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# **A RESEARCH OF CHINESE RURAL ECONOMY**

## **—A CASE STUDY OF MOLING PEOPLE'S COMMUNE OF JIANGSU PROVINCE—**

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### **FOREWORD**

From September, 1980 to August, 1981, the author studied Chinese socialist economy and agriculture at the University of Nanking. This research of rural economy, forming a link in the chain of his program of study in China, was done from May 16 to May 30, 1981.

The objectives of this research are as follows :

1. to trace the history of this district
2. to examine land utilization
3. to analyze the relation between population and land area
4. to analyze agricultural production
5. to analyze industrial production
6. to observe farmers' household situation
7. to examine the relation of this rural district to urban area

During the 15 days, the target of this research was limited to the whole Commune, one Productive Brigade, and two Productive Teams. The data were obtained through the cooperation of 15 Commune accountants.

The analysis of this paper puts emphasis on the analysis of land utilization, agriculture production, and the relation of this district to the urban area.

### **1. OVERVIEW**

Moling People's Commune, established in 1958, is located 32 km from the City of Nanking, the capital of Jiangsu Province, China. This People's Commune is standard in scale, organized with 17 Productive Brigades and 257 Productive Teams. According to the statistics of the year 1980, it occupies 80,800 mow land and 29,987 people. As the land square per capita is 2.69 mow, compared with the average of other districts, this People's Commune is densely-populated.

The climatic conditions of these areas give many benefits for agricultural production. The annual average temperature is 15.4°C; the annual pre-

precipitation is 800~1,000 mm, and the River of Qing Huai, one of tributaries of the River Yangtze, provides abundant water to this district. So, this district has developed agricultural production from ancient times. After 1958, a broad uptrend in farm output continued. According to the data of 1980, this People's Commune produced 41.4 million jin units of rice, barley and wheat at a total monetary value of 7.3 million yuan. The food supply per capita amounted to 628 jin, and the income per capita came to 530 yuan. Although this income per capita is lower than that of laborer (840 yuan), it is higher than the average income of farmers in the whole of China. They succeeded in raising agricultural production.

On the other hand, there has been a marked change in the pattern of total output in recent years. In 1980, thanks to development of rural industry, total output of the Commune amounted to 15 million yuan. Compared with 1958, when this Commune was established, industrial production was about 4,500 percent higher. Today, this People's Commune has 70 enterprises, with 3,216 workers. Besides, it manages 43 schools, including 322 teachers and 7,590 pupils, and has established 21 hospitals. Thus, Moling People's Commune is wealthy and comprehensive.

## 2. LAND UTILIZATION

In the whole of China from 1957 to 1977, 188.6 million mow of cultivated land has disappeared. During this same period, the population increased by almost 300 million. There are many causes for the reduction of cultivated land, but two significant ones are the change from cultivated land to desert, and the increase of land used for capital construction. In 1957, the total cultivated land was 1,677.41 million mow (111.82 million ha.). Thus within twenty years, 11 percent of the cultivated land area disappeared. And the cultivated area per capita declined from 2.59 mow in 1957 to 1.56 mow in 1978. As the economy has modernized, it has become necessary to use the land for both capital construction and residence. Today, for Chinese agriculture, the adjustment between limited cultivated land and overpopulation presents its most serious problem. Historically viewed, on the occasion of Moling People's Commune, because the Central Government and the Provincial Government had not ordered them to change the agricultural land to other aims, the total agricultural land area of Moling has not been reduced.

The total land area of Moling is 80,800 mow. Classification of this total land area by geographical features is as follows: the mountainous region is 4,800 mow (5.9 percent), the hilly district is 21,900 mow (27 percent), and the level ground is 54,100 mow (66.9 percent) (the level ground includes ponds, river, reservoir and others).

The data of land utilization of the total Commune was obtained as

follows :

for agriculture	48,376 mow
for industry and mining	1,300 mow
for transportation	750 mow
for culture and amusement (for example school and theater)	204 mow
for construction	30,170 mow
Total	80,800 mow

The utilization of the agricultural land is observed in detail ;

1. cultivated areas for grain owned by collectives	34,900 mow
2. plots of land for personal needs	1,331 mow
3. grove	4,350 mow
4. vegetable gardens owned by collectives	330 mow
5. fishponds	6,715 mow
6. uncultivated land	570 mow

The degree of land utilization is very high. Of the above 6 categories, 1 and 2 are the so-called cultivated land. Of the total Commune land squares, 1 has declined from 36,369 mow in 1962 to 34,900 mow in 1978. The paddy fields for rice, however, have not declined. The sum total of this category and irrigation fields has increased from 29,500 mow in 1957 to 34,866 mow in 1980. As to the present situation of land utilization, because the land area for industry and mining is limited to 1.6 percent of the total area, we can say that the land area for these items does not occupy a significant amount of the agricultural land. Land utilization of Dong Wang Productive Brigade, however, offers us another situation.

Dong wang Productive Brigade is the biggest Brigade among the 17 Brigades in Moling People's Commune. It covers 5,670 mow of land. Land utilization data from 1958 is given in Table 1.

TABLE 1 LAND UTILIZATION OF DONG WANG PRODUCTIVE  
BRIGADE (mow)

	agriculture	industry and mining	construction	transportation	amusement and culture
1958	3,627.4	0	1,964.7	24	53.9
1963	3,627.4	0	1,964.7	24	53.9
1971	3,618.8	0	1,961.9	35.4	53.9
1973	3,583.8	54	1,927.9	50.4	53.9
1976	3,565.4	143.1	1,854.4	50.4	56.7
1978	3,523.2	196.3	1,843.4	50.4	56.7
1980	3,501.2	196.3	1,843.4	72.4	56.7
1981	3,501.2	196.3	1,843.4	72.4	56.7

In Dong Wang Productive Brigade, the land used for industry and mining occupies 3.5 percent of the total land area. This percentage is higher than the average percentage of the whole Commune. Furthermore, historically observed, the land area used for industry and mining, for transportation and for culture and amusement, has steadily increased. In particular, the land area used for industry and mining increased twice during the eight years from 1973 to 1981. During this period, the increase of the area used for industry and mining was 142.3 mow. On the other hand, during the same period, the agricultural land area declined by about 84.5 mow. The total area declined by 161.7 mow. We can estimate that a large part of the decreased agricultural land area has changed into industry and mining. As we observe later, in Dong Wang Productive Brigade, they have maintained their own cultivated land and each Productive Team has maintained it for a long time. But, it is a fact that some of the agricultural land is now used for other utilities, particularly industry and mining. Table 2 shows this process.

TABLE 2 INDEX OF LAND UTILIZATION OF THE DONG WANG  
PRODUCTIVE BRIGADE (given 1958 as 100)

	agriculture	industry and mining	construction	transportation	amusement and culture
1958	100	—	100	100	100
1963	100	—	100	100	100
1971	99.8	—	99.9	147.5	100
1973	98.8	100	98.1	210	100
1976	98.3	265	94.4	210	105.2
1978	97.1	363.5	93.8	210	105.2
1980	96.5	363.5	93.8	301.7	105.2
1981	96.5	363.5	93.8	301.7	105.2

There is the possibility that in the recent future widening of the industrial land will reduce the cultivated land. In this situation, we can guess that the continuation of economic modernization in Chinese rural areas may accelerate the conflict over land utilization between the agrarian and industrial sectors.

### 3. POPULATION

In 1981, the total population of Moling People's Commune was 29,987. If 1958 is taken as 100, the population index at present is 159.3. A twenty year growth rate of 59.3 percent is very high. The annual average growth rate is 2.9 percent. However, in recent years, because of the birth policy by the Central Government, the growth rate has been beginning to

slow down. This same tendency of population growth is observed in other productive units.

In the case of Dong Wang Productive Brigade, as shown in Table 3, the annual growth rate of the population during these twenty years was 2.38 percent. Since 1978, this growth rate has been declining. The same trend is observed also in No. 2 Team and No. 15 Team.

TABLE 3 A STATISTICS OF POPULATION IN DONG WANG PRODUCTIVE BRIGADE

	population	index	number of families	index
1966	2,257	100	591	100
1967	2,360	104.6	620	104.9
1968	2,452	108.6	628	106.3
1969	2,650	117.4	656	111.0
1970	2,740	121.4	677	114.6
1971	2,799	124.0	684	115.7
1972	2,876	127.4	691	116.9
1973	2,926	129.6	713	120.6
1974	2,971	131.6	717	121.3
1975	2,987	132.3	722	122.2
1976	3,011	133.4	725	122.7
1977	3,068	135.9	739	125.0
1978	3,124	138.4	737	124.7
1979	3,067	135.9	725	122.7
1980	3,022	133.9	719	121.7
1981	3,062	135.7	718	121.5

According to the Table, the number of families recorded it's peak in 1977, and declined after 1978. In China, before 1949, it was the norm for all sons to succeed their fathers equally. Today this system of succession has already disappeared, but, even now, the second son and the third son separate from their family when they get married and then keep house for themselves. Therefore, the number of family members remains about four, as before 1949. Even today, this tendency is not changing.

Concerning the population statistics, we can observe two other factors: the flow of persons between districts and the crude birth and death rates. Unfortunately, the data on the former could not be collected perfectly. Generally speaking, in China it is a very rare case that peasants move from a rural area to an urban area. Free relocation of peasants is prevented by the regulations of the Government. Thus in order to analyze the character

of this Commune's population, this flow of persons between districts is not of important significance.

In spite of the imperfect data on population flow, we can recognize that marriage flow plays the most important role. Since 1975 No. 15 Team has taken eight women for its young men's wives from other Productive Brigades, and given nine daughters away in marriage to other Brigades. No. 2 Team, during the same period, received five daughters from other Brigades while giving five to other Brigades. However, no women moved outside the territory of the People's Commune, nor did any women come into the Commune from outside areas. As to the flow of persons, particularly of women who get married, they have a small circle of acquaintances.

On the other hand, in No. 2 Team, there have been eight men who moved in from other People's Communes since 1975, and seven that transferred to other Communes. It is impossible to examine what was the cause of these male's movements, though, it might be related to their occupations. On the aggregate, it is safe to say that movement within the whole Commune is limited to about 1.5 percent of the total number.

Data on the crude birth and death rates were collected only on Dong Wang Productive Brigade. They are presented in Table 4.

TABLE 4 DATA OF BIRTH AND DEATH IN DONG WANG PRODUCTIVE BRIGADE

	births	deaths
1971	48	7
1972	55	15
1973	54	13
1974	56	12
1975	50	16
1976	32	12
1977	49	19
1978	45	10
1979	43	8
1980	35	10

According to these figures, the crude growth rate of the population is about 10 per 1,000 population. The decline to 8 per 1,000 population in 1980 suggests that the birth registration has been trustworthy even in the Chinese rural area. However, because the Central Government has just given publicity to its policy of birth registration, we cannot judge whether the Chinese will succeed in their policy target of only one child per family.

The data on age distribution of the population could not be obtained, but fragmentary data were obtained on the whole Commune. In 1981, the whole Commune had 9,005 people aged under 15. In addition, it had 1,505 people called semi-ablebodied workers. If we estimate 66 percent of these workers as at ages under 17, they number about 900. The sum total of people at ages under 17 are 9,905: about 33 percent of the total number. This percentage is higher than that of a developed country where the birth registration is more trustworthy. We can regard this high number of people at ages under 17 as a potential factor for future overpopulation.

#### 4. DECLINE OF CULTIVATED LAND AREA PER CAPITA & TRANSITION OF MANPOWER ON ONE UNIT OF LAND

It has already been pointed out that there is a conflict between overpopulation and the limited land area. In Moling, this leads to a decline of the cultivated land area, and to a decline of the agricultural land area per capita. In the whole Commune, the cultivated land area per capita has been declining rapidly as follows:

1959: 2.04 mow, 1966: 1.75 mow, 1971: 1.36 mow 1978: 1.18 mow

In Dong Wang Productive Brigade, not only the cultivated land but also the agricultural land area per capita has been declining. Today, the cultivated land area per capita is only 1.08 mow; only 2/3 of the average of overall China.

This tendency of cultivated land area is a common feature in every productive unit: *i.e.*, in the whole Commune, in Dong Wang Productive Brigade, in two Productive Teams. On the other hand, the amount of labor input into one unit of land occurs on an individual basis. Table 5 presents the data on agricultural workers and Table 6 shows a comparison between the rate of population growth and the rate of agricultural workers' change.

TABLE 5 STATISTICS OF POPULATION

(1) WHOLE COMMUNE

	population	farmhouses	agricultural workers	industrial workers
1959	18,719	5,288	8,115	120
1966	21,965	5,783	9,265	—
1971	27,607	6,415	12,200	—
1978	30,735	7,630	13,725	—
1979	29,826	7,725	—	—
1980	29,931	7,815	13,755	—
1981	29,987	7,729	14,320	3,216

## (2) DONG WANG PRODUCTIVE BRIGADE

	popula- tion	farm- houses	agricultural workers		industrial workers		com- mercial workers	pupils and students
			m.	f.	m.	f.		
1966	2,257	591	450	553	32	1	0	251
1967	2,360	620	473	548	41	1	0	275
1968	2,452	628	458	587	48	1	0	281
1969	2,650	656	455	641	60	3	0	287
1970	2,740	677	457	654	66	3	0	344
1971	2,799	684	485	632	80	5	0	330
1972	2,876	691	479	660	85	7	0	357
1973	2,926	713	426	628	97	9	0	403
1974	2,971	717	454	612	105	10	0	424
1975	2,987	722	467	566	116	20	0	435
1976	3,011	725	454	623	127	21	0	490
1977	3,068	739	462	677	161	32	0	606
1978	3,124	737	444	649	170	51	2	753
1979	3,067	725	431	636	190	58	2	759
1980	3,022	719	418	596	267	97	7	740
1981	3,062	718	426	602	272	101	7	762

## (3) No. 2 Team

	population		farm- houses	agricultural workers		industrial workers		pupils and students
	m.	f.		m.	f.	m.	f.	
1975	91	83	50	34	34	8	0	36
1976	90	83	46	33	44	12	0	38
1977	91	86	48	38	35	12	0	35
1978	92	84	48	31	35	19	0	41
1979	92	88	49	36	36	25	0	32
1980	94	93	48	35	33	29	0	41
1981	95	91	48	—	—	—	—	46

## (4) No. 15 Team

	population		farm- houses	agricultural workers		industrial workers		pupils and students
	m.	f.		m.	f.	m.	f.	
1976	67	50	30	20	31	5	1	30
1977	70	54	34	20	30	6	1	31
1978	74	54	36	20	30	7	1	35
1979	71	47	32	19	29	8	2	43
1980	72	55	35	18	27	11	3	51
1981	67	56	34	18	27	11	3	51

TABLE 6. A COMPARISON BETWEEN THE RATE OF POPULATION GROWTH AND THE RATE OF AGRICULTURAL WORKERS' CHANGE

1) Whole Commune			2) Dong Wang Productive Brigade		
	population	workers		population	workers
1959	100	100			
1966	117	114	1966	100	100
1971	147	150	1967	104.6	101.8
1978	164	169	1968	108.6	104.2
1979	159	—	1969	117.4	109.3
1980	159.9	169.5	1970	121.4	110.8
1981	160	176.5	1971	124.0	111.4
3) No. 2 Team			1972	127.4	113.6
	population	workers	1973	129.6	105.1
1976	100	100	1974	131.6	106.3
1977	102	95	1975	132.3	103.0
1978	102	86	1976	133.4	107.4
1979	104	94	1977	135.9	113.6
1980	108	88	1978	138.4	109.0
1981	108	—	1979	135.9	104.4
4) No. 15 Team			1980	133.9	101.1
	population	workers	1981	135.7	102.5
1976	100	100			
1977	106	98			
1978	109	98			
1979	101	94			
1980	109	88			
1981	105	88			

There seem to be two contrasting tendencies between the data of Commune and of Dong Wang Productive Brigade.

From Table 6, we can see that the Commune's growth rate of agricultural workers was always higher than that of the growth rate of the population, except for 1966. But in Dong Wang Productive Brigade, the former rate is always lower than the latter during these twenty years.

The amount of labor input certainly reflects this tendency. As shown in Table 7, the amount of labor input in the whole Commune is 0.39 per one unit of land, and this amount tends to expand. By contrast, in Dong Wang Productive Brigade, it is only 0.33 per mow. Furthermore, in the teams

regulated by Dong Wang Productive Brigade, it is even lower. We might be able to explain what this contrast means by examining the construction of their industry. As already shown in Table 5, in recent years, the factory workers have been increasing in every productive unit. The percentage of industrial workers to total population is 10.7 in the whole Commune. However, since it is 12 in Dong Wang Productive Brigade, Dong Wang Productive Brigade's industry is more developed. Furthermore, in 1980, although agricultural workers constituted almost 50 percent of the total population, in Dong Wang, they constituted only 35 percent.

TABLE 7 AMOUNT OF LABOR INPUT (per 1 mow)

	Commune	Dong Wang Productive Brigade	No. 2 Team	No. 15 Team
1966	0.25	0.33	—	—
1971	0.34	0.37	—	—
1972	—	0.37	—	—
1973	—	0.35	—	—
1974	—	0.35	—	—
1975	—	0.34	—	—
1976	—	0.37	0.37	0.33
1977	—	0.37	0.35	0.32
1978	0.39	0.36	0.32	0.32
1979	—	0.35	0.35	0.31
1980	0.39	0.33	0.33	0.29

In conclusion, it is important to point out that the rich Commune of Moling has a significant problem which is true of every Chinese rural district; that of the conflict between overpopulation and limited land area. Certainly, there is a hopeful example in Dong Wang Productive Brigade, where the rapidly developing rural factories offer opportunities for labor. If we view the whole Commune, however, the ways of using the growing number of able bodied people are limited. Therefore, the Commune planners are obliged to continue agrarian policy which demands more and more agricultural workers as in the old days.

## 5. TECHNOLOGICAL TRANSFORMATION

In China, as is well known, there have been two principal types of agriculture policy under the People's Government: socialist transformation and technological transformation. In Moling, the former type of policy was

accomplished in the 1950's, as well as other districts of China. This socialist transformation's process is outlined below :

- 1950 : practice of land reform
- 1951 : organization of mutual aid group
- 1955 : foundation of elementary agricultural producers' cooperative
- 1957 : foundation of advanced agricultural producers' cooperative
- 1958 : establishment of People's Commune

Now, we shall deal with the latter, technological transformation, aimed at the modernization of Moling's agricultural production with new developments and farming technics. In this section, mechanization, irrigation, electrification, fertilization and seed-breeding will be examined in detail. By this analysis, a most important point is whether or not they make the new technical materials used in agricultural production by themselves in their own factories. If they make these new technical materials at their own factories, the Commune can be seen to have a character of autonomy. But, if they buy them from urban factories, this may show that Chinese rural areas are connected economically with urban areas. This paper will try to examine the connection of Moling People's Commune to urban areas in two aspects, agriculture input and output.

First, in the aspect of agriculture output, the main function of Moling's agriculture in the national economy is to deliver crops to other sections such as urban areas. Table 8 shows the commodity grain rate. In recent years, the rate of commodity grain has been fixed, and this rate is higher than the average of Jiangsu Province and of all China. This means, first, one person of Moling supplies enough food for one person of the urban areas. Secondly, the Commune makes a contribution to the national economy which suffered from supply problem. This suggests that this Commune is closely related to the national economy. Thirdly, the planners of Moling must endeavour to increase the productivity of labor. Because the Commune's function is crop delivery, it is obliged to accept the policy of increasing the productivity of labor. This is the fate compelled by the national economy.

TABLE 8 DISTRIBUTION OF CROPS COMMODITY  
GRAIN RATE

	No. 2 Team	No. 15 Team
1975	43.0%	—
1976	51.3%	56.7%
1977	46.3%	50.6%
1978	38.0%	43.4%
1979	47.99%	53.0%
1980	36.3%	40.3%

TABLE 9 AGRICULTURAL MACHINES AND FARM  
IMPLEMENTS OF WHOLE COMMUNE (unit)

	tractor	diesel engine	pump	thresher	motor	oil press	rice mill	duster	boat	farm cattle
1958	—	—	—	—	—	—	—	200	—	500
1966	—	—	50	—	—	2	30	450	45	1,000
1970	—	—	180	—	—	4	50	650	69	—
1971	—	—	—	—	—	—	—	—	—	1,450
1976	—	—	220	—	—	6	75	720	70	—
1977	—	—	—	—	—	—	—	—	—	1,280
1979	—	—	275	—	—	—	—	—	—	—
1981	275	57	289	534	515	6	81	766	112	1,050

TABLE 10 AGRICULTURAL MACHINES AND FARM IMPLEMENTS  
OF DONG WANG PRODUCTIVE BRIGADE

	tractor (Unit/h. p.)	motor (unit/kW)	diesel engine (unit/h. p.)	pump (unit)	boat (unit)	thresher (unit)	duster (unit)	farm cattle
1959	—	3	—	3	—	—	—	—
1960	—	3	—	3	—	—	—	—
1961	—	3	—	3	—	—	—	—
1962	—	3	—	3	—	—	—	—
1963	—	3	1	3	—	1	—	68
1964	2/ 16	3	1	3	—	8	—	78
1965	5/ 40	8	—	2	—	16	—	84
1966	5/ 40	18	—	2	—	19	—	105
1967	5/ 40	20	—	3	—	23	—	113
1968	5/ 40	20	—	5	—	26	—	112
1969	5/ 40	22	—	6	—	27	—	112
1970	6/ 52	25	—	6	—	27	—	115
1971	7/ 64	31/185.2	6/ 64	9	41	35	65	121
1972	18/ 77	31/284.1	9/ 96	16	42	35	86	133
1973	22/244	32/286.9	13/144	16	41	37	110	131
1974	18/214	43/330.4	14/156	22	41	38	100	116
1975	16/192	44/337.9	12/144	22	40	38	108	117
1976	18/216	58/340.7	16/192	23	37	42	115	111
1977	18/216	58/340.7	14/168	25	36	45	122	104
1978	20/240	59/347.7	14/168	25	29	49	122	100
1979	23/276	68/448.5	15/180	24	25	51	119	97
1980	26/312	77/519	19/228	27	25	53	113	94

TABLE 11 AGRICULTURAL MACHINES AND FARM IMPLEMENTS  
OWNED BY No. 15 TEAM AND No. 2 TEAM

	tractor (unit)		thresher (unit)		motor (unit)		pump (unit)		farm cattle		diesel engine (unit)	
	No. 2	No. 15	No. 2	No. 15	No. 2	No. 15	No. 2	No. 15	No. 2	No. 15	No. 2	No. 15
1975	1	1	3	3	2	2	1	1	9	—	—	1
1976	1	1	3	3	2	3	1	1	8	—	—	1
1977	1	1	3	3	3	4	1	1	6	—	—	1
1978	1	1	4	3	3	4	1	2	7	—	—	1
1979	2	2	4	4	3	4	2	2	7	—	—	1
1980	2	2	4	4	3	4	2	2	7	—	—	1
1981	2	2	—	4	—	4	—	2	6	—	—	1

However, it is a difficult problem to pursue a higher productivity of labor because the surplus labor prevents the mechanization of agriculture. There is a contradiction between the goals of agriculture policy and the existing conditions of the limited amount of arable land and surplus of labor. Therefore, a major step in developing agriculture, before modern farm developments become available, is to increase unit yields.

#### 1) AGRICULTURAL MECHANIZATION

Use of modern agricultural mechanization is restricted by the surplus of labor. In part, however, the mechanization of agriculture has certainly been proceeding. Table 9, 10 and 11 show the agricultural machines and the farm implements owned by each productive unit.

These Tables show that farm cattle play a relatively important role in agrarian production even today. However, the number of cattle has been declining in recent years. In the whole Commune, from 1971 to 1980, they declined by 400. Today, on the average, each productive Team owns about four cattle. In No. 2 Team as well the number of cattle declined to 6 in 1981. But the agricultural machines: tractors, electric motors, threshing machines, have been steadily increasing. The whole Commune has 275 tractors; about one unit distributed to each Team. In Dong Wang Productive Brigade, each Team owns about 1.4 units (the tractor unit is a standard size of 20 h. p.).

Nevertheless, as mechanization is proceeding, the great portion of farming is done by traditional methods. Table 12 shows rate of mechanization classified by the kind of farming. According to this data, the machines are not used for major farming work such as rice planting, mowing, harvesting, etc. Totally speaking, the level of mechanization is quite limited. In spite of a high rate of operation of tractors, its main utility is transportation.

All tractors owned by Productive Teams are made in other districts

TABLE 12 RATE OF MECHANIZATION CLASSIFIED BY  
THE KIND OF FARMING (%)

	ploughing		transportation		threshing	
	No. 2	No. 21	No. 2	No. 15	No. 2	No. 15
1965	5	—	—	—	20	—
1966	12	—	—	—	80	—
1967	15	—	10	—	95	—
1968	15	—	10	—	95	—
1969	15	—	10	—	95	—
1970	35	—	20	—	95	—
1971	50	—	20	—	100	—
1972	50	—	20	—	100	—
1973	50	—	80	—	100	—
1974	50	—	90	—	100	—
1975	55	—	90	—	100	—
1976	60	60	90	80	100	100
1977	60	60	90	50	100	100
1978	85	75	90	75	100	100
1979	85	80	90	80	100	100
1980	85	80	90	80	100	100

In China, there are some People's Communes which manage their own tractor factories. As Moling People's Commune has no machine factories, they bought all tractors from urban factories. Depending on agricultural implements made in urban areas also causes the Commune increased expenditures on materials such as fuel, lubricating oil and repair incurred. In 1980, this kind of expense was 10,164 yuan in Dong Wang Productive Brigade, 631 yuan in No. 2 Team and 578 yuan in No. 15 Team.

## 2) IRRIGATION & ELECTRIFICATION

The significant year for irrigation was 1959, when power irrigation began. Before the establishment of the Commune, this district often suffered from draught and flood. In the 1970's, they overcame these disasters completely. Today, in all, this Commune has 36 power irrigation stations operated by 4,800 kilowatts of electricity. The total waterway area is 450 mow, total waterway distance is 25 km, and total paddy field area irrigated by electricity amounts to about 20,000 mow, 57 percent of the total area.

Irrigation development makes it possible to introduce an annual two harvest system while uniting the rural area with the urban area by offering electric power. Some Chinese People's Communes have their own power plants and generate electricity. Since Moling has no power plant, the state

supplies electricity to this Commune. The cost of power irrigation is about 7 yuan per 1 mow of paddy field. Dong Wang Productive Brigade's expenditure on electricity was 21,963 yuan in 1980, No. 2 Team's it was 1,405 yuan and No. 15 Team spent 993 yuan.

### 3) A CROPPING SYSTEM AND SEED-BREEDING

Before 1949, Moling had a system of one crop of rice and one crop of wheat in a single year. Changes in the cropping system have taken place in two main directions: the extension of the multiple cropping system and the substitution of one crop for another. After 1957, they tried the system of five harvests in two years, and since 1966, this system has been fixed. This cropping system repeats three circles of land utilization:

1. rice, wheat, rape
2. rape, rice, wheat
3. green manure crop, rice, wheat

Each year of the cultivated land is divided into these three blocks. Table 13 shows this cropping system after 1963. It is important to point out, first, that the vegetable area has occupied an increasing some part of the total area in recent years. This means that the output per yield of vegetables is higher than that of other crops. Second, the double cropping index is very high. According to 1957's long-term policy, the district's goal of a double cropping index of 200 percent has already been accomplished.

TABLE 13 CHANGE OF PLANTING AREA BY  
THE KIND OF CROPS

(mow)

	culti- vated area	rice	wheat	bean	rape	flax	vege- table	green- manure	total	double cropping index (%)
1963	36,369	31,369	25,328	98	3,087	n.a.	38.5	2,836	67,756.5	186
1966	36,369	36,369	19,068	54	n.a.	161.8	125.8	10,566	—	—
1971	36,369	35,171	21,754	85	3,378	142.5	n.a.	7,419	—	—
1977	36,369	34,791	18,570	132.5	3,952	181.5	181.5	7,683	65,490	180
1978	34,900	34,700	18,786	35	7,795	140	261	7,153	68,870	197
1979	34,900	34,895	20,791	31	6,326	35	585	8,677	71,340	204
1980	34,900	34,843	20,627	58	6,938	42.5	662.5	8,611	71,782	206

Because the main policy of this Commune is to increase unit yields, it is important to introduce improved and excellent seed. In order to succeed in the cropping system of five harvests in two years, this Commune's leaders have been endeavoring to develop new improved middle and late rice seed. Replacement of seeds advances very rapidly, as presented in Table 14. It ought to be noted that all but 5~10 percent of the total amount of seeds

TABLE 14 SITUATION OF INTRODUCING IMPROVED  
AND EXCELLENT SEED (%)

## (1) EARLY-RIPENING VARIETY OF RICE

No.	1	2	3	4	5	6	7	8	9	10	11	12
1963	100											
1964	100											
1965	100											
1966	90	10										
1967	85	15										
1968	82	18										
1969	81	19										
1970	45	55										
1971	3	83	12.5	1.5								
1972		62	2.5	24	8	2	1.5					
1973		10.5		20	41	13.5	15					
1974					54	21.6	18.4	5	0.5	0.5		
1975					53	3	22	11	4	7		
1976					1.5		18	24.5	16	40		
1977							15	13	28	42	2	
1978							7	24		58	11	
1979							12	13		63	12	
1980								15		70	13.5	1.5
1981								16		78		6

## (2) MIDDLE AND LATE RICE

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1957	53	47																
1958	75	22	3															
1959	31	5	61	2	1													
1960			45		51.5	3.5												
1961			36		47	12	5											
1962					51	35	14											
1963					11	27	58	4										
1964							49	10	41									
1965							16	9	75									
1966								6	92									
1967								5	91	2	2							
1968								5	85		10							
1969								4	76		20							
1970								4	71		25							
1971								5	18		75	2						
1972									3		74	16	7					
1973											68	20	12					
1974											65	17	18					
1975											59	19	22					
1976											59	16	25					
1977											52	3.5	31	1.5				
1978											40		14	20	15	11		
1979											40		14	25	15	6		
1980											42			22	25		8	3

planted in the Commune are self supplied.

#### 4) FERTILIZATION

One characteristic of East Asian agriculture is the use of fertilizer in large quantities. In order to promote the policy increasing unit yield and the cropping system of five harvests in two years, it is increasingly necessary to supply fertilizer in large quantities. Table 15-18 present the statistics on

TABLE 15 STATISTICS ON FERTILIZER INPUT AND AGRICULTURAL MEDICINE IN THE WHOLE COMMUNE

(1)=native fertilizer (mill. dan) (2)=chemical fertilizer(jin) (3)=agricultural medicine(jin)

	rice			wheat			rape		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1955	145			100			20		
1958	255		80,000	150			50		
1962	264		85,000	210		500	70		2,000
1966	350	1,000,000	92,000	230	20,000		70		2,500
1971	370	1,200,000	90,000	300	210,000		70	157,500	
1977	400	2,000,000	105,000	320	300,000	12,000	70	231,000	5,000
1978	400	2,000,000	135,000	320	300,000		70		
1979	400	2,000,000	132,000	330	320,000		80	240,030	4,500
1980	420	2,100,000	145,000	315	320,000	10,000	100	241,150	4,000

TABLE 16 STATISTICS ON FERTILIZER AND AGRICULTURAL MEDICINE IN THE DONG WANG PRODUCTIVE BRIGADE

	native fertilizer (dan)	chemical fertilizer (yuan)	agricultural medicine (yuan)
*1957-62	15-25 mill.	3,700-5,000	—
*1963-64	22-25	25,200	
1865	26	27,363	4,199
*1966-70	30	35,000	
*1971-73	32	54,000	
1974	33	70,215	9,868
1975	33	60,156	13,406
1976	35.1	72,586	14,205
1977	35.4	75,858	14,357
1978	37.2	102,757	16,096
1979	35.4	105,609	15,749
1980	38.3	108,161	16,991

\* annual average

TABLE 17 STATISTICS ON FERTILIZER INPUT AND AGRICULTURAL MEDICINE IN No. 2 TEAM

(1)=native fertilizer (dan) (2)=chemical fertilizer (yuan)  
 (3)=agricultural medicine (yuan)

	rice			wheat			rape		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1975	23,300	2,874	705		1,072	250	—	120	101
1976	24,500	3,353	605		2,000	150	—	270	130
1977	23,000	3,353	369		2,200	120	—	268	70
1978	26,000	3,505	650		2,350	255	—	490	128
1979	24,000	4,090	650		2,800	255	—	701	128
1980	35,000	5,680	815	12,000	3,020	305	—	1,009	199

TABLE 18 STATISTICS ON FERTILIZER INPUT AND AGRICULTURAL MEDICINE IN No. 15 TEAM

(1)=native fertilizer (dan) (2)=chemical fertilizer (yuan)  
 (3)=agricultural medicine (yuan)

	rice			wheat			rape		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1976	148,000	2,940.7	480	61,440	1,200	80	17,000	300	50
1977	148,000	2,745.35	400	61,440	1,000	70	14,400	350	30
1978	198,400	3,725.75	835.86	61,440	1,200	120	24,000	400	55
1979	198,400	3,569.57	668.79	92,160	1,280.75	118.7	19,200	379.5	52.47
1980	200,000	3,944.27	1,203.26	92,160	1,200	90.1	17,600	420.7	40.27

fertilizer input and agricultural medicines. It is impossible to examine their effect, however, by weight, as a large part of fertilizer depends upon native fertilizer. The data on fertilizer and agricultural medicines were obtained by weight for the whole Commune. Unfortunately, in other units they were obtained by their price. So, it is impossible to precisely compare their effects.

As for the native fertilizer, the comparison between the whole Commune and Dong Wang Productive Brigade in weight is possible. According to this data, the amount of native fertilizer per one unit of land is 239.3 dan in Commune and 125.4 dan in Dong Wang Productive Brigade. The former is twice of the latter. This might be a potential factor of the existence of the difference in unit yields between the former and the latter.

In the whole Commune, 1,567,000 jin of chemical fertilizer were used in 1971, and the amount in 1980 was 2,661,150 jin. It increased 70 percent in 10 years. The average amount of chemical fertilizer used per unit of land is 76.3 jin. Compared with the average used in all of China of 11.13 jin,

this is quite high. During the same period, from 1971 to 1979, the output of grain increased only 7 percent. In contrast, the input of native fertilizer increased 9 percent and the input of chemical fertilizer increased 72 percent. Similar data were also obtained by Dong Wang Productive Brigade.

Of course, all native fertilizer is self supplied. Although this item is considered an agriculture expenditure, it is not a flow of money to the outside. In contrast, 100 percent of the chemical fertilizer is purchased from the outside because the Commune has no factory to produce it. As for agricultural medicine, the rate of self supply is 20 percent. There is a factory which produces 575 ton of agricultural medicine a year. However, this factory produces only one kind of agricultural medicine. Therefore it is necessary to buy the other 80 percent from urban factories.

## 6. Conclusion

As observed, Moling People's Commune's main function in the national economy is crop delivery. In order to maintain this function, the leaders endeavor to increase unit yield. Therefore, in agricultural modernization they have given priority to irrigation and fertilization and seed-breeding. Because this policy, the output of one unit of land has greatly increased and the income per capita has also increased. However, it should be pointed out that the modernization of agriculture has reduced the rate of input output relations. The modernization of agriculture of Moling is promoted by introducing modern agrarian materials from urban areas. This is certainly a reflection of the Commune's relation with urban areas, but this also means that Moling's agriculture is easily affected by the national economy and urban economy. The rate of increased usage of modern materials is higher than the rate of increased agricultural output. The proportion of expenditure on materials such as fuel, chemical fertilizer, agricultural medicine and electricity, to total agrarian expenditure, is increasing more and more. According to statistics of 1980, this proportion was about 61 percent in Dong Wang Productive Brigade. And this leads to a reduction in the rate of profit and to an increase in the cost of agrarian products.

Also, as observed, there is a conflict between agriculture and industry for land utilization. Accordingly, as modernization of the economy continues, problems will occur to some extent in the recent future.