

A STUDY ON AGRICULTURAL MECHANIZATION IN THE PEARL RIVER DELTA OF GUANGDONG PROVINCE

THE AGRICULTURAL COMMISSION OF GUANGDONG PROVINCE

Lianhui Wei

ABSTRACT

The standard of agricultural mechanization is one of the important indicators for measuring the realized degrees of agricultural modernization in some regions. The Pearl River Delta is most fertile, and thereby reputed as a land of fish and rice in the province. Studying the proceedings, profits and experiences of agricultural mechanization in the region obviously possesses the generally guiding significance for Guangdong to realize agricultural modernization by the year 2010. This paper involves these fields such as drainage, irrigation, harrowing, harvesting, transportation, processing and etc, in the Pearl River Delta. Results show as follows: (1) 80% work load in main production links has been mechanized; (2) changed took place in traditional agricultural production means and ways so that individual farmer in this region became commercial producer and then march toward commodity production of modernization with high yields, good quality and high profits; (3) further tapping production potential to improve land output and labour productivity.

Results also show that the degrees of agricultural mechanization in the Pearl River Delta are closely related to government's policies, finance, moderate land scale management, rural industrialization and machine utility as well as talent training, shortage of which will surely affect the proceeding of agricultural mechanization. Therefore, government must be urged to guarantee it by preferential policies and financial loan so as to greatly run rural industry, to create conditions for land scale management, to set up the socialized service system of agricultural mechanization, to actively train scientific talents and to introduce advanced equipments and technology from abroad in order to quicken the progress of agricultural mechanization in this regions.

1. INTRODUCTION

The Pearl River Delta, located in the convergence of the Pearl River system of Guang Dong Province in southern China, include 10 municipalities (ie, the municipality of Guang Zhou, Shen Zhen, Zhu Hai, Fo Shan, Jiang Men, Dong Guan, Hui Zhou, Zhao Qin, Qing Yun) and 21 counties, With a total area of 47 thousand square kilometers, and total population of 21.18 million, accounting for 26.6% of the total land area and 33.5% of the total population of Guang Dong Province respectively. This Delta is a highly mechanized area in Guang Dong. This paper analysis its agricultural mechanization approach so as to refering beneficially by other areas for agricultural mechanization approach.

2. STANDARD OF AGRICULTURAL MECHANIZATION

Agricultural mechanization is one of the important factors for agricultural modernization. Since the rural economic system reform were conducted in 1980 in China, agricultural machanizing models have been changed in the use of agricultural produce and the development of agricultural mechanization has been promoted. By 1992, the Delta Area had 8.11 million KW of the total farm machinery power, accounting for 70.7% of the total farm machinery power of Guang Dong Province. There were 7.5 KW of farm machinery powers for per hectare of cultivated land which was higher than the average level of the whole province by 80.3%. The summary of the farm machinery from 1980 to 1992 are listed in table (1):

Table (1) The summaries of the farm machinery
in the Pearl River Delta Area

Items	unit	1992/1980 change%
The total farm machinery power.	million KW	176.45
large and medium-sized tractors	unit KW	-40.49 -16.91
walking tractors	unit KW	279.92 211.23
Farm implements drawn by large and medium tractors	unit	-72.20
Farm implements drawn by and walking tractors	unit	281.37
Rice transplanter	unit	-86.36

	KW	-88.31
motor irrigation and drainage machine	unit million KW	60.53 38.18
Spray irrigation machine	unit	1.0
Combined harvester	unit KW	148.74 262.93
motor harvester	unit KW	809.61 618.06
motor thresher	unit	207.85
processing machine	unit	207.85
Farm-use truck	unit million KW	595.79 677.53
Motor carrying vessels	unit million ton million KW	284.16 243.96 191.23
Motor ship for fishing	unit ton KW	705.62 178.40 203.68
Spray machine	unit KW	244.73 275.26

Note: (1), This table doesn't include Hui Zhou, Dong Guan, Zhao Qin and Qing Yun .

(2), Resource: The Yearbook of GuangDong Agriculture Statistics.

From table (1), We can know that the total powers of farm machinery was increased by the speed of 8.84% annually, especially the small tractor and farm implements drawn by the small tractor, harvester, farm-use truck machine, fishing-use motor vessels. While the large tractor etc. were decreased. This change was tallied with the basic situation that a farm household was a main unit of production and management in rural area at that time.

According to investigations, the scopes of higher mechanization were in riceplanting, produces processing, and transportation.

2.1 80% of works in tractor-ploughing, irrigating draining and harvesting have been mechanized. According to our investigations, in Nan Hai, the power irrigating and draining areas by electron-power covered more than 90% of cultivated land, the tractor-ploughing areas covered 81% of rice planting areas and 95% of arable land areas, the motor thresher areas covered 8% of planting areas. In Shun De, the total agricultural machinery powers were in which there was 50 thousand KW of irrigating and draining machine, 30 thousand KW of tractor-ploughing machine and 7 thousand KW of harvesting machine. The whole cultivated land in this municipality had been effectively irrigated and 80% of works in the major production process had been mechanized.

2.2 The mechanization standard in the agricultural production process was increasing. The agricultural machine power was increased by 28.7% in 1992 as compared with 1980. The major agricultural production process includes birds and beasts processing aquatic products processing, fruit processing, rice processing and feed processing in the Pearl River Delta. For example, four lines for processing chicken processing lines introduced by GuuangDong were located in the Pearl River Delta area with a total processing capacity of 5 million chicken each year. In addition, the other 27 processing bases in Shun De city introduced the advanced technology and equipments from abroad including 18 cold storage plants and 5 fishery processing factories with the the annually processing capacity of 1.057 million tons of fish can.

2.3 Farm transportation has been mechanized According to statistics in 1992, farm-use trucks were increased by 660%, motor carrying vessels were increased by 280% as compared with 1980.

3. THE EFFECTS OF AGRICULTURAL MODERNIZATION.

The continuous increase in agricultural mechanization in Pearl River Delta area has effectively lowered inputs of farm labour forces and promoted development of agricultural production specialization and commercialization in this areas.

3.1, the agricultural mechanization have reduced the farm labour force inputs so that a large number of farm labor forces could shift to the secondary and tertiary industries. In 1980, the inputs of farm labor forces in the Pearl River Delta area were 5.454 million, accounting for 91.3% of the total farm manpower. In 1992, the inputs of farm labor forces were 3.51 million, accounting for 54.6% of the total farm manpowers and decreased by 37% as compared with 1980.

3.2, the agricultural mechanization has promoted development of

moderate scale land operation. For instance, In Ai Guo village, Xi Qiao town of Nan Hai municipality .23 persons have contracted 63.7 ha. of rice field since 1986 and furnished with 16 walking tractors, 10 combined harvesters and 2 power irrigation drainage stations. The total rice output reached to 794 thousand KG, the average yield was 12060 KG/per ha. and per catipa was 39.5 thousand KG. According to investigations, the household who had the motor machine equipments or produced with farm machine contracted a large area of rice field and had higher economic benefits. (see table 2).

3.3, the agricultural mechanization has promoted the shift of the traditional agri-produce means and modes and formed the modernizing produce with large-volumes, many-varieties, high-quality, , high-output, best-effect. In Pearl River Delta area, because of the continuous improvement in agricultural mechanization standard, the high-quality agri-production commodity producing bases were continuously forming. Such as in Bei Gao town, in Shun De municipality, the culture of birds and beasts was scattered in many households and consumed by themself in the past. In 1987, they introduced a set of chicken-cut production lines with the annual production capacity of 5 million. At the same time, they also established a feed plant , a birds and beasts cultivated farm in order to provide a series services of feed, technology, processing and etc. for households and hence cultural colony had been brought along to develop. The number of specialized households who had provided more than 3 thousand chickens to market annually was 135. The increasing speed of birds and beasts was 51% per year. This had not only meet the demands of chicken-cut processing, but also export 500 thousand chicken to the international market.

3.4. the agricultural mechanization has further tapped and unearthed the latent power of talents and lands to promote the growth of labour productivity and land input-output ratio. According to investigation, the average labor productivity was 34 thousand Yan (RMB) and the average land inputoutput ratio was 12795 Yun (RMB) /per ha. in the Peral River Delta , respectively increased by 1450% and 3650% as compared with 1980. For instance, in Lian Gao village, DaLi town of Nan Hai municipality, the rice produce process had all realized machanization so that the sow time was shorted by 15 days and the summer harvest and sow time was also shorted by 15 days, but the output was increased from more than 4500 KG to more than 6750 KG per ha.

4. THE MAJOR EXPERIENCES OF AGRICULTURAL MECHANIZATION

After making a comprehensive survey , we can summarized some respects of experiences as follows:

4.1 In the feature of household contract responsibility, the small size and scatter of the unit of production hinder agricultural mechanization, the collective economic organization input capital to purchase farm implements, adopted the modes of collective owning-collective operating, collective owning-scattered operating and household owning-organization services, launched the unified social services of tractor-ploughing, irrigating and draining, harvesting. As in Nan Hai municipality, the tractor-ploughing team was set up in every village which the town government provided oil and unified the tractor-ploughing price for providing tractor-ploughing, irrigating and drainage, harvesting work for household. This had given full play to the agricultural mechanization in agriculture produce.

4.2 In the situation that large number of labor forces shifted to the second and third industry and careless cultivated or throw aside the land, the town government help the specialized rice-planting households purchase agricultural mechanization and contract local land to develop scale operation. For example, in Xin Qiao town of Nan Hai municipality, the town government provided 20 thousand Yan (RMB) of discounted loan to help them purchase agriculture machine and contract 16 ha. of local land. This not only overcame some peasant's loading to land-use and promoted countryside to divide works and industry, but also raised the land input-output ratio. The output raised from 9000 KG to 11160 KG per ha.

4.3. In the objective demand, agricultural commodity must vigorously develop agricultural mechanization, the agricultural mechanization must be help and conserved on policy. For instance, the government adopted the policy of 'subsidize agriculture by industry' to financially help agricultural mechanization. In Nan Hai municipality, the number of 'subsidize agriculture by industry' had more than 30 million Yan (RMB) every year. It was major applied to repair motor irrigation and drainage stations and subsidized tractor-ploughing fee, water-electric fee, combined harvester fee, fish oxygen-supply machine, motor rake, small walking tractor, etc. in which every combined harvesting was subsidized 2500 to 4500 Yan (RMB) every harvest-dry machine was subsidized 100 Yan (RMB) and every motorrake was subsidized 10-20 Yan (RMB).

5. CONCLUSION.

Agricultural mechanization is one of the important factors for agricultural modernization. In the situation, the household responsibility system was prevalence and agricultural mechanization level was low, the experience of agricultural mechanization made by the people in the Pearl river Delta area have offered us benefit enlightenments on quickening

agricultural mechanization process.

(1) Vigorously developing the secondary and tertiary industry in countryside to create favorable conditions to contain the surplus labour force and promoting the land scale management, raising the application and usage of agricultural mechanization.

(2) The governments and rural collective economic organization must raise the understanding of the importance of agricultural mechanization and give some necessary help and guide on finance and policy.

(3) Positively organizing the social services of agricultural mechanization.

Table 2

The effective comparison for three typical rice specialized household on pre-post mechanization

Items	Zhu Jin Chen		Chin Qi Feng		Zhu con Biao	
Production scale	77	145	20	148	11	88
labour force	3	3	3	3	3	3
Circumstance of mechanizations walking tractor		2		2		1
horse power		16				12
motor rake		1				
thresher	2	2				
small type combined harvester		2		1		1
motor spray machine		1		1		1
water pump	2	3				3
feed grinder		1				
motor shake sieve	1	1				
wind machine						1
labour force average (days)	30	15	38.5	16	24	14

consume (per mu)	200	100	218	116.5	181	160.5
average cost (per mu, Yan)	4388	7254	400	4751	497.5	4843
labour productivity (Yan)	9788	15000	1850	7400	681	8773
commodity-rice pro- vided by work (KG)	15000	29000	2500	15000	1216.5	15612

REFERENCES

THE YEARBOOK OF GUANGDONG PROVINCIAL AGRICULTURAL STATISTICS.
1980, 1985, 1992.

FANG WENG; A SURVEY OF THE GUANG DONG RICE PROBLEMS AND MODERATE
SCALE OPERATION. -----GUANGDONG FARM MACHINE. 1989.