

OFF-FARM ACTIVITIES IN SHUIMO TOWNSHIP

The effect of government policy in the development of off-farm opportunities in Shuimo has been at two levels. As in the rest of China, the Contracting of Production Responsibility to Households (CPRH) system has brought about a number of changes in the household economy. The impact has been more pronounced in the areas of commodity production for the market. At the other level, Shuimo has been receiving assistance from the county government in the development of livestock, particularly pig raising. This assistance was started much before 1978 and included the introduction of pigs of better breed, prevention and control of epidemics and other livestock diseases, and training in pig raising skills. The development of livestock in Shuimo has benefitted from this assistance from the county government.

Types of Off-farm Activity

Two major categories of off-farm employment have been distinguished here: those outside agriculture (non-farm employment) and those within or related to agriculture.

Off-farm Activities outside Agriculture

According to township statistics, there were 76 rural enterprises providing employment to 351 persons or 10.5 per cent of the total labour force in 1990. All the 76 rural enterprises are non-agricultural establishments. Among these, 65 enterprises are privately-owned and 11 are collectively-run, that is, are either owned and run by the township or the village. The total output value of these rural enterprises in 1990 was 1.02 million *yuan*. Non-agricultural income made up 22.3 per cent of the total rural income. This was lower than the county average by about 11 per cent.

In 1977 there were only 115 employees in the rural enterprises in Shuimo. The total output value from these enterprises was less than 52,000 *yuan*. In 1990 not only the employment but also the output value had increased many times.

The major rural enterprises in Shuimo include industrial, building, transportation, and tertiary (commerce, catering, and services) activities. Among the rural enterprises, construction has a predominant place in terms of both the number of employees and the income value. In 1990 the employment in building/construction was 150. This accounted for 42.7 per cent of the total employment and 59.3 per cent of the total output value (Table 4) in rural enterprises.

Building/Construction. The "Shuimo Township Building Team" under the township administration and managed by the CHRP System of is the only building enterprise in Shuimo. It often sub-contracts construction work from the Seventh Construction Bureau of the Ministry of Electricity which is a large State-run construction enterprise in the county. Most of the tasks undertaken by the Building Team are simple but demanding in labour. This speciality has made construction an important rural enterprise.

Table 4: Breakdown of Rural Enterprises in Shuimo

Year: 1990

Items	Enterprises		Employment		Total Output Value	
	No.	Per Cent	No.	Per Cent	'000 yuan	Per Cent
Building	1	1.3	150	42.7	601.80	59.3
Industrial	9	11.8	130	37.0	195.4	19.2
Transport	36	47.4	36	10.3	180.8	17.8
Tertiary	30	39.5	35	10.0	37.4	3.7
Total	76	100.00	351	100.00	1015.4	100.00

Rural Industries. In 1990, excluding the building enterprise and a restaurant, there were nine industrial enterprises under the township or village administration. These included a paper plant, brick, sand quarrying, and prefabrication enterprises - all of which employed more than 10 persons each (Table 5).

Table 5: Industrial Enterprises in Shuimo, 1990

Enterprises	Employment	Output Value ('000 yuan)
<u>Township-run</u>	<u>113</u>	<u>183.1</u>
Paper	31	37.1
Brick	43	45.7
Prefabrication	14	24.3
Sand Quarrying	21	50.7
Farm Tools	2	2.6
Sawmills	2	22.7
<u>Village-run</u>	<u>17</u>	<u>12.3</u>
Farm Tools	6	4.3
Sand Quarrying	5	4.4
Rape Oil Extraction	6	3.6
TOTAL	130	195.4

For a township with about 7,000 people, the industrial base of Shuimo is relatively poor. There are no enterprises that are run privately. Most of the industries have strong "localisation" factors, i.e., the raw materials are all from the locality and, with the exception of the paper plant, a large proportion of the products are sold locally. All employees in the industries are also from Shuimo township itself.

Transportation. All transportation enterprises in Shuimo are individually run. These are mainly self-employment ventures. Most of these are concentrated in Majiaying village. Individual transportation was first established in 1985. In that year, due to the construction project of a State-owned factory, about 110 *mu* of cultivated land was taken over by the State. Many farmers in the village, who lost land because of the project, were paid a considerable sum as compensation. Some farmers used this money to buy mini-tractors. Meanwhile, there were some basic construction projects near the township. This created the demand for tractors. These two reasons encouraged the growth of individual transportation. The drivers who also own the tractors undertake long-distance as well as local transportation. Because of the decline in construction projects, this sector is not doing well at present.

Tertiary Activities. The tertiary sector in Shuimo is made up of retail trade, catering, and services. The common features of the tertiary enterprises are small scale, low profit rate, and diverse functions. Most of the tertiary enterprises are concentrated along the road and central locations. Most of these are also self-employment ventures. There is a total of 30 such enterprises employing a total of 35 individuals.

Off-farm Activities related to Agriculture

Off-farm activities related to agriculture include mainly three sectors, namely livestock, horticulture, and sideline activities. This made up about 50 per cent of the total agricultural income (Table 6) and 47.1 per cent of the total rural income.

Livestock. Livestock is a traditional off-farm activity. Commonly raised animals include pigs, cattle, and fowl.

Pigs are the main livestock raised in Shuimo. Almost every household raises a certain number of pigs. A household has an average of 2.6 head of pigs. Most farmers raise pigs for self-consumption. Pigs also fulfill the demand for manure. In 1990, income from pig-raising was nearly 1.5 million *yuan*. Income from pig-raising made up 34.6 per cent of the total agricultural income. According to township records

Table 6: Breakdown of Agricultural Income in Shuimo

Total Agricultural Income (<i>yuan</i>)	Cropping Income (<i>Yuan</i>)		Non-cropping Income (<i>Yuan</i>)					
	Crop total	Grain only	Non-crop total	Horticulture only	Husbandry		Side-line	Fishing
					Total	Pig raising only		
4,328,462	2,168,042	1,739,833	2,159,975	120,898	1,634,710	1,495,769	404,367	445
Per Cent of total	50.1	40.2 (80.2)	49.9	2.8 (5.6)	37.8	34.6 (91.5)	9.3 (18.7)	*

Source: Statistics of the Rural Economy in Shuimo Township

Note: Figures in parentheses are percentages of respective sub-totals.

* Less than 0.1 per cent.

171,705 kg of pork were sold in 1990. This is 45.6 per cent of the total pork production (Table 7). This indicates its important role in both agriculture and in the rural economy. At present, pig raising is still based on traditional skills, and the output and profits are not high. There is no household specialised in pig-raising in Shuimo as yet.

Table 7: Basic Information about Livestock in Shuimo (1990)

	Pig	Cattle	Sheep	Poultry		Total
				Birds	Bee (box)	
No. raised	3,684	339	510	11,283	85	
Meat production (kg)	376,452	-	-	1,382		
Per Cent of meat production sold	45.6	-	-	81.3		100.00
Eggs (kg)				27,188		
Per Cent of egg production sold				50.4		
Total Income (yuan)	1,495,769			138,541	400	1,634,710
Per Cent of Total Income from Sales	46.3			53.1	100	47.0

Source: As for Table 6

Cattle is used mainly for draft power. In 1990, there were 339 head of cattle, every 4.4 households had one head of cattle. Before the 1960s there were many sheep but now sheep raising has declined rapidly because of the limited market demand and the lack of grazing land. In 1990, there were only 510 head in the whole township.

Every household keeps poultry, mainly chickens. Other fowl include ducks and geese. Beekeeping is also an activity pursued by some households. Poultry is an important auxiliary source of cash for most farm households.

Horticulture. Unlike in the northern part of Wenchuan County, climatic and soil conditions in Shuimo township are not fit for the growth of apples, Chinese peppers, and other common fruits found in northern areas. Apples and peppers are staple horticultural products in Wenchuan County and have a lucrative market. Many farm households plant a few species of fruit trees just for self consumption.

For a long time, tea was the main horticultural crop in Shuimo. Before 1984, there were large tea gardens which were collectively owned, and Shuimo was an important base of tea production in Wenchuan County. Since 1984, the tea gardens have degenerated rapidly because of two reasons. The first reason is that no one paid attention to the management of existing tea gardens because the gardens were also contracted out to farm households. The second is that local people, including both township officials and farmers, think local tea is not profitable and does not have a good market. In 1990, the total output of tea was approximately 22,112.5 kg, and the income was only 29,225 yuan (Table 8).

Table 8: Output and Income from Horticulture and Forests (1990)

	Output	Income (yuan)	Per Cent of Output Sold	Income from Sale (yuan)
Tea	22,113.5 (kg)	29,225	85.2	21,044
Timber	295 (m ³)	76,076	100.0	76,076
Bamboo	30,000 (kg)	4,050	100.0	4,050
Lacquer	455 (kg)	10,920	100.0	10,920
Fresh Fruit	100 (kg)	262	73.9	201
Walnuts	20 (kg)	165	38.0	72
Other Dried Fruits		200	80.0	160
Total		120,898		112,523

Source: Statistics of Rural Economy in Shuimo Township, 1990

Shuimo has natural conditions favourable for the production of timber and bamboo and was selected as a base for afforestation by both the prefecture and county in 1980. Since then, a large area of uncultivated land has been afforested. Now plants have grown large enough to be selectively harvested, but most of the income from timber does not go to the local villages and farmers. Timber is State property. The villages and concerned farmers can receive only 20 per cent of the total income from timber. Villagers and farmers can only use the woods in areas contracted to them. The felling of trees is strictly controlled by the Government because of the forest protection policy. Therefore, the amount of timber cut down in Shuimo is small although the forest area is large. In 1990, only 295 cubic metres of timber were harvested from Shuimo forests.

Bamboo groves are widespread in Shuimo. There are many species also. But bamboo has not been used properly. In 1990, the income from bamboo was only 4,050 yuan.

Medicinal Plants. From 1985 some farmers have started to plant three species of trees used in traditional Chinese medicine. These are *HuangBo* (*Phellodendron*), *Duzhong* (*E. ulmoides*), and *Houpu* (*M. officinalis*). Local biological conditions are ideal for the growth of these plants. These are known as *Shanmuyaochai* by the local people, and this literally means "three medicinal plants". The profit margin from these medicinal plants is quite high. According to rough estimates based on current market prices, the expected net income of *Shanmuyaochai* would be: *HuangBo*, 1000 yuan/year/mu; *Duzhong* 3,000 yuan/year/mu, and *Houpu* 300 yuan/year/mu respectively. These incomes are higher than those of other existing crops. Because of the big profit, *Shanmuyaochai* has been selected as a key income generating project by both the township officials and local farmers. There is a rising enthusiasm for cultivating these plants. In 1990, the village of Lianshanpo alone, 480,000 saplings of *Duzhong* and *Huangbo* have been planted.

Lacquer and *moyu* are other cash crops in Shuimo. Although the output of lacquer was only 455 kg in 1990, it has significant potential. *Moyu* (a kind of tuber which is thought to be very nourishing) used to be a widely cultivated traditional crop in Shuimo. In the 1930s, the output of *moyu* was about 250,000 kg per year. The emphasis on cereal grains in later years led to the neglect of *moyu*.

Sideline Activities. Sideline activities in Shuimo mainly include seasonal jobs, weaving bamboo articles, and professional trades such as carpentry, bricklaying, and blacksmithing. The total income from sideline activities in 1990 accounted for 9.3 per cent of the total agricultural income. Seasonal jobs, which include construction (irrigation, road building) and logging, are activities that take place within the county during the slack farming season.

Spatial Variations in Off-farm Activities

The variations in off-farm activities within agriculture between mountain and valley villages are not that wide, although the valley villages have definite advantages. It is estimated that 57.3 per cent of the total income from off-farm activities within agriculture is generated from valley villages. In terms of off-farm activities outside agriculture, however, 91.2 per cent of the income is generated in valley villages.

The areas in which mountain villages have advantages include horticultural and medicinal plants such as *Phellodenidron* and *E. ulmoides*. Valley villages, naturally, have a larger concentration of rural enterprises as well as tertiary services and transportation activities. Among the township-run enterprises, only one sawmill is located in a mountain village. Over 70 per cent of the workers in Shuimo Building Team are from valley villages. The prospects for sideline activities are also greater in valley villages.

The demand for *moyu*, both domestic and international (particularly Japan), has been on the rise in recent years. It is estimated that one *mu* of *moyu* can bring in over 200 *yuan* net income. This is a considerable source of cash income. At present *moyu* production is on a very small scale. The main constraint is that *moyu* saplings are not easily available.

Labour Demand for Major Activities

Labour demand for major crops was estimated on the basis of information derived from the household survey. Among the crops grown in Shuimo, maize is the staple crop and is the most labour intensive. One *mu* (15 *mu* = one hectare) of maize requires a total of 30-35 *gongs* (one *gong* = a labour day of 8 hours). This includes 10-12 *gongs* of ploughing and land preparation; two *gongs* for sowing; two to four *gongs* for manuring; eight to ten *gongs* for weeding (which is normally done twice); and six to seven *gongs* for harvesting and storage. Wheat requires about 18 *gongs* per *mu*. The labour demand for raising pigs is difficult to estimate because the demand decreases with the rise in the number of pigs. Pig raising is also a labour intensive activity, second only to maize. *Shanmuyaochai* requires only about five to six *gong* per *mu* whereas *moyu* needs only three *gongs* per *mu*. Both these crops do not demand much labour except during planting and some manuring.

Potential Off-farm Activities in Shuimo

On the basis of information from key informants as well as from the sample households, pig raising, horticulture (medicinal plants), and sideline activities appear to be the off-farm activities with the most potential in Shuimo.

Pig-raising in particular has advantages both for farming and non-farming activities. Medicinal plants like *Shanmuyaochai* have considerable advantages from the point of view of environment because these can be grown on uncultivated, marginal lands and along hill slopes. The experiences in neighbouring counties with similar natural conditions show that the potential of these medicinal plants is considerable in Shuimo. The only problem is that it takes five to six years for *Phellodenidron* to be mature (to yield the bark from which traditional medicine is made). For *Encommia ulmoides*, the maturation time is six

to eight years. Although cultivation of these plants brings in more cash, the farmers express the fear that change in the policy regarding CPRH would be disastrous for farmers cultivating these plants. Others also expressed the fear that the trees, once they are mature, might be stolen.

The potentials of *moyu* have been dealt with earlier. However, there is a scarcity of *moyu* seeds and it is only since 1988 that most farmers have come to realise the demand for *moyu*. One of the additional advantages of *moyu* is that it can be interplanted with maize and wheat. While the tuber is used for food, the plant is good fodder. Before 1950 there were seven private mills processing *moyu*. Many old people do still have the requisite skills.

Other activities with potential include tea plantations, bamboo, pears, lacquer and grapes. Bamboo articles have a considerable market demand and their manufacture could be an important sideline activity.

Factors Affecting Off-farm Employment in Shuimo

A number of factors have contributed to as well as inhibited the growth of off-farm activities in Shuimo Township. Some of the major factors will be discussed under the headings below.

Support to Livestock Development

As indicated earlier, pig raising in Shuimo has been assisted by the county government as this area was known for pig-raising even before 1978. Although this assistance has contributed to the growth of the activity in Shuimo, there are no households as yet that specialise in this activity. There is, however, enough scope for such development in the future.

Support to the Construction Sector

Shuimo Township Building Team is a major source of off-farm income and employment in this township. The Building Team has received assistance from the Seventh Construction Bureau in terms of both technical guidance and contracts.

Learning from Neighbouring Townships

After the economic reforms, particularly after 1980, the county government placed a lot of emphasis on the development of apples and peppers. However, since this township did not have natural conditions favourable for the development of such fruits, no aid or assistance was provided by the county government. It was only in 1989, when township and village leaders visited a neighbouring county to share experiences, that the potential of medicinal plants, such as *Phellodenidron* and *Encommia ulmoides*, in Shuimo was realised. During the past two years the county government has begun to provide saplings of these plants at subsidised prices and has encouraged farmers to plant these on the contracted hill lands.

Market Opportunities

The products of most village and township-run enterprises, such as bricks, prefabricated components, sand, farm tools, and wood, are mostly sold in the local market or markets within the county. Paper is the only product that has a market outside the county and province in southeastern China.

The township building team has, in the past, been involved in building bridges, hydropower stations, and irrigation structures among other things. However, the number of persons employed in the building teams has declined slightly since 1989 as a result of the reduction in construction activities. Most workers are engaged in building activities for almost nine months in a year.

Livestock products, particularly pork and piglets, have a market both within the township and within the town of Xiankao. Xiankao, which has a population of 11,000 (with non-agricultural identify cards (IDs), has a great demand for livestock products and prospects of specialisation in this area are significant.

Moyu, as indicated earlier, has a market domestically as well as in southeast Asia. This market has led to the growth of private merchants dealing with *moyu* who come from outside the county. Similar market opportunities exist with respect to *Phellodenidron* and *E. ulmoides*.

Capital and Technology

Capital for most rural enterprises has been generated locally by the township government or individually. The Paper Plant was set up with loans (36.4 per cent of total investment) and government aid funds (27.2 per cent) for technology innovation. Township enterprises that run at a loss are to a certain extent subsidised by the County Enterprise Bureau. For enterprises such as the Building Team, which is a major source of off-farm employment, the Township Enterprise Office has been offering financial assistance for technical training. Bank loans have also been provided for individual transport (up to 40 per cent in some cases). It is the livestock sector that has not received assistance from financial institutions in spite of the fact that considerable extension assistance has been provided in this area.

Food Grain Self-sufficiency

The drive for food grain sufficiency in the 1960s had a negative impact on the development of medicinal plants and *moyu* in this township. Although the production of maize, and later wheat, increased, the advantages that could have been derived from specialisation were foregone. At present (1990) Shuimo township produces 501.5 kg of grain per capita per year while the county average is only 446 kg per capita per year. About 6.8 per cent of the grain output is sold. This proportion is higher than that for the county (2.9 per cent) as a whole. As in other townships, maize is bartered for rice in the Township Grain Purchasing Station managed by the Government.

Role of Tradition

The lack of knowledge and adequate information on the market economy has remained a factor affecting the growth of off-farm employment. Also, traditional notions of expenditure on weddings and house construction are so strong that the bulk of the cash income goes into these activities. Risk aversion is typical of highlanders in China.

Spatial Variations in Labour Demand and Supply

In Shuimo township the valley areas (villages like Majiaying and Maopingzhi) have a greater supply of labour and so there is what could be termed "surplus" labour in these areas. On the other hand, in mountain villages, like Tengchaoping, there is a shortage of labour for essential farm and off-farm activities. In these villages life is a little difficult because of a lower economic level and so many young

people migrate to the valley settlements. Tengchaoping village had a population of 350, 15 years ago; it has the same population now. One group of households in Lianshanpo had 160 residents 15 years ago; it has 110 now. In one group of households in Dayandong village there were 80 farmers in 1983; there were only 40 in 1981. Shortage of labour has meant that even the lucrative off-farm activities, such as the collection of medicinal plants, cannot be undertaken.

In addition to those noted above, other factors like the poor state of the road and communication infrastructure, lack of adequate extension, and lack of training affect the level and extent of off-farm employment in Shuimo township.

The Contribution of Off-farm Income to Farm Households

Information gained from surveying the income breakdown of sample households indicates that off-farm activities are playing a more and more important role in the economic and daily life of most farmers. Some basic information about the sample households is presented in Table 9. Table 10 presents the income breakdown of the households.

Table 9: Basic Information from Sample Households (1990)

Number of Sample Households	Population	Labour Force	Cultivated land (<i>mu</i>)	Sowing area (<i>mu</i>)	Fixed Assets for Production (<i>yuan</i>)	Animals cattle (head)
48	286	153	483.4	653.74	33,351	7

Source: Sample Household Survey

In Table 10 (i) gross income means the total of all kinds of income received, including income both in kind and in cash; (ii) cash income means the cash actually received by selling goods or providing services; and (iii) income from building is paid in variable wages and is not fixed.

It is evident that the cropping sector is predominant in the context of income. This brings in to focus the farmers' dependence on subsistence cereal production. Agriculture in these sample households is for subsistence. However, the total gross income of all off-farm activities taken together surpasses income from cropping. In the case of cash income the case is different. The share of cropping decreases sharply. It is only 12.4 per cent. This shows the important role of off-farm activities. Livestock play a critical role in both gross income and cash income. In gross income, they contribute 36.5 per cent and in cash income the share goes up to 47.7 per cent.

Sidelines are an important source of cash income. In the cash income structure, the earnings from sidelines contribute 20.8 per cent of the total income.

The role of non-agricultural activities (rural enterprises) in income structure is not as important as off-farm activities within agriculture. Their total share in gross and cash income is only 7.3 per cent and 16.2 per cent respectively. Among non-agricultural activities, tertiary services contribute 5.3 per cent and 11.9 per cent of the total gross income and cash income respectively.

In short, off-farm activities are mainly within agriculture and livestock and sideline activities are the two critical ones. Off-farm activities outside agriculture do not play a key role in the income of farm households.

Table 10: Income Breakdown of Sample Households (1990)

	Gross Income		Cash income	
	yuan	per cent	yuan	per cent
Cropping	96740	45.1	11845	12.4
Horticulture and Forestry	3836	1.8	2692	2.8
Livestock	78186	36.5	45732	47.7
Sidelines	19933	9.3	19933	20.8
Fishing	200	0.1	140	0.2
Industries	1500	0.7	1500	1.6
Transportation	2400	1.1	2400	2.5
Building	-	-	-	-
Tertiary Sector	11360	5.3	11360	11.9
Other Trades	272.50	0.13	272.50	0.3
Total	214427.50	100.00	95874.5	100.00

Source: Sample Household Survey