

Recent Trend and the Characteristics of Large-Scale Farm Households Engaged in Paddy Field Farming in Japanese Prefectures (exc. Hokkaido)

The Study based on the Analysis of Censuses of Agriculture

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1. Introduction

The Purpose of the Study

- “Showa-hitoketa” generation of farmers (born between 1926 and 1934) are now aged 80 years or older
 - Major farming operators in paddy field farming are retiring
- Farmland liquidity proceeds intensively
 - Can existing farmers take over the responsibilities of the released or abandoned farmlands?
- Important roles to sustain regional agriculture played by not only community-based farming groups, whose formation and incorporation are in progress, but also family-operated farm households
- Emergence of large-scale farms with cultivated land under management in an area of 20 or 30 ha, a size considered to be beyond the family-owned management
 - The trend and management status of large-scale farm households needs to be studied

Analytical Perspectives and Questions

1. Ownership of rice cultivating machinery/equipment

Farm expansion decreases the ratio of depreciation of machinery/equipment, while requiring additional investment after a certain degree of expansion

2. Farming Workforce

Family-operated farm's core workforce has been provided by family members,

who will need to employ workforce from outside at some point of expanded farming operation

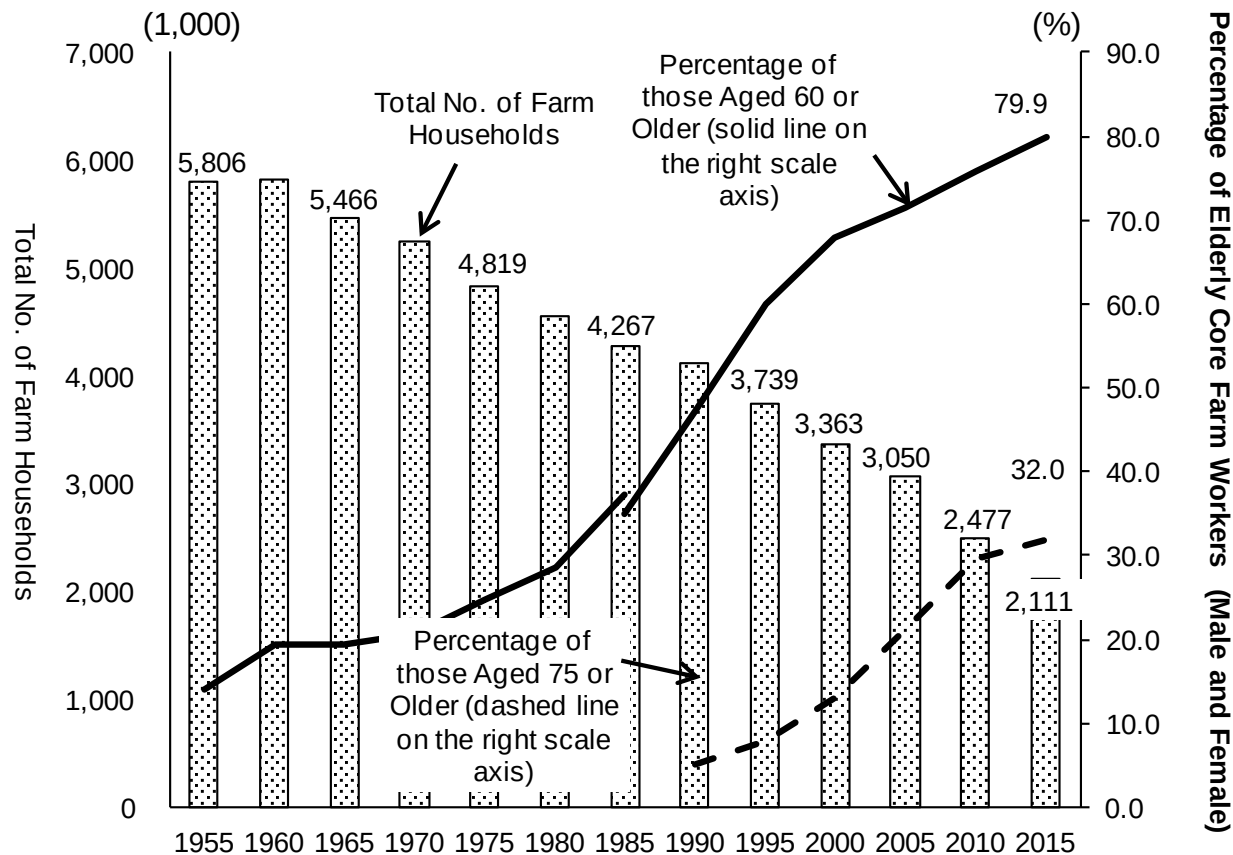
→ Expanded farming operation requires additional investment and employed workforce, but where?

Today's Presentation Outlines:

1. Introduction
2. The Trend of Paddy Field Farming
in Japanese Prefectures (exc. Hokkaido)
3. Machinery/Equipment and the Farm
Workforce
4. Farm Household Area Expansion and
Farm Successors
5. Conclusions

2. The Trend of Paddy Field Farming in Japanese Prefectures (exc. Hokkaido)

Farm Household Number and Other Changes over Decades (in Japanese Prefectures exc. Hokkaido)

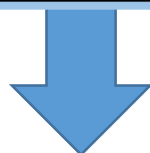


- Large decrease of farm household
 - Aging of core farmworkers
- Aging of farmers, who have been taking over farmlands released or abandoned by ex-farmers, leads to another issue of securing successors to farm management

Changes in Number of Farm Households Engaged in Paddy Field Farming under Management Classified by Area and Total Area of Paddy Field under Management (in Japanese Prefectures exc. Hokkaido)

Unit: 1,000 household, %, 1,000 h

		Less than 1 ha	1–2 ha	2–3 ha	3–5 ha	5–10 ha	10 ha or More	
No. of Farm Households	Actual No.	1990	1,842	499	125	55	11	1
		2000	1,444	404	113	60	21	4
		2010	940	280	83	53	28	10
		2015	720	226	71	49	30	13
	Percentage	1990	72.7	19.7	4.9	2.2	0.4	0.1
		2000	70.6	19.8	5.5	2.9	1.0	0.2
		2010	67.5	20.1	5.9	3.8	2.0	0.7
		2015	65.0	20.4	6.4	4.4	2.7	1.2
Area of Paddy Field under Management	Actual No.	1990	919	682	299	201	69	21
		2000	703	549	268	220	135	63
		2010	466	381	197	199	185	158
		2015	358	307	169	184	201	215
	Percentage	1990	42.0	31.1	13.6	9.2	3.2	0.9
		2000	36.3	28.3	13.8	11.3	7.0	3.3
		2010	29.4	24.0	12.4	12.6	11.7	9.9
		2015	24.9	21.4	11.8	12.8	14.0	15.0



Large decrease



Large increase
Expanded farmland share

Development of Large-Scale Farm Household Engaged in Paddy Field Farming (in Japanese Prefectures exc. Hokkaido)

Unit: household, %

		5 ha or larger in total	5– 7.5 ha	7.5– 10 ha	10– 15 ha	15 ha or larger	15– 20 ha	20– 30 ha	30– 40 ha	40– 50 ha	50 ha or
No. of Farm Households	1995	19,108	13,553	2,936	1,542	1,077	N.A.				
	2000	25,094	16,272	4,586	2,638	1,598					
	2005	31,798	18,715	6,198	4,188	2,697					
	2010	37,611	20,390	7,452	5,845	3,924	2,024	1,347	350	117	86
	2015	42,806	21,438	8,556	7,180	5,632	2,846	1,899	534	192	161
No. of Farm Households Increased	95-00	5,986	2,719	1,650	1,096	521	N.A.				
	00-05	6,704	2,443	1,612	1,550	1,099					
	05-10	5,813	1,675	1,254	1,657	1,227					
	10-15	5,195	1,048	1,104	1,335	1,708	822	552	184	75	75
% of Farm Households Increased	95-00	31.3	20.1	56.2	71.1	48.4	N.A.				
	00-05	26.7	15.0	35.2	58.8	68.8					
	05-10	18.3	9.0	20.2	39.6	45.5					
	10-15	13.8	5.1	14.8	22.8	43.5	40.6	41.0	52.6	64.1	87.2

2010–2015 :

A brisk increase by a group of 7.5 ha or larger, esp. among a group of 15 ha or larger showing a steady increase from each previous period

Accumulation of Paddy Fields under Management of Large-Scale Farm Households and Others Engaged in Paddy Field Farming (in Japanese Prefectures exc. Hokkaido)

Unit: 1,000 households, %

Prefectures (exc. Hokkaido)	Area of Paddy Field Managed by Agriculture Management Entities	Area of Paddy Field Managed by Farm Households by Area Scale											Area of Paddy Field Managed by Organized Management Entities
		5 ha or larger in total	5– 7.5 ha	7.5– 10 ha	10– 15 ha	15 ha or							
							15– 20 ha	20– 30 ha	30– 40 ha	40– 50 ha	50 ha or larger		
Actual Area	2010	1,824	343	122	63	69	88	34	32	12	5	6	239
	2015	1,737	416	128	73	85	130	48	45	18	8	11	
Percentage by Area	2010	100.0	18.8	6.7	3.5	3.8	4.8	1.9	1.7	0.7	0.3	0.3	13.1
	2015	100.0	24.0	7.4	4.2	4.9	7.5	2.8	2.6	1.0	0.5	0.6	
Area of Increased/ Decreased		-87	74	7	10	16	42	14	13	6	3	5	65
% of Area Increased/ Decreased		-4.8	21.5	5.4	15.1	22.8	47.2	41.3	41.0	51.7	65.0	92.0	27.2

Share of paddy field area among different agricultural management entities:

Farm households of 5 ha or larger: 18.8% → 24.0%

Organized management entities: 13.1% → 17.5%

- Paddy fields accumulated intensively by organized management entities and large-scale farm households,

esp. among groups of 15 ha or larger, i.e., a significant increase of 42,000 ha

3. Machinery/Equipment and the Farm Workforce

Machinery/Equipment and Paddy Field Area (in Japanese Prefectures exc. Hokkaido)

Unit: no./household

2015	Tractor		Powered Rice Planter		Combine		No. of farm Households with more than 95% of Paddy Field Area for Rice Production	Powered Rice Planter		Combine	
	Median Value	(Arithmetic Mean)	Median Value	(Arithmetic Mean)	Median Value	(Arithmetic Mean)		Median Value	(Arithmetic Mean)	Median Value	(Arithmetic Mean)
5–7.5 ha	1	(1.7)	1	(0.9)	1	(0.9)	10,022	1	(1.0)	1	(1.0)
7.5–10 ha	2	(1.9)			1	(1.0)	3,647	1	(1.0)	1	(1.0)
10–15 ha	2	(2.2)			1	(1.1)	3,041	1	(1.1)	1	(1.1)
15–20 ha	2	(2.6)			1	(1.2)	1,258	1	(1.1)	1	(1.2)
20–30 ha	3	(3.1)			1	(1.5)	728	1	(1.2)	1	(1.4)
30–40 ha	4	(3.8)	1	(1.3)	2	(1.8)	203	1	(1.4)	2	(1.7)
40–50 ha	4	(4.3)	1	(1.4)	2	(2.1)	55	1	(1.5)	2	(1.9)
50 ha or larger	5	(5.3)	1	(1.5)	3	(2.6)	38	2	(1.7)	2	(2.2)

Combine and powered rice planter in focus

- Number of powered rice planter did not increase with expanded farming scale
 - possibly because more farmers practice direct seeding, along with transplanting rice seedlings?
- Increased number of combine shown clearly by groups of 30 ha or larger and by a group of 50 ha or larger,
 - possibly because farmers procure all-purpose combines to grow soybeans?
 - Controlled number of owned combines enabled by expanded production of various need types of rice including rice for feeding
 - Expanded farming scale requires not so much additional investment for agricultural machinery/equipment

The Farm Workforce Classified by Area Group of Paddy Field (in Japanese Prefectures exc. Hokkaido)

Unit: person/ household, person-day/ household

2015	No. of Household Members Engaged for 30 Days or Longer per Year				No. of Permanently Employed Workers	Person-Days of Temporarily Employed Workers
	No. of Household Members Engaged for 150 Days or Longer per year					
	Male	Female	Male	Female		
	Median Value (Arithmetic)	(Arithmetic)	Median Value (Arithmetic)	(Arithmetic)	Median Value (Arithmetic)	Median Value (Arithmetic)
5–7.5 ha	1 (1.4)	(1.0)	1 (1.0)	(0.6)	0 (0.1)	0 (28)
7.5–10 ha	1 (1.5)	(1.1)	1 (1.1)	(0.6)	0 (0.2)	2 (37)
10–15 ha	1 (1.5)	(1.1)	1 (1.3)	(0.7)	0 (0.2)	12 (48)
15–20 ha	2 (1.6)	(1.2)	1 (1.4)	(0.8)	0 (0.3)	20 (64)
20–30 ha	2 (1.7)	(1.2)	1 (1.5)	(0.9)	0 (0.5)	36 (82)
30–40 ha	2 (1.8)	(1.4)	2 (1.6)	(1.0)	0 (0.8)	55 (116)
40–50 ha	2 (1.8)	(1.3)	2 (1.7)	(1.1)	0 (1.2)	60 (164)
50 ha or larger	2 (1.8)	(1.4)	2 (1.6)	(1.1)	1 (2.1)	100 (225)

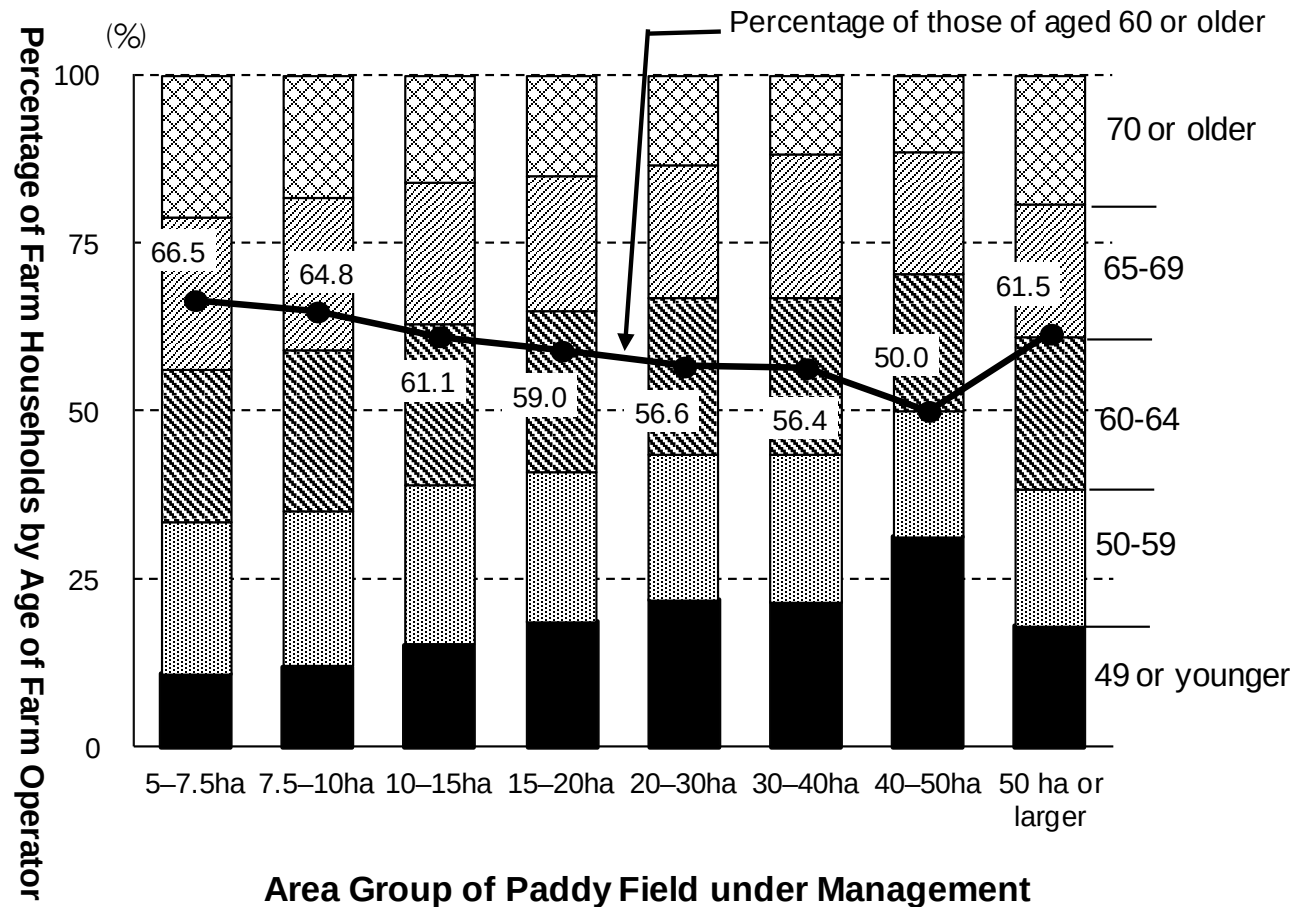
Family
provided
workforce

Area groups under 15 ha: One male full-time + female
 Area groups 15–30 ha: One male full-time +
 one male part-time + female
 Area groups 30–50 ha: Two males full-time + female

Employed
workforce

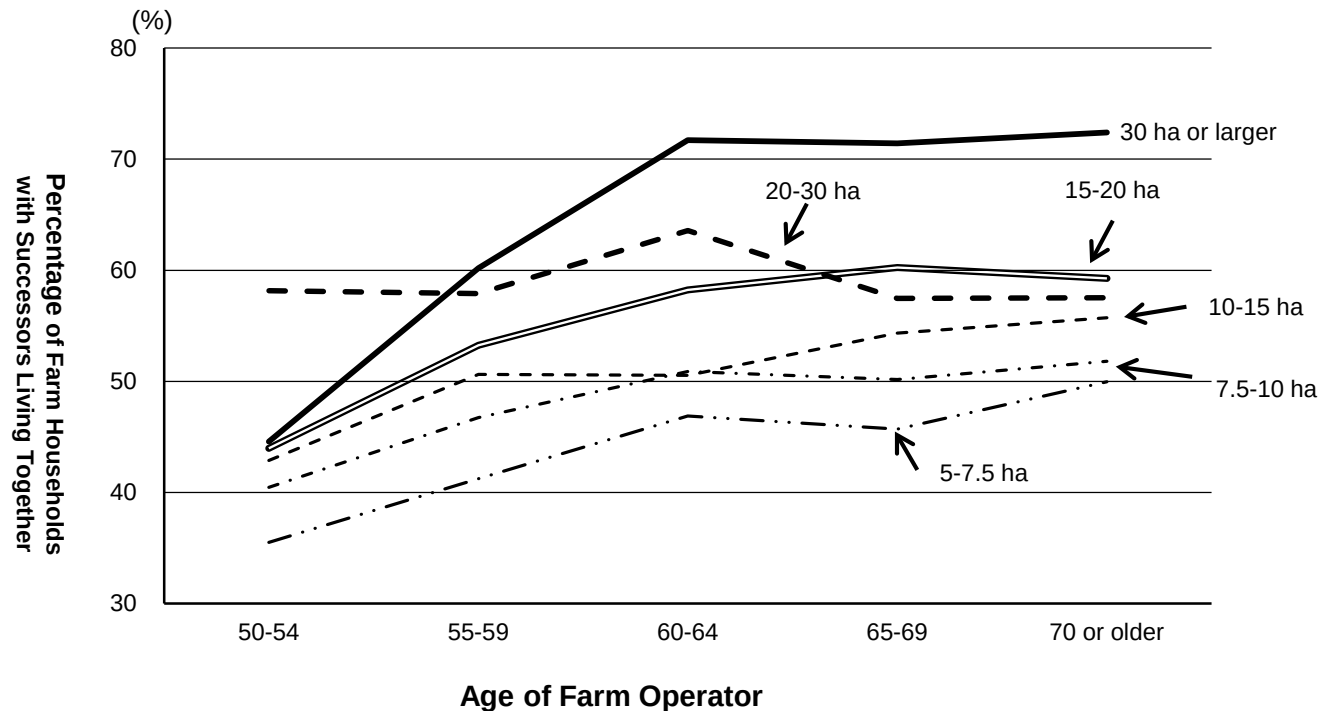
Area groups 50 ha or larger: Family + employed
 (farm management with employed workforce)

Farm Operator's Age Classified by Area Group of Paddy Field



Percentage of farm households operated by those aged 60 years or older is still half in its lowest group (40—50 ha)

Farm Operator's Age and the Percentage of Farm Households with Successors Living Together



- With farm operator's age, percentage of farm households with successors increases
- With farm operator's age over 60, the rise of percentage of farm households with successors slows down
- Approx. 30% of farm households, 30 ha or larger and operated by those aged 60 or older, belong to farms w/o living successors

Status of Farm Successors Engaged in Farming at Farm Households Managed by Farm Operators Aged 60 or older (in Japanese Prefectures exc. Hokkaido)

Unit: household, person/household, %

Farm Operators Aged 60 or Older	No. of Farm Households	No. of Male Farm Household Members Engaged in Farming for 30 Days or Longer per Year		Percentage of Farm Households with Successors				No. of Permanently Employed Workers	
			150 Days or Longer per Year		Percentage of Farm Households with Successors Living Together				
						Engaged in Farming for 30 Days or Longer per Year			
						150 Days or Longer per Year			
		Median Value (Arithmetic)	Median Value (Arithmetic)					Median Value (Arithmetic)	
10–15 ha	4,407	1 (1.5)	1 (1.1)	71.7	53.2	41.4	26.9	0 (0.2)	
15–20 ha	1,688	2 (1.6)	1 (1.2)	77.5	59.2	48.5	36.8	0 (0.3)	
20–30 ha	1,082	2 (1.7)	1 (1.3)	77.7	60.1	53.4	44.0	0 (0.5)	
30–40 ha	303	2 (1.8)	2 (1.5)	87.1	71.9	66.0	60.7	0 (0.7)	
40–50 ha	97	2 (1.8)	2 (1.6)	87.6	71.1	63.9	60.8	0 (1.0)	
50 ha or Larger	99	2 (1.8)	2 (1.7)	83.8	71.7	65.7	61.6	1 (1.6)	

- High percentage of farm households operated by those aged 60 years or older and with successors, i.e., **70—90%**

Over **60%** of farm households, 30 ha or larger, are with full-time successors living together

- The workforce needed by large-scale farm households is generally provided by farm successors

Still some farm households are without successors

Farm Successors and Large-Scale Farm Households Engaged in Paddy Field Farming: Its Correlation Organized

		Farm operator aged 60 or older
Less than 15 ha	One male full-time + female	a farm operating couple
15 ~ 30 ha	One male full-time + male part-time + female	a farm operating couple + successor's help
30 ~ 40 ha	Two males full-time + female	a farm operating couple + a full-time successor
40 ~ 50 ha		
More than 50 ha	Family + employed	a farm operating couple + a full-time successor + permanently employed

Status of successor's farm workforce differs with farming scale

→ Will days engaged by farm successors increase with expanded scale?

4. Farm Household Area Expansion and Farm Successors

Results of Connected Individual Data from Each Census in 2010 and 2015 (in Japanese Prefectures exc. Hokkaido)

(Unit: %, household)

	Total (No. of Farm Households)	2015										2010 to 2015			
		Self- sustaining Farm	5 ha or smaller	5– 7.5 ha	7.5– 10 ha	10– 15 ha	15– 20 ha	20– 30 ha	30 ha or larger	Other than Farm Households(1)	Unable to Connect	Downward Shift	No Shift	Upward Shift (2)	(1)+(2)
2010	5– 7.5 ha 100 (20,390)	0.9	19.2	51.5	15.3	5.3	0.8	0.2	0.0	2.9	4.0	20.0	51.5	21.6	24.5
	7.5– 10 ha 100 (7,452)	0.5	7.1	12.9	41.0	26.5	3.8	0.8	0.1	2.8	4.5	20.5	41.0	31.2	34.0
	10– 15 ha 100 (5,845)	0.6	4.3	3.3	8.5	49.1	19.7	5.6	0.5	3.3	5.0	16.7	49.1	25.9	29.2
	15– 20 ha 100 (2,024)	0.5	3.0	1.2	1.5	9.9	44.2	26.6	3.0	4.0	6.1	16.1	44.2	29.6	33.6
	20– 30 ha 100 (1,347)	0.2	2.4	1.0	1.0	2.9	6.8	50.0	22.0	7.8	5.9	14.3	50.0	22.0	29.8
	30 ha or larger 100 (553)	0.7	3.4	1.4	0.2	1.4	1.6	5.8	65.3	11.6	8.5	14.6	65.3	-	11.6

Ref.: Based on cross-calculation of data from Census of Agriculture and Forestry, MAFF.

- High percentage of farm households made upward shifts, i.e., more than 20% by each area group (2) and around 30% by groups (1) and (2), after including those that developed into entities other than farm households

Among groups of 10–15 ha and 20–30 ha, however, slightly lower than other area groups that made upward shifts

→ Correlation between the farm workforce to be needed and expanded area groups

- Around 15% of farm households made downward shifts on the other hand

Farm Successors and the Workforce Observed from Farm Household Mobility among Area Groups 20–30 ha under Management (Farm Operators aged 60 or older)

Unit: %, household

Changes from 2010 to 2015		Total	Reduced to 5–20 ha	Maintained (20–30 ha)	Expanded to 30 ha or larger
Total (No. of Farm Households)		100 (364)	18.7 (68)	54.7 (199)	26.6 (97)
Percentage of Farm Households with Successors	2010	82.1	67.6	82.9	90.7
	2015	78.0	67.6	75.9	89.7
Percentage of Farm Households with Successors Living Together	2010	65.1	50.0	65.8	74.2
	2015	62.6	47.1	61.3	76.3
Successors Living Together and Engaged in Farming Engaged in Farming for 30 Days or Longer per Year	2010	57.1	42.6	56.3	69.1
	2015	54.7	39.7	52.3	70.1
	2010	40.7	30.9	39.2	50.5
	2015	46.7	30.9	43.7	63.9
Percentage of Farm Households with Permanently Employed Workforce	2010	19.0	13.2	20.1	20.6
	2015	24.7	8.8	24.1	37.1
Percentage of Farm Households without Successors Living Together	2010	8.8	7.4	9.0	9.3
	2015	8.8	5.9	8.0	12.4

Expanded and reduced groups compared in terms of securing farm successors

Reduced groups: Percentage of farm households w/ secured successors is more than 20% lower than that of expanded groups

→ Less than 50% of farm households have successors engaged in farming

Expanded groups: Most of farm households have successors, and number of days worked by successors living together increases with expanded scale

→ Farm households w/o successors cover the labor shortage with the employed workforce

5. Conclusions

1. The large-scale farm households engaged in paddy field farming increased with concentration in the Eastern Japan,
esp. those 15 ha or larger increased in number, making progress in farmland accumulations
2. The manageable scale of paddy field farming operated by family-based farm households is determined by the status of farming workforce among household members
3. Expanded scale of farm operation is observed among those farm households with full-time successors; however, other farm households w/o successors attempted to expand farming scale with employed workforce
4. For expanding the scale, secure agricultural labor force is equal to or more important than agricultural machinery.

- Workforce among farm households with managed area scale of up to 50 ha is provided by family members
- Some farm households reduced managed area, depending on the status of successors engaged in farming
- The percentage of farm households w/ secured successors did not rise with expanded area of management accordingly, due to the peak ratio of securing successors
 - Some farm households have not secured their successors

The large-scale farm households engaged in paddy field farming are important for sustainable development of regional agriculture

→ Our future task is to clarify the condition for smooth succession of farm management through examining the results of field surveys on the issue

Thank you for your kind attention.