (18%).

Except for the response options offered in the questionnaire, some respondents mentioned having obtained local prefectural certifications for eco-friendly farming as well as ISO9001.

In the free comment section, some respondents have expressed their concern that other certification are more popular among consumers, which can even further lower awareness level of JAS Organic certification:

- *I feel that the level of awareness about organic farming is lower than that of Eco-farmer and GAP. And farming technique is less mature (on my own experience).* – Respondent from Tottori prefecture.

- *JGAP and other certification schemes have emerged, which poses risk on the value of JAS Organic certification*. – Respondent from Kagoshima prefecture.

GAP certification scheme has received especially received concerns due to the fact that it has received main attention for the upcoming Tokyo Olympics:

- *It is unfortunate that GAP certification has been chosen over JAS Organic for the Tokyo Olympics 2020. It makes me worried that the interest towards organic farming might decrease*. – Respondent from Kumamoto prefecture.

- *How will JAS Organic and GAP be related? Is it possible to integrate the two?* – Respondent from Yamagata prefecture.

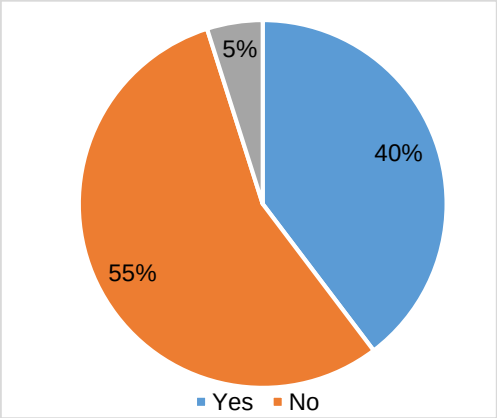


Figure 42. Certifications Held Other than JAS Organic.

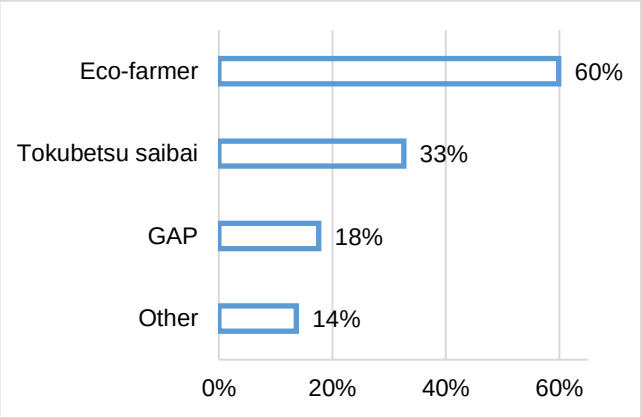


Figure 43. Types of Certifications Held Other than JAS Organic.

B) ABCD Comparison

Certification types other than JAS Organic that were provided as response options, namely Eco-farmers, Tokubetsu-saibai and GAP, in general, have less strict requirements for obtaining certification compared to JAS Organic. Thus, a hypothesis was made that having other types of certifications can make obtain JAS Organic easier and was supposed that the areas with high concentration of JAS certified organic farmers would have high number of respondents holding certifications other than JAS Organic. However, Group B (High&Growth) demonstrated the lowest share of respondents holding certification other than JAS Organic (33%), which was almost the same as in Group D (Low&Decline). In terms of the type of certifications, some minor discrepancies were found across the four groups, with Group C having the highest number of "Eco-farmer" certification holders (65%), Group B having the highest number of "Tokubetsu Saibai" holders (42%), and Group A demonstrating the highest share of GAP certification holders (26%).

Table 32. Types of Certifications Held Other than JAS Organic (ABCD). The respondents were asked whether they have obtained any other certifications except of JAS Organic and what type.

	# of resp	share	# of resp	share	# of resp	share	# of resp	share
Yes	95	43%	45	33%	46	48%	37	34%
No	117	53%	83	60%	45	47%	67	62%
n/a	9	4%	10	7%	5	5%	4	4%
Total	221	100%	138	100%	96	100%	108	100%
Eco-Farmer	57	60%	26	58%	30	65%	23	62%
Specially Cultivated Products (tokubetsu saibai)	32	34%	19	42%	12	26%	11	30%
GAP	25	26%	7	16%	5	11%	3	8%
Other	6	6%	8	18%	7	15%	10	27%

4.3.1.7. Benefits and Problems of obtaining JAS certification

- **Benefits of Obtaining JAS Organic Certification**

A) Overall

In deepen understanding on the benefits of obtaining JAS Organic certification, relevant question was set and several response options were provided as multiple choice. Two most popular options were “having gained trust from consumers” (68%) and “having secured sales channel” (58%), which is somewhat aligned with the purpose of JAS Organic establishment – to provide consumers reliable information about the product and avoid false labeling. Next popular responses were being able to sell products at higher price (37%), having increased interaction with consumers (31%) and having improved farming technique (30%). Having the feeling of personal satisfaction also scored rather high (26%), whereas improvement in natural environment (21%) and having contributed to regional promotion (12%) were the least popular responses. Additionally, 8% of respondents have stated that do not feel any benefits of having obtained JAS Organic certification. In the free comment section, the respondents have also mentioned following benefits: having better organization of the production process,

including leaving records that can be revisited later, receiving support and recognition from government, being able to differentiate their products, being able to export their produce abroad, and getting a chance to interact with different people.

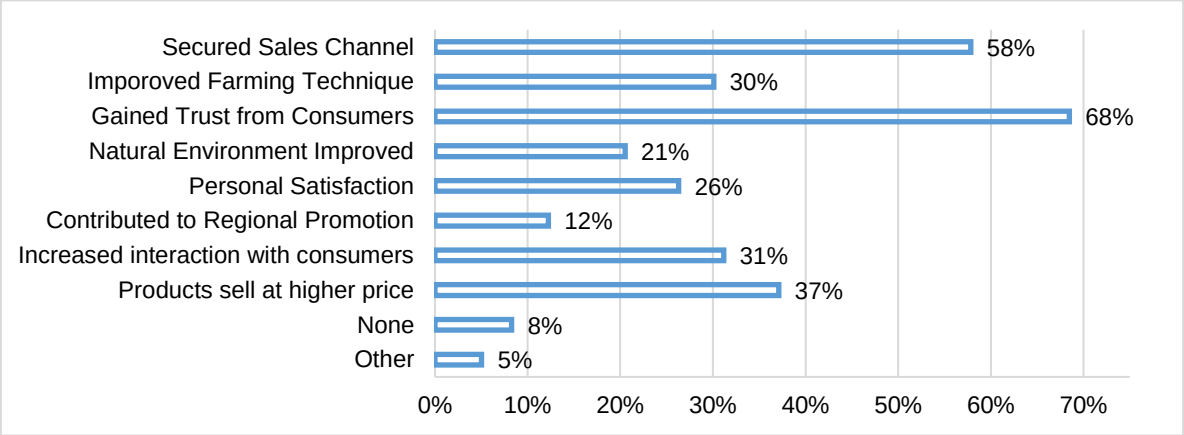


Figure 44. Benefits of Having Obtained JAS Organic.

B) ABCD Comparison

Similar to results of ABCD group comparison for other questions, overall tendency stayed the same across the four groups except for Group B scoring slightly higher than other groups for three following options – securing sales channel (63%), having gained trust from consumers (75%), and having gained the feeling of personal satisfaction (31%).

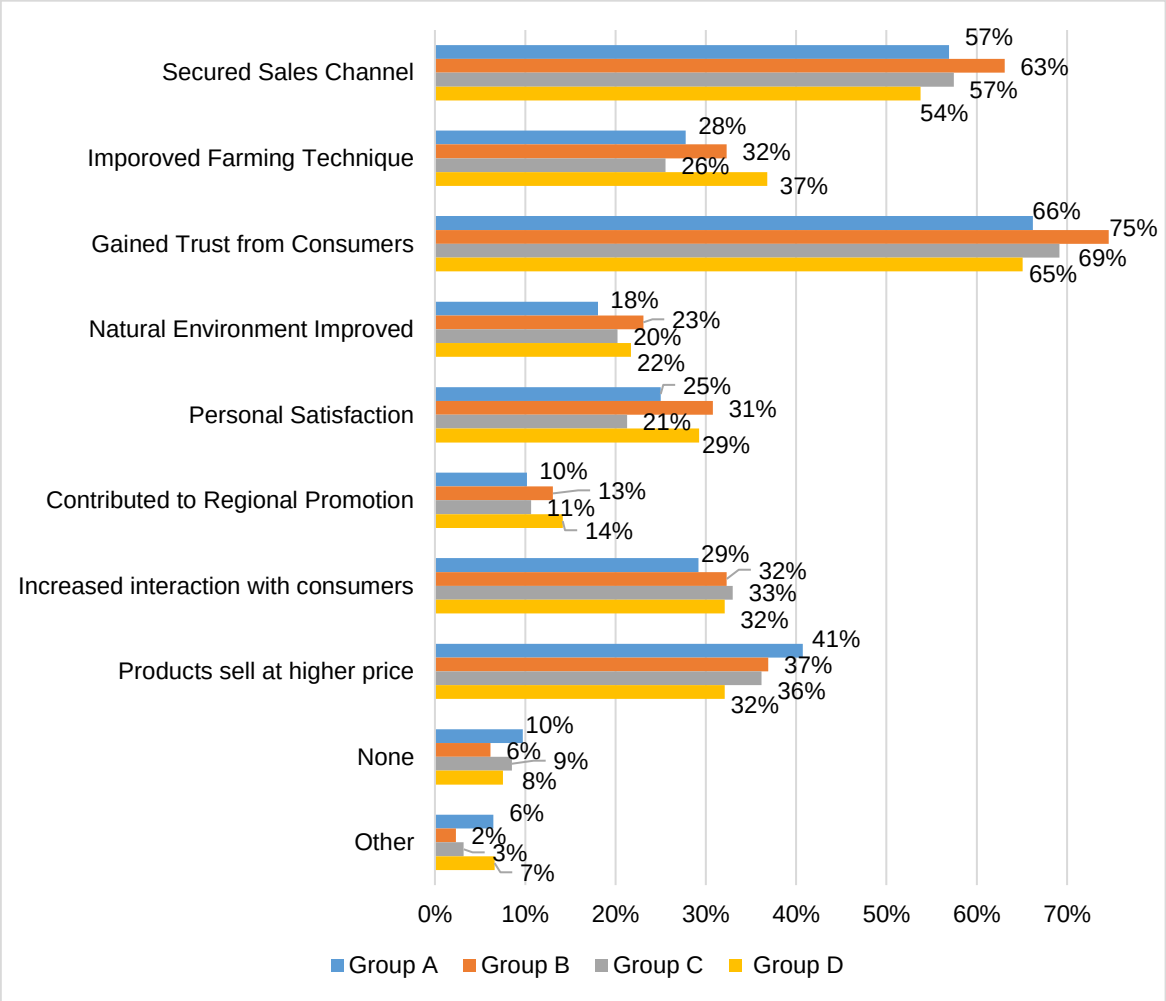


Figure 45. Benefits of having obtained JAS Organic (ABCD).

– **Problems after Obtaining JAS Organic Certification**

A) Overall

In order to cover negative aspects of having obtained the certification and suggesting how JAS Organic certification can be further improved, a question asking about the problems that farmers have encountered after obtaining the certification was asked. Eleven options were

provided to respondents for multiple choice.

The three most popular problems that were encountered by respondents were feeling that the expense for obtaining certification are too high (42%), having unstable yields (39%) and not having enough labor force (38%). Remarkably, nineteen percent of respondents have mentioned not having encountered any problems after obtaining the certification. Options such as not being able to sell at high price (17%), having poor understanding from other farmers (16%), not being able to secure sales channel (14%), having poor understanding from consumers (11%). Less than ten present of respondents have mentioned having problems with certification procedure (9%) or having the quality of their produce getting worse (6%).

Other problems that were mentioned by the respondents include feeling that the government does not understand the importance of organic farming, having small choice of distribution channels, feeling that the process of obtaining certification is too troublesome, including the burden of paperwork and annual inspections, low awareness about JAS Organic, poor relationship with government, weeding begin too labor consuming, limited variety of fertilizers and equipment allowed for use.

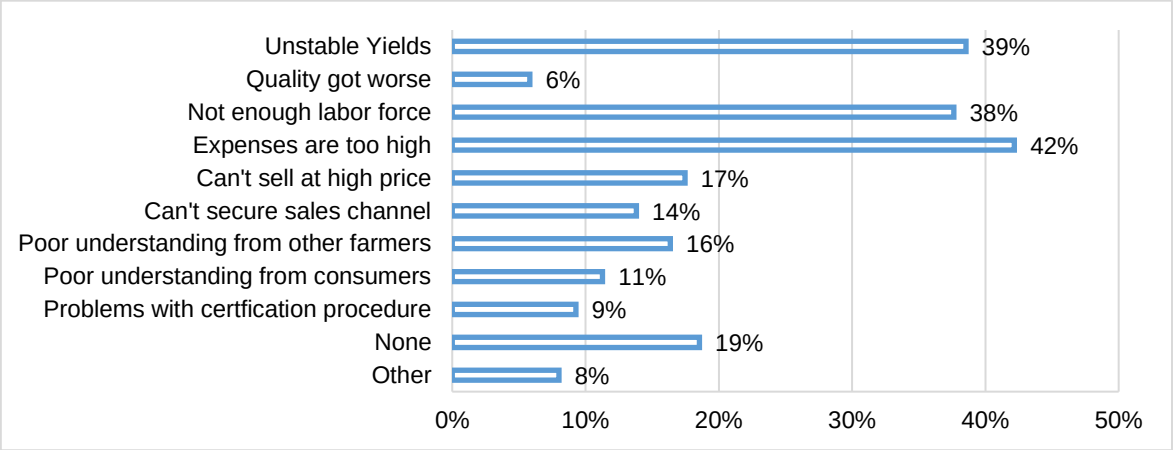


Figure 46. Problems after Having Obtained JAS Organic.

The majority of the comments left by respondents in the free comment section designed at the bottom of the questionnaire sheet were, in fact, about problems related to JAS Organic certification and obstacles for obtaining it. Similarly to the results of the multiple choice questions, majority of respondents have commented on the high fees of obtaining certification:

- *People from certification center come every year to check our paperwork and farming field and we have to pay their travelling expenses*, - Respondent from Hokkaido;
- *Currently, the examination [by the certification center] is conducted every year. Is it possibly to make once in several (for example, 3) years. I live in Tanegashima Island, and it is more than 10,000JPY for a ferry ticket alone.* – Respondent from Kagoshima prefecture.

Another popular comment that was not reflected enough in the result of the multiple choice question was touching upon the burden of complicated paperwork needed for application and annual renewal of the certification:

- *There are too many paperwork that has to be submitted for the certification,* - says a

comment received from a respondent from Hokkaido;

- *The paperwork become troublesome with age so I decided to quit the certification.* – adds a respondent from Ehime prefecture.

Although it is not the most popular answer among the multiple choice options, still a number of respondents have commented on the awareness regarding JAS organic certification by both consumers and producers:

- *Consumers do not know JAS Organic.* – Respondent from Niigata prefecture.
- *There are pesticides that allowed and not allowed for use, which makes it confusing for the consumers. I think a stricter requirements that allow for clearer differentiation should be introduced.* – Respondent from Kochi prefecture.
- *I think that consumers' awareness towards JAS Organic is rising. However, consumers still have a tendency to buy conventional products, which are cheaper and have better appearance.* – Respondent from Kagoshima prefecture.
- *Organic farming is somewhat isolated from the rest of agriculture in Japan. I feel like I am not being trusted by the farmers around*. – A comment received Saga prefecture.

Finally, some respondents provide concrete advice and suggestions on how to improve or further promote the certification:

- *The most important is to have promotion policy for increasing consumption of JAS Organic certified products.* – Respondent from Niigata prefecture;
- *It would be nice if the national government creates a commercial about organic products to show it to the citizens*. - Comment from Kagoshima prefecture.

- *It is important that JAS Organic matches international requirement*. – Adds a respondent from Hokkaido.

B) ABCD Comparison

Comparison among the four groups did not show any significant differences across the groups.

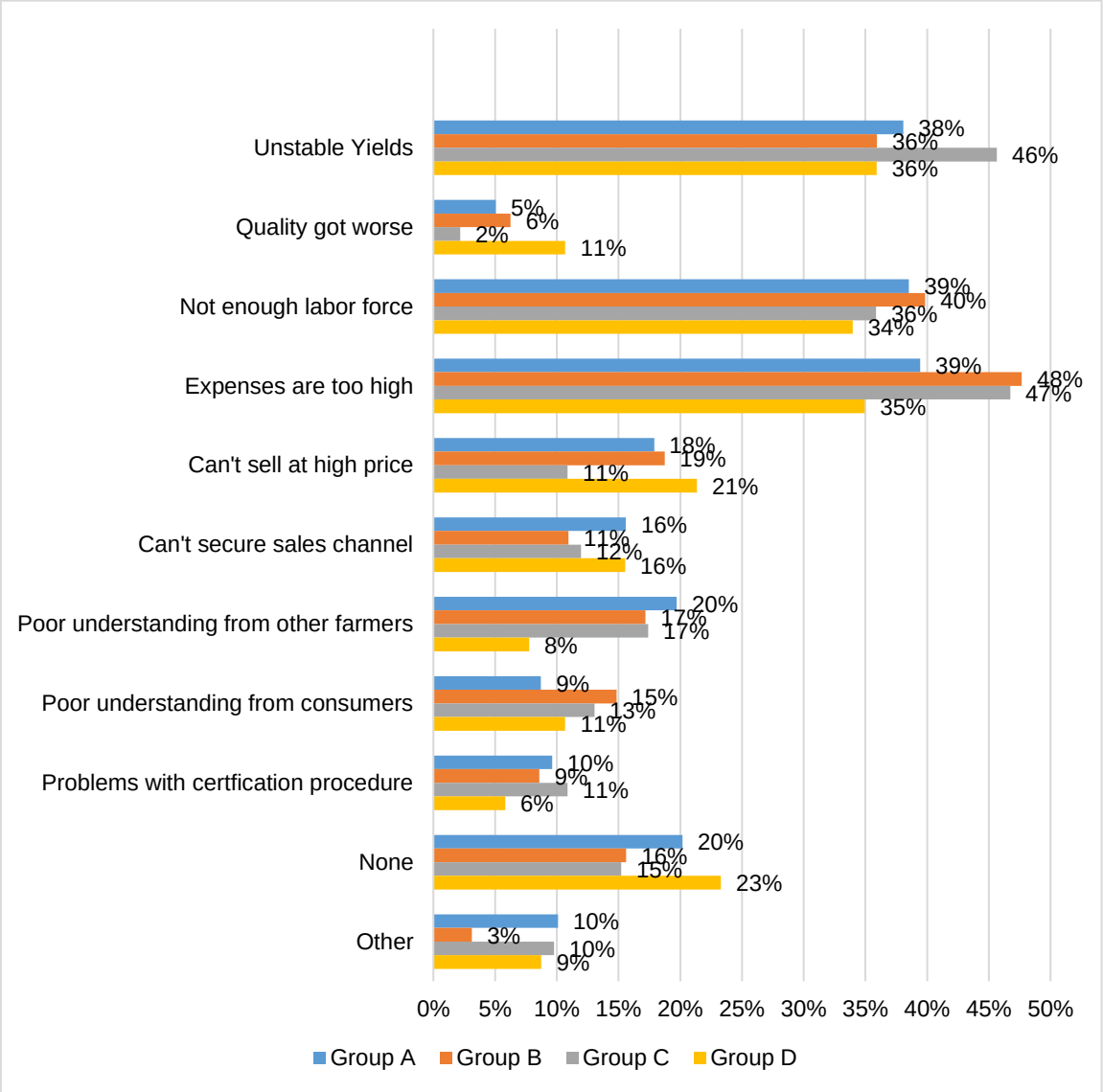


Figure 47. Problems after Having Obtained JAS Organic (ABCD).

– **Willingness to Renew Certification**

A) Overall

Despite the variety of problems encountered by respondents after obtaining JAS

Organic certification, the majority of 88% are still willing to further keep and renew certification, with only 7% of respondents mentioning not having intention to keep the certification next year.

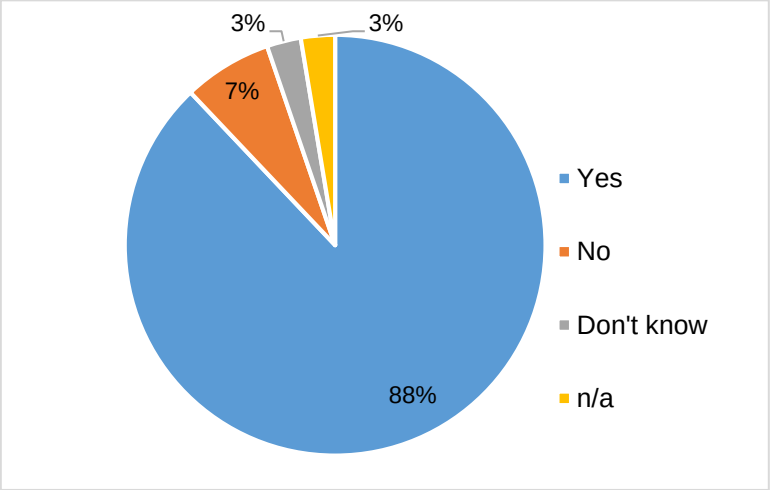


Figure 48. Willingness to Renew JAS Organic Certification.

B) ABCD Comparison

The share of respondents willing to renew and keep the certification was found to be the lowest in Group D (Low&Decline) and accounted for 84% with the highest share of respondents willing to give up the certification in the year coming – 10%. The share of respondents willing to give up the certification was found to be the lowest in Group B accounting for 4%.

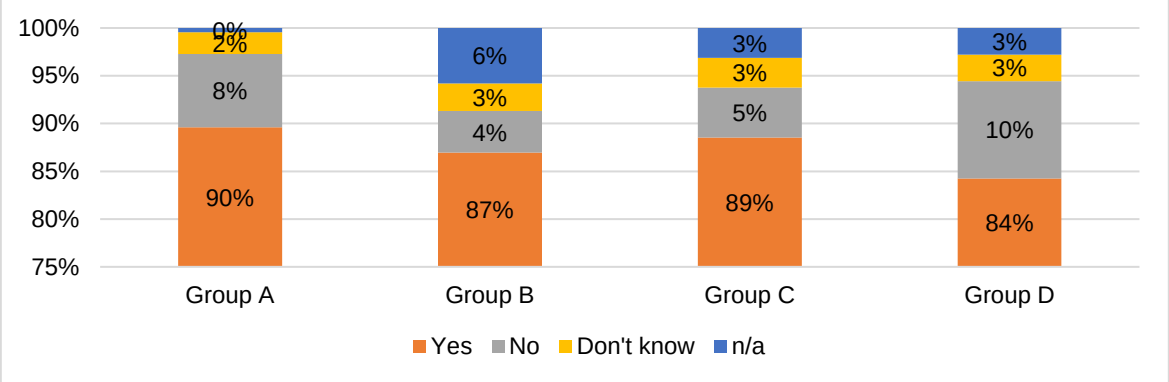


Figure 49. Willingness to Renew JAS Organic Certification (ABCD).

4.3.1.8. Farmers' Perceptions

– **Farmers Opinion on JAS Organic Certification**

A) Overall

Perceptions of farmers on JAS Organic certification have been also examined to double check the findings from the previous questions. A set of eight statements regarding JAS Organic certification has been provided asking respondents to rate them using 5-point scale from Strongly Disagree to Strongly Agree. Opinion of farmers was found to be rather unified agreeing on items stating that it is costly (68%) and troublesome (67%) to obtain the certification. The majority of respondents also agreed that consumers, in general, trust JAS Organic label (62%) and that JAS Organic requirements guarantee that natural environment will not be harmed (57%). At the same time through choosing negative response option (disagree & strongly disagree) respondents' opinion was found to be unified stating lack of subsidies for JAS Organic certification promotion (71%) and low awareness of consumers about the certification (65%). Farmers' perceptions on other statements provided regarding JAS Organic certification

have demonstrated less consistency.

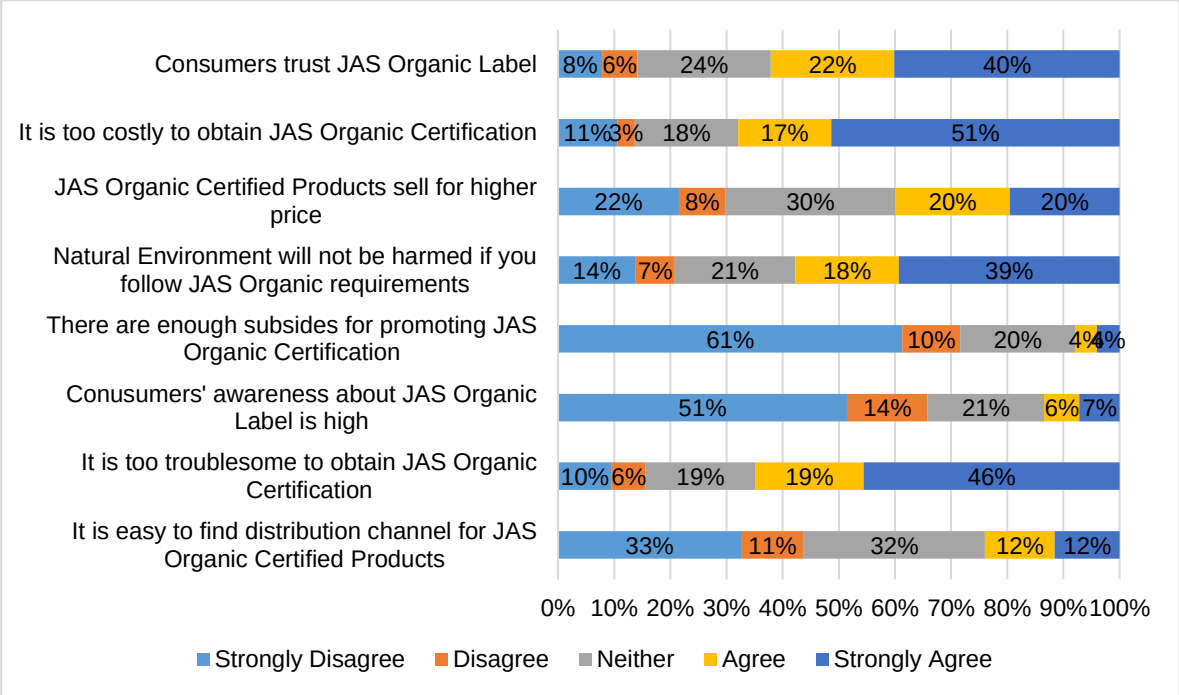


Figure 50. Opinions on JAS Organic Certification.

B) ABCD Comparison

The comparison of the results for ABCD groups did not show much difference across the four groups. Some differences were find in the responses of Group D. In Group, the lowest share of respondents has agreed to the statement that JAS Organic Certified products sell for higher price (34%, compared to Group A – 42%, B – 44%, C – 38%), and that it is easier to find distribution channels for JAS Organic (15%, compared to Group A – 42%, B – 44%, C – 38%). Moreover, Group D was also the highest for the share of respondents agreeing that obtaining JAS Organic certification is too troublesome (70%, compared to Group A – 65%, B – 64%, C – 62%). These findings are reasonable in the context that Group D has the lowest concentrations of (the lowest LQ) of JAS Organic farmers, which is further declining.

At the same time, however, Group D demonstrated the highest share of respondents saying that there are enough subsidies for promoting JAS Organic certification (12%, compared to Group A – 9%, B – 5%, C – 4%), and that consumers' awareness about JAS Organic Label is high (20%, compared to Group A – 14%, B – 9%, C – 11%).

Table 33. Opinion of Farmers on JAS Organic Certification (ABCD).

		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Consumers trust JAS Organic Label	Group A	9%	7%	20%	23%	41%
	Group B	8%	5%	25%	20%	42%
	Group C	11%	6%	27%	20%	36%
	Group D	4%	7%	30%	24%	36%
It is too costly to obtain JAS Organic Certification	Group A	9%	3%	17%	17%	53%
	Group B	12%	2%	22%	13%	50%
	Group C	11%	2%	17%	17%	52%
	Group D	11%	5%	18%	20%	46%
JAS Organic Certified Products sell for higher price	Group A	22%	8%	28%	22%	20%
	Group B	24%	8%	24%	19%	25%
	Group C	14%	10%	38%	21%	17%
	Group D	21%	9%	36%	19%	15%
Natural Environment will not be harmed if you follow JAS Organic requirements	Group A	15%	10%	21%	16%	39%
	Group B	12%	2%	25%	19%	42%
	Group C	16%	4%	22%	23%	34%
	Group D	13%	8%	18%	20%	41%
There are enough subsides for promoting JAS Organic Certification	Group A	60%	11%	19%	4%	5%
	Group B	63%	8%	25%	2%	3%
	Group C	66%	11%	19%	3%	1%
	Group D	58%	9%	21%	7%	5%
Conusumers' awareness about JAS Organic Label is high	Group A	51%	11%	24%	7%	7%
	Group B	56%	18%	17%	4%	5%
	Group C	57%	12%	20%	3%	8%
	Group D	45%	16%	19%	10%	10%
It is too troublesome to obtain JAS Organic Certification	Group A	9%	7%	20%	14%	51%
	Group B	9%	6%	20%	18%	46%
	Group C	9%	6%	23%	23%	39%
	Group D	10%	7%	14%	30%	40%
It is easy to find distribution channel for JAS Organic Certified Products	Group A	33%	9%	30%	14%	14%
	Group B	34%	7%	33%	14%	12%
	Group C	31%	12%	33%	13%	10%
	Group D	31%	21%	33%	8%	7%

– **Farmers Opinion on Organic Farming**

A) Overall

An attempt to separate farmers' decision-making process for obtaining JAS Organic Certification and practicing JAS Organic farming was made in this study. For this purpose farmers' perception on organic farming have been collected through designing additional question for this purpose. Twelve statements on organic farming have been offered, and respondents were asked to rate them using 5-point scale from 'Strongly Disagree' to 'Strongly Agree'.

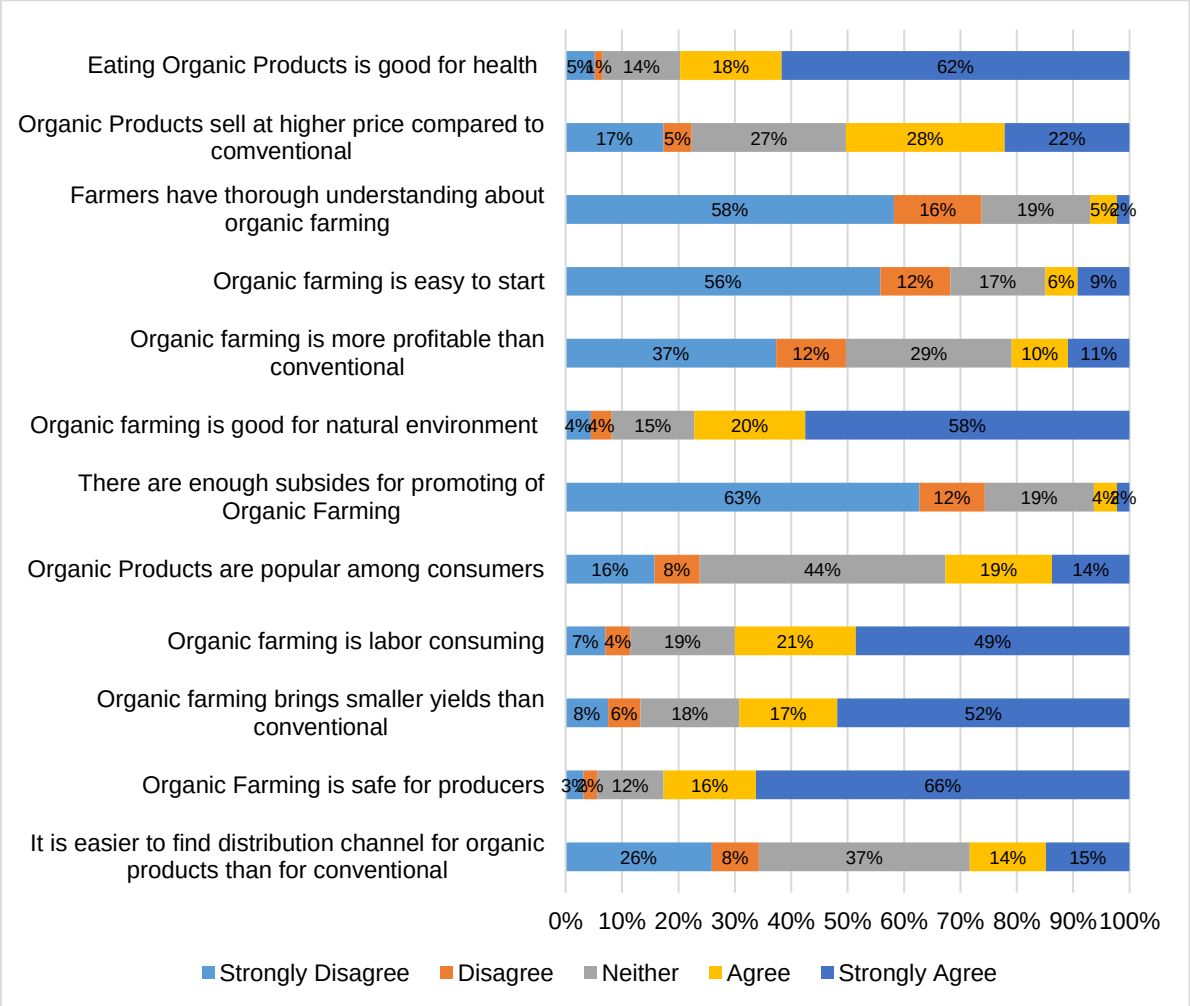


Figure 51. Opinions on Organic Farming.

There were a number of statement that have received wide agreement of respondents. These included statement on the health and safety aspects of organic farming for both consumers (80%) and producers (83%) as well as the statement that organic farming is good for natural environment (78%). There was also overall agreement that organic farming is labor consuming (70%) and brings smaller yields than conventional farming (69%).

Respondents have also, in general, demonstrated unified opinion on other challenging aspects of organic farming by disagreeing to the statement about farmers having thorough understanding about organic farming (74%), that organic farming is easy to start (68%), that there are enough subsidies (75%), organic farming being more profitable than conventional (49%).

B) ABCD Comparison

Comparison across the four groups did not show significant difference compared to the overall trend.

4.3.2. Comparison of JAS Organic Farmers with Conventional Farmers

To understand the drivers behind the decision to obtain JAS Organic certification it is important understand the differences between conventional farmers and certified organic farmers. However, due to time and budget restrictions the questionnaire survey only targeted JAS Organic certified farmers and uncertified organic farmers. Nevertheless, in order to grasp main differences with conventional farmers, available data from agricultural CENSUS2015 was used and questionnaire results have been compared with the national average. This section

summarizes comparison results for the following categories: age of farmers, incorporation status and type, distribution channels, as well as the size and type of farming area.

4.3.2.1. Average age of farmers

An average age of all JAS Organic certified respondents was compared to the national average based on the data from CENSUS2015. The comparison has shown that JAS Organic certified farmers are on average 6 years younger than conventional farmers.

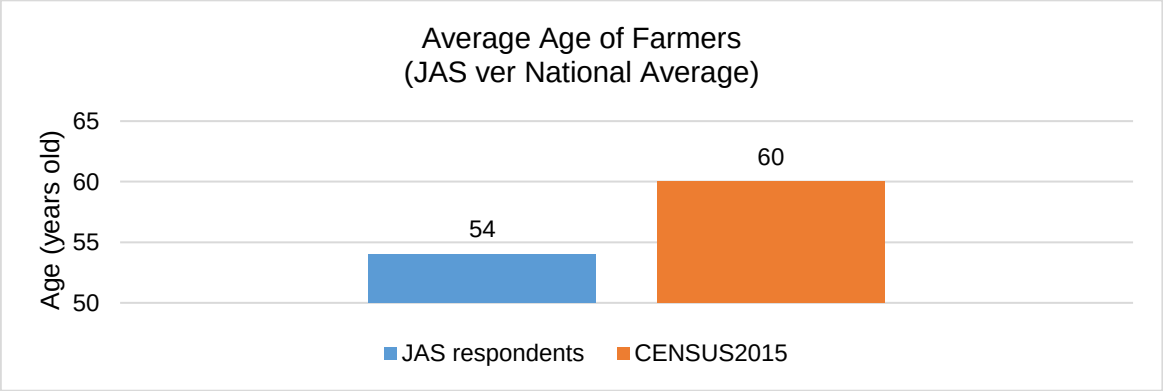


Figure 52. Average Age of Farmers (JAS Organic certified farmers versus National Average)

4.3.2.2. Incorporation Status and Type

Further incorporation status and type of questionnaire respondents was compared to the CENSUS 2015 data. A significant difference was found in regards with the incorporation status with JAS Organic certified respondents showing 18 times higher level of incorporation – 36% compared to 2%.

For those incorporated, the incorporation status has also demonstrated some discrepancies. Joint-Stock Company (including Limited company) was found to be the most popular type of

incorporation for both groups of farmers. However, the share of JAS Organic certified farmers having this type of incorporation (84%) was found to be the 25% higher than national average (59%). On the other hand, on the national average a higher share of farmers is incorporated as Farmers Union or Agricultural Cooperative (JA). Interestingly, for JAS Organic certified respondents JA type of incorporation accounted only for 1%.

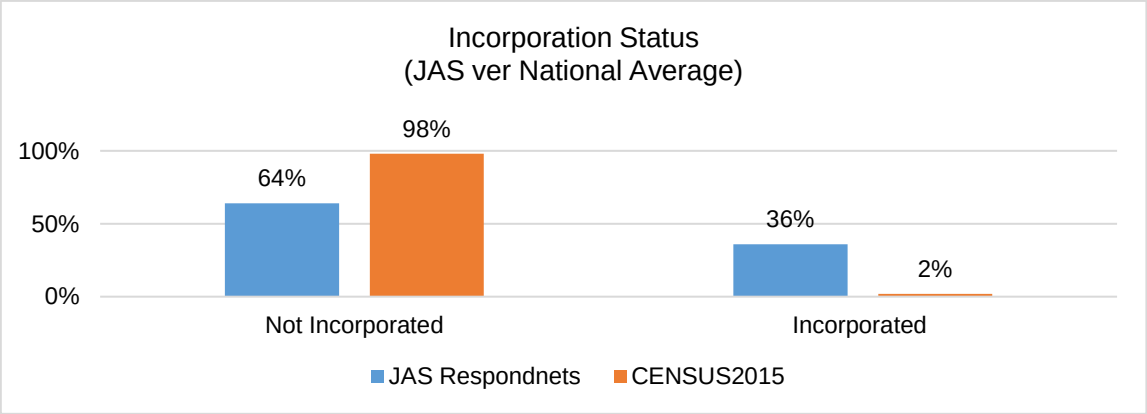


Figure 53. Incorporation Status (JAS Organic farmers versus National Average). Incorporated (z-score=55.445, p<.01).

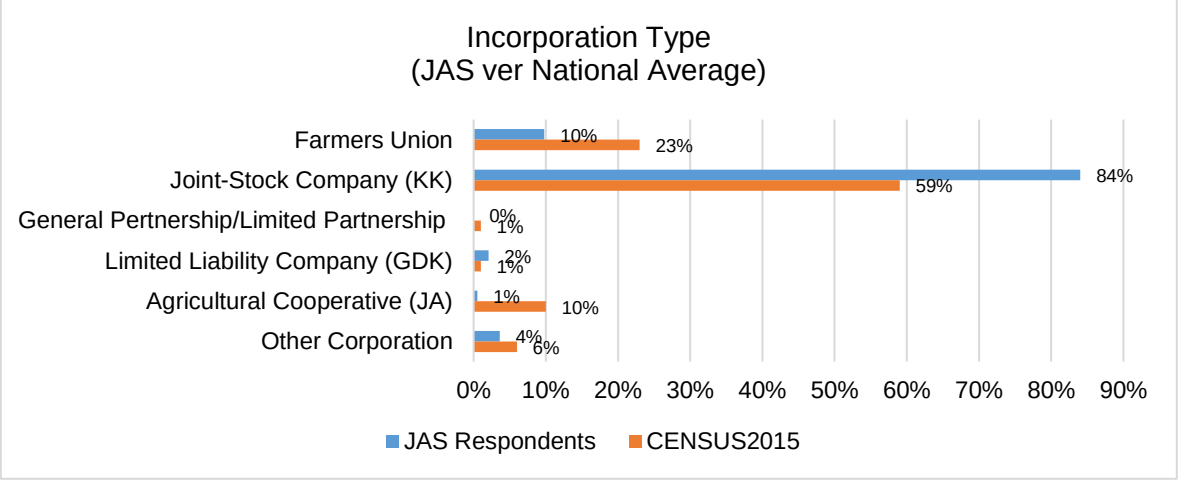


Figure 54. Incorporation Type (JAS Organic farmers versus National Average)

4.3.2.3. Distribution Channel Type

The comparison has revealed some more differences in terms of where the two groups of farmers are selling their agricultural produce. The most common distribution channel on the national average is JA (73%). However, the share of JAS Organic certified respondents selling their produce to JA is more than two times lower and only accounts for 30%, which is somewhat correlated with the fact that only 1% of certified organic respondents have selected JA as their incorporation type. For all other selection options, JAS Organic certified farmers have scored significantly higher, especially for such distribution channels as "Retail" (50% versus 8%), "Food Industry & Restaurants (27% versus 3%), and "Directly to Consumer" (65% versus 19%). These findings demonstrate that JAS Organic respondents have more diversified distribution channels and have less dependency on JA for selling their agricultural produce.

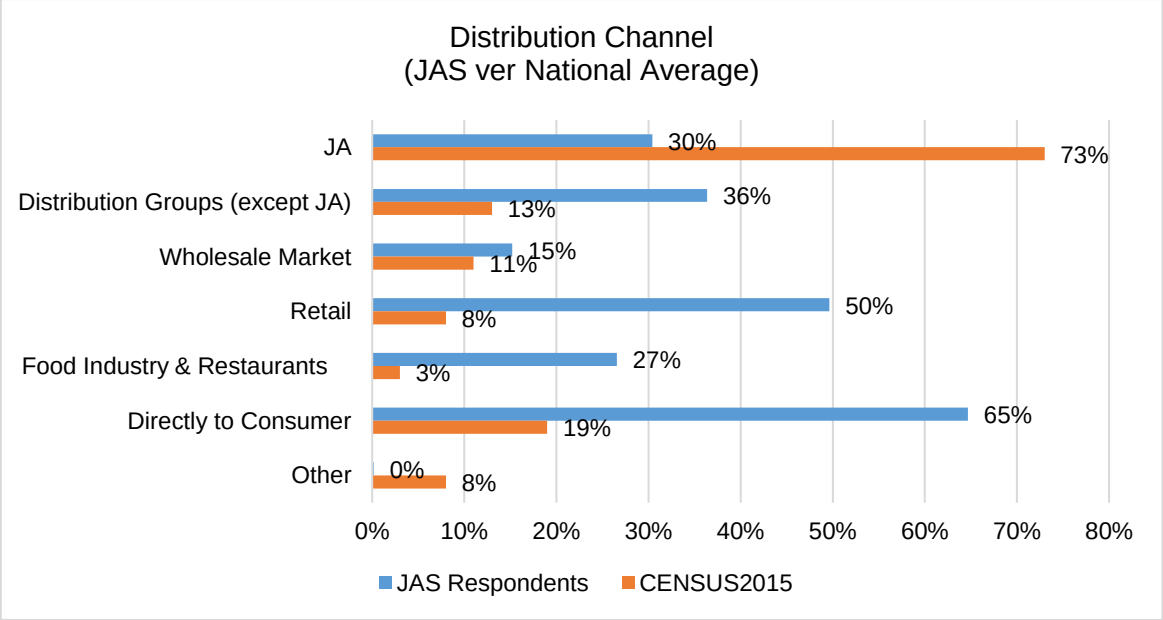


Figure 55. Types of Distribution Channels (JAS Organic Certified Farmers versus National Average). JA (z-score=23.038, p<.01); Retail (z-score=35.503, p<.01); Directly to consumer (z-score=27.282, p<.01).

4.3.2.4. Farming Area

Farming area size was also compared for the two groups of farmers. Thirteen groups organized by farm area size have been formed and a share of respondents in each group was calculated and compared for JAS Organic certified respondents and the national average. With the exception of farms having area smaller than 0.3 hectares, the overall tendency is that JAS Organic certified respondents demonstrate a higher share of larger scale farms (above 2.0 hectares). National average, on the contrary, demonstrates prevalence within the range 0.3~2.0 hectares.

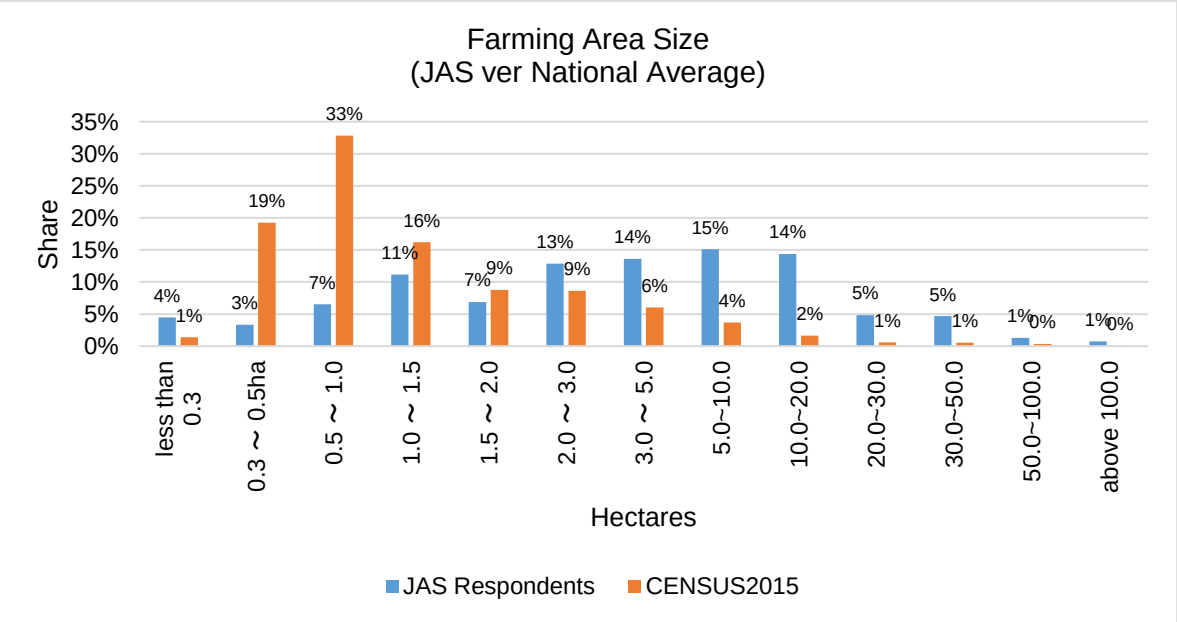


Figure 56. Farming Area Size (JAS Organic Certified Farmers versus National Average)

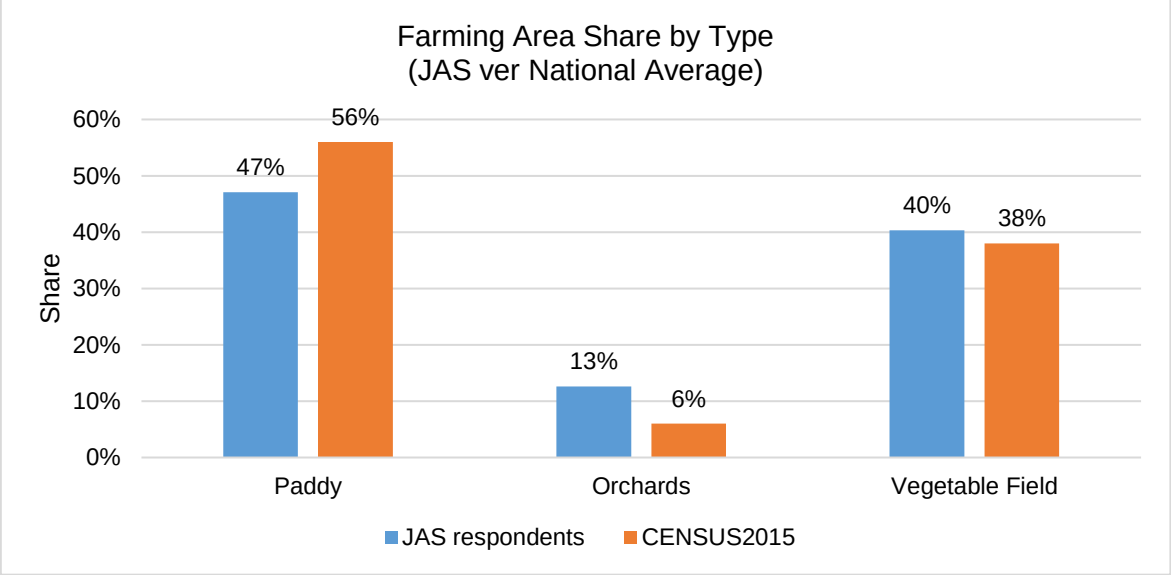


Figure 57. Farming Area Share by Type (JAS Organic Certified Farmers versus National Average)

Comparison of farm land distribution organized by the three types of farming land, namely – paddies, orchards and vegetable fields, was further conducted. Although no significant differences have been found, JAS Organic certified farmers have demonstrated slightly higher share of vegetable fields and orchard, whereas the share of paddies was lower compared to the national average.

4.4. Interviews with Farmers.

To follow up the results of the questionnaire survey and collect more detailed information, an interview with two JAS Organic certified farmers from Saitama area was conducted in September of 2019. Main interview findings are summarized in the table on the next page.

First of all, the two respondents have a different story on how they have started organic farming, and they also run their farm in a different way (individual farm and a Farmers Union Member). One of the most significant differences is the Respondent 2 has more variety in his distribution channels, whereas Respondent 1 mostly selling his produce to the wholesale market with the help of his son working there, which indicates that developing new distribution channels is more difficult for individual farmers. Respondent 1 has also mentioned that he has been thinking of starting online sales directly to consumers, but currently does not have the capacity for this. He also mentioned that he does not bring his produce to direct selling stations (chokubaijo) as this is too troublesome.

Regarding the certification procedure itself, it was mentioned that the number of certification centers used to be more. For example, Respondent 1 had to switch to a certification center in Gunma prefecture midway, as his local certification center in Saitama prefecture was closed. Based on his experience, he has mentioned that both certification center and the format of the paperwork is different in each certification center. Overall impression is that over 17 years that he is holding JAS Organic certification the paperwork was simplified.

Table 34. Summary of the Interviews with JAS Organic Certified Farmers from Saitama Prefectures.

	Respondent 1	Respondent 2
Location	Saitama prefecture, Misato City	Saitama prefecture, Kamisato Town
Farming Experience	Used to be an office worker. Started agriculture around 29 years old helping his parents in-law.	From fathers generation.
Farm Type	Individual farmer	Farmers Union member
Organic Farming Experience	Decided to convert from conventional agriculture to organic around 1994	From fathers generation.
JAS Organic certification	Obtained JAS organic certification in 2002. Prior to this obtained Saitama prefecture certification in 1997.	Since 2005
Motivation to obtain JAS Organic Certification	Considered it to be a management strategy: increasing profit through improving quality and differentiation his products.	Was suggested by a client (MOA International)
Certification Center Selection	Local Certification center in Saitama prefecture. After it got closed was introduced to a certification center in Gunma prefecture (reasonable fee and not too far away).	A certification center in Gunma prefecture, Maebashi City. No particular reason for selection. (Assumption: was recommended, distance is close).
Distribution Channels	Main: Wholesaler Tokyo Seika. His son is taking the produce there every morning by car around 4am except for Tuesday. The price for his produce is in the higher range. Other: middleman, department stores	Retail, Food Industry, Direct deliveries to individual consumers, direct selling station (chokubaijo)
Crops and products	Japanese mustard spinach komatsuna (4 vinyl houses), tomato (2 vinyl smaller houses), blueberry (in transition phase) Komatsuna powder	40 types of vegetables, rice, soy
Other comments	The first one to get JAS Organic certification in Saitmata prefecture. The paperwork was troublesome in the beginning, now is used to it.	

4.5. Discussion and Additional Findings from the Interviews with Stakeholders.

Questionnaire survey of JAS Organic certified farmers has been conducted, and the results have been compared in two different ways. Firstly, the results of all JAS Organic respondents have been compared to the relevant items of Agricultural CENSUS2015. The survey this time did not cover conventional farmers as respondents due to time and budget constraints. Although, JAS Organic certified farmers are included in the CENSUS2015 survey, the share of certified organic farmers is estimated to account for not more than 0.2%, and this share is not considered to be large enough to influence overall results. Therefore, for the

purpose of comparison between organic certified farmers and conventional farmers, CENSUS2015 data was found to be suitable and was utilized as a substitute to respondents practicing conventional agriculture.

The findings indicate that the age of JAS Organic certified farmers is on average 6 years younger than that of conventional farmers. Significant difference confirmed by two-tailed Z-test for two population proportions (z-score=55.445, $p<.01$) was found in the level of incorporation status, with certified farmers demonstrating 18 times higher levels of incorporation. This finding is also backed up by comments from respondents that for an individual farmer obtaining JAS Organic certification is not feasible because of financial burden of certification fee and workload related to the paperwork. For those incorporated, the incorporation type also showed some differences with conventional farmers having higher share of incorporation as JA or Farmers Union. During the interviews, officials from the certification centers have also mentioned that paperwork not only during the application stage, but also throughout the production process, which includes creating a manual and keeping daily record, can be challenging for individual farmers as they are not used to it and do not have enough capacity and labor force for this. It was also mentioned that on average the application process for JAS Organic certification takes around 2-2.5 months, and most of this time spent on revising and often resubmitting numerous application forms. Moreover, all the paperwork is supposed to be handled by producers with no support from local municipality officials since there is a direct contract between the producer and certification center.

The findings regarding incorporation type are somewhat reflected in how differently conventional farmers and certified farmers approach selling their produce. Whereas JAS Organic farmers have a more diversified variety of distribution channels with significant share

of respondents selling their produce directly to consumers (z-score=27.828, p<.01) and retail (z-score=35.503, p<.01), while conventional farmers strongly depend on JA (z-score=23.038, p<.01) for the distribution of their produce. The interviews with farmers have identified that even within certified organic farming there is a variation regarding the number of distribution channels, with Respondent 2 having more types of distribution channels to sell to most probably due to support and information exchange within the Farmers Union he belongs to.

In terms of farm related characteristics, JAS Organic certified respondents demonstrate a higher share of larger scale farms (above 2.0 hectares). National average, on the contrary, demonstrates prevalence within the range 0.3~2.0 hectares. Although no significant differences have been found, JAS Organic certified farmers have demonstrated slightly higher share of vegetable fields and orchard, whereas the share of paddies was lower compared to the national average. In the interviews, one of certification centers officials has mentioned that for smaller scale farmers, the risks of converting to organic are higher and the certification fee is less affordable.

Secondly, a comparison of questionnaire results was conducted within JAS Organic certified respondents among prefectures by dividing them into four groups (ABCD). This division was based on the concentration level of certified organic farmers (Location Quotient coefficient) calculated in Chapter 2.

Although no significant difference was found among the four groups, and respondents have demonstrated similar trend in general, Group D (Low & Decline) has demonstrated some traits similar to those found in conventional farmers. For example, the average age of respondents was found to higher. Subsequently, Group D (Low&Decline) demonstrates the highest number of respondents for whom farming is not the main income source. This can be

explained by the fact that the share of respondents in their 70s and older is the highest in the Group D, and respondents in this group may be relying rather on pension payments over the farming income.

Additionally, Group D the only group including respondents who specified their incorporation type as JA. Moreover, it has demonstrated the lowest share of respondents selling their produce to retail sector, which was also found to be similar to conventional farmers. This correspond to the findings that Group D has scored the lowest on choosing retail request as a reason for obtaining JAS Organic certification. Group B (High & Growth), on the contrary, scored the highest for this question, which indicates that retail being interested in having organic products on their shelves and having retail as a distribution channel can be one of the driving forces for obtaining the certification.

For the question about information source on JAS Organic Certification, the option of obtaining information from other farmers was 2.5~3 times lower in Group D than in other groups. With Group D being the lowest in terms of JAS Organic certified farmers certification, with the concentration declining, these findings indicate that having a strong network of farmers supporting each other through the information exchange can leverage further diffusion of JAS Organic certification.

In the question about JAS Organic Certification, differences in the perceptions of respondents from Group D (Low & Decline) became more apparent. For example, there is strong agreement among respondents in Group D that it is difficult to sell organic products for higher price and difficult to find distribution channel. Moreover, 70% of respondents, which is more than in other groups found it troublesome to obtain the certification.

At the same time, respondents in Group D (Low & Decline) demonstrated the highest share of respondents saying that there are enough subsidies for promoting JAS Organic certification. However, it is difficult to indicate whether there are more subsidies in the prefectures constituting Group D or if the respondents are more eager to be looking for the information about subsidies to improve their current situation.

CHAPTER 5. PRACTICING ORGANIC FARMING AND OBTAINING JAS ORGANIC CERTIFICATION – SEPARATING THE DECISION-MAKING PROCESS

5.1. Practicing Organic Farming versus Obtaining Organic Farming Certification

In the previous chapter, a comparison of the questionnaire results was conducted across the four groups (ABCD). The four groups of respondents included only JAS Organic certified respondents. However, such analysis does not fully uncover the reasons why some farmers practicing organic farming do not apply for JAS Organic certification. A better understanding of such reasons will explain the problems and limitations of JAS Organic certification.

In a study on organic farmers in the US and USDA organic certification, Veldstra et al. (2014) separate a decision to adopt organic certification into the decision to practice organic agriculture and further decision to obtain certification. The researchers argue that the two choices are influenced by different characteristics and perceptions of the farmers, saying it is crucial to distinguish them to set a more focused target for the promotion policies.

Chapter 5 attempts to separate the decision to practice organic farming and the decision to obtain JAS organic certification. For this purpose, the questionnaires were sent to organic farmers not certified under the JAS Organic scheme (hereinafter, referred to as "non-JAS"). The results of uncertified respondents were compared to the responses of the JAS Organic certification holders.

Section 5.2 summarizes the differences among questionnaire responses by JAS-certified organic farmers and non-certified organic farmers and identifies the key factors influencing the decision to obtain JAS Organic certification. Consequently, subsection 5.3 explains the findings derived from the analysis of the qualitative information based on free comments from the

respondents. Section 5.3 is categorizing the problems regarding JAS Organic certification raised by both certified and uncertified organic farmers.

5.2. JAS and non-JAS comparison - Survey Design.

The questionnaires were sent out in September of 2017. In the case of non-certified organic farmers, 189 questionnaires were sent, and 62 responses were collected. The list of respondents was retrieved from the fourth edition of "National Map of Organic Farmers" (*Zenkoku Yuuki nougyousha mappu dai yon ban* in Japanese). The fourth edition of "National Map of Organic Farmers" does not specify whether the farmers listed there are holding the JAS Organic certification. For this reason, the questionnaire sheet was designed in a way that allowed farmers to report if they hold JAS Organic certification. The respondents of certified farmers were analyzed together with the responses of JAS Organic farmers summarized in Chapter 4. Uncertified farmers could skip the questions related to JAS Organic certification (e.g., JAS Organic certification type, problems, and benefits of obtaining the certification, etc.).

5.2.1. Characteristics of JAS Organic Certified and non-JAS Organic Farmers

The comparison of JAS and non-JAS respondents follow the questionnaire structure. The questions that are not relevant to the uncertified farmers (e.g., reasons, problems, benefits) are excluded from the analysis.

5.2.1.1. Respondents information

The section of the questionnaires covering respondents-related information was similar to the questionnaires sent to JAS Organic certified farmers. The questionnaires to non-JAS respondents included questions about sex, education, age of respondents as well as about successors for their farming activities. Additionally, non-JAS organic farmers were asked about their farming experience. The question was divided into two parts, asking about the overall

number of years in farming and the number of years practicing organic agriculture. The results of non-JAS questionnaires and comparison with the responses of certified farmers are summarized in the following subsections.

– ***Demographic Characteristics of Respondents***

The questions about the demographic characteristics of the respondents include questions about sex, age, and academic background of respondents. The comparison of JAS certified and non-JAS organic respondents demonstrated that the share of female respondents was slightly higher among non-certified farmers (see Figure 58).

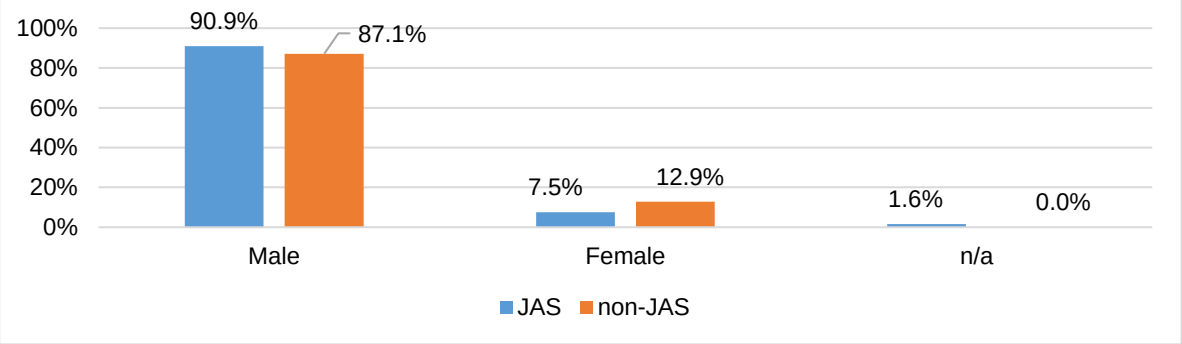


Figure 58. Respondents Info - Sex (JAS ver. non-JAS).

Regarding the age of respondents, the share of younger respondents, in their 30s and 40s, was higher for certified farmers. The percentage of older farmers, in their 70s and 80s, was higher for non-JAS farmers (see Figure 59). The difference is especially apparent for farmers in their 30s and 80s. The share of certified farmers in this age group is more than two times higher (3.2% - uncertified, 7% - certified). Among the respondents in their 80s, the share of non-JAS organic farmers is more than four times higher (9.7% - uncertified, 2.3% - certified).

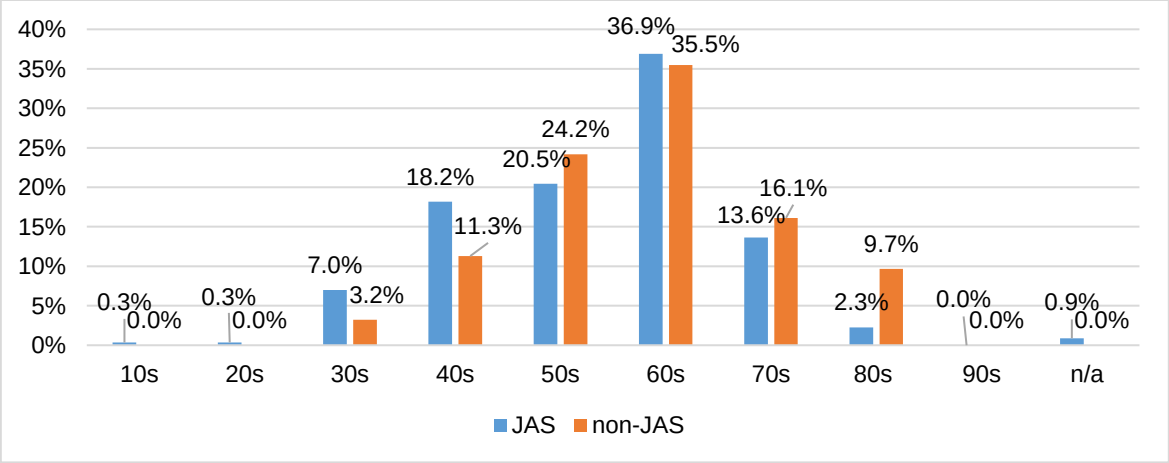


Figure 59. Respondents Info - Age (JAS ver. non-JAS).

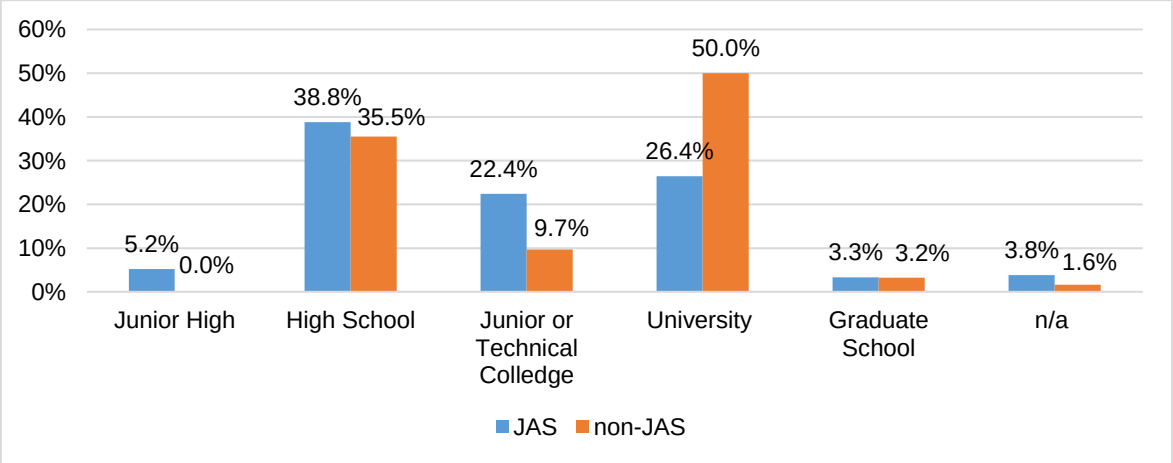


Figure 60. Respondents Info - Education (JAS ver. non-JAS). University Graduates (z-score—3.164, p<.05).

The results regarding academic background have also demonstrated some differences between the two groups of respondents. The share of respondents with lower levels of the educational background was higher for JAS Organic certified farmers. For example, the percentage of Junior or Technical Colledge Graduates is more than two times higher for certified organic farmers (22.4%, against 9.7% for non-JAS organic farmers). At the same time, the opposite is true for university-level graduates. Remarkably, half of the non-JAS organic respondents graduated from university. Among the certified respondents around one-fourth

(26.4%) had a university degree.

– ***Farming Related Characteristics of Respondents***

Further, the information about farm characteristics and farming activities of the respondents was collected. Firstly, the respondents were asked whether they have successors to continue their farming business. Although the share of older farmers was higher for non-certified organic farmers, the percentage of respondents having a successor was almost 20% higher for JAS Organic certified farmers (44.2% for certified farmers compared to 25.8% for non-JAS respondents).

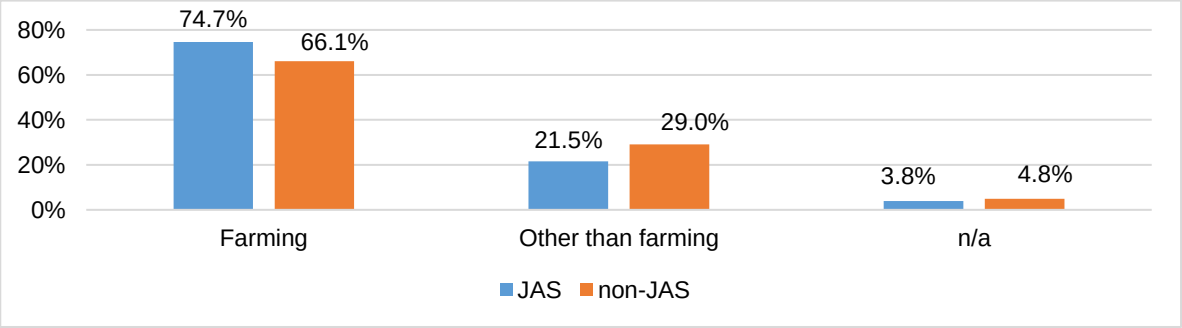


Figure 61. Respondents Info - Main Source of Income (JAS ver. non-JAS)

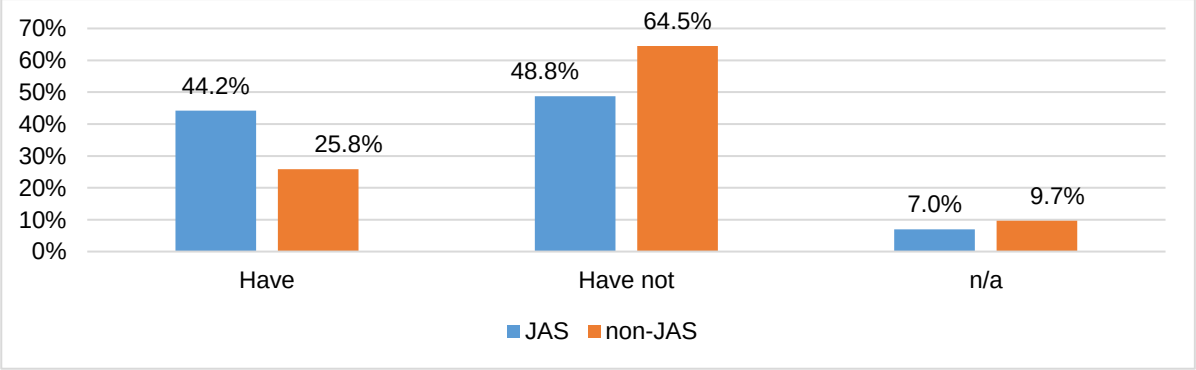


Figure 62. Respondents Info - Successor (JAS ver. non-JAS).

At the same time, non-certified organic farmers demonstrated a higher share of

respondents for whom farming was not their primary source of income. One of the possible reasons is that the share of older farmers, in their 70s and 80s, among non-certified respondents is higher. Respondents over the age of 70 may, to a higher degree, financially rely on their pension.

Further, the respondents were asked about their farming experience, including the number of years practicing conventional and organic farming. The results indicated that the average number of years that took to transition from conventional agriculture to organic was more for certified farmers. The results demonstrate that for JAS Organic certified farmers on average, and it took almost 12 years to switch (in many cases only partially) to organic farming. As Chapter 4 indicates, it further took around 5.5 years on average to obtain JAS Organic certification.

For non-JAS organic farmers, it took less than five years to start practicing organic farming. These findings indicate that among the non-JAS respondents, there may be a larger share of farmers who entered agriculture as organic farmers or succeeded organic farming practices from previous generations. Thus, they never had to convert to organic farming in the first place.

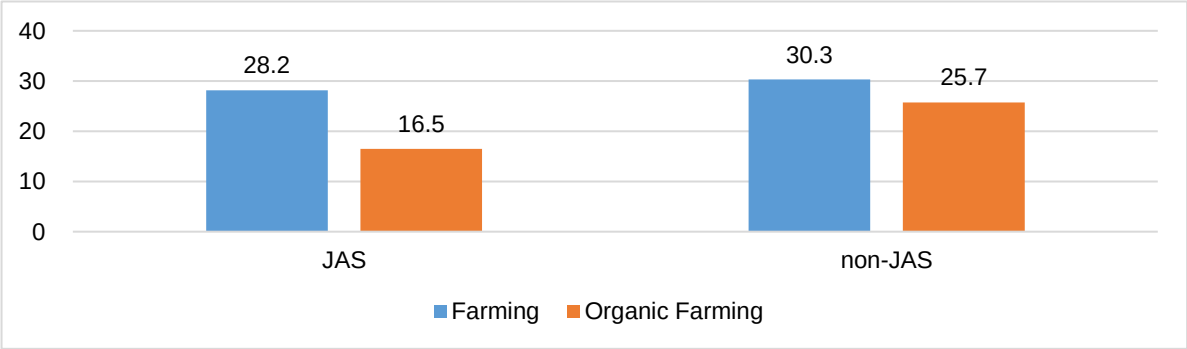


Figure 63. Respondents Info - Years of Experience (JAS ver. non-JAS).

5.2.1.2. Farm management

– ***Family management & Incorporation***

The next group of questions was designed to explore how the respondents manage their farms. The questionnaire asked whether the respondents manage their farms as family farms or not. The results showed that non-certified organic farmers had a 10% higher share of respondents with their farms run by families.

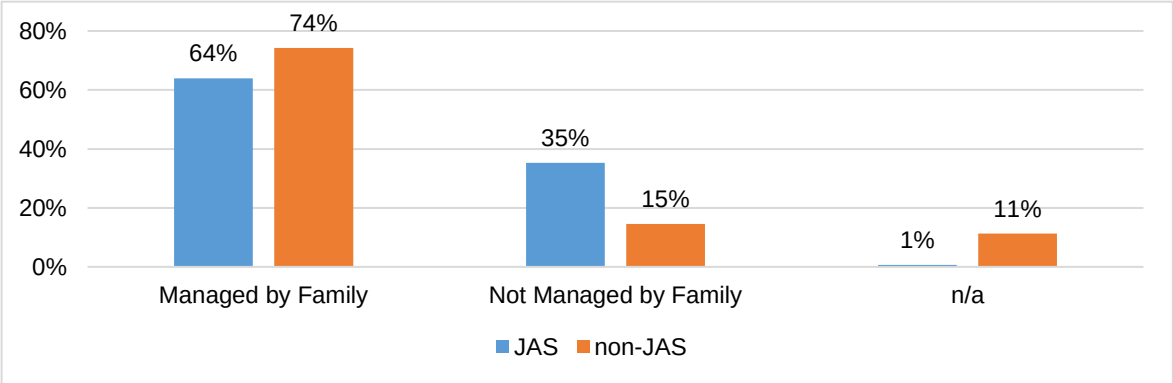


Figure 64. Family managed farms (JAS versus non-JAS).

Further, the respondents were asked about their incorporation status. The incorporated respondents were further asked about their incorporation type. Contrary to the results regarding the family management, the share of incorporated farms was more than three times higher for JAS Organic certified farmers (34% compared to 11% non-certified respondents). A free comment left by a respondent from Nara prefecture serves as an explanation of such difference between the two groups stating that '*JAS Organic certification is too expensive for individual farmers and not feasible without subsidies from the government.'*

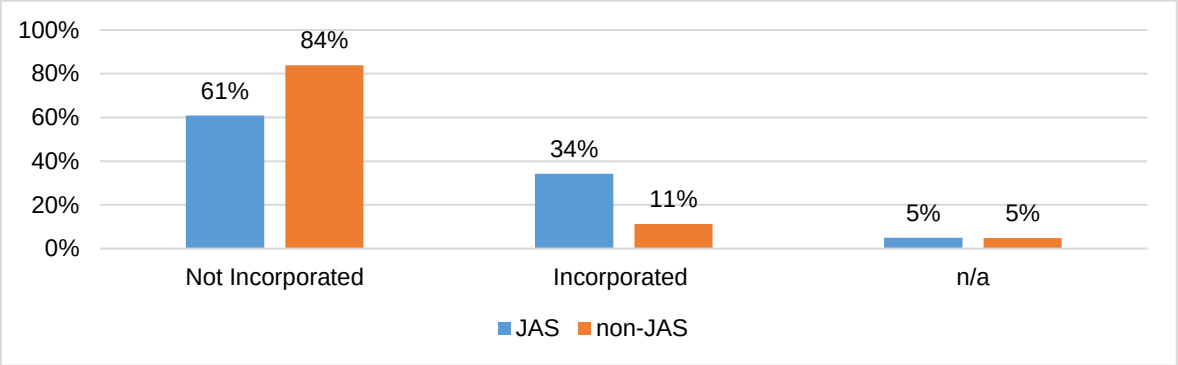


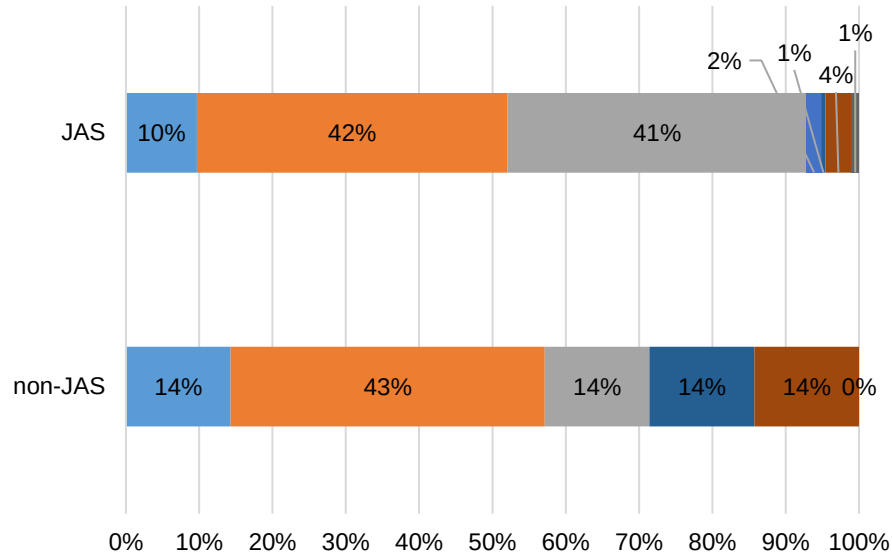
Figure 65. Incorporation Status (JAS ver. non-JAS). "Incorporated" (z-score=3.071, p<.05)**.**

Among the incorporated respondents, the joint-stock company ('*kabushiski-gaisha*') turned out to be the most popular incorporation type. It accounted for a little over 40% for both certified and non-certified respondents. However, there was some difference in the responses indicating incorporation types other than a joint-stock company. For example, among JAS Organic certified farmers, the limited-company ('*yugen-gaisha*') was almost as wide-spread as a joint-stock company. It accounted for 41%. The third most popular option among certified respondents was farming unions. Ten percent of respondents chose this option.

Among non-certified respondents, the joint-stock company accounted for an absolute majority of 43%. The four other options, including farmers union, limited-company ('*yugen-gaisha*'), agricultural cooperative (JA), and other, each accounted for 14%. Among the JAS Organic certified group, only one percent of respondents were incorporated as Agricultural Cooperative (JA).

The respondents specified their incorporation type as 'Other' was further requested to explain the details. The responses of JAS-Organic certified farmers included NPO, prefectural agricultural high school, social welfare facilities, general incorporated foundation, and public

interest incorporated associations. Due to smaller sample size, non-certified respondents mentioned only NPO as other incorporation types in their responses.



	non-JAS	JAS
Farmers Union	14%	10%
Joint-Stock Company (KK)	43%	42%
Limited Company (YK)	14%	41%
General Pertnership/Limited Partnership	0%	0%
Limited Liability Company (GDK)	0%	2%
Mutual Company	0%	0%
Agricultural Cooperative (JA)	14%	1%
Other Corporation	14%	4%
n/a	0%	1%

Figure 66. Incorporation Types (JAS ver. non-JAS). "JA" (z-score=-3.363, p<.05).

5.2.1.3. Farming Area and Crops

- ***Farming Area Types***

A comparison between JAS Organic farmers and non-certified organic farmers was conducted. For this purpose, the information about the overall farming area size and the size of the farming area by type (rice paddies, orchards, vegetable fields, and pasture lands) was analyzed. The results indicate that, on average, non-certified organic farmers have farms smaller than certified farmers. For example, the total farming area held by non-certified farmers on average was around 8.7 times smaller than the farming area size of certified farmers.

The difference is even more substantial for the maximum size of the total farming area. The maximum area size of the certified farmers is approximately 12.8 times larger than for uncertified farmers. When compared by farming area type, for non-certified farmers, the size for each farming land type does not exceed 1.6ha. Orchard fields have the smallest area size of 0.38ha on average. Moreover, none of the non-certified organic farmers reported having pasture lands.

Table 35. Farming Area Size by Type (JAS ver. non-JAS).

Farming Area (JAS ver non-JAS)			Min	Aver	Max
Paddy	JAS	ha	0.10	7.71	216.30
	non-JAS	ha	0.03	1.11	11.90
Orchards	JAS	ha	0.10	3.98	57.00
	non-JAS	ha	0.02	0.38	1.50
Vegetable Field	JAS	ha	0.10	4.83	311.50
	non-JAS	ha	0.04	1.56	40.07
Pasture Land	JAS	ha	0.20	10.13	97.80
	non-JAS	ha	0.00	0.00	0.00
Total	JAS	ha	0.50	26.64	682.60
	non-JAS	ha	0.09	3.05	53.47

Further, the distribution of each farming area type was compared for certified and un-certified respondents. The most significant difference between the two groups was that, on average, 38% of the farming areas of certified JAS Organic farmers were occupied by pasture lands. After the pasture lands were eliminated from the comparison, the results showed that JAS Organic farmers on average had larger areas under rice paddies (47% compared to 36% for uncertified farmers) and orchards (24% compared to 13% for uncertified farmers). At the same time, the uncertified organic farmers reported to be using more than half (51%) of their farming land to grow vegetables.

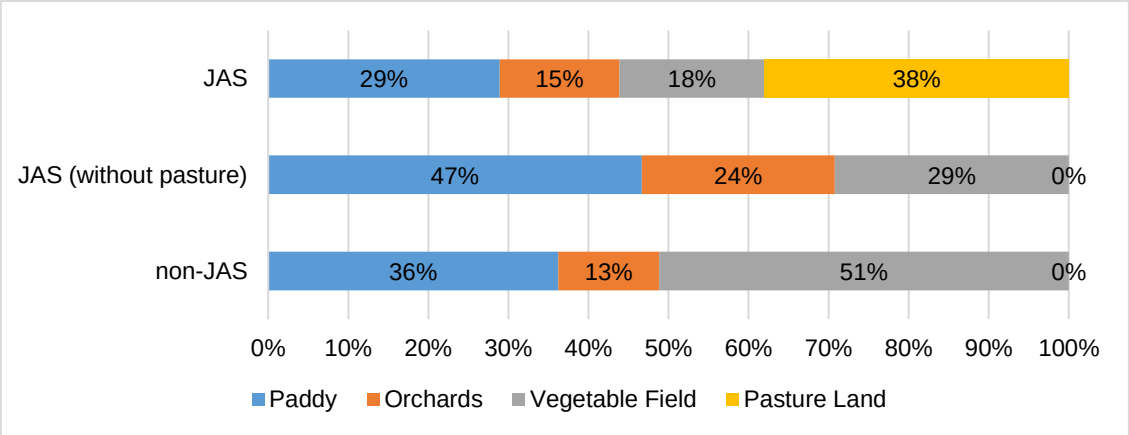


Figure 67. Distribution of Farming Area Types (JAS ver. non-JAS).

– ***Number of Crops***

In the questionnaire, the farmers were also asked about the number of crops grown within the last year. The results showed that non-JAS organic farmers had a wider variety of crops, growing approximately 2.9 times more crop types compared to JAS Organic farmers (see Figure 68). These results correspond to the findings from the previous question mentioning that uncertified organic farmers, on average, have more than half of their farming land used to grow vegetables.

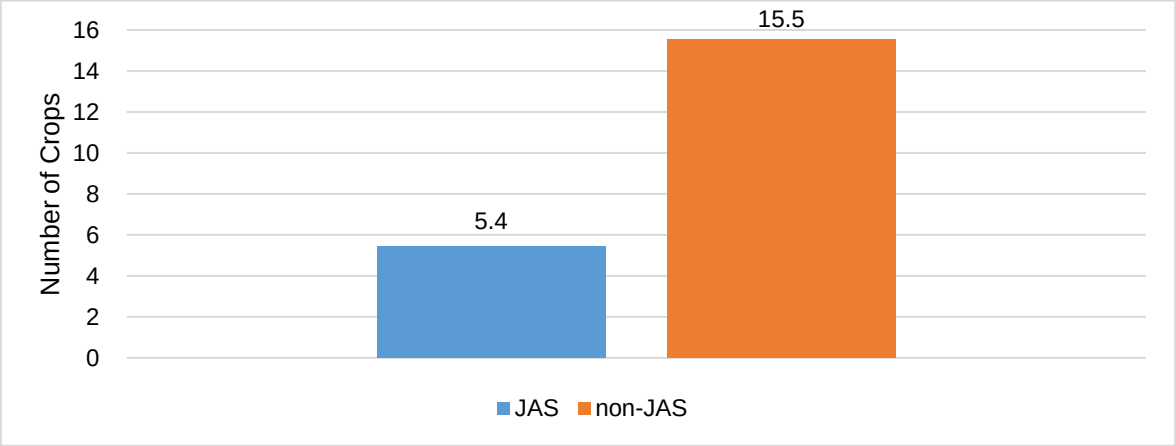


Figure 68. Average Number of Crops Grown Last Year (JAS ver. non-JAS).

5.2.1.4. Distribution of Agricultural Products

– ***Types of Distribution Channels***

More differences between JAS Organic farmers and non-certified farmers emerged upon a comparison of the distribution channels used by each group of respondents. The certified JAS Organic farmers demonstrated a higher share of respondents using a mix of several distribution channels. The only options with a higher percentage of non-certified farmers were

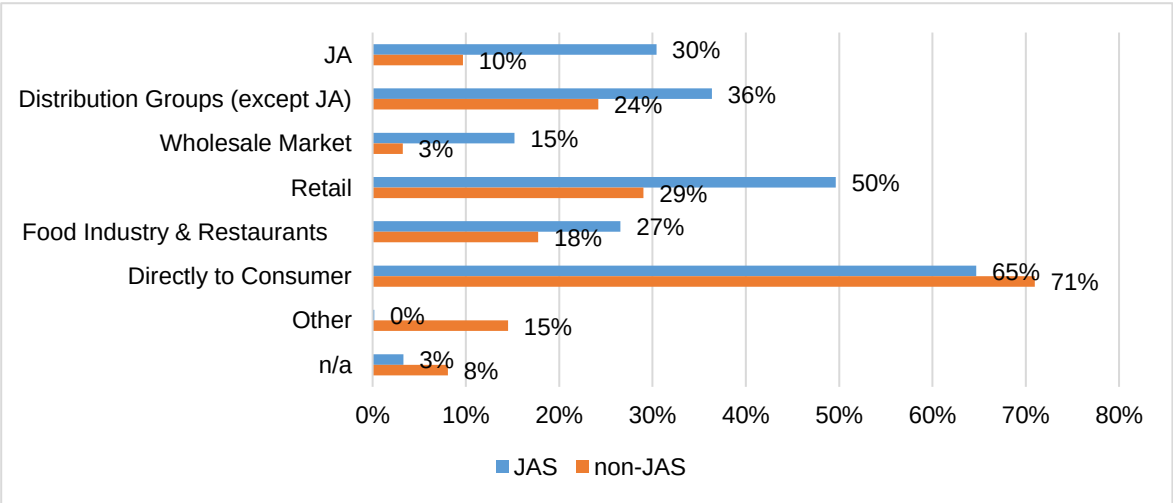


Figure 69. Distribution Channel (JAS ver. non-JAS). "Retail" (z-score=5.757, p<.05).

'selling directly to consumers' and 'other.' The highest gap in the responses of the two was found for selling agricultural products to JA (30% for JAS and 10% for non-JAS) and retail sector (50% for JAS and 29% for non-JAS). Other options listed by uncertified respondents included community-supported agriculture, selling directly on their farmlands, or consuming the products they grew themselves.

– ***Main Distribution Channel***

Subsequently, the respondents were asked to choose only one distribution channel among the listed options to specify the distribution channel accounting for the highest amount of sales. Almost half of the non-certified respondents (47%) mentioned that the highest amount of sales was coming from selling directly to consumers. The JAS Organic farmers, on the contrary, demonstrated more variety within their responses. The majority choose distribution groups other than JA (22%) and the retail sector (21%) as their primary distribution channel in the past year.

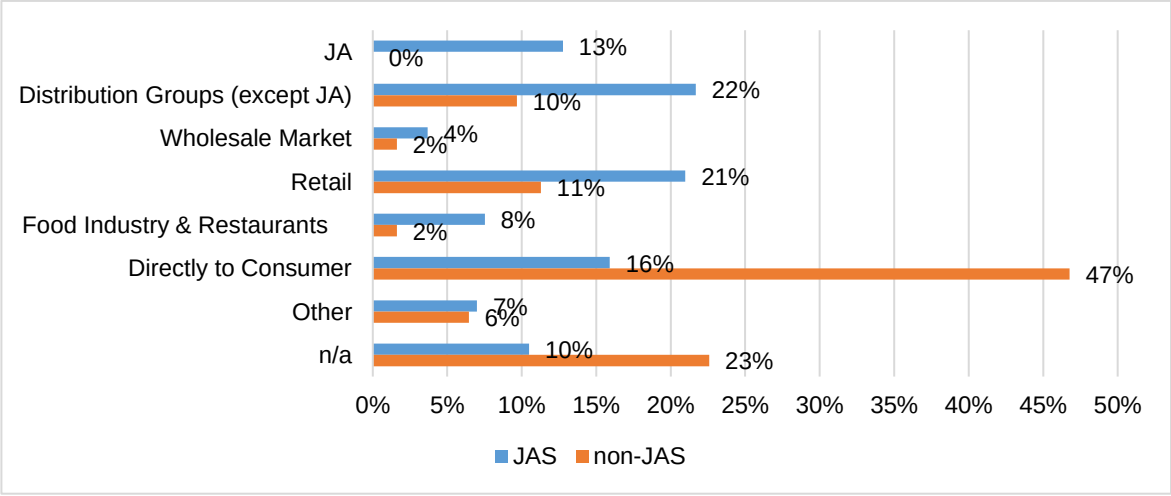


Figure 70. Main Distribution Channel (JAS ver. non-JAS).

A non-JAS respondent from Tochigi prefecture has summarized his opinion and overall tendency on distribution by saying – *For organic farmers who sell directly to consumers, JAS*

Organic labels do not provide any benefits.

5.2.1.5. Certification Center Location and Information Sources

- ***Certification Center Proximity***

The farmers have to apply to the authorized certification center to obtain JAS Organic certification. For this reason, the proximity of such centers can act as a critical factor influencing farmers' decision to obtain the certification. One of the hypotheses of this research is that the closer the certification center is, the higher is the possibility that a farmer decides to obtain JAS Organic certification.

In the questionnaires, the respondents were asked whether there was a certification center close to them. For this question, the distance or travel time to the certification center was not specified. The judgment regarding the proximity of the certification center was left to farmers based on their perception of the closeness.

The results demonstrated a significant difference in the responses of JAS Organic and non-JAS organic farmers. The share of respondents reporting to have a certification center close by was almost 2.4 times higher among the certified farmers. Reversely, the percentage of

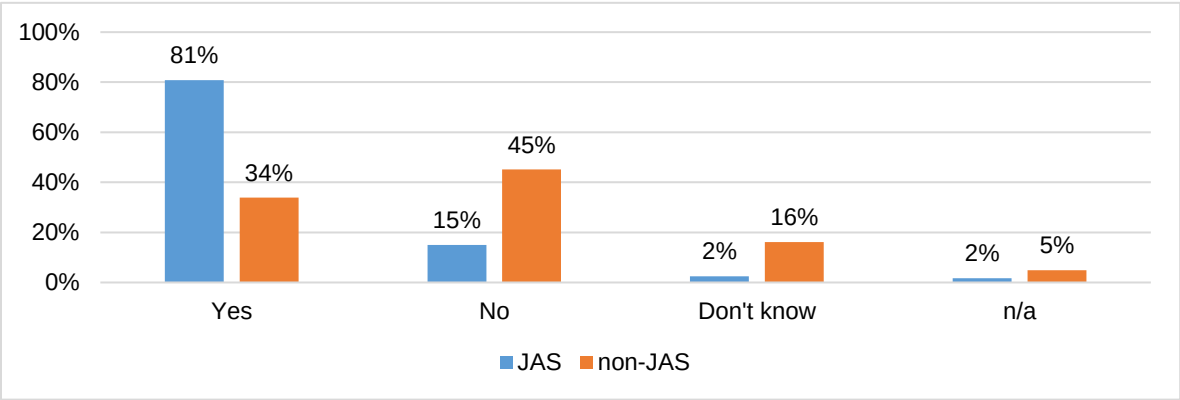


Figure 71. Q: Is there a certification center close to you? (JAS ver non-JAS). "Yes" (z-score=-5.867, p<.05).

respondents saying they did not have a certification center close to them was three times higher among uncertified farmers. Moreover, sixteen percent of uncertified respondents did not know whether there was a certification center close to them or not. These findings indicate that the proximity of a certification center may play an essential role in farmers' decision-making regarding obtaining of JAS Organic certification.

- ***Information Sources on Organic Farming***

The results of the questionnaire analysis of JAS Organic farmers summarized in Chapter 4 demonstrated that certified farmers strongly relied (79% of respondents) on certification centers to obtain information about JAS Organic certification. Besides, 59% of respondents rely on certification centers as a source of information regarding organic farming techniques.

Uncertified organic farmers do not need to follow any certification-related procedures and do not apply to the certification center. Therefore, it was hypothesized that other sources of information on organic farming practices play a more significant role for uncertified farmers. This hypothesis was proved to be accurate, and only eleven percent of non-JAS farmers chose the certification centers as a source of information about organic farming.

The majority of 63% chose books as a source of information. The next popular answer was learning from other farmers (40% of the respondents). Both options demonstrated a higher share among uncertified respondents compared to JAS Organic farmers. On the contrary, JAS Organic farmers have scored higher on the three following options – JA (5% compared to 2% for non-JAS), a municipality (7% compared to 2% for non-JAS), and Internet (24% compared to 18% for non-JAS). A higher share of older respondents can explain a lower degree of Internet use among the uncertified farmers. A higher percentage of using JA as information source corresponds to the findings that 30% of JAS Organic farmers supply their produce to JA, with

13% of JAS Organic respondents reporting JA to be their primary distribution channel. Along these lines, one of the non-JAS respondents left a comment and wished for JA to participate in the promotion of JAS Organic certification more actively. Finally, a higher share of JAS Organic farmers mentioning the municipalities as their information source indicates that certification holders are more actively looking for receiving subsidies from the municipalities.

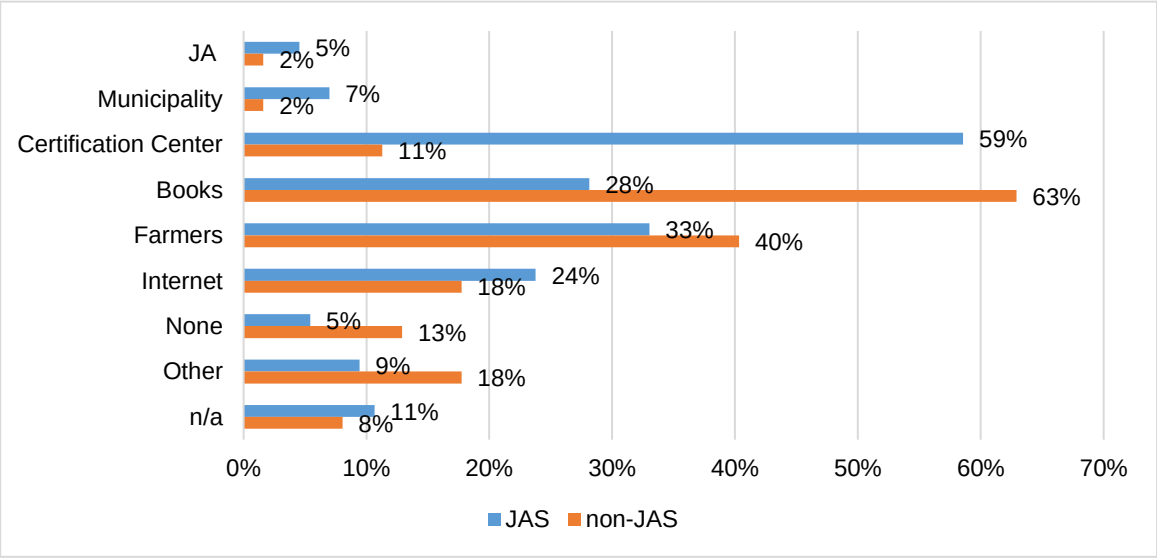


Figure 72. Information Source about Organic Farming (JAS versus non-JAS).
"Books" (z-score=-5.594, p<.05); "Certification Center" (z-score=7.094, p<.05).

5.2.1.6. Other Certifications Held

The respondents were asked whether they held any other types of environmentally friendly certifications for agricultural products. Forty percent of JAS Organic respondents reported holding certification other than JAS Organic. Among non-certified farmers, the share accounted for only thirteen percent. Such a small percentage of uncertified farmers holding different types of certifications indicates an overall lack of concern towards any certification type.

At the same time, among those thirteen percent holding the certification other than JAS

Organic, more than half reported holding Eco-Farmer certification. Additionally, the one-fourth reported holding Specially Cultivated Products ('*tokubetsu saibai*') certification. Moreover, one of the respondents mentioned having obtained a local environmentally friendly agriculture certification of Nagano prefecture. These findings demonstrate that the small share of uncertified respondents interested in obtaining certification seems to choose cheaper certification options, such as Eco-farmer or Specially Cultivated Products. Moreover, application procedures for receiving Eco-Farmer certification are often conducted by municipalities. This way, farmers are not limited by the proximity of certification centers, as in the case with JAS Organic certification.

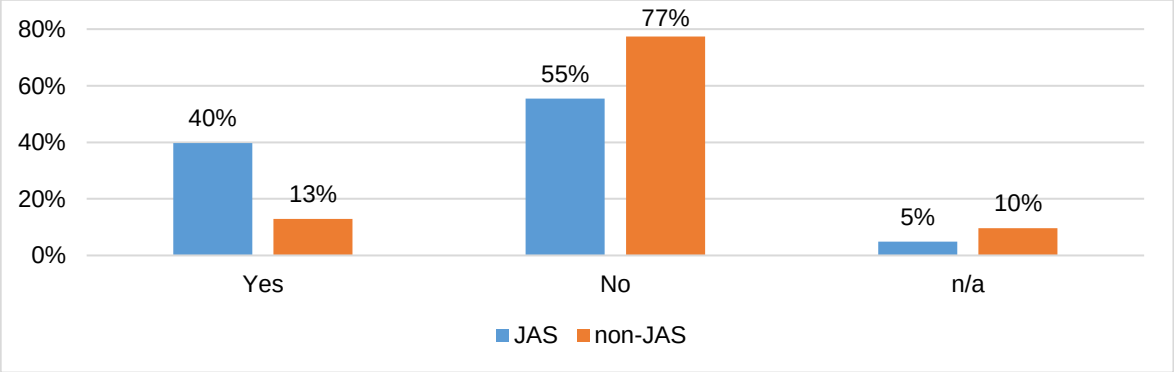


Figure 73. Certifications Held Other than JAS Organic (JAS ver non-JAS).
Yes (z-score=4.174, p<.05).

5.2.1.7. Reasons for Practicing Organic Farming

In the following section of the questionnaire, the farmers were asked about the reasons to practice organic farming. The two options including 'strengthening of the bond between the producers and consumers' (35% for JAS and 34% for non-JAS) and 'organic farming being good for health' (51% for JAS and 48% for non-JAS) were rated approximately the same by both groups of respondents.

The certified respondents rated the following options higher than their non-certified

counterparts – 'to produce safe products,' 'to increase the price,' 'to respond to retail requests,' 'to receive subsidies,' 'to follow the municipal and JA policy.' The widest gap in the responses of the two groups was found for the options on 'increasing the price' (41% for JAS and 13% for non-JAS), and 'responding to retail request' (22% for JAS and 5% for non-JAS). These results relate to the findings that the retail sector serves as one of the main distribution channels for JAS Organic certified farmers. Moreover, the fact that the potential rise in the price and requests from retail encourage farmers to obtain JAS Organic certification indicates that certified respondents have a more business-like way of thinking and are more profit-oriented. This explanation is also related to the fact that the incorporation rates are higher among certified farmers.

Uncertified organic farmers, on the contrary, valued 'environmental protection' higher. Among uncertified respondents, 65% chose it as a reason for obtaining JAS Organic certification. Among JAS Organic respondents, this number was ten percent smaller and accounted for 55%. 'Environmental protection' is the second most popular reason chosen by non-JAS organic farmers following the safety of the products (74% of respondents). These results indicate that for uncertified organic farmers, the environment, and the safety aspect of organic farming seem to be of the highest priority. A much smaller share of the uncertified respondents considers

organic agriculture as a business strategy compared to their certified counterparts.

Moreover, fifteen percent of the uncertified respondents chose the option 'Other' saying that they practice organic farming because they want "*the agriculture and society to be sustainable*" or "*prevent the Japanese agriculture from declining*." Some of the respondents commented that organic agriculture was the only natural way of farming they knew. One of the respondents also mentioned that he used to have the JAS Organic certification earlier but decided not to renew it. Despite exiting the certification scheme, he continued to practice organic farming.

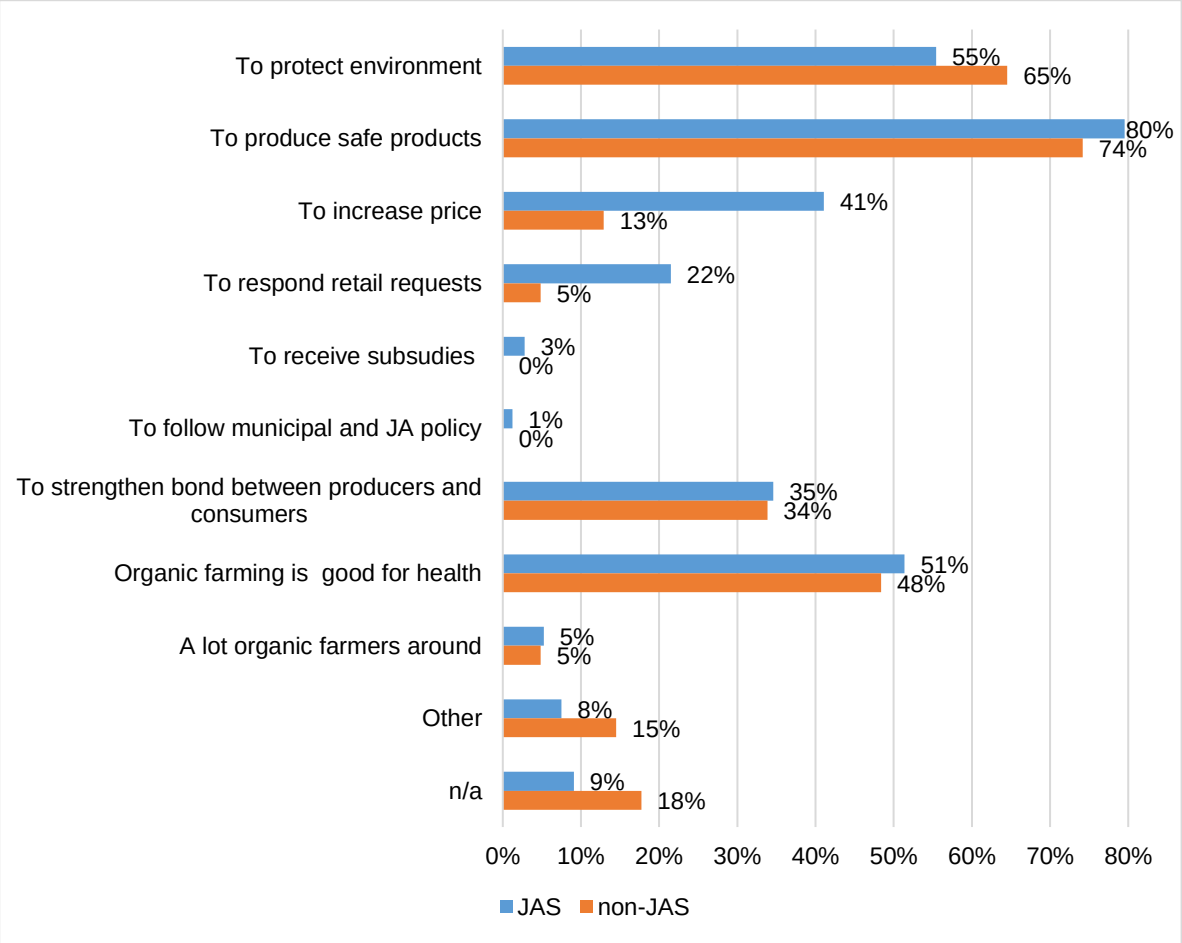


Figure 74. Reasons for Practicing Organic Farming (JAS ver. non-JAS). 'To increase price' (z-score=4.335; p<.05); 'To respond to retail requests' (z-score=3.123, p<.05).

Some of the JAS Organic certified respondents also mentioned that organic farming was felt natural to them and commented on the importance of health and environmental aspects. Nevertheless, the reasons related to the management and strategic aspects of farming were more dominant. Such business-oriented purposes mentioned in the comment section of the questionnaire included "*following the company's policy*," "*responding to requests from hotels and restaurants*," "*adding value to the products*," and "*differentiating the product on the market*."

5.2.1.8. Farmers' Perceptions

- ***Farmers Opinion on JAS Organic Certification***

Among other questions, the respondents were asked about their perceptions towards the JAS Organic Certification. The questionnaire provided eight statements about JAS Organic certification. The respondents had to read those statements and express their opinion using a 5-point scale from "Strongly Disagree" to "Strongly Agree." The overall tendency of respondents was nearly the same for most of the statements in both groups (JAS Organic and uncertified organic farmers). Nevertheless, the opinions of respondents on the regarding the following aspects split: certification fees, the easiness to obtain the certification, and environmental effects of JAS Organic certification.

Table 36. Opinion of Farmers on JAS Organic Certification (JAS ver. non-JAS).'Troublesome' (z-score=-2.184, p<.05); 'Weak environmental effects' (z-score=-2.834, p<.05).

Opinion on JAS Organic Certification (JAS ver non-JAS)		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Consumers trust JAS Organic Label	JAS	8%	6%	24%	22%	40%
	non-JAS	8%	8%	29%	27%	29%
It is too costly to obtain JAS Organic Certification	JAS	11%	3%	18%	17%	51%
	non-JAS	2%	0%	10%	12%	77%
JAS Organic Certified Products sell for higher price	JAS	22%	8%	30%	20%	20%
	non-JAS	19%	6%	38%	19%	17%
Natural Environment will not be harmed if you follow JAS Organic requirements	JAS	14%	7%	21%	18%	39%
	non-JAS	35%	8%	21%	17%	19%
There are enough subsides for promoting JAS Organic Certification	JAS	61%	10%	20%	4%	4%
	non-JAS	50%	21%	29%	0%	0%
Conusumers' awareness about JAS Organic Label is high	JAS	51%	14%	21%	6%	7%
	non-JAS	47%	8%	36%	4%	6%
It is too troublesome to obtain JAS Organic Certification	JAS	10%	6%	19%	19%	46%
	non-JAS	4%	0%	8%	9%	79%
It is easy to find distribution channel for JAS Organic Certified Products	JAS	33%	11%	32%	12%	12%
	non-JAS	19%	9%	49%	9%	13%

Firstly, almost ninety percent of uncertified respondents expressed their agreement towards the statement that JAS Organic certification is too costly (21% higher than among certified respondents) and too troublesome to obtain (23% higher than among certified respondents). These findings correspond with the fact that there are more not incorporated, family-run small-scale farms among uncertified organic respondents. A potential explanation

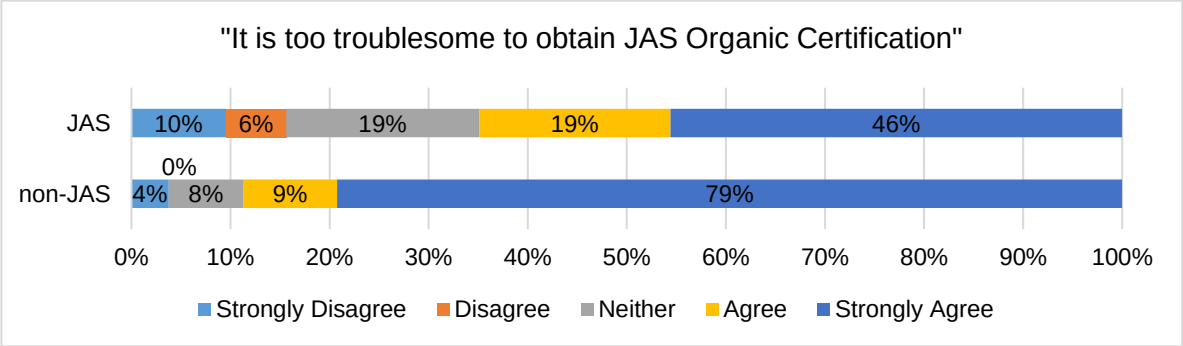


Figure 75. Perceptions on JAS Organic Certification – Certification Process (JAS ver. non-JAS)

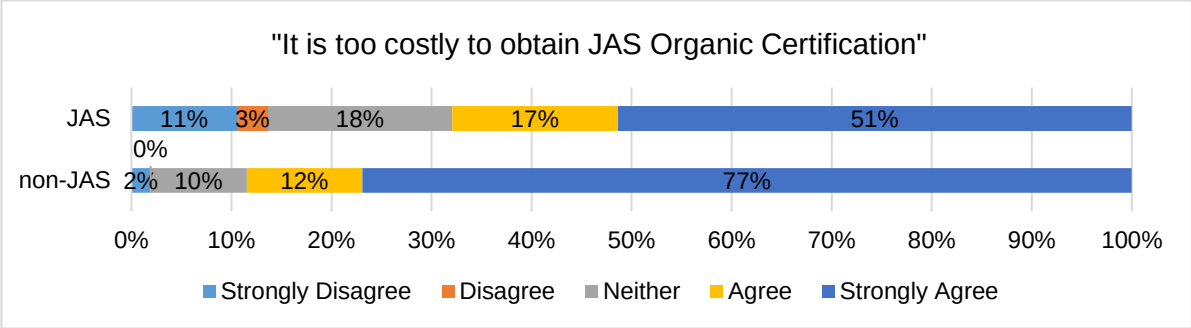


Figure 76. Perceptions on JAS Organic Certification – Certification Fee (JAS ver. non-JAS)

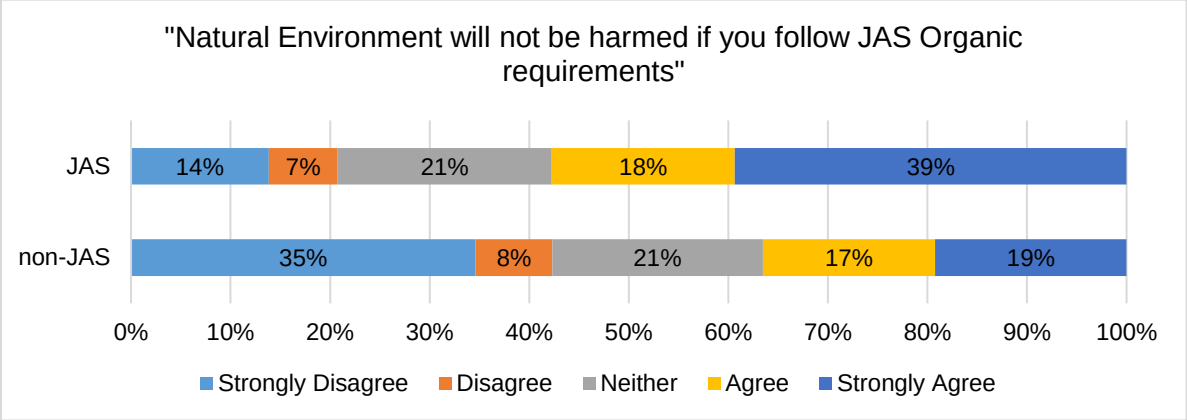


Figure 77. Perceptions on JAS Organic Certification – Environmental Effects (JAS ver. non-JAS)

is that it is simply not feasible for uncertified farmers – both economically and in terms of time and labor required to complete the application paperwork – to apply and obtain for JAS Organic certification. In other words, both direct financial costs and indirect costs of obtaining the certification are higher for small scale farms.

Secondly, the uncertified respondent demonstrated a stronger skepticism towards the reliability of the environmental effects of JAS Organic certification. Forty-two percent of the respondents expressed their disagreement with the statement 'Natural environment will not be harmed if you follow JAS Organic requirements'. Among the JAS Organic certified respondents, this number was two times lower and accounted for twenty-one percent of all respondents. These results indicate that uncertified organic farmers practice farming in a way that is stricter and having even less impact on the natural environment than required by the JAS Organic standard. It also demonstrated that the negative perception of farmers towards the certification scheme lowers the participation rates.

– ***Farmers Opinion on Organic Farming***

Apart from the farmers' opinions on the certification scheme, the information was collected regarding farmers' views on organic farming itself. The questionnaire provided twelve different statements about organic farming. Respondents were asked to rate those statements using a 5-point scale within the range from "Strongly Disagree" to "Strongly Agree." An overall trend for the majority of provided statements was similar for both groups of respondents, as summarized in Table 37.

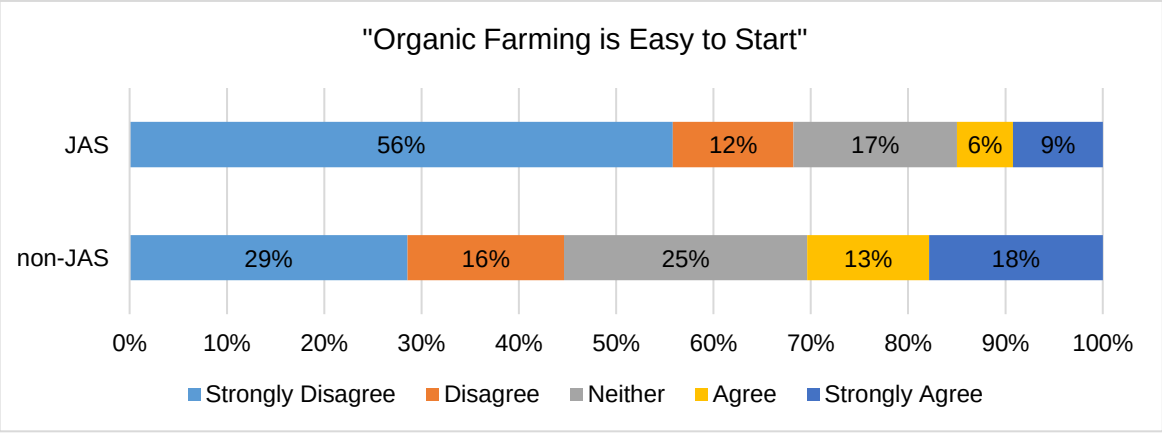


Figure 78. Perceptions on Organic Farming (JAS ver. non-JAS)

The only statement that demonstrated some differences in the opinions between the two groups of respondents was referring to the easiness of organic farming. Sixty-eight percent of JAS Organic certified farmers expressed their disagreement. Among the uncertified respondents, the share of disagreed accounted for forty-five percent. The fact that JAS Organic farmers find it more challenging to start organic farming can be linked to the shorter farming experience compared to uncertified farmers, as revealed in the questionnaire results.

Table 37. Farmers Opinions on Organic Farming (JAS ver. non-JAS).

Opinion on Organic Farming (JAS ver non-JAS)		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Eating Organic Products is good for health	JAS	5%	1%	14%	18%	62%
	non-JAS	2%	0%	18%	23%	58%
Organic Products sell at higher price compared to comventional	JAS	17%	5%	27%	28%	22%
	non-JAS	21%	2%	23%	29%	25%
Farmers have thorough understanding about organic farming	JAS	58%	16%	19%	5%	2%
	non-JAS	61%	18%	14%	5%	2%
Organic farming is easy to start	JAS	56%	12%	17%	6%	9%
	non-JAS	29%	16%	25%	13%	18%
Organic farming is more profitable than conventional	JAS	37%	12%	29%	10%	11%
	non-JAS	35%	15%	42%	5%	4%
Organic farming is good for natural environment	JAS	4%	4%	15%	20%	58%
	non-JAS	4%	2%	14%	21%	60%
There are enough subsides for promoting of Organic Farming	JAS	63%	12%	19%	4%	2%
	non-JAS	54%	20%	25%	2%	0%
Organic Products are popular among consumers	JAS	16%	8%	44%	19%	14%
	non-JAS	11%	7%	49%	14%	19%
Organic farming is labor consuming	JAS	7%	4%	19%	21%	49%
	non-JAS	13%	5%	21%	25%	36%
Organic farming brings smaller yields than conventional	JAS	8%	6%	18%	17%	52%
	non-JAS	14%	5%	30%	16%	35%
Organic Farming is safe for producers	JAS	3%	2%	12%	16%	66%
	non-JAS	4%	0%	2%	23%	72%
It is easier to find distribution channel for organic products than for conventional	JAS	26%	8%	37%	14%	15%
	non-JAS	14%	7%	47%	16%	16%

5.2.2. Farmers Opinion on JAS Organic Certification

The questionnaire design offered a space for the respondents to leave a free comment. An empty section was added to collect the opinions of respondents without limiting them by themes and topics set by each question. Approximately one-third of all respondents left a comment in this section. JAS Organic certified respondents wrote 189 comments. Uncertified respondents left 26 comments.

To capture the overall picture, each of these comments was assigned single or multiple keywords reflecting the content of the comment. The initial grouping was made based on the general character of the comment. The four groups were formed – "problems," "reasons," "comment," and "n/a" (comments with the content not contributing to the analysis). For both groups of respondents, most of the comments (over sixty percent in each group) refer to the problems associated with JAS Organic certification. Eleven percent of the JAS Organic respondents also commented about the reasons for obtaining JAS Organic certification. The rest of the comments that did not explicitly mention either "problems" or "reasons" were classified as "comment." They accounted for ten and fifteen percent in each group of the respondents and included the information representing valuable insights on farmers' perceptions towards the JAS Organic certification.

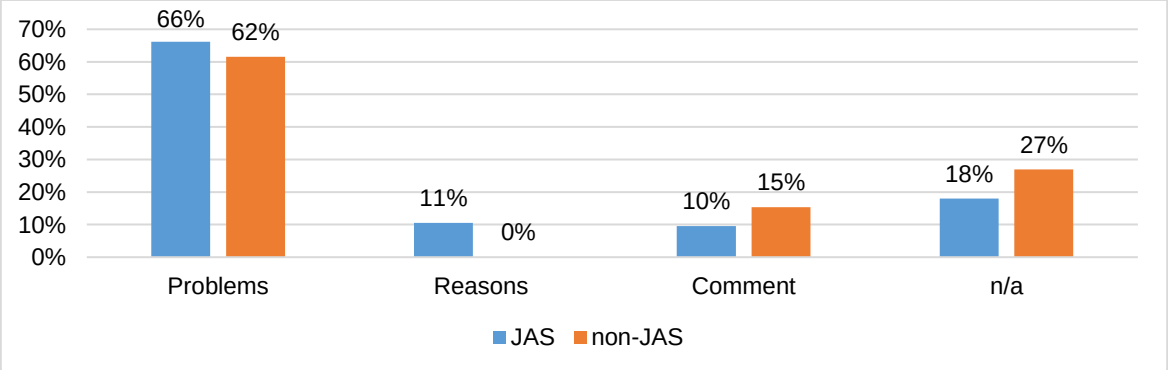


Figure 79. Types of Free Comments (JAS ver. non-JAS).

Further, break down was conducted within the three groups (excluding "n/a"), assigning each comment the keywords representing its content. For example, the largest group of comments referring to the problems or obstacles associated with JAS Organic certification was further divided into two levels. Firstly, all the comments within the group were divided into five subgroups. The five subgroups included the keywords mentioned most frequently by the respondents in both groups – certified and uncertified.

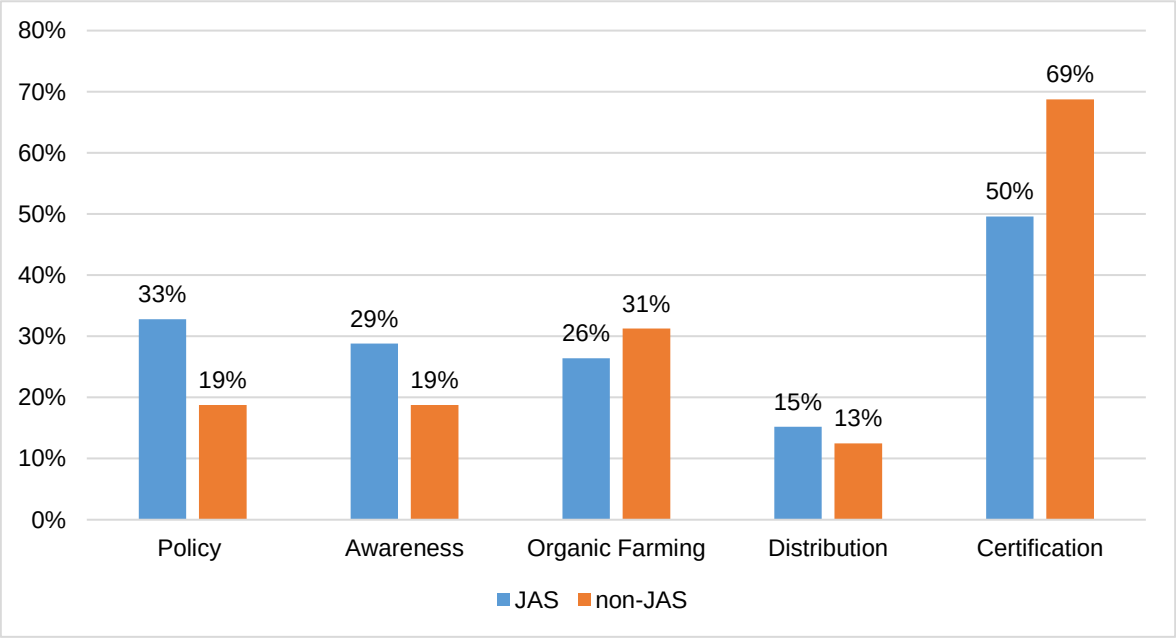


Figure 80. Free Comments - "Problems" Group (JAS ver. non-JAS).

Table 38. Free Comment - Main Themes in the "Problems" Group (JAS ver. non-JAS).

Sub Groups	Policy				Awareness				Organic Farming				Certification						
Keywords	Overall	Subsidies	Promotion	Information	Overall	Producers	Consumers	Retail	Labor	Cost	Competitiveness	Materials	Fee	Paperwork	Trust	Safety	Necessity	Rival	False
JAS	29%	49%	34%	10%	17%	14%	81%	3%	27%	15%	39%	45%	37%	42%	5%	29%	2%	15%	8%
non-JAS	67%	33%	0%	0%	0%	0%	100%	0%	40%	0%	40%	40%	36%	27%	9%	18%	73%	0%	0%

Further, additional keywords were added within each of the five subgroups to capture the details better. One of the most significant differences between the certified and uncertified respondents was that much higher share of the uncertified organic farmers doubted the necessity of JAS Organic certification and criticized its overall concept (see Table 38).

For example, one of the uncertified organic respondents commented that *organic agriculture is the most natural way of farming; putting a label on organic products creates a false impression among consumers that there is something special about it*. Another respondent mentioned that localization of food consumption (*chisan-chisho*) was more important than certification as it was more effective in strengthening the bonds between producers and consumers.

Several uncertified respondents vocalized more valuable insights regarding the overall concept of organic certification in their comments:

- *The farmers using chemical pesticides and fertilizers should be the ones to display information about the use of the chemicals on their products*.
- *Agricultural labels should be displaying information about the pesticides and other substances harming the safety of the food and ecosystems*.
- *The schemes where information about products has to be displayed should be mandatory for the agricultural practices and products having a high risk of causing harm to consumers, for example, conventional farmin*g.

Some of the JAS Organic certified respondents also commented on the purpose and the meaning of the certification itself and its limitations:

- *Organic fertilizers have bad odor and are often regarded as a nuisance by the neighbors.*

Summers are so hot recently that weeding in such heat can be dangerous for farmers' health. Organic farming could harm producers more than conventional agriculture. The certification is designed for consumers and environmental protection, but not for the farmers. This is unfortunate. – By a respondent from Miyazaki prefecture.

- *The times when it was enough to put the JAS Organic label on the product for it to sell have passed. Today, no one will buy the product if the taste is not good. The burden placed on the retail sector is too high. I think that the number of distribution channels for JAS Organic will not increase anymore.* – By a respondent from Hokkaido.

5.3. Discussion and Additional Findings from the Interviews with Stakeholders.

- *Summary of Results*

Chapter 5 attempted to separate the decision-making process for practicing organic farming and obtaining the JAS Organic certification. This separation was conducted through a comparison of the questionnaire results of JAS Organic certified respondents with the responses of uncertified farmers practicing organic farming.

The comparison revealed that some characteristics of uncertified organic farmers are similar to those of conventional farmers and certified JAS Organic farmers from the areas with a low penetration rate of the certification (Group D respondents). These characteristics were identified in Chapter 4 and included older age of respondents, small-scale family-run farms with low overall incorporation levels, and a higher share of JAs as incorporation type. Similarly to conventional farmers, the uncertified respondents run on average smaller scale farms and grow more variety of crops compared to their certified JAS Organic counterparts.

For the distribution of their products, the uncertified farmers mostly rely on direct sales to consumers, whereas JAS Organic has a more significant variety of distribution channels. A larger share of certified respondents named retail as their primary distribution channel. These findings are supported by the fact that a much larger percentage of certified respondents mentioned responding to retail requests to be the reason to practice organic farming. Interestingly, none of the uncertified respondents mentioned supplying their products to JA.

Regarding the reasons to practice organic farming, the uncertified farmers valued the environmental protection the highest. Some respondents commented that organic agriculture was the only natural way of farming they knew. This idea is backed up by the findings that the uncertified farmers, on average, take less number of years before the conversion to organic. The shorter time before the transition to organic on average also indicates that more of uncertified farmers entered agriculture as organic farmers.

The perceptions of the uncertified farmers on JAS Organic certification had a more negative tone. More of the uncertified respondents perceived the certification as costly and troublesome to obtain, which is similar to the certified respondents from Group D. Additionally, the lower share of uncertified farmers mentioned that there was a certification center close to them, which indirectly explains why they considered the certification procedure to be troublesome and expensive.

In the free comment section, uncertified organic farmers demonstrate an interesting trend. The comments representing skepticism towards the idea of certification itself and criticizing the JAS Organic certification requirements appeared repeatedly. Several respondents mentioned that certification schemes were designed for consumers and did not take into consideration the needs and safety of the producers. It was also mentioned that the demand for

certified products and the awareness of consumers could significantly vary in urban and rural areas. Such an ability to critically evaluate the JAS Organic certification scheme can be linked to the fact that the share of university graduates among the uncertified respondents is almost two times higher compared to the certified farmers.

- *Identifying the Factors Influencing Adoption of JAS Organic Certification*

This research is focusing on agricultural producers, including the individual farmers, the farming companies, and farmers' groups. Geographic distribution of JAS Organic certified farmers and prefectural policy analysis was conducted in Chapter 3. The focus of Chapter 4 and 5 shifted from prefectural to the individual level. The two chapters presented the analysis of the questionnaires sent to both JAS Organic certified farmers and uncertified organic farmers. The potential factors influencing the adoption of JAS Organic certification were introduced in Chapter 4 and Chapter 5 based on the results of the questionnaire analysis. Further, a two-tailed z-test for two population proportions was conducted to identify statistically significant factors influencing the adoption of JAS Organic certification.

The results of the z-test demonstrated that there was a significant difference in the incorporation rates and the types of distribution channels among the three groups of respondents. The three groups of respondents included conventional farmers (CENSUS2015 data), certified JAS Organic respondents (MAFF data on certified farmers), and uncertified organic respondents (data from the organic farming map).

The comparison of JAS Organic and non-JAS organic farmers revealed that the main factors influencing the decision to obtain the JAS Organic certification include the respondents' opinion regarding the proximity of certification centers, the information source about organic farming, the business-oriented motives to practice organic farming, and opinion on JAS Organic

certification (cost, administrative burden and environmental effects of the certification).

The findings of the questionnaires were verified during the interviews with four certification centers located in Tokyo. The interviews with the centers' officials revealed more details regarding how the proximity of the certification centers may influence the decision to obtain certification. Although the producers do not have physically visit the center to apply for JAS Organic certification, they have to attend a compulsory training session. Depending on the certification center, the venue for the training session was either limited to Tokyo or included other locations (e.g., Nagoya, Osaka, Shizuoka, and Kumamoto).

The producers certified through the certification center were, to a large extent, limited to North Kanto and Tohoku area when the centers offered the training session only in Tokyo. In the case of a certification center offering the training session in five various locations, the list of certified producers included the producers from almost all prefectures from Hokkaido in the North to Okinawa in the South. The certification centers offering the training sessions only in the Tokyo area commented that they also provide training sessions in other locations upon request. However, this option is feasible only when then request is made by a group of 6~10 producers, which means that individual farmers practicing organic farming are in a less favorable position as they have to travel to Tokyo and cover transportation expenses by themselves.

Regarding the incorporation rates, the certification center officials indeed confirmed that the share of incorporated producers was much higher compared to individual farmers among the certified producers. The interviewees also mentioned that incorporated farmers had less resistance towards the paperwork necessary for JAS Organic certification.

CHAPTER 6. CONCLUDING DISCUSSIONS.

6.1. Summary of the Results

"JAS Standards for Organic Plants" (JAS Organic) certification scheme was established in 2000. Despite the efforts to promote organic farming, the share of organic farming land in Japan accounted for only 0.22% in 2017. This share is significantly lower than in other countries that have the national certification schemes for organic farming compatible with JAS Organic.

This research examined the current situation in the promotion of JAS Organic certification and identified primary determinants for the certification adoption. The determinants were identified based on the analysis of the differences in prefectural promotion policies, characteristics of the producers, and their perceptions on the JAS Organic certification scheme. The focus of the analysis was placed on the factors that influence (reduce or increase) direct or indirect costs of obtaining the certification.

The analysis embraced the three following steps:

1) Analysis of JAS Organic adoption rate on prefectural level (Chapter 3; RQ#1);

2) Review of organic farming promotion policy on prefectural level (Chapter 3; RQ#1);

3) Analysis of the characteristics of certified and uncertified organic producers on the individual level (Chapter 4 and Chapter 5; RQ#2).

The two first steps of the analysis answered the research question #1, and the third part of the analysis addressed the research question #2. Finally, research question #3 summarized

the findings of the research question #1 and #2. The results for each research question are presented below.

Research Question 1: Are there any prefectural differences in concentration rates of certified JAS Organic farmers and farming lands? Is there any connection between these differences and the content of the prefectural promotion policies?

The geographic distribution of JAS Organic in Japan was analyzed across 47 prefectures for five years from 2010 to 2015. The findings indicate that the concentration of JAS Organic farmers either stayed the same or declined for most of the prefectures, except for the Kyushu region. In the Kyushu region, the concentration increased in all prefectures. Based on the results of the concentration analysis, the prefectural typology composed of four groups (ABCD) was established. The typology incorporated two parameters, namely, concentration level in 2015 and the concentration trend from 2010 to 2015. This typology further informed the analysis of prefectural promotion policies and questionnaire survey results.

The analysis revealed that the content and implementation approach of the prefectural promotion plans for organic farming vary significantly between the prefectures. For example, promotion plans of the prefectures belonging to the advanced Group B, demonstrating high concentration and further growth in the concentration of JAS Organic farmers, explicitly mentioned JAS Organic certification. In the promotion plans, these prefectures set concrete numeric targets and offered supporting initiatives to facilitate the promotion of JAS Organic. Such initiatives included offering guidance on the certification process, raising awareness among both producers and consumers, and assisting with finding new distribution channels.

Promotion plans of Kumamoto, Saga, and Kochi prefectures explicitly mention financial subsidies covering the certification-related expenses. Other prefectures in Group B provide concrete measures supporting the development of organic farming techniques, finding new distribution channels, and facilitating the dissemination of relevant information to producers. This way, the promotion policies in prefectures with higher JAS Organic adoption rates help to absorb and reduce both direct financial costs (certification fees) and indirect costs (implementing new farming techniques, obtaining information about the certification schemes, searching for new distribution channels).

Research Question 2: What are the possible factors influencing the adoption of JAS Organic certification on the individual level?

A questionnaire survey was conducted to identify the factors influencing JAS Organic certification adoption on an individual level. A thorough literature review of similar studies both in Japan and overseas informed the questionnaire design. The questionnaires were distributed to both JAS Organic certified farmers and uncertified organic farmers. Chapters 4 and 5 summarized and discussed the main characteristics of JAS Organic certified producers.

Further, the questionnaire results were compared between the three groups, including JAS Organic certified producers, uncertified organic producers, and conventional farmers. The results of this comparison were tested for statistical significance applying a two-tailed z-test for two population proportions. Statistically significant results were interpreted as factors that can potentially influence the JAS Organic certification adoption by reducing direct and indirect costs borne by farmers.

The results of the questionnaires and selected factors were further validated through the interviews with farmers and officials from MAFF and certification centers. The policy recommendations section of this chapter summarizes the information obtained through the stakeholder interviews. The results of the questionnaire surveys and selection of the critical factors are outlined below and in Table 39.

Firstly, the results of the questionnaire survey of certified JAS Organic farmers and conventional farmers (CENSUS2015 data) were compared. The findings indicated a younger age and a higher incorporation rate of certified organic farmers compared to the conventional. The conclusion regarding the younger age of the farmers practicing organic farming is consistent with the existing literature (Damianos et al., 2002; Izcara Palacios, 2005; Vanslembrouck et al., 2008). The difference in the incorporation rate has not been addressed in the literature before and is an original finding of this research. Regarding the incorporation rate, the interviews with stakeholders suggested that the producers running incorporated farms that are incorporated are more used to paperwork and keeping records. Less resistance towards the paperwork means that the administration-related indirect costs of incorporated producers would be lower, and they would not perceive the certification itself as troublesome. It is also possible that incorporated farms have more available labor force and a stronger financial base to absorb both direct and indirect costs of obtaining the certification.

The certified organic farmers also demonstrated less dependence on JA. There are fewer JA members among the JAS Organic certified farmers. Subsequently, a significantly smaller share of the certified farmers reported selling their products to JA. Additionally, the certified farmers demonstrated a wider diversity of distribution channels and a higher percentage of respondents selling their produce directly to consumers and the retail sector. A

more diversified distribution network can be interpreted as having fewer risks of losing the profit in case of one the buyers exits the agreement. Diversified distribution network also has the potential to reduce the indirect costs associated with the information search about new distributors and direct costs of establishing contact with them, which is aligned with the previous literature (Ahnstrom et al., 2009; Lemeilleur, 2013).

The JAS Organic certified respondents demonstrated a higher share of larger-scale farms (above 2.0 ha) compared to conventional farmers. This result confirms the findings from existing literature (Dupraz et al., 2002; Falconer, 2000; Waldman & Kerr, 2014; Wätzold et al., 2006) that small-scale farms have a less stable financial base and less available labor force to bear direct costs of paying the certification fees and indirect administration costs of paperwork and developing new farming techniques. Therefore, small-scale farms have less willingness to participate in agri-environmental schemes.

Secondly, the questionnaire results were compared between the JAS Organic certified farmers and uncertified organic farmers. The differences between the two groups were found for the age and academic background of the respondents, and the incorporation rate of the farms. As in the case with conventional farmers' comparison, the JAS Organic respondents were found to be younger on average. On the other hand, a share of university graduates was higher for non-certified organic producers. Again, the JAS Organic certified farmers had a larger share of incorporated producers, which confirms the idea that incorporated farmers' experience with the paperwork may reduce the indirect administration-related indirect costs of obtaining the certification.

Further, the share of respondents reporting to have a certification center close by was almost 2.4 times higher among the certified farmers. Reversely, the percentage of respondents

saying they did not have a certification center close to them was three times higher among uncertified farmers. Although the farmers do not have to visit the certification centers to apply for the certification, the distance to the venue of the compulsory training influences their transportation fees. The transportation fees of the inspectors dispatched to the farm also change depending on the location of the inspectors. Ultimately, if there is no training venue and inspectors close by, the direct costs of the certification will increase since it includes the transportation fees of the farmers and inspectors.

In terms of the distribution channels, a larger share of the certified farmers reported selling their agricultural products to retail. The reasons to practice organic farming among the certified farmers included the requests from the retail sector, and, therefore, were more profit-oriented. Such demand from the retail sector creates a perception that having JAS Organic certification will lead to more profit and indirectly create an impression of reduced indirect costs associated with searching for new buyers. Perceiving the certification as profitable and less risky encourages the decision to adopt JAS Organic certification, which is consistent with the ideas outlined in the existing literature (Falconer, 2000). Moreover, a larger share of uncertified producers viewed JAS Organic certification as troublesome and costly. They also criticized the certification for lacking the regulations strict enough to protect the environment. These findings confirm that negative perceptions towards the certification may hinder the decision to participate in the scheme, as mentioned in the previous research (Hu, 2005; Ahnstron, et al., 2009).

The results of the analysis for Research Question #1 and Research Question #2 are generally in line with the previous studies on the agri-environmental schemes, as described in

the paragraphs above. Based on the results of Research Questions #1 and Research Question #2, the determinants of JAS organic adoption is summarized into three groups:

1) the direct costs of certification associated with certification fees, purchasing of new equipment, transportation costs to the training venues and transportation cost of the inspectors, and marketing costs;

2) indirect costs associated with the time and effort required for the development of new farming techniques, obtaining information about the certification, and developing of new distribution channels;

3) Farmers' perceptions of the certification and the environment.

The factors that have the potential to reduce the direct costs include financial compensations and subsidies, shorter distance to certification centers, training venues, and inspectors' locations, as well as larger farm scale. At the same time, information dissemination, supporting the development of a new distribution model, and simplifying the certification-related paperwork can help to reduce indirect costs.

The perceptions of the farmers towards the JAS Organic certification as being troublesome, costly, and risky may hinder the decision to obtain the certification. In the Japanese context, the incorporation of the farm can indirectly influence and lower farmers' negative perceptions regarding the administrative burden of the certification. Moreover, the demand for certified organic products from the distribution side can help the farmers to perceive the certification as profitable and encourage the adoption of the certification. Additionally, spreading correct information about JAS Organic certification rules, potential distributors, and available subsidies can improve farmers' perceptions of the certification.

Table 39. Summary of Main Questionnaire Results. Statistically significant (when compared to JAS Organic) results of the two-group comparisons are in bold font and marked with an asterisk.

	Respondents Type	CENSUS2015	non-JAS Organic	JAS Organic
Characteristics	Aver. Age	60y.o	58y.o	54y.o
	Area Size	0.3~2.0ha (majority)	0.5~20.0ha (majority)	1.0~20.0ha (majority)
	Area Type	more paddies	more vegetable fields	more orchards
	Incorporation	**2%****(compared to JAS Org.)	**11%***(compared to JAS Org.)	36%
	Incorporation Type	JA - 10% Farm Union - 23% Company - 59%	**JA - 14%***(compared to JAS Org.) Farming Union - 14% Company - 57%	JA - 1% Farming Union - 10% Company - 84%
Perceptions	Opinion on JAS Organic Certification	n/a	Costly – 89% **Troublesome – 88%*** **Weak Environmental Effects – 43%***	Costly – 68% Troublesome – 65% Weak Environmental Effects – 21%
	Proximity of Certification Center	n/a	**Not available close by – 45%***	Not available close by – 15%
Reasons	Organic farming	n/a	Environmental Protection – 65% **Respond to retail requests – 13%*** **Increase price – 5%**	Environmental Protection – 55% Respond to retail requests – 41% Increase price – 22%
	JAS Certification	n/a	n/a	Environmental Protection – 45% Food Safety – 77% Health – 40% Retail requests – 32% Increase Price – 51% Policy – 2% Subsidies – 4%
	Information Source	n/a	**Cert. Center – 11%*** **Books - 63%*** Farmers - 40%	Cert. Center – 59% Books- 28% Farmers - 33%
Outcomes	Distribution Channels	**JA – 73%****(compared to JAS Org.) **Directly to consumer – 19%****(compared to JAS Org.) **Retail – 8%****(compared to JAS Org.)	JA –10% Directly to consumer – 71% **Retail – 29%***(compared to JAS Org.)	JA –30% Directly to consumer – 65% Retail – 50%
	Benefits	n/a	n/a	Distribution Channels – 58% Increased price – 37% Consumers trust – 68%
	Problems	n/a	n/a	High certification expenses – 42%
	Renew	n/a	n/a	Plan to renew current certification – 88%

*p<.05; **p<.01

6.2. Discussion and Policy Recommendations

This section is addressing Research Question #3 by summarizing the main discussion points and developing policy recommendations. This discussion and policy recommendations take into consideration the determinants of JAS adoption identified in the previous section.

Research Question 3: How can an understanding of prefectural differences and individual-level factors be integrated into the current policy to promote JAS Organic further?

- ***Prefectural Promotion Policy***

Each prefectural government establishes its own promotion plan for organic farming. Such division allows a higher degree of freedom and flexibility in the content and the implementation approach of the policy. According to the interview with MAFF officials, establishing promotion plans on the prefectural level is considered beneficial for organic farming promotion. The reason is that prefectural policies and initiatives reflect local climatic and soil conditions and take into consideration the types of crops grown in the area. Such background information facilitates a better understanding of the challenges local farmers facing and helps to provide adequate technical support and guidance.

However, establishing promotion plans on the prefectural level creates a risk of JAS Organic certification to be overlooked or left out entirely. A decision not to mention JAS Organic certification in the policy and promotion plan may reflect local agricultural policies, budget availability, or personal preferences of the officials. Therefore, further promotion of JAS Organic may benefit from making it compulsory to include JAS Organic certification into the scope of promotion plan and establishing a concrete numerical target for its promotion as found in the advanced prefectures in Group B.

Questionnaire results demonstrated that expensive certification fees are one of the main concerns of already certified farmers. It is also one of the main obstacles mentioned by uncertified farmers. Most of the existing subsidies applicable to organic farming do not cover the certification fees. Only one national-level subsidy program established recently covers certification-related expenses. However, this subsidy requires newly certified farmers to export their products overseas, which can be challenging for many and may not match their management strategy and priorities. Therefore, it is recommended to establish new or enhance existing subsidizing schemes covering certification expenses and make them available to small-scale individual farmers.

Additionally, one of the interviewees commented that 50% of the budget for existing subsidy programs called Direct Payments for Environmentally Friendly Agriculture is coming from prefectural and municipal budgets. Therefore, the rate of the farmers receiving these subsidies varies greatly from depending on the availability of the budget in each prefecture and municipality. Thus, introducing a more flexible approach where the national government pays more than 50% for the municipalities lacking budget, for example, recovering from a natural disaster, should be considered.

Apart from the subsidies compensating for direct financial costs, such as certification fees and purchase of the new equipment, it is equally important to implement measures reducing indirect costs borne by farmers. Advanced prefectures in Group B already introduce such initiatives in their promotion plans.

Due to lack of a universal definition of indirect costs, and it is easy to overlook their impact on farmers' decision to participate in JAS Organic certification scheme. Analysis of research questions #1 and #2 demonstrated that along with financial compensation of direct

financial costs, adequately addressing indirect costs can critical for enhancing JAS Organic adoption. Such indirect costs can be associated with technological issues, administration burden, the time needed for information search. Moreover, perceived indirect costs depend on farmers' perceptions of the certification scheme. One of the ways to incorporate indirect costs into the policy is by quantifying these costs and adjusting the compensation amount accordingly. At the same time, indirect costs can be reduced by providing necessary support to the farmers.

For example, the growth rate of certification adoption varies depending on crop type, according to MAFF. The growth rate of JAS Organic certified crop amount produced in 2003-2013 accounted for 146% for vegetables, 138% for soy, and 125% for fruits and green tea. The growth rate of certified rice produced within the same period accounted only for 106% (MAFF, 2015c). Such differences indicate that rice requires more labor and complicated farming techniques to be produced organically. Additionally, it may be more challenging for organic farmers growing rice to find new buyers. Therefore, the expected profit does not cover the required production costs as well as direct and indirect expenses associated with certification adoption. Thus, additional measures supporting the development of farming techniques, distribution channels, and the exchange of related information should be introduced for the crops demonstrating a lower growth rate.

- ***Distribution Channels***

Having stable distribution channels is vital for producers to be able to sell their products and gain profit. The questionnaire results demonstrated that most of the certified respondents chose to sell their products directly to consumers. At the same time, the survey of consumers revealed that 88% of consumers bought organic products in the supermarkets. More

consumers are expected to rely on supermarkets for purchasing food in the future since the share of the population living in urban areas is high and continues to grow. Therefore, increasing the percentage of the certified products sold to the retail sector can help to increase profit. Many prefectures already support farmers in searching for the distribution channels. Additionally, support and guidance should be provided to the retail sector to help them fulfill the requirements associated with storing and selling organic products.

Regarding the price premium for organic products, in 2016 organic products sold on average for 181% a higher price compared to conventional product for onions, 174% higher - for carrot, 154% higher – for Japanese mustard spinach (komatsuna), and 147% higher – for potatoes (MAFF, 2016). At the same time, some of the questionnaire respondents in this study commented that the behavior of consumers was different in rural areas and urban areas. The comments mentioned that it was challenging to sell their products at a higher price in rural areas where they relied on direct selling stations (chokubaijo).

Most of the prefectural promotion plans mention support initiatives helping organic producers to find distribution channels. It is advisable to differentiate those measures for producers in rural and urban areas helping the former to access the market where they can sell their products at a higher price than a similar conventional product.

Interviews with farmers demonstrated that individual farmers experience more difficulties in developing new distribution channels due to lack of labor force, limited network, and insufficient information exchange with other organic producers. Thus, more focused support for small-scale individual farmers is required.

Although certification centers serve as primary providers of the information on JAS Organic certification, they are not able to provide information and support regarding the distribution channels. Such support is beyond the scope of their professional activities and does not align with their position of an independent authority. Therefore, another organization has to provide support and information about distribution channels.

- ***Other Certifications***

Organic farming is one type of a broader category of alternative agriculture. For this reason, there are a lot of different kinds of certifications, such as Eco-farmers, GAP, or other local certifications. Local (prefectural level and smaller) certifications can be a useful tool for the promotion of consumption of the products locally grown and creating a local brand.

At the same time, a large number of various certifications and labels can create confusion among consumers. Despite a large number of other certifications for alternative agriculture, JAS Organic remains the strictest in terms of environmental requirements. It is compatible with major international organic certification schemes (e.g., EU, Canada, US, and others). However, this is not always fully understood by consumers. Therefore, on the prefectural level, it is advisable to clearly outline how JAS Organic certification compares to local certification and, when possible, integrate the two in a way, for example, Kumamoto and Okayama prefectures do.

On the national level, G.A.P. (Good Agricultural Practice) certification has been receiving attention recently. It is an internationally recognized standard for farm production covering

food safety, environment, workers' health, and animal welfare, among other areas. It was selected as a standard for food procurement for the 2020 Olympics and Paralympics in Tokyo. Several respondents have expressed their concern over this, worrying that consumers may lose interest in certified organic products and become more aware of G.A.P. instead.

In this regard, MAFF officials interviewed for this research commented that JAS Organic and G.A.P. are not competing standards; they cover different areas and have different requirements. Nevertheless, it is advisable to enforce the measures for raising awareness among consumers (and as necessary among producers) about JAS Organic certification and clearly outline how it compares to other existing certifications since consumers' understanding of the JAS Organic is still limited.

- ***Certification Centers***

The findings from Chapter 2 and Chapter 4 demonstrate that certification centers are not distributed equally among prefectures. Some prefectures have multiple certification centers, and others do not have any. At the same time, questionnaire survey results revealed that certification centers act as the primary information source about JAS Organic certification for the majority of respondents.

The interviews with officials from certification centers explained that physical distance to the certification center is not always an obstacle in accessing certification related information required for initial decision-making. Farmers can obtain such information, apply for the certification, and communicate with the certification center remotely, for example, by post or email.

The share of farmers saying that there is no certification center close to them was three times higher among the uncertified respondents, according to the questionnaire survey results. The interview results with certification center officials clarified that it was not the distance to the certification centers itself, but to the venues of the annual training sessions and locations from where the inspectors are dispatched.

Producers have to attend compulsory training every year. Certification centers decide where the training is conducted. Depending on the center, several locations may be available, including the center itself. Moreover, the certification center can conduct training upon request (for a group of producers).

The farmers cover the transportation expenses to the venue where the training is conducted. Additionally, the certification fees include travel expenses of inspectors dispatched for audit to the farm from the place of their residence. Therefore, further distance from the inspector's house to a farm results in higher certification fees and annual certification renewal costs.

Based on these findings, the following measures can be considered. Firstly, additional subsidies can be introduced to support farmers, willing to obtain the certification, and having to travel far away to attend the training or pay high transportation fees during inspector visits. Secondly, national-level top-down intervention that would encourage the certification centers to increase the number of the training venues and inspectors, and adjusting their geographic distribution can be beneficial. Such measures may include establishing new training venues and hiring the inspectors in the areas with a large number of uncertified organic producers. Thirdly, prefectural governments and municipalities may register as certification centers. This way, the local governments will become a one-stop information provider for both organic farming and

JAS Organic certification-related support. For example, Ishikawa, Fukushima, and Tottori prefecture, as well as some municipalities in Yamagata and Miyazaki prefecture, are already registered as certification centers. Location Quotient analysis demonstrated that they score higher than the national average for one or both parameters, including JAS Organic concentration and its growth.

- ***Tailoring of Promotion Policy to Match Farmers' Categories***

Most of the promotion policies are focusing on converting conventional farmers into organic and supporting new enterers to agriculture. Such measures are undoubtedly crucial for the promotion of organic farming. However, the development of JAS Organic certification often requires a different set of measures. The findings from questionnaire surveys indicated the differences between the three groups of producers, including conventional, uncertified organic, and JAS Organic certified producers. Therefore, it may be useful to align the promotion policies taking into consideration the original characteristics of each group. The three following steps are advisable to promote JAS Organic certification further:

1) Retention Measures: the measures targeting existing JAS Organic certified producers and preventing them from exiting the certification. Such measures may include providing support for finding new distribution channels, simplifying certification-related paperwork and stimulating information exchange among organic farmers;

2) Recruiting Measures (Step 1): the measures targeting uncertified organic producers and promoting the adoption of JAS Organic certification. As a first step, the target can

be limited to producers similar to certified JAS Organic producers (large-scale, incorporated, selling, or looking to sell to retail, food industry or restaurants).

3) Recruiting Measures (Step 2): more advanced measures targeting uncertified organic producers and promoting the adoption of JAS Organic certification among them. At this stage, producers different from JAS Organic certified farmers (small-scale, not incorporated or incorporated as JA or Farming Union, relying on direct sales to consumers) could be added to the target.

After conducting these three steps, promotion policies should start targeting conventional producers or new enterers to agriculture.

6.3. Limitations and Suggestions for Future Research

This study analyses the responses of a large number of farmers having different attitudes towards organic farming and JAS Organic certification. An effort was made to cover the opinions of farmers from different categories. Nevertheless, the design and the methodology of this research pose some limitations and, at the same, create opportunities for future work.

The research scope is limited to organic farmers in Japan. Thus, the study does not take into consideration organic farmers certified under JAS Organic located overseas or certification schemes for organic farming other than JAS. Further international comparison of international practices can provide valuable insights for the future promotion of organic agriculture in Japan.

The questionnaire survey and comparative analysis covered three categories of farmers, including JAS Organic certified organic farmers, uncertified organic farmers and conventional farmers (based on CENSUS2015 data). Due to the lack of records, however, it was not possible to identify farmers who decided to exit JAS Organic certification or quit organic farming. An additional survey of former JAS Organic or uncertified organic farmers may help to identify main obstacles and explain how the certification scheme can be improved further.

Due to budget and time constraints, the study, to a high extent, relied on the secondary data and the data collected through the questionnaires. A small number of stakeholder interviews, including farmers, MAFF, and certification center officials was conducted. Moreover, the qualitative comments left by respondents in the free comment section of the questionnaire helped to explain the findings and their causal relationship. Still, further interviews with farmers and fieldwork are desirable to deepen understanding of the topic and further clarify the results of the study.

Finally, the research focused on the producer side by setting farmers as the main research subject. Additional research on the perceptions of consumers, distributors, policy makers, and other stakeholders active in this field is necessary to create a holistic overview of the problem and find practical solutions.

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有機栽培と有機 JAS 認証制度に関するアンケート調査

１．農業経営についてお尋ねします。

Q1-1. 家族での農業経営ですか？あてはまるものを１つお選びください。

□ 家族による経営である　□ 家族による経営ではない ➡ ２ページへ

「家族による経営である」と回答した方のみご記入ください。

Q1-2. 世帯員は何人ですか。それぞれの世帯員について世帯主との続柄、年齢、性別、過去１年間に自営農業に従事した日数をご記入ください。

	ア	イ	ウ		エ
	世帯主との続柄	満年齢（歳）	男女別		過去１年間に自営農業に従事した日数
			男	女	
	該当番号		いずれかに○		該当番号
回答例：世帯員 N	7	47		○	4
世帯主	1				
世帯員１					
世帯員２					
世帯員３					
世帯員４					
世帯員５					
世帯員６					
世帯員７					
世帯員８					
世帯員９					
世帯員１０					

【続柄番号】
1:世帯主
2:世帯主の配偶者
3:子
4:子の配偶者
5:世帯主の父母
6:世帯主の配偶者の父母
7:兄弟姉妹
8:祖父母
9:孫
10:孫の配偶者
11:その他

【自営農業に従事した日数番号】
（1日を8時間として従事した日数）

0:　従事していない
1:　１～２９日
2:　３０～５９日
3:　６０～９９日
4:　１００～１４９日
5:　１５０～１９９日
6:　２００～２４９日
7:　２５０日以上

2 ページの Q2-1 へお進みください。

「家族による経営ではない」と回答した方のみご記入ください。

Q1-2.　経営の責任者・役員・構成員のうち、過去１年間に農業経営に従事した人について、**従事日数別**に**実人数**をご記入ください。

自営農業に従事した日数 (1日を8時間として従事した日数)	男 （人）	女 （人）
１～２９日		
３０～５９日		
６０～９９日		
１００～１４９日		
１５０～１９９日		
２００～２４９日		
２５０日以上		

注:「経営の責任者」は、農業経営を統括している者をいいます。

「役員」とは、会社、農事組合法人などの役員をいいます。

「構成員」は、集落営農の構成員をいいます。

ここからは全ての方がご記入ください。

２．労働力についてお尋ねします。

Q2-1. 過去１年間に農業経営のために常雇いした人（あらかじめ年間７か月以上の契約で雇った人）について、 **実人数**と従事した**日数**の合計をご記入ください。

男女別	実人数（人）	従事日数の合計（日）
男		
女		

Q2-2. 過去１年間に日雇い・季節雇いなどで、農業経営のために臨時雇いした人（手伝い等を含む）について、 **実人数**と従事した**日数**の合計をご記入ください。

男女別	実人数（人）	従事日数の合計（日）
男		
女		

３．農業経営の特徴についてお尋ねします。

Q3-1. 経営体は会社等の法人ですか。あてはまるものを１つお選びください。

□ 法人ではない

□ 法人である →
- □ 農事組合法人
- □ 株式会社　□ 有限会社　□ 合名・合資会社
- □ 合同会社　□ 相互会社
- □ 農協　□ その他の法人（　　）

□ その他（　　）

４．今年（2017 年度）作付けされた面積についてお尋ねします。

Q4-1. 今年（2017 年度）作付けされた田の面積をご記入ください。

	(ha) 町	反	(a) 畝
回答例：１町２反５畝の場合	１	２	５
田の面積			
そのうち、有機 JAS 認証を受けている田の面積			

Q4-2. 今年（2017 年度）作付けされた樹園地（普通畑や牧草専用地を除きます）の面積をご記入ください。

	(ha) 町	反	(a) 畝
樹園地の面積			
そのうち、有機 JAS 認証を受けている樹園地の面積			

Q4-3. 今年（2017 年度）作付けされた普通畑（牧草専用地 、樹園地は除きます）の面積をご記入ください。

	(ha) 町	反	(a) 畝
普通畑の面積			
そのうち、有機 JAS 認証を受けている普通畑の面積			

Q4-4. 今年（2017 年度）作付けされた牧草専用地の面積をご記入ください。

	(ha) 町	反	(a) 畝
牧草専用地の面積			
そのうち、有機 JAS 認証を受けている牧草専用地の面積			

Q4-5. 今年（2017 年度）作付けされた区画数（枚数）をご記入ください。

	(枚)
田の区画数	
そのうち、有機 JAS 認証を受けている田の区画数	
樹園地の区画数	
そのうち、有機 JAS 認証を受けている樹園地の区画数	
普通畑の区画数	
そのうち、有機 JAS 認証を受けている普通畑の区画数	
牧草専用地の区画数	
そのうち、有機 JAS 認証を受けている牧草専用地の区画数	

５．　農産物の生産についてお尋ねします。

Q5-1. 過去１年間に販売目的で栽培した品目を**全て**お選びください。

栽培した品目			そのうち、有機 JAS 認定済み
稲・麦・雑穀	水稲	□	□
	陸稲	□	□
	小麦	□	□
	大麦・裸麦	□	□
	そば	□	□
	その他の雑穀	□	□
芋類	ばれいしょ	□	□
	かんしょ	□	□
豆類	大豆	□	□
	あずき	□	□
	その他の豆類	□	□
野菜類	トマト	□	□
	なす	□	□
	ピーマン	□	□
	きゅうり	□	□
	キャベツ	□	□
	はくさい	□	□
	レタス	□	□
	ほうれんそう	□	□
	たまねぎ	□	□
	だいこん	□	□
	にんじん	□	□
	さといも	□	□
	いちご	□	□
	すいか	□	□
	メロン	□	□
	ブロッコリー	□	□
	やまのいも	□	□
	その他の野菜	□	□

栽培した品目			そのうち、有機 JAS 認定済み
果樹類	温州みかん	□	□
	他の柑橘類	□	□
	りんご	□	□
	ぶどう	□	□
	日本なし	□	□
	西洋なし	□	□
	もも	□	□
	おうとう	□	□
	びわ	□	□
	かき	□	□
	くり	□	□
	うめ	□	□
	すもも	□	□
	キウイフルーツ	□	□
	パインアップル	□	□
	その他の果樹	□	□
工芸農作物	さとうきび	□	□
	たばこ	□	□
	茶	□	□
	てんさい	□	□
	こんにゃく芋	□	□
	その他の工芸農作物	□	□
花き類		□	□
花木		□	□
その他の作物（　　）		□	□

６．農産物の販売についてお尋ねします。

Q6-1. 過去１年間に販売した農産物の**全て**の出荷先とそのうち売上高が最も多かった出荷先について、 それぞれあてはまるものをお選びください。

	販売した農産物の出荷先			そのうち、有機 JAS 農産物の出荷先		
農協	□	うち売上１位出荷先	□	□	うち売上１位出荷先	□
農協以外の集出荷団体	□		□	□		□
卸売市場	□		□	□		□
小売業者	□		□	□		□
食品製造業・外食産業	□		□	□		□
消費者に直接販売	□		□	□		□
うち、インターネット	□		□	□		□
うち、農産物直売所	□		□	□		□
その他（　　）	□		□	□		□

７．有機 JAS 認定についてお尋ねします。

Q7-1. あなたの身近に有機 JAS 認証の審査手続きができる有機登録認定機関（認証センターなど）がありますか。あてはまるものを**１つ**お選びください。

□ ある　　□ ない　　□ わからない

Q7-2.　あなたが現在、取得している有機 JAS 認証の種類を**全て**お選びください。

□ 有機農産物　□ 有機加工食品　　□　小分け　　□ その他（　　）

Q7-3. 有機栽培に取り組んだ理由と有機 JAS 認証の取得を決めた理由は何ですか。
あてはまるものを**全て**お選びください。

	有機栽培	有機 JAS 認証の取得
地域の環境保全のため	□	□
安全・安心な農産物の提供のため	□	□
販売価格の向上のため	□	□
小売業者などの要望	□	□
補助金が出るから	□	□
市区町村や農協などの方針	□	□
生産者と消費者の絆を深めるため	□	□
健康に良いから	□	□
周りに実践者が多いから	□	□
その他（　　）	□	□

Q7-4. 有機栽培と有機 JAS 認証について、主な情報源は何ですか。
あてはまるものを**全て**お選びください。

	有機栽培について	有機 JAS 認証について
農協	□	□
市区町村	□	□
有機登録認定機関（認証センターなど）	□	□
関連書籍	□	□
他の農家	□	□
インターネット	□	□
特にない	□	□
その他（　　）	□	□

Q7-5. 有機 JAS 認証を取得した利点はありましたか。あてはまるものを**全て**お選びください。

□ 販路の安定　□ 栽培技術の向上　□ 消費者からの信頼
□ 田畑周辺の環境改善　□ 満足感が得られる　□ 地域振興に役立つ
□ 消費者との交流　□ 通常より高く売れる　□ 特にない
□ その他（　　）

Q7-6. 有機 JAS 認証を取得した後、問題はありましたか。あてはまるものを**全て**お選びください。

□ 安定した収量がない　□ 品質が落ちた　□ 労働力が足りない
□ 経費が高い　□ 商品が高く売れない　□ 出荷先が見つからない
□ 他の農家の理解が得られない　□ 消費者の理解が得られない
□ 認定関連作業がうまくいかない　□ 特にない
□ その他（　　）

Q7-7. 現在取得している有機 JAS 認証を更新する予定はありますか。あてはまるものを**１つ**お選びください。

□ ある　□ ない　□ わからない

Q7-8. 有機 JAS 認証以外の認証（エコファーマー、特別栽培、JGAP など）を取得していますか。あてはまるものを**１つ**お選びください。取得している場合、認証名をご記入ください。

□ 取得している　（認証名：　　）　□ 取得していない

Q7-9. 有機 JAS 認証制度、有機栽培（有機 JAS 認証済みではない有機栽培法）と自然環境についてどうお考えですか。
それぞれあてはまるものを**1つ**お選びください。

		そう思わない	←	どちらでもない	→	そう思う
有機JASについて	消費者は有機 JAS 認定マークを信頼している	□	□	□	□	□
	有機 JAS 認定マークを得るには費用がかかりすぎる	□	□	□	□	□
	有機 JAS 認定マークを貼付した農産物がより高く売れる	□	□	□	□	□
	有機 JAS 制度の基準を満たして生産すれば自然環境を壊さない	□	□	□	□	□
	有機 JAS 認定の推進に活用できる補助事業が十分行われている	□	□	□	□	□
	有機 JAS 認定に対する消費者の認知度が高い	□	□	□	□	□
	有機 JAS 認定マークを得るには手間がかかりすぎる	□	□	□	□	□
	有機 JAS 農産物は販売先が見つかりやすい	□	□	□	□	□
有機栽培について	有機栽培農産物を食べるのは健康に良い	□	□	□	□	□
	有機栽培農産物は慣行栽培農産物より高く売れる	□	□	□	□	□
	ほとんどの生産者は有機栽培を十分理解している	□	□	□	□	□
	有機栽培は手軽に始められる	□	□	□	□	□
	有機栽培は慣行栽培より利益が上がる	□	□	□	□	□
	有機栽培は自然環境にやさしい	□	□	□	□	□
	有機栽培の推進に活用できる補助事業が十分行われている	□	□	□	□	□
	有機栽培農産物は消費者に人気がある	□	□	□	□	□
	有機栽培は人手がかかりすぎる	□	□	□	□	□
	有機栽培は慣行栽培より収量が低い	□	□	□	□	□
	有機栽培は生産者にとって安全安心である	□	□	□	□	□
	有機栽培農産物は慣行栽培農産物より販売先が見つかりやすい	□	□	□	□	□
自然環境について	世界の人口は地球が支えることができる限界に近付きつつある	□	□	□	□	□
	人間は自分たちの必要に応じて自然環境を変える権利がある	□	□	□	□	□
	人間が自然に干渉すると壊滅的な結果を引き起こす	□	□	□	□	□
	人間の知恵は地球上が生存不可能な状態になることを防ぐ	□	□	□	□	□
	人間は自然環境をかなり乱用している	□	□	□	□	□
	開発方法を正しく学べば地球上にはかなりの天然資源がある	□	□	□	□	□
	動植物は人間と同じくらい、存在する権利がある	□	□	□	□	□
	自然界のバランスは、現代社会の影響に耐えられるほど強い	□	□	□	□	□
	特別な能力にもかかわらず人間は自然法則の支配下にある	□	□	□	□	□
	人間による自然環境の破壊は、誇張されすぎている	□	□	□	□	□
	地球には、限られた空間と資源しかない	□	□	□	□	□
	人間は自然を支配するために創造された	□	□	□	□	□
	自然のバランスは繊細で簡単に破壊されてしまう	□	□	□	□	□
	人間はやがて自然の仕組みを十分学んで、自然をコントロールできるようになるだろう	□	□	□	□	□
	今のままであればすぐに生態系の破壊に直面するだろう	□	□	□	□	□

８．あなたご自身についてお尋ねします。

Q8-1. ご自分にあてはまるものを各項目それぞれ**１つずつ**お選びください。

性別	□男性		□女性		
年齢	□20 代	□30 代	□40 代	□50 代	
	□60 代	□70 代	□80 代	□90 代	
最終学歴	□中学校	□高校	□短大・専門学校	□大学	□大学院
家族構成	□一人暮らし	□夫婦 2 人暮らし	□子どもと同居		
	□親と同居	□その他（			）
経営体における役割	□世帯主（家族経営）		□経営責任者	□役員	□取締役
	□取締役社長		□その他（		）
農業経営継続者	□いる	□いない			
主な収入源	□農業	□農業以外			

Q8-2. 農業経験は何年ですか。年数をご記入ください。

（年）

農業経験年数	
うち、有機栽培経験年数	
うち、有機 JAS 認定を取得している年数	

Q8-3.　農業経営体の住所をご記入ください。

＿＿＿＿＿＿＿＿都・道・府・県　＿＿＿＿＿＿＿＿市・区・町・村・郡

Q8-4. 本調査の結果の集計は 2018 年 3 月頃に完了する見込みです。集計結果の受信を希望される方はメールアドレスをご記入ください。

＿＿＿＿＿＿＿＿＿＿＿＿@＿＿＿＿＿＿＿＿＿＿

Q8-5. 本調査または有機栽培、有機 JAS 認証制度に関してご意見などがおありでしたらご自由にお書きください。

ご協力ありがとうございました！

アンケートは返送用封筒に入れて、ポストへ投函してください。