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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 <u>Sanjiang Plain</u>



Outlines of the presentation

. Introduction

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- . Farm Survey and Data Collection Method
- . Results and Discussions
- 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
- . Conclusions

. Introduction

Subjects of the Study Α. 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.



) Features of the development of paddy fields at XSF

Sources of Irrigation:

a. <u>Rivers</u> (Until late 1980's)

b. <u>Groundwater</u>(After then) (Groundwater wells 9,607)





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

) 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.

. 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.





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

Introduction of 'invited farm households'

What is the 'invited farm households ?

- 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 (45%) came from invited FHs.

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.

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

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



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

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.
<u>1994-2006, the migration rate</u>

was 29%.

Out of the 19 <u>large scale</u> <u>households</u>, 6 households(<u>32%</u>) <u>have actually increased their</u> <u>scale during this period</u>(1994-2006). Table4 Mobility and scale variation in PG No.17(1994-2006)

Unit: Household



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

			Unit	:Household
Year	Scale expansion c	Scale Em	igration	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

Table5 Time of migration

	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	m 1	f 2	m25,f24	m24,f24		m19	m2
Parents (grandchildren)				m48,f47	m57,f52	m1	m 1	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 tear	n Farming Team	Invited	Machinery team	Move-in	Staff
Move-in year	1989	1995	1974	1998	1978	1968	1990	1973	2004	1996
	_	Farmer in	Machinery	Rice	PG No.14 in	PG No.13	Farmer in	Snadong Prov	. Engaged	Vice chief of
	Farmer in	Boli Hisen	team in Heli	farmer in	X State	in X	Bin	Pingyuan	in carrier	PG No.17.
	Huanan	(1ha)	River State	Wuchang	Farm	StateFar	Hisen(0.5ha)	Hisen	business	Parents work
Before move-in	Hisen		Farm	Hisen		m			at home	in the factory
	(1.4ha dry									in the X
	field)									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 86 87			2.5ha							
88 80	2.7ha		+4.0ha							
90	+1.4ha		4.0ha				4.0ha	1		
91 92 93										
94	5.0ha				5.0ha	7.9ha	+2.5ha	dry field8.0ha		
95	LE Oba	7.4ha	+2.0ha				+0.7ha			
96	+5.0na									
98				5.1ha						
99	0.01									
00	+3.3ha	+7.0ha						+6.5ha		
02		17.0114								
03				+4.8ha	+4.0ha					
04	* 15 Oba		+5.0ha						5 Oba	4.1ha
05	+5.0Ha								5.0Ha	
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 near	ngs								

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.

Farmer number Classification Year Price Finaced Currently in possesion 1989 ractor 12ps * 2,600 Borrowed from family 25ps* 1998 13,000 Personal 40ps 2004 53,000 Personal 180 m² x 2 Seedling house 1998 7,000 Finance loans from the farm 120 m² x 13 1999 16,900 Personal Rice planter 6rows* 1992 3,000 Borrowed from family 2000 11,500 Personal 8rows ombine .3m 2005 54,000 Personal 12,000 Borrowed from family(5000) ractor 12ps 30ps 1995 2000 50,000 Personal 6 houses Seedling house 2000 7.000 8,500 5 houses 2001 Rice planter 1996 12,000 Personal 6row 9,800 Personal 2005 6row ombine .2m 2005 52,500 Personal ractor 12ps 1985 2 30ps 2004 30.500 Personal 195m² 1999 Seedling house 3.500 Finance loans from the farm 126 m² × 6 2004 8 400 126m² 2005 1,400 126m² 2006 1,400 1998 10,000 Rice planter 6rows 6rows 2006 12,000 Combine Contract 2004 ~ 600/ha 10,000 Tractor 12ps 1998 4 24ps 2004 12,400 Agricultural Bank Seedling house $159m^{2} \times 4$ 2004 4,800 Agricultural Bank (partly) 188 m² x 5 2006 7,700 Agricultural Bank (partly) Rice planter 2000 7,000 6row* 2006 2000~ 500/ha Contract ombine ractor 12ps * 1994 6.500 2004 31,400 Personal 30ps 390m² 1996 6,400 Seedling house 135 m² x 7 2004 8.400 Rice planter 6rows 1996 9.800 . Combine 5m 2006 63,000 2001 40,000 Personal Tractor 6 Seedling house 1996 10,100 Personal Rice planter 6rows 6rows 2006 13,500 Personal 1999 ~ 650/ha ombine Contract 30,000 Personal ractor 2003 30ps 180m² Seedling house 1999 3,500 Personal 180 m² x 2 2002 7,000 Personal 135 m² × 2 2004 3,000 Personal Rice planter 2005 12,000 Personal 6rows ombine Contract 2003~ 600/ha Tractor 2000 17,500 Personal 135 ~ 144 m² × 5 2000 Seedling house 9.000 Rice planter 2002 11,300 Personal 6rows ombine Contract - 700/ha 2004 ~ Spring180/ha, Fall220/ha Tractor Contract Seedling house 204 m² × 2 6,400 2,400 144 m² × 2 -2004 Just a few Rice planter Contract Combine Hands 10 Tractor - 200/ha Contract Seedling house 3 houses, 400m Rice planter 600/ha Contract Combine Contract - 750/ha Note1: Data from hearings, * in the model show that it was used, not new

Table10 Progress of rice farming mechanization

Table11 Balance of payments of the farm househodls (2005)									n Vuan	
	1	7	2	4	3	6	8	9	<u>5</u>	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	12,25 <mark>0</mark>	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 <u>rice farming operation has higher stability, both technologically and economically.</u>

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 <u>the land rent-bearing capacity</u> and <u>the</u> <u>ratio of employment expenses to production cost</u> in the large

scale operation of farm households.

Thank you for your attention !