Census analysis series No.1

As part of the project, "Study of the structural changes in agriculture and rural regions and the state of agricultural producers amid population decline, aging population, and new agricultural policies" (fiscal years 2015–2017), a team assembled by the Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries, has conducted a comprehensive analysis of the 2015 Agricultural Census. The highlights of the analysis will be discussed in the next five issues, starting in this issue.

From the analysis of agricultural producers

Census analysis team of the project on the structure of the agricultural industry and rural regions

1. Development of large-scale rice farm management

Liquidization of farmland continues to occur as farmers who were born in the first decade of the Showa period leave farming, resulting in the formation of large-scale rice farm households in the prefectures (excluding Hokkaido) that have lagged behind in structural reforms. This is occurring mainly in the flat paddy field regions in eastern Japan. The number of farm households with more than 15 ha of cultivated land under management in prefectures increased from 1,598 farm households in 2000 to 5,632 farm households in 2015, with 887 farm households of more than 30 ha operating.

The published statistical data alone do not permit an adequate level of analysis of those large-scale rice farm households with more than 15 ha of cultivated land under management, as their number is still small. Thus, in order to accurately grasp the degree to which the status of the agricultural labor force and equipped machinery has changed in response to the expansion of farm size, the present analysis links individual survey responses between the 2010 and 2015 Agricultural Census and examines rice farm households with more than 5 ha of cultivated land under management (the threshold for measuring the farm household increase/decrease in prefectures) by retabulating them by size.

First we discuss the retention of agricultural labor. Table 1 shows that the composition of the agricultural labor force retained by farm household changes as the size of cultivated land under management increases. The table shows that farm households with less than 15 ha of cultivated land under management are typically operated by two family members who work as full-time farmers, one male and one female (a married couple). Furthermore, farm households with approximately 30 ha of cultivated land are typically operated by three family members who work as full-time farmers, two male household members (male full-time farmers) who engage in farming for 150 days or more and one female household member (occasionally with the addition of regular employees). Here, the male household members are assumed to be the farm owners and their sons (farm successors). In addition, operations greater than 50 ha incorporate several workers as hired labor (regular employment). It should be noted that the changes since 2010 indicate that the number of household members who work as full-time farmers has not changed significantly in any farm-size group, while regular employment has increased for farm households larger than 50 ha.

Next, in regard to farm machinery ownership, the number of rice planting machines and combines owned does not change significantly even if the size of the operation increases, with farm households over 50 ha typically owning fewer than two rice planting machines. In addition, typically one combine is owned at farm households up to approximately 30 ha, two combines are owned at farm

Table 1. Changes in the status of agricultural labor force and equipped machinery among large-scale rice farm households in prefectures (excluding Hokkaido)

Size of cultivated land under management	Number of farmers (person)								Number of pieces of farm machinery (units)					
	Total		Full-time farmers (Household members who engage in own farming for 150 days or more)				Regular employment		Tractors		Rice planting machines		Combines	
			Male		Female									
	2010	2015	2010	2015	2010	2015	2010	2015	2010	2015	2010	2015	2010	2015
5～7.5	1.8	1.7	1.0	1.0	0.6	0.6	0.1	0.1	1.7	1.7	1.1	0.9	1.0	0.9
7.5～10	2.0	1.9	1.1	1.1	0.7	0.6	0.1	0.2	2.0	1.9	1.1	1.0	1.1	1.0
10～15	2.2	2.2	1.3	1.3	0.8	0.7	0.2	0.2	2.3	2.2	1.1	1.0	1.2	1.1
15～20	2.5	2.5	1.4	1.4	0.9	0.8	0.2	0.3	2.7	2.6	1.2	1.1	1.3	1.2
20～30	2.8	2.9	1.5	1.5	0.9	0.9	0.4	0.5	3.3	3.1	1.2	1.2	1.6	1.5
30～40	3.3	3.4	1.7	1.6	1.0	1.0	0.7	0.8	4.1	3.8	1.4	1.3	2.0	1.8
40～50	4.2	4.0	1.7	1.7	1.2	1.1	1.2	1.2	4.9	4.3	1.6	1.4	2.4	2.1
50 or more	4.6	4.8	1.8	1.6	1.0	1.1	1.8	2.1	5.2	5.3	1.6	1.5	2.8	2.6

Source: Retabulated individual survey responses of the Agricultural Census (2010, 2015)

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households of between 30 to 50 ha, and three combines are owned at farm households larger than 50 ha. Farm households in almost all farm-size groups own fewer units of such farm machinery than in 2010, and the decline is particularly noticeable in the 40–50 ha group.

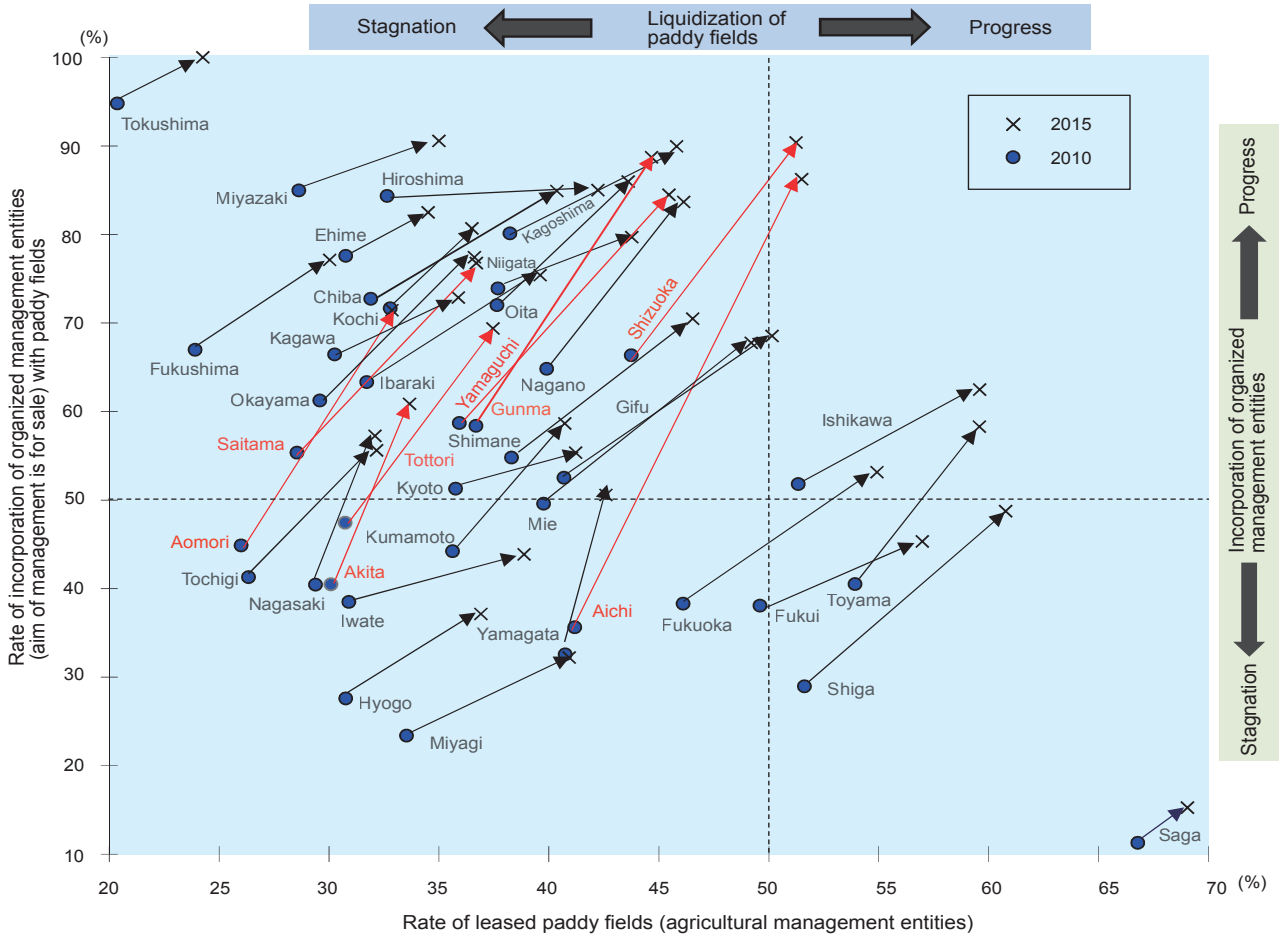
When large-scale rice farm households attempt to increase their farm size, they tend to adopt direct seeding of rice, making it less likely that rice planting machines will be utilized. Furthermore, the number of combines owned has tended to increase for large-scale operations, as these operations often plant soybeans on the diverted land, where combine harvesters for multi-crops are needed in addition to head-feeding combines. In recent years, however, we speculate that some large-scale farm households have attempted to innovatively expand their operations by engaging in crop diversion by growing rice for feed and rice for processing use, without making the additional investment in more combines.

2. Development of organized management entities

The current census shows that the number of organized management entities has continued to increase in the midst of the declining number of farm households. As a result, the significance of organized management entities, particularly corporate management entities, is increasing. Between 2000 and 2015, the share of organized management entities (for sales purposes) in land use increased from 3% to 13% for cultivated land under management (from 2% to 10% under corporate management), from 2% to 16% for rice fields (from 1% to 10% under corporate management), and from 7% to 36% for leased rice fields (from 4% to 22% under corporate management). This reflects the effort since 2005 among community-based farm cooperatives to incorporate their organizations in light of the growth in the number of these organizations. These community-based farm cooperatives focused on rice farming and constituted the majority of organized management entities in the land-extensive farming sector.

Figure 1 shows the relationship between the rate of incorporation of organized management entities (aim of management is for sale) in rice farming and the rate of liquidization of paddy fields through land lease (measured for all agricultural management

Figure 1. The relationship between the progress in the incorporation of organized management entities (aim of management is for sale) and the liquidization of paddy fields (prefectures: 2010–2015)



Source: Agricultural Census (2010, 2015)

Note: (1) Except for the prefectures that have less than 10,000 ha of cultivated land under management. Note that those prefectures in which the rate of incorporation has increased more than 20% are indicated in red;

(2) The rate of leased paddy fields is the percentage of leased paddy fields in the cultivated land under management of an organized management entity.

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entities combined) for each prefecture. Looking at individual years, the relationship between the rate of incorporation of organized management entities and the rate of liquidization of paddy fields was -0.477 in 2010 and -0.374 in 2015, indicating a weak negative correlation. The trend in the last five years, however, indicates that both rates are increasing in most prefectures, and shows that the increase in the rate of leased paddy fields tends to be greater in those prefectures in which the rate of incorporation increased significantly (the coefficient of correlation between the percentages of increase was 0.349). That is, we can observe that the liquidization of paddy fields through land lease started to accelerate as the incorporation of community-based farm cooperatives progressed. However, it is also true that the regional gap between prefectures is still large.

Among these prefectures, Aichi Prefecture has demonstrated dramatic changes, with the rate of incorporation of organized management entities with paddy fields jumping from 36% to 86% in the last five years, and the rate of leased paddy fields rising from 41% to 51%. We can also observe that other prefectures, such as Shizuoka, Gunma, and Yamaguchi, have experienced the acceleration of paddy field liquidization through land lease alongside the progress in the incorporation of organized management entities.

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