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# ANALYSIS ON POVERTY IN MOUNTAIN AREAS BASED ON OFF-FARM INDUSTRIES

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**ABSTRACT**: This paper reveals that agricultural growth trend in China is strongly correlated with the growth of off-farm industries—the curve of net income from off-farm industries reflects the general characteristics of net income of households. That means the increase of net income of farm households is chiefly from off-farm industries, more than from agriculture. The authors therefore conclude that the "poverty" in mountain areas or the gap between mountain areas and plain areas lies in the underdevelopment of off-farm industries in mountain areas. Finally, the authors make suggestions of strategic adjustment of economic structure: 1) present situation of mountain areas in China should be fully considered; 2) a full industrial system is not our desire; 3) advantageous industries should be promoted to create famous products; 4) industrialization and urbanization in mountain areas should be promoted and so on.
**KEY WORDS**: regional developmental difference; off-farm industry; per capita net income; mountain areas of China

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## 1 INTRODUCTION

China is a country with a large area of mountains and concurrently a country with a relatively small arable land per capita. It has been a key national economic activity to meet the demand for food. Since the rural economic reform in 1978, China has made a rapid growth in agriculture. The supply for food has shifted from shortage in total to surplus in structure. At present when people's basic need for food and clothes in mountain areas has been met, the sustainable, healthy and harmonious development of China's national economy will, at a large extent, depend on farmers' income in mountain areas. How to consolidate achievements and to increase farmers' income in mountain areas has been not only a problem to be tackled in the new century, but also a practical necessity to maintain a stable society and a sustainable economic development in China.

Before the 1980s, Chinese researches on regional sciences seldom focused on regional development differences due to the centralization of state power and planned-economic system. At the same time, most of them paid more attention to regional policy analysis catering for the slogans instead of case study. The practice of Reform & Open Policy and the building of market economic system promote local economic development. However, the disparity among regions is becoming larger and larger, which attracts the attention of governments and in turn drives the researches on regional development. So, recently, many papers about regional economy have been issued in China, such as, *Regional Economics* (ZHOU and LIU, 1989), *Research on Regional Development in China* (YANG Kai-zhong, 1989), *Location Theory* (YANG Wu-yang, 1989), *Regional Development and Its Spatial Structure* (LU, 1999), *Regional Development Strategy* (FANG, 2002). But, researchers were interested in macro-scales, such as *three belts* (Chinese mainland territory is often divided into the East, Middle and West belts), and seldom did some researches based on landforms, especially for mountains and their poverty alleviation. In the 1990s, some took up mountain poverty, but they mainly focused on agricul-

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tural natural resources, human employments (CHEN and LI, 1996; CHEN and YANG, 2000), and infrastructures(CHEN, 1992a, 1992b, 1993, 1995a, 1995b, 1997, 1998a, 1998b, 1999), less on off-farm industries (CHEN and WANG, 2002a,2002b.).

To fill the gap, this paper does a research based on off-farm industries levels.

## 2 PRESENT STATES OF OFF-FARM INDUSTRIES IN CHINA

Industrial economics shows that agriculture is under the influence of both the law of declining return and the law of low elastic demand for agricultural products when society is in the transition stage from "meeting basic demands" to "living a relatively comfortable life". Forced by comparative return, labors will transfer from primary sectors to secondary and tertiary sectors. In order to reflect present agricultural development in China, the data, from *Empirical Analysis of Farmers' Income in China during the Ninth Five-year Period from 1996 to 2000* (The Office of Policy Research of Central Government and Agricultural Ministry'rural monitoring net-work in China, 2001), have been reorganized to indicate the net income of farmers in China (Table 1). The approach is as follows:

Net income = net income from agriculture + net income from off-farm industries

Income from agriculture = income from farming +income from forestry + income from livestock + income from fishery

Table 1 shows that the net income of farmers in China has constantly increased in recent ten years and particularly percentage of off-farm industries in farmers' income has been gradually increased. However percentage of income from agriculture has been decreasing since 1995 and its contribution rate to net income of farm household has reduced, which has led to the declining trend of the increment of farmers' average income per capita after 1998. The declining increment of output value in agriculture after 1995 indicates that market of agricultural products has turned into a state of relative surplus of supply from the shortage of supply, and the total expansion of agricultural production can no longer bring farmers more income. Increase of output in agriculture does not mean increase or proportional increase in farmers' income. A sharp contrast is the development of off-farm industries as output value of off-farm industries per household in 1995 was 4899.76 yuan (RMB), which had surpassed the output value of agriculture (4760.99 yuan) for the first time. Contribution rates of off-farm industries and agriculture to net income of farmers

Table 1 Income of farm household and its change of composition in 1990–2000

| Item | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|
| Average net income per household(yuan) | 3920.16 | 9660.75 | 10392.66 | 10572.6 | 10229.68 | 10260.31 | 10651.06 |
| Average net income per household from agriculture(yuan) | 2189.55 | 4760.99 | 4827.75 | 4552.89 | 4390.66 | 3098.70 | 3760.78 |
| Average net income from off-farm industries(yuan) | 1730.61 | 4899.76 | 5564.91 | 6019.71 | 5839.02 | 6351.61 | 6890.28 |
| Percentage of agricultural output(%) | 55.85 | 49.28 | 46.45 | 43.06 | 42.92 | 38.10 | 35.31 |
| Percentage of off-farm industries(%) | 44.15 | 50.72 | 53.55 | 56.94 | 57.08 | 61.90 | 64.69 |

Source :The Office of Policy Research of Central Government and Agricultural Ministry' Rural Monitoring Net-work in China, 2001.

have respectively reached 49.28% and 50.72%. Up to 2000 the difference between off-farm industries and agriculture has widened, as contribution rates of them have respectively been 64.69% and 35.31%. All these show that income earned by farmers from doing temporary jobs in cities and in enterprises has been a main source for increment of net income of farm household. It is indicated that agricultural growth trend in China is strongly correlated with the growth of off-farm industries; the curve of net income from off-farm industries reflects the general characteristics of net income of agriculture (Fig. 1). That is to say that increase of net income of farm households is chiefly from off-farm industries, more than from agriculture.

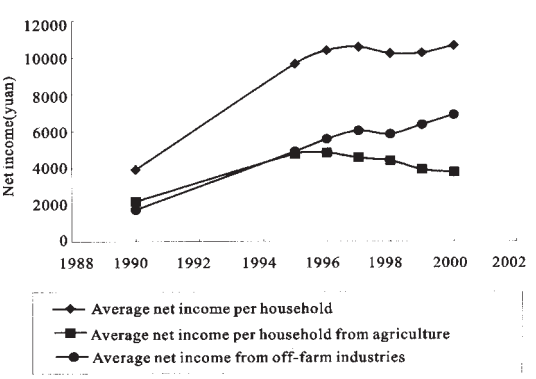


Fig. 1 Fluctuation trend of farm household's income in China (1990–2000)

## 3 A CASE STUDY

### 3.1 Macro-scale: a Comparison among Mountain Areas, Hilly Areas and Plain Areas

Economic development in 2000 showed that although the number of counties in plain areas is 31% of the total number of counties in China, the GDP accounts for 46% of total GDP, and GDP in counties in both hilly and mountain areas makes up only 54% but with the number of 69%. Table 2 indicates that GDP per capita in mountain areas, hilly areas and plain areas are respectively 4194.16 yuan, 5424.76 yuan and 6333.91 yuan. It means that per capita GDP in mountain areas is less than that in hilly areas and per capita GDP in hilly areas is less than that in plain areas. The percentages of added value of agricultural output in GDP are respectively 29.20%, 26.56% and 25.53% in mountain areas, hilly areas and plain areas, which imply that the percentage in mountain areas is more than that in hilly areas, and that in hilly areas is more than that in plain areas. If the added values in secondary sector and tertiary sector are added together or in term of output value of off-farm industries, the percentages of added value of off-farm industries in GDP are 70.79%, 73.34% and 74.78% respectively in mountain areas, hilly areas and plain areas, with a increasing trend. Considering the general macro-economic development in China in 2000, the GDP per capita in mountain areas is less than that in hilly and plain areas, but the added value of agricultural output in mountain areas is higher than that in hilly and plain areas. There is no much difference in added value of agricultural output per capita in mountain, hilly and plain areas as the added value per capita is only 393.1yuan less than that in plain areas, and it is 76.65% of that in plain areas. In terms of added output value of off-farm industries per capita, it is 1766.7 yuan in mountain areas, which is less than that in plain areas (as it is 62.70% of that in plain areas). Therefore the difference in net income per capita between mountain areas and plain areas is chiefly due to difference in development of off-farm industries.

Table 2 Comparison of rural economic development (for counties and county-level cities) in 2000

| | Mountain areas | Hilly areas | Plain areas |
|---|---|---|---|
| Number of counties | 901 | 532 | 646 |
| Area ($\times 10^3 km^2$) | 4363.513 | 2055.077 | 2581.820 |
| Total population ($\times 10^6$) | 295.90 | 281.12 | 365.71 |
| Population density (persons/$km^2$) | 67.81 | 136.79 | 141.65 |
| Rural population ($\times 10^6$) | 253.76 | 236.96 | 307.29 |
| Per capita GDP (yuan) | 4194.16 | 5424.76 | 6333.91 |
| Added output value of primary industry per capita (yuan) | 1224.8 | 1445.9 | 1597.9 |
| Per capita added output value of off-farm industries (yuan) | 2969.3 | 3978.8 | 4736.0 |

Source: National Bureau of Statistics of China, 2001

### 3.2 Meso-scales: a Comparison between Mountain Areas and Delta Areas of Zhujiang (Pearl) River Delta in Guangdong Province (Eastern Region of China)

Comparing the 50 mountainous counties and the Zhujiang River Delta in Guangdong Province (Table 3) (Guangdong Statistical Bureau, 2001), the following conclusions can be reached:

Table 3 Comparison of the mountain areas and plain areas in Guangdong Province in 2000(yuan)

| Region | Per capita GDP | Per capita agricultural added output value | Per capita offfarm industrial added output value |
|---|---|---|---|
| 50 mountainous counties | 5687.35 | 1818.60 | 3868.80 |
| Zhujiang River Delta | 31989.54 | 1858.60 | 30130.94 |

(1) The average per capita GDP in the developed areas of the Zhujiang River Delta is much higher than that in the 50 mountainous counties. The added output value of agriculture per capita in the two types of areas has not much difference, as the added output value in the mountainous counties is slightly lower (about 40 yuan) than that in the developed delta areas. The added output value of off-farm industries per capita in the area of the Zhujiang River Delta is, however, much higher than that in the 50 mountainous counties with a difference of 26 262.14 yuan. The backwardness of economy in mountain areas is mainly due to underdevelopment of off-farm industries.

(2) As for agricultural production, the area in the Zhujiang River Delta is more advantageous in water and thermal resources and has a higher potential agricultural productivity, but it has met a problem of having no increase of income despite of an increase in agricultural output due to law of declining return and law of low elastic demand for agricultural products. In contrast, agriculture in mountain areas often has a high

input-output rate due to its labor-intensive and diversity & scarcity of agricultural products in mountains. The net income per acre from agricultural production in mountain areas is therefore high.

(3) In term of off-farm industries, there is a big difference in both economic structure and development level between the delta area and mountain areas. Regarding industrial structure, ratio of income from agriculture and that from off-farm industries in the developed delta areas is below 5.81∶94.19. It means that most income is from secondary and tertiary industries, and tertiary industry has a higher contribution rate to per capita GDP than secondary industry. In contrast the ratio of income from agriculture to that from off-farm industries in the 50 mountainous counties is over 32.0∶68.0, which means that income in mountainous counties is mainly from primary and secondary industries. As for industrial development level, the secondary industry in the developed areas, for instance, is chiefly composed of processing and assembling industries with high added value, taking characteristics of post industrialization. The secondary industry in mountain areas, however, is composed of primary processing of agricultural and mining products with low added value and low technical requirement, taking the characteristics of economy in early industry.

### 3.3 Micro scale: a Comparison Between Chengdu Plain and Mountain Areas in the Western Sichuan (the Western Region of China)

In order to illustrate the spatial difference in economic development level between mountain areas and plain areas in the western region of China, a comparison between Chengdu Plain and the Western Sichuan is made. Five counties in Chengdu Plain have been randomly selected (they are Shuangliu, Guanghan, Xindu, Wenjiang and Pixian) and five counties have also been selected respectively in the Garzê (namely Kangding, Luding, Yajiang, Garzê and Batang) and Aba prefectures (namely Aba, Lixian, Songpan, Jiuzhaigou and Barkam) in the western Sichuan. The average per capita GDP, the added output value of agriculture per capita and that of off-farm industries per capita in the above 15 counties have been processed (Sichuan Statistical Bureau, 2001).

The results (CHEN and WANG, 2003) show that the average agricultural output per capita in plain and mountain areas are both lower than 2000 yuan without much difference, but the difference is great in output value of off-farm industries between plain and mountain areas. The output value of off-farm industries accounts for about 90% of GDP in plain areas, but in mountain area it is 70% of GDP. The authors therefore conclude that the "poverty" in mountain areas or the gap between mountain areas and plain areas lies in the underdevelopment of off-farm industries in mountain areas.

## 4 STRATEGIES AND APPROACHES FOR DEVELOPMENT OF OFF-FARM INDUSTRIES IN MOUNTAIN AREAS

At present on condition that per capita net income growth rate of farmers in mountain areas is not so high, it is the best time to promote adjustment of rural economic structure since backward productive forces are under great pressure and strategic adjustment of economic structure (including state-level adjustment and decision of local governments) are desired. Concurrently there are both opportunity and challenge for development. Adjustment of economic structure is a process to redistribute economic interest and to reallocate resources, so social pressure should be fully considered, particular the interest of disadvantaged group, in order to have a stable society.

The following key points should be emphasized in establishing off-farm industries in mountain areas:

(1) Present situation of mountain areas in China should be fully considered. In China where there is a large population with a high unemployment rate, both labor-intensive and technology-intensive industries should be remained for some years as an approach to solve the problem of unemployment, and they have advantages in international competition.

(2) A full industrial system is not our desire. Many mountain areas in China have a complete system of industries and there are often many similarities in industrial structure in different mountain areas. Specialization in industries and social cooperation has not formed in many mountain areas. Each mountain area should take its own advantage to develop its advantageous industries and enterprises equipped with advanced technology. By spatial transfer of industries, transfer of technology, support and cooperation based on mutual exchange with developed areas, mountain areas should have a rapid development.

(3) Advantageous industries should be promoted to create famous products. In order to develop famous products, we should utilize resources with local characteristics and traditional cultures to develop products

with a promising market, a high economic efficiency and a high social reputation by high and new technology and methods. At present when there are no advantages for mountain areas regarding technology, scale production, they should take their own advantages in resources, particularly the local unique resources.

(4) Industrialization and urbanization in mountain areas should be promoted. The first step is to promote development of tertiary industries, particularly service industries like intermediary institutions, real estates, tourism, finance, insurance, transportation and telecommunication, in order to better support the primary and secondary industries. Urbanization in mountain areas is not simple accumulation of population but a natural transfer of population and labors with economic development and prosperity. Urbanization can become possible only when rural economic development level has been enhanced with a high income and high living standard for farmers. In the process of urbanization, it is desired to promote urban construction and to perfect urban functions, to make cities or towns a center of processing and circulation. It is also necessary to strengthen construction of urban centers in mountain areas or in the interleaving between mountain areas and plain areas, to enhance their ability of accommodating a larger population and supporting rapid economic development in mountains.

(5) Nurture mechanism of risk investment with private capital as its main component and governmental investment as its auxiliary part.

(6) Promote institutional innovation as to nurture markets in mountain areas, particularly the capital market, labor market and technology market.

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