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Study on the Development and Operation of Paddy Fields Agriculture at State Farms in China

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Location of Sanjiang Plain

Outlines of the presentation

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- **II** . Farm Survey and Data Collection Method
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  - i. Development of paddy fields and position of focus area at X State Farm
  - ii. Key features of paddy fields development by Production Group No. 17
  - iii. Characteristics of rice farming management and economic analysis of farm households
- **IV**. Conclusions

Ⅰ. Introduction

A. Subjects of the Study

a) History of paddy fields development

b) Management of rice farming

c) A brief establishment of land use order

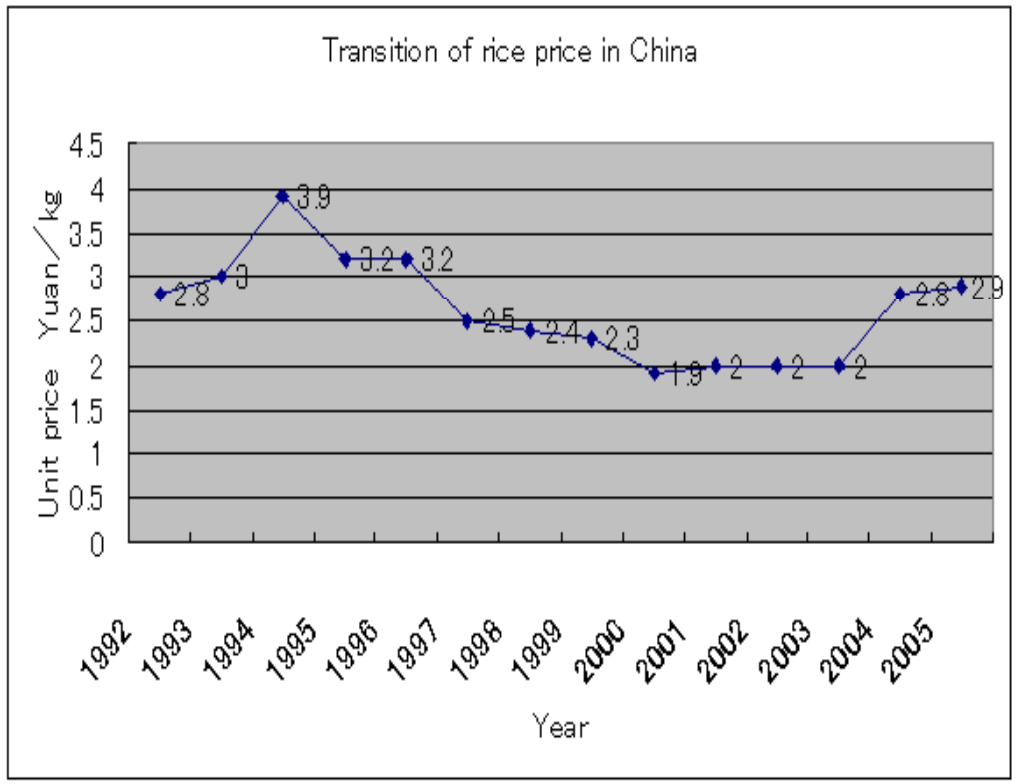
B. Study Area

X State Farm in Sanjiang Plain

Background and Purpose

- This study have been conducting in X State Farm since 1997.
- It was found out that paddy fields have been decreased from 1999 to 2002 and the large areas have been changed to dry fields. But the drastic conditions found in 2003.
- The main reasons were that drop in market rice price has been decreased by natural disasters and overproduction of rice (excess of supply).

However, the rice price has been increased again from 2004. Therefore, it is necessary to conduct further studies to reinvestigate the recent trends and the actual situation of rice farming.

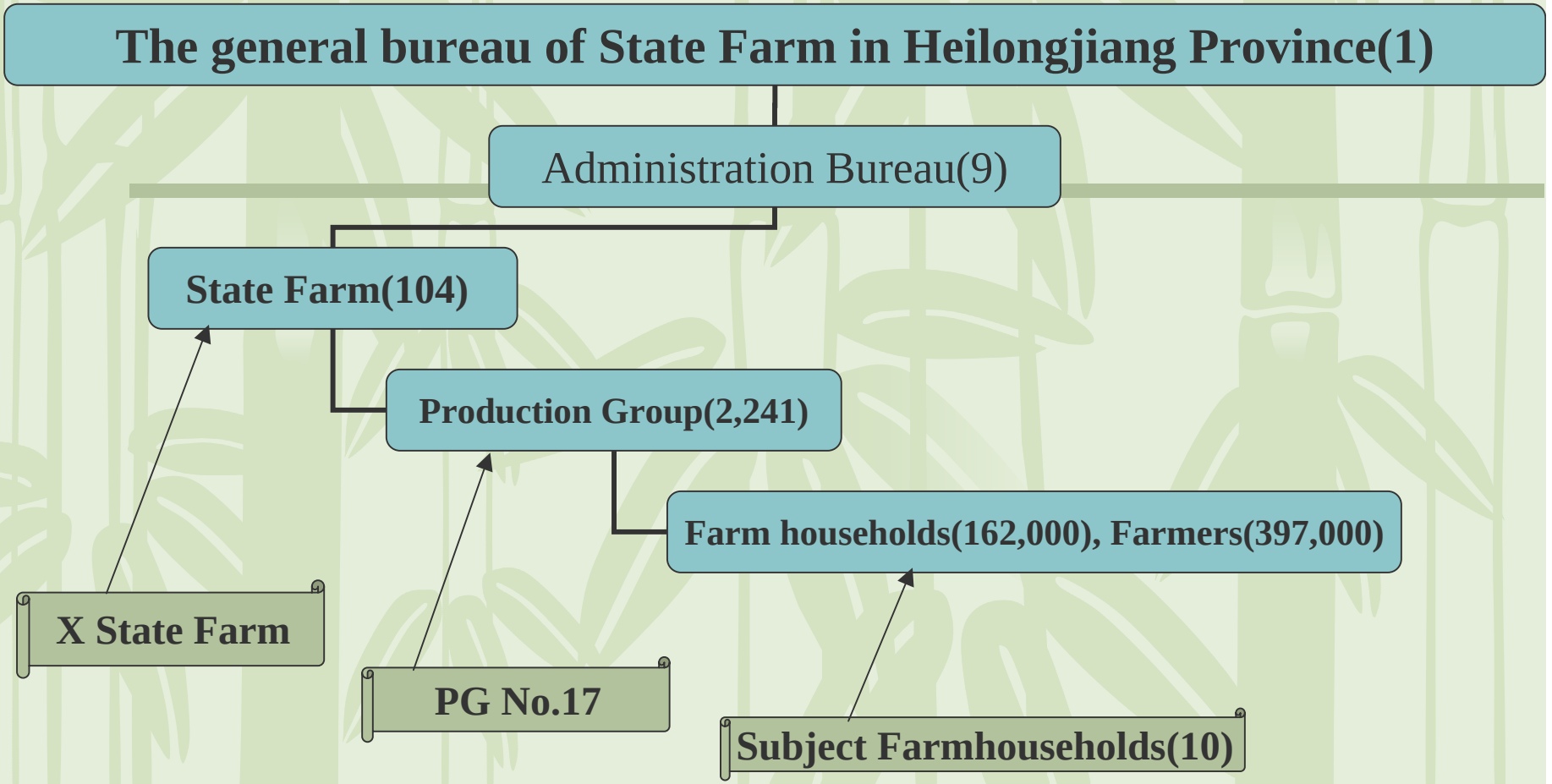


2. Farm Survey and Data Collection Method

- Primary data and case studies are used in this study.
- Primary data were collected from 10 farm households of one production group (PG) in X state Farm those who belongs to different farm scales.
- Ten (10) farm households kept their farm-records (cash revenue and expenditure, work diary and interview records) separately for one year from spring of 2007 to 2008.
- As a pre-research, this study has been conducted on top officers of the PG to hearing their personal opinions and also the 10 farm households.

3. Results and Discussions

i. Development of paddy fields at X State Farm(XSF)



ⅰ） Features of the development of paddy fields at XSF

Sources of Irrigation:

a. Rivers (Until late 1980's)

b. Groundwater (After then)

(Groundwater wells 9,607)

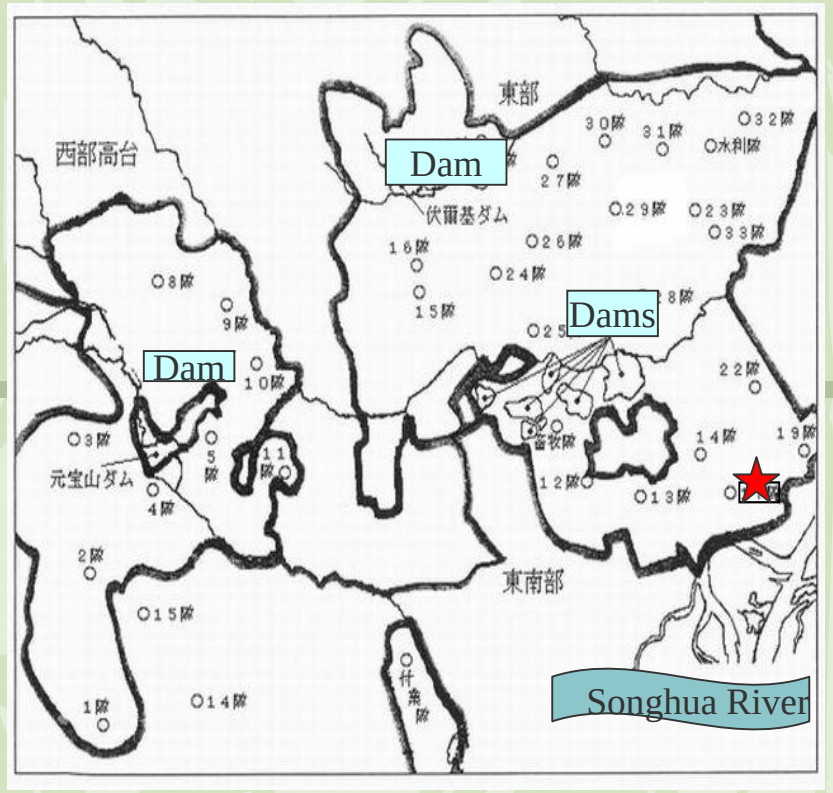


Fig.1 Area of XSF and the location of PG No.17

ⅱ) History of the development of paddy fields (since late 1980's)

- Development of paddy fields by groundwater wells from 1989.
- ‘Sanjiang Plain Agriculture Multidiscipline Development Plan’
- One groundwater well irrigate 10ha of paddy fields.
- Generally, one farm household owns one well.
- The depth of groundwater wells has become increasingly deep.

  17m→20m→25m→28m→30m

  Because of the water resource tends to be insufficient.

ⅱ. Key features of the development of paddy fields by Production Group No. 17

i) Outline of the development of paddy fields for PG No. 17

- Irrigation plan has been introduced since 1992.
- The PG have been started to establish groundwater wells since 1992 and 1993 for irrigation.
- Because of the rapid expansion of groundwater wells, therefore many areas comes under rice farming.
- **In 1994, out of 673.7ha, 552.6ha (82 %) have been changed into rice farming in PG No.17.**

ii) Process of paddy fields development in Production Group No. 17

❖ Introduction of ‘invited farm households'

- ***<u>What is the 'invited farm households</u> ?***

  They come from the outside of the State Farm and they have vast knowledge of rice farming as well as financial solvency for rice farming.
- The PG No.17 introduced the ‘invited farm households’ proactively from 1989, and terminated in 2001.
- Currently, within the 65 households of the **<u>PG No.17,</u>** there were 29 households **<u>(45%) came from invited FHs</u>**.

❖ Preferential treatment plan

- The farm households would be responsible for the costs where <u>50 % of the costs could be financed loan by the state farm</u>.
- The agricultural tax and Land rent for the initial year was exempt.

iv) Characteristics of rice farming Management

Description	Numbers
Farm households	65
Average farm area	8.5 ha
Groundwater wells	70
irrigation area of one well	7.9 ha
On the average, one household	one well

scale	Numbers farm households
large scale	2
upper-medium scale	3
lower-medium scale	3
small scale	1

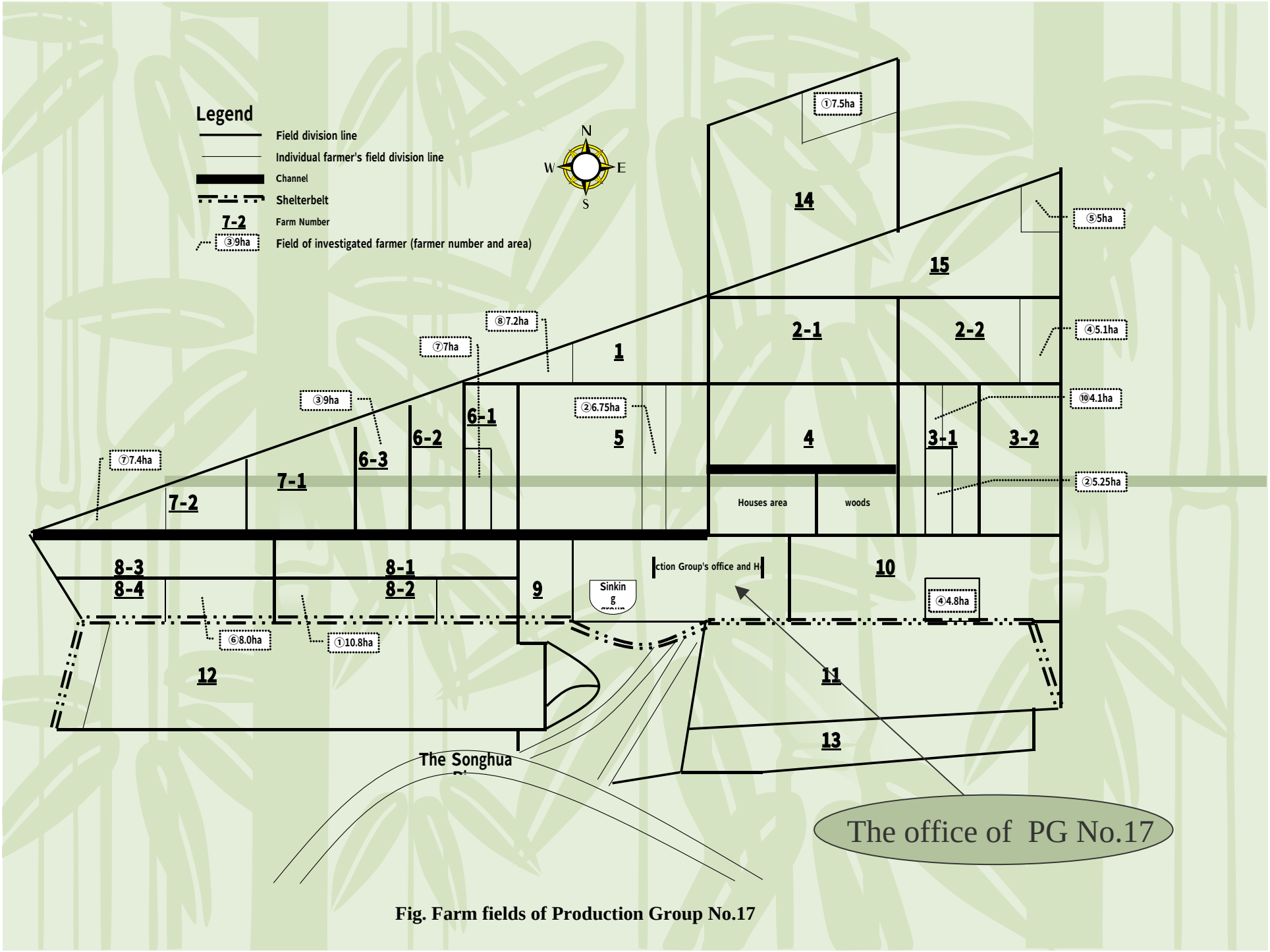


Fig. Farm fields of Production Group No.17

ⅲ. Characteristics of rice farming management and economic analysis of farm households

ⅰ) *Mobility of farm households and change of scales*(Table 4)

- 73 households in 1994 dropped to 65 households in 2006.
- 1994-2006, the continued existence of households only 52, 21 emigrated, 13 immigrated.
- 1994-2006, the migration rate was 29%.
- Out of the 19 large scale households, 6 households (32%) have actually increased their scale during this period (1994-2006) .

Table4 Mobility and scale variation in PG No.17 (1994-2006)

Unit: Household

		Scale composition in 1994									
		～5	5～7.5	7.5～10	10～12.5	12.5～15	15～17.5	17.5～	Sub total	Move-in	Sum total
Scale Composition in 2006	～5	6	1		1				8	1	9
	5～7.5		15						15	4	19
	7.5～10		1	11				1	13	5	18
	10～12.5		1	1	6				8	3	11
	12.5～15		2			2			4		4
	15～17.5			2			1		3		3
	17.5～				1				1		1
	Sub total	6	20	14	8	2	1	1	52	13	65
Emigration		4	8	6	1	1	1		21		
Total		10	28	20	9	3	2	1	73		

Note: Developed from PG No.17 data. 86 households in the original list.

- The migration happens after decrease in rice farming income,
- especially in 2003 during which rice farming area dropped dramatically throughout the farm.

Table5 Time of migration

Unit:Household

Year	Scale expansion	Scale contraction	Emigration	Move-in
1994				
1995			1	
1996				
1997			1	1
1998		2	1	1
1999				
2000				
2001			3	4
2002	1		4	2
2003	7	1	11	5
2004				
2005				
2006				
Total	8	3	21	13

Note: Developed from PG No.17 data

Table6 Basic information of the 10 farm households (Family, Land, History)

	№1	№7	№2	№4	№3	№6	№8	№9	№5	№10
Number of family	3	3	3	5	5	5	5	4	3	3
Operator	m33,f32	m41,f37	m40,f40	m26,f26	m26,f24	m56,f54	m46,f44	m30,m26	m44,f41	m33,f31
Children	m10	m17	m15	m1	f2	m25,f24	m24,f24		m19	m2
Parents (grandchildren)				m48,f47	m57,f52	m1	m1	m61,f57		
Operation area	18.3ha	14.4ha	12.0ha	9.9ha	9.0ha	7.9ha	7.2ha	6.5ha	5.0ha	4.1ha
Classification	Invited	Invited	Machinery team	Invited	Machinery team	Farming Team	Invited	Machinery team	Move-in	Staff
Move-in year	1989	1995	1974	1998	1978	1968	1990	1973	2004	1996
Before move-in	Farmer in Huanan Hisen (1.4ha dry field)	Farmer in Boli Hisen (1ha)	Machinery team in Heli River State Farm	Rice farmer in Wuchang Hisen	PG No.14 in X State Farm	PG No.13 in X StateFarm	Farmer in Bin Hisen(0.5ha)	Snadong Prov. Pingyuan Hisen	Engaged in carrier business at home	Vice chief of PG No.17. Parents work in the factory in the X StateFarm

Note: Data from hearings

Transition of expansion of ten subject farm households scale

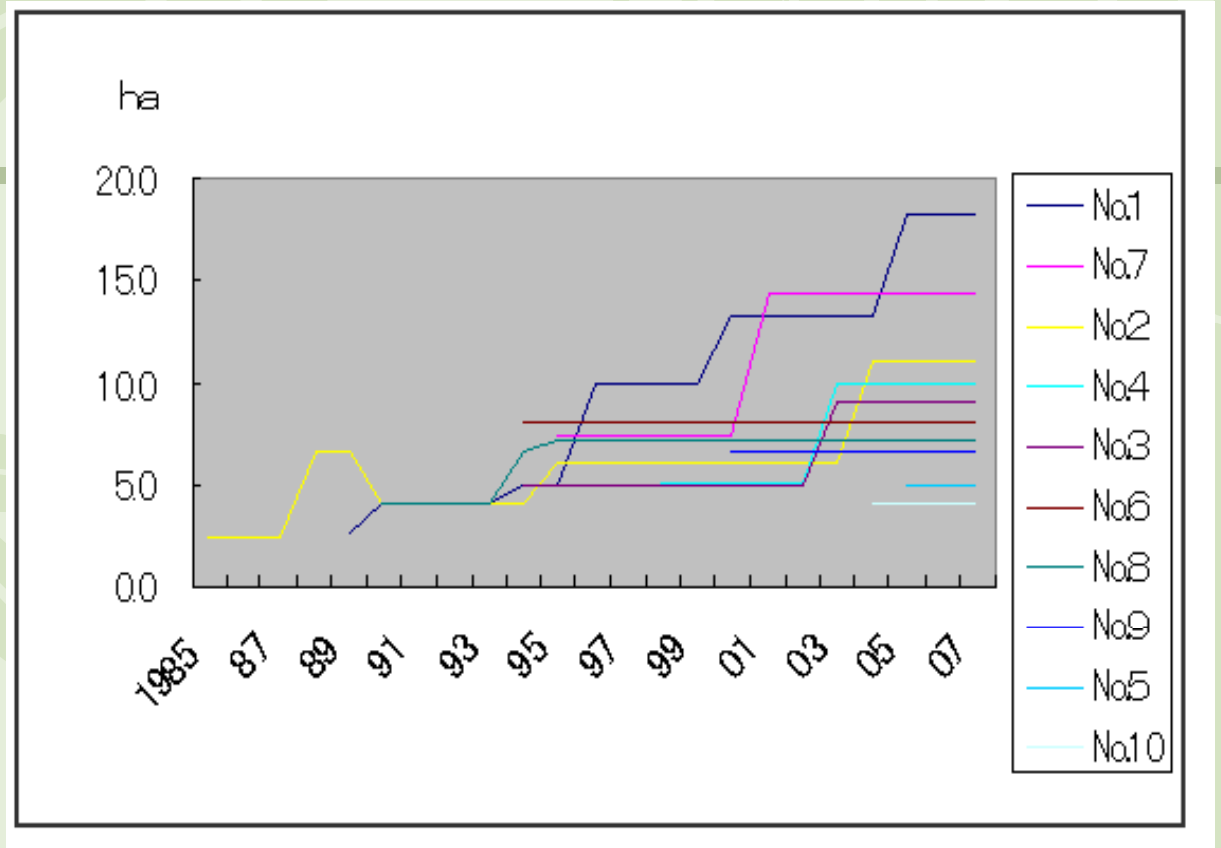


Table7 Mobility of farmlands

Farmer number	№1	№7	№2	№4	№3	№6	№8	№9	№5	№10
Calssification	Invited	Invited	Machinery	Invited	Machinery	Farmhand	Invited	Machinery	Move-in	Staff
1985			2.5ha							
86										
87										
88			+4.0ha							
89	2.7ha									
90	+1.4ha		4.0ha				4.0ha			
91										
92										
93										
94	5.0ha				5.0ha	7.9ha	+2.5ha	dry field8.0ha		
95		7.4ha	+2.0ha				+0.7ha			
96	+5.0ha									
97										
98				5.1ha						
99										
00	+3.3ha							+6.5ha		
01		+7.0ha								
02										
03				+4.8ha	+4.0ha					
04			+5.0ha							4.1ha
05	∗+5.0ha								5.0ha	
06										
07								-dry field8.0ha		
Total	18.3ha	14.4ha	12.0ha	9.9ha	9.0ha	7.9ha	7.2ha	6.5ha	5.0ha	4.1ha

Note: Data from hearings

Adoption and renewal of machineries (Table 10)

- The large scale farmers have advancement in machineries.
- Small scale farmers still harvest partly by hands or by contracting machines.

Table10 Progress of rice farming mechanization

Farmer number	Classification		Model	Year	Price	Finaced	Currently in possesion
№1	Tractor	①	12ps＊	1989	2,600	Borrowed from family	
		②	25ps＊	1998	13,000	Personal	
		③	40ps	2004	53,000	Personal	○
	Seedling house	①	180㎡×2	1998	7,000	Finance loans from the farm	○
		②	120㎡×13	1999	16,900	Personal	○
	Rice planter	①	6rows＊	1992	3,000	Borrowed from family	
		②	8rows	2000	11,500	Personal	○
	Combine	①	2.3m	2005	54,000	Personal	○
№7	Tractor	①	12ps	1995	12,000	Borrowed from family(5000)	
		②	30ps	2000	50,000	Personal	○
	Seedling house	①	6houses	2000	7,000	－	○
		②	5houses	2001	8,500	－	○
	Rice planter	①	6row	1996	12,000	Personal	
		②	6row	2005	9,800	Personal	○
	Combine	①	2.2m	2005	52,500	Personal	○
№2	Tractor	①	12ps	1985	－	－	○
		②	30ps	2004	30,500	Personal	○
	Seedling house	①	195㎡	1999	3,500	Finance loans from the farm	○
		②	126㎡×6	2004	8,400	－	○
		③	126㎡	2005	1,400	－	○
		④	126㎡	2006	1,400	－	○
	Rice planter	①	6rows	1998	10,000	－	
		②	6rows	2006	12,000	－	○
	Combine		Contract	2004～ 600/ha			
№4	Tractor	①	12ps	1998	10,000	－	
		②	24ps	2004	12,400	Agricultural Bank	○
	Seedling house	①	159㎡×4	2004	4,800	Agricultural Bank (partly)	○
		②	188㎡×5	2006	7,700	Agricultural Bank (partly)	○
	Rice planter	①	6row＊	2000	7,000	－	
		②		2006		－	○
	Combine		Contract	2000～ 500/ha			
№3	Tractor	①	12ps＊	1994	6,500	－	
		②	30ps	2004	31,400	Personal	○
	Seedling house	①	390㎡	1996	6,400	－	○
		②	135㎡×7	2004	8,400	－	○
	Rice planter	①	6rows	1996	9,800	－	○
	Combine	①	2.5m	2006	63,000	－	○
№6	Tractor	①	－	2001	40,000	Personal	○
	Seedling house	①	－	－	－	－	－
	Rice planter	①	6rows	1996	10,100	Personal	
		②	6rows	2006	13,500	Personal	○
	Combine		Contract	1999～ 650/ha			
№8	Tractor	①	30ps	2003	30,000	Personal	○
	Seedling house	①	180㎡	1999	3,500	Personal	○
		②	180㎡×2	2002	7,000	Personal	○
		③	135㎡×2	2004	3,000	Personal	○
	Rice planter	①	6rows	2005	12,000	Personal	○
	Combine		Contract	2003～ 600/ha			
№9	Tractor	①	－	2000	17,500	Personal	○
	Seedling house	①	135～144㎡×5	2000	9,000	－	○
	Rice planter	①	6rows	2002	11,300	Personal	○
	Combine		Contract	－ 700/ha			
№5	Tractor		Contract	2004～ Spring180/ha、Fall220/ha			
	Seedling house	①	204㎡×2	－	6,400	－	○
		②	144㎡×2	－	2,400	－	○
	Rice planter		Contract	2004 Just a few			
	Combine		Hands				
№10	Tractor		Contract	－ 200/ha			
	Seedling house	①	3houses、400㎡	－		－	○
	Rice planter		Contract	－ 600/ha			
	Combine		Contract	－ 750/ha			

Notel: Data from hearings, ＊in the model show that it was used, not new

Table11 Balance of payments of the farm householdls (2005)

Unit：ha、ton/ha、ton、Yuan

	№1	№7	№2	№4	№3	№6	№8	№9	№5	№10
Paddy area	18.3	14.4	12.0	9.9	9.0	7.9	7.2	6.5	5.0	4.1
Unit crop	8.5	8.0	8.0	9.9	8.0	9.2	8.7	9.0	7.5	8.7
Volume of sales	113.1	115.2	96.0	90.0	72.0	72.7	62.2	58.5	37.5	35.7
Gross income	192,270	172,800	153,215	135,000	115,200	130,860	81,516	81,900	56,210	65,129
Fertilizer	11,970	16,580	18,000	12,000	10,000	1,976	8,000	7,600	4,100	4,800
Pesticide	3,600	7,045	7,000	5,000	4,000	1,500	3,000	2,900	2,200	1,830
Raising seedlings	5,000	5,750	4,800	4,500	3,850	1,600	890	1,050	490	600
Sub total	20,570	29,375	29,800	21,500	17,850	5,076	11,890	7,504	6,790	7,230
Hiring	9,800	24,000	10,000	4,000	4,500	3,627	4,500	2,600	0	4,500
Land Rent	31,920	32,829	29,807	24,255	20,250	17,775	20,020	960	12,250	14,145
Others	14,500	17,420	12,500	14,000	9,500	8,200	20,000	11,064	5,000	15,770
Gross expenditure	76,790	103,624	82,107	63,755	52,100	34,678	56,410	22,128	24,040	41,645
Net income	115,480	69,176	71,108	71,245	63,100	96,182	25,106	19,475	32,170	23,484

Note1: Data from farm research.
Note2: Numbers for No.9 and No.10 are from 2006.

- In terms of total income, because of rice single-crop management, therefore there is a prescription of certain production amount from each ha.

- **Unit crop differs from 7.5 to 9.9 tons,** and obviously small scale farmers have low production amounts.
- **In the case of expenditures, the land rent is about 30 to 50 percents.** This high percentage of land rent limits the income of farm households.
- **The range of employment fees from a few percentages to nearly 25 percent.** Even though there is advancement in machineries, the cost for temporary employment contract is high.

- The results also showed that the net income does not always correspond to scale.
- In all cases, the gross income is 100,000-200,000 Yuan, and net income is 60,000-100,000 Yuan which implies that **rice farming operation has higher stability, both technologically and economically.**

4. Conclusions

The findings of the study concluded:

- A certain degree of stability as well as scale expansion in a group of farm households.
- Problems of rice farming management was clarified.

a. Water problem -The potential exists problem is shortage of water resources.

b. Employment problem

c. Farmer's burden problem -Increase of land rent

Remaining tasks

In the near future, it is necessary to analyze elaborately. especially regarding **the land rent-bearing capacity** and **the ratio of employment expenses to production cost** in the large scale operation of farm households.

Thank you for your attention !