



# **Mountain Population and Employment**

**Discussion Paper Series**

## **OFF-FARM EMPLOYMENT IN THE HENGDUAN MOUNTAIN REGION OF SICHUAN PROVINCE, CHINA**

**Chen Guojie, Chen Zhijian, Huang Xiyi,  
Wang Fei, Yu Side, Zhang Jun**

*MPE Series No. 12*

such as qualitative-oriented research involves both reviews and field studies. The review of the "Mountain Farming Systems" Programme of ICIMOD focus on different level development.

a series of "state of the art" reviews on agricultural policies and programmes in the mountainous areas of the world. The policies and programmes have been sponsored by the Ministry of the FAO Region. The purpose of these studies was to understand the constraints of mountain development. These studies were also used in preparing comprehensive development, agriculture and marketing in different countries.

the paper entitled "Transformation of Mountain Agriculture: World Case Studies" were also published during 1988-1993. The paper focuses on

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## PREFACE

The research on off-farm employment in the Hengduan Mountains began in September, 1990. This report is based on the first phase. The selection of this region for study was based on the following reasons: (a) this region is a part of the Qinghai-Xizang Plateau and, hence, a part of the Himalayan Region. The landscape and economic situation are similar to those in neighbouring countries; (b) this area is a microcosm of undeveloped mountains in West China; this makes it possible to extend the validity of the research results to these mountains in general; (c) the contours in this region make the border quite distinct from the Sichuan Basin and other regions; and (d) the inhabitants consist of mostly minority nationalities and the area is rich in natural resources, but it is one of the most difficult regions in the context of bringing about changes in the rural labour force.

This report is one of a series covering mountain areas in three countries and was guided by Dr. Deepak Bajracharya and Dr. Pitamber Sharma from the International Centre for Integrated Mountain Development (ICIMOD). The outline for the report was discussed and eventually finalised by the participants of the first Planning and Review Meeting in Chengdu in November, 1990. The participants included representatives from ICIMOD, China, Nepal, and Pakistan. The outline was, therefore, a result of collective efforts.

Several authors contributed to this report. Chapter One was written by Chen Guojie and Zhang Jun; Chapter Two by Wang Fe; Chapter Three by Yu Side; Chapter Four by Chen Guojie, Yu Side, and Huang Xiyi; Chapter Five by Chen Zhijian; Chapter Six by Wang Fei; and Chapter Seven by Chen Guojie.

The first draft was completed in March, 1991, and submitted to ICIMOD. Based on the comments and suggestions received from ICIMOD, we modified and reorganized some chapters. In the Second Planning and Review Meeting held at Peshawar, Pakistan, from May 18 to June 5, 1991, the revised report was discussed and commented upon again by the participants. Dr. Deepak Bajracharya offered invaluable advice for further improvements. I take this opportunity to thank all the friends who worked with me over the years. In particular, I would like to thank Dr. Deepak Bajracharya and Dr. Pitamber Sharma for their help and friendship.

In this report, we have made an effort to comply with both the content and form as suggested by ICIMOD. This should be comparable, therefore, to the other reports by the teams from Nepal and Pakistan. At the same time, we have tried our best to highlight specific characteristics and issues pertaining to China. We hope that readers will find these useful and interesting.

Chen Guojie  
Team Leader  
Chinese Study Team



## Foreword

The present discussion paper by Chen Guojie and colleagues, entitled "Off-farm Employment in the Hengduan Mountain Region of Sichuan Province, China" constitutes one of the three studies on the current state of off-farm employment in selected mountain regions in the Hindu-Kush Himalayas. The studies were initiated by ICIMOD in conjunction with the Programme on Population and Off-farm Employment. The general objective of the programme is to identify viable off-farm alternatives and promote practical approaches to employment generation, income enhancement, and sustainability of mountain environments.

The programme is based on the premise that the promotion of off-farm employment and income opportunities in mountain communities is imperative in order to counteract the gradual breakdown of stable relationships between population, economy, and environment. In the absence of adequate employment and income opportunities, rural mountain communities are continually faced with increasing poverty which leads to migration from the hills and rapid environmental deterioration. Comparative advantages provided by mountain conditions and resources must therefore be used as the basis for promoting off-farm opportunities. Further, a systemic perspective is essential to analyse the constraints as well as the potentialities of off-farm employment.

A number of diverse off-farm activities are presently undertaken by mountain households in the Hindu Kush-Himalayas. While many such activities can be labelled "distress employment" because they are not remunerative enough, there are also areas where considerable opportunities exist. Further, off-farm employment in the mountains has been a matter of considerable policy concern and a number of programmes have been implemented in recent decades.

In this context the major purpose of the present study is

- (i) to apply a comprehensive analytical framework to assess critical issues and options in off-farm employment;
- (ii) to determine data and information requirements and identify gaps to facilitate the promotion of off-farm employment;
- (iii) to develop qualitative and quantitative criteria of "success" and identify "constraints" in the promotion of prominent and potential off-farm activities, based on the examination of experiences from different countries;
- (iv) to synthesise experiences from different mountain regions of the Hindu-Kush Himalayas and develop institutional and organizational guidelines, as well as investment and implementation options, for the promotion of environmentally sound off-farm employment activities.

The present study is basically a review and assessment of the off-farm employment situation in the Hengduan Mountain Region of Sichuan Province, China. This study sets the stage for a more in-depth and location-specific analysis of prominent/potential off-farm activities that will be carried out in the second phase of the study and will be published in this series.

This study was made possible by a grant from the International Development Research Centre (IDRC), Canada for which I am extremely grateful. ICIMOD was also fortunate to have working on this study professionals from various national institutions in China, Nepal, and Pakistan. Mutual consultations and a review of on-going and completed work were held at workshops in Chengdu, Sichuan Province, China, and Peshawar, NWFP, Pakistan. The methodological framework and the structure of the studies were mutually agreed upon by participating researchers. From ICIMOD's side the programme was coordinated and executed by Dr. Deepak Bajracharya (now with UNICEF) and Dr. Pitamber Sharma.

Readers might be interested to know that all of the three case studies mentioned above, including the present one, are brought out in the Discussion Paper Series of the Mountain Population and Employment Division. ICIMOD is hopeful that these studies will contribute to a better understanding of the problems and prospects of off-farm employment in the mountains.

E.F. Tacke  
Director-General



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## INTRODUCTION

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### Significance of Off-Farm Employment Research

The transfer of the rural labour force to off-farm employment is not only a crucial, social and economic problem, but also an important, scientific research issue, particularly from the perspective of policy-making. Based on historical insights from around the world, rural labour transfer is an inevitable social phenomenon that has to be resolved in time. A country, irrespective of whether it is developed or developing, whether its social system is based on a capitalist market economy or a socialist planned economy, has to accept the challenge sooner or later. Generally speaking, developed countries have already experienced the transfer of their rural, surplus labour force into industries and tertiary sectors through the movement of their rural population into cities. Unfortunately, developing countries are still faced with the problem. The authorities and scientists in developing countries are questioning whether to follow the pattern followed by the developed countries and thereby create more employment opportunities for the rural jobless. Their concerns may be expressed in the form of several questions: (a) how can the rural labour force be transferred in order to support industrial development and direct it towards economic development? (b) what are the conditions that have to be fulfilled in order to progress from an agricultural society to an industrial society? (c) how can the stability of a country or a region be assured and public confidence be maintained? and (d) what are the ways of alleviating population pressure on the environment? The research on rural labour force transition is of great significance. For this, it is necessary to understand the historical process before scientific decisions of practical value can be made.

China is a developing country. Serious though they are, the sluggish market, regional trade barriers, and the increasing debt of enterprises are comparatively as serious as the mounting employment pressure. Rural employment is of serious concern in China. The important issue is how to absorb the successful experiences from developed and developing countries, streamline these with the prevailing circumstances in China, and transform the rural labour force from a social burden into a powerful resource for development. It should be remembered that there are no ready-made measures that can be copied by China in order to bring about full and productive employment of the rural labour force. We hope that our research can produce some useful findings to help the country tackle the problem.

### *From Utter Neglect to Serious Concern*

Studies on rural labour force transition and off-farm employment started only in the eighties. Before the eighties, there was very little literature on the subject in China. In recent years, however, a great deal of literature on off-farm employment has appeared in journals and newspapers, dealing particularly with agricultural, rural and economic strategies, and regional development. It is expected that research on off-farm employment will continue for a long time into the future.



Why did the situation change so much from before the eighties to after the eighties? There are many reasons for this state of affairs. Prior to the introduction of reforms and economic liberalisation, nobody dared state, because of the ban on opinions, that unemployment existed in China. Research on rural labour surplus and employment was prohibited and people could be penalised if so involved. The commune system controlled rural activities at that time. Agricultural efficiency was low and the surplus labour force was concealed. In the eighties, the phenomenon of the surplus labour force in rural areas could not be concealed any longer when the Household Contract Responsibility System was introduced and productivity increased. Today, studies on off-farm employment are considered relevant. Because of a free academic environment in which different points of view can be expressed, different schools of thought and different theories have been actively pursued. The concern for off-farm employment has been voiced by decision-makers at all levels, particularly now when the situation in the countryside is serious. Local authorities and farmers hope that academicians and researchers will provide appropriate theories and methods to overcome the crisis.

### *Current Thinking about Off-Farm Employment in China*

Based on publications on this issue, the current thinking has been summarised.

1. Changes in the rural labour force are inevitable with changes in the agricultural economy. Transformation in the pattern of the rural labour force is necessary for social and economic development. Increase in the surplus labour force is indicative of the low development level and irrational economic structure. The task ahead is not to conceal the phenomenon and argue about it but to resolve it by analysing the social and economic development process.

The development of the market economy and the decline of the subsistence economy are external factors that motivate the transformation of the rural labour force. The pressure of the increasing population on land and the desire to improve living standards are the internal factors. The constraints that inhibit the process are: the urban-rural barrier; the low level of rural labour skills; lack of capital; and unbalanced production patterns (as characterised by the coexistence of modern industry and traditional agriculture) as caused by the inappropriate economic development strategies in the past.

In order to transform the rural labour force structure, the following measures should be taken: (a) strengthening the concept of the market economy, (b) opening up the labour force market step by step, (c) adopting favourable policies, (d) adjusting the economic structure, and (e) increasing agricultural inputs.

2. Situation regarding off-farm employment in China. The development pattern of off-farm activities is quite different from those of industrialised countries. Traditionally, China adopted the strategy of giving priority to heavy industries. Compared with other economic sectors, investment was concentrated in capital-intensive industries rather than in labour-intensive industries. Furthermore, the commerce and service sectors have not progressed much. While the value on industrial output kept on increasing, the capacity to absorb employment did not increased proportionately. In order to prevent rural labourers from flowing into the cities, the household registration system was adopted in which the employment of rural labourers was confined mainly to rural areas.



With the introduction of economic reforms, China is attempting to eliminate the negative effects created by the traditional development strategy. Hence, emphasis is now placed on enhancing the capacity of urban industries to absorb more labourers and, to some extent, on reducing the blockade created between rural and urban areas in relation to labour flow. However, this alone cannot eradicate immediately the deep-rooted obstacles which prevent rural labourers from doing off-farm work. One of the reasons is that the cities themselves have a large amount of surplus labour. Meanwhile, the government has not been able to allocate adequate amounts of human resources, material resources, and financial resources to promote rural off-farm employment. Therefore, since 1978, we have not pursued the method of industrialized countries, i.e., to create opportunities for rural labourers by enlarging urban industry. Production was expanded by increasing investment and enlarging production scale in order to solve rural employment problems. The main feature in China is that the town and township enterprises, not the urban industries, have been absorbing the bulk of the rural labour force. Furthermore, the enterprises are characterised by collective ownership and individual ownership, not state ownership.

3. Main causes of the surplus labour force in China. There are four causes for the surplus labour force in China.

- (a) The rate of population growth exceeds the growth rate of job opportunities. For instance, from 1978 to 1987, the rural labour force in China increased by 83,620,000 from 306,380,000 to 390,000,000 at an average of 8,360,000 per year. The maximum absorption capacity for employment was, however, only 5,666,000 per year. This means that, in China, surplus rural labour force accumulated by 2,694,000 each year.
- (b) Employees in some sectors lost their jobs when these sectors could not be sustained. For instance, thousands of employees engaged in logging lost their jobs because forest resources were exhausted.
- (c) Agricultural efficiency was raised by saving on labour inputs, but without the replacement of appropriate job substitutes for the displaced labour force. For instance, in the early eighties, cultivated land was divided into small pieces for distribution to different families. Specialised households cultivated one or two crops with relatively high efficiency, but the land area did not increase, thereby contributing to the surplus labour force.
- (d) Some farmers, engaged in traditional agriculture, lost their jobs because they were unable to fit into the new market situation.

4. Basic principles for transformation of the rural labour force . In China, it is imperative to forestall rapid economic development and prevent the recurrence of an unstable economy and the imbalance in aggregate demand and supply. This is also true in the Hengduan Mountains. It is more reasonable to promote off-farm employment according to the principle set down below.

- (a) Rural labour force transformation must be a long-term process. We should avoid the impetuosity of treating the rural labour force transfer as a rush job which we hope to complete in as little time as possible. The other point is that we should not neglect local conditions by copying the pace of development in coastal areas. The transfer of the



agricultural labour force to off-farm employment is a definite necessity, but it is not a simple task and there is no short cut.

- (b) Transfer of the labour force needs suitable coordination. Off-farm employment is an integral part of a comprehensive system that includes society and economy. When analysing the essential conditions for transfer of the rural labour force and implementation of off-farm employment plans, we should simultaneously analyse the problems related to industrial expansion, marketing, capital requirements, technology, and necessary skills.
- (c) Labour force transfer can take place only with the willingness of the local people affected. We should not forget that in the past many development strategies and plans, directed by a few leaders without the full consent of the people, had resulted in failure and had dampened people's enthusiasm. Transfer of the labour force implies changes in occupational patterns local customs, living style, and the value system. It is a big challenge to farmers who have been used to the same life style from one generation to another. This is particularly true of minority nationalities in the Hengduan Mountains who have strong religious beliefs. Therefore, we should be very careful to implement off-farm activities and related policies without damaging their belief systems. Innovations will not be successful unless the people accept the new policies and agree to change their lifestyle.
- (d) Transfer of the labour force must be accomplished step by step: from leaving the land without leaving the township to leaving both land and township, from countryside to town, and then to city. There are several ways to transfer the surplus labour force: off-farm sectors within agriculture, specialization within households, rural industry, tertiary sectors, and migration to urban areas. The first step should be to transfer the existing surplus labour force. More jobs can be created later to absorb the labour force displaced because of increased agricultural efficiency. Job-seekers may have to go through different stages: from peasant-workers holding many jobs to seasonal employee status, to full-time wage labourer, to professional employee.

5. Limitations of the studies to date. Studies on the subject have progressed recently and some of the results have been accepted by decision-makers. However, current research on off-farm employment in China is in the preliminary stage and needs to be extended further to address the problems outlined below.

- (a) Most of the studies analyse the matter from a macroscopic perspective on a country scale and use second hand information. Only a few are based on first hand data.
- (b) Current research on the subject does not address the problems in a comprehensive and systemic fashion.
- (c) Current research has devoted more attention to rural enterprises and only a few to seeking other ways and other industries.
- (d) There are only a few papers that focus on West China and almost none that deal with the problems in the Hengduan Mountains.

- (e) The women's role in rural labour structure and the relationship with off-farm employment have been neglected.
- (f) The policy studies on labour force transition paid more attention to the employment system than to economic factors over the past 40 years and are very superficial. Systemic research related to policy is very weak.

## A General Survey of Off-Farm Employment in China

1. There were about 86.11 million rural labourers in China engaged in off-farm activities in 1988, according to the State Statistics Bureau. If the rural labourers concurrently doing farm work and other activities were included, the data base on the sample survey in 222 villages indicates that there were about 123.86 million engaged in off-farm employment. This accounts for about 29.3 per cent of all rural labourers. Table 1.1 portrays the overall scale and speed of off-farm employment at different development stages since the rural economic reforms. A new development occurred in 1989. About 10 million people who were engaged in off-farm employment had to return to farm work.

According to the census, 10 million rural labourers will be added to the labour force every year. At this rate, by the year 2000, there will be 200 million rural labourers who will be seeking work opportunities outside the farm. This is based on the assumption that the level of agricultural technology remains unchanged during the period. Nationally, the distribution of the surplus rural labour force is expected to be 24.5 per cent in the eastern coastal areas, 51.5 per cent in the central region, and 23.9 per cent in the western region.

**Table 1.1: Off-farm Employment from 1978 to 1988**

	Unit	Total (1978-1981)	Preparation Period (1978-1988)	High Growth Period (1981-1985)	Gradual Growth Period (1985-1988)
Total growth	Thousand	54,615	-1,227	36,852	18,990
	%	173.4	-3.9	121.7	28.3
Average annual growth	%	10.6	-1.3	22.0	6.4

2. The main concentration of off-farm employment is in industries and commerce and service sectors. As shown in Table 1.2, rural industries employ 3.5 times more people than the commerce and service sectors. The corresponding output value is about 5 times greater. The rate of increase is, however, greater in rural commerce and service sectors.



**Table 1.2: Employment and Output Value in Industry and Commerce & Service Sectors in Rural Enterprises**

	Industry		Commerce & Service	
	Output Value (100 Million yuan)	Employment (Million)	Output Value (100 Million yuan)	Employment (Million)
1978	420.06	19.70	36.82	2.49
1988	5,357.08	71.88	1,023.31	21.07
Annual growth average	29.00	13.80	39.40	23.90

Note: The conversion rate between the U.S. dollar and RMB yuan was 1.53 in 1978 and 3.75 in 1988.

3. In towns and townships, total off-farm employment has increased from 28.26 million to 95.45 million between 1978 to 1988. The occupational pattern has also changed significantly. Agricultural labourers have decreased drastically (from 21.5% to 2.6%). The relative proportion has doubled in construction as well as communications and transportation and trebled in commerce and service (see Table 1.3).

### **Regional Differences in Off-Farm Employment in China**

Economic and social development are very unbalanced among the provinces in China. The provinces in the Eastern Coastal Areas constitute the most developed region. On the other hand, because of geographical constraints and natural conditions, the provinces in the Western Region are behind economically and socially. The economic and social conditions in the Central Region lie in between the two. This imbalance is reflected in the development of off-farm employment in rural China. Some important features are discussed below.

1. The conditions of off-farm employment are distinctly different among the three regions (Table 1.4). The rate of increase of labourers engaged in off-farm activities is significantly greater in the Eastern Region. The Western Region is clearly the worst off. The implications are apparent in the sense that the surplus labour force is largest in the Western Region, and a large proportion of the labour force is still engaged in agriculture. The transition to off-farm employment is relatively much lower here.

**Table 1.3: Employment in Different Off-Farm Enterprises in Towns and Townships of China**  
(Unit of employment: million)

Year	Total employ- ment	Agriculture		Industry		Construction		Communication & Transportation		Commerce & Service	
		employ- ment	%	employ- ment	%	employ- ment	%	employ- ment	%	employ- ment	%
1978	28.26	6.08	21.5	17.34	61.3	2.36	8.4	1.04	3.7	1.44	5.1
1988	95.45	2.50	2.6	57.03	59.7	14.85	15.6	6.84	7.2	14.23	14.9

**Table 1.4 : Regional Differences in Off-Farm Employment Indicators (1985)**

	China	Eastern Region	Central Region	Western Region
Surplus labour force (%)	28.1	22.8	27.2	40.5
Increase in the off-farm labour force compared with the increase in total labour force (%)	68.3	131.7	62.4	19.5
Annual shift from agricultural labour force (%)	16.1	18.2	15.0	12.7
Proportion of labour force shift from traditional agriculture to cash crop cultivation (%)	15.1	6.9	18.2	28.3
Proportion of labour force shift from traditional agriculture to livestock and sideline production (%)	25.7	13.4	34.0	26.7
Proportion of labour force shift from traditional agriculture to off-farm activities (%)	59.1	79.7	47.8	45.0

Source : Deng Yiming 1989

- The ownership patterns in the three regions are distinctly different. As shown in Table 1.5, in the relatively developed eastern region, the productive conditions were favourable even under the former system and they had accumulated funds from agriculture for the development of urban industry. Some Commune and Brigade-run enterprises were therefore established prior to 1978. After 1978, the collective economy was not destroyed with the disintegration of the People's Commune. Instead the collective economy has been strengthened because of the positive actions taken by the townships and villages towards organizing production and encouraging off-farm employment among the agricultural labour force. So, in the Eastern Region, off-farm employment is promoted mainly through collective enterprises owned by townships and villages (average of 75%).



**Table 1.5 : The Composition of Output Value in Township  
Enterprises by Ownership and by Province (1988)**

Province	Total output value of township enterprises (Billion yuan)	Output value of township enterprises by ownership (%)				
		Total	Township	Village	Households	Individuals
<b>National Total</b>	<b>6495.66</b>	<b>100.00</b>	<b>37.54</b>	<b>29.62</b>	<b>8.64</b>	<b>24.20</b>
<b>Eastern Region</b>	<b>4328.72</b>	<b>100.00</b>	<b>41.41</b>	<b>33.83</b>	<b>7.89</b>	<b>16.90</b>
Beijing	139.55	100.00	41.43	47.31	1.88	9.39
Tianjin	127.91	100.00	26.96	63.14	5.75	4.14
Shanghai	231.86	100.00	59.83	35.54	3.27	2.36
Zhejiang	607.17	100.00	51.72	29.92	9.15	9.21
Jiangsu	1078.41	100.00	53.72	34.45	2.65	9.18
Guangdong	476.14	100.00	40.72	26.36	8.59	24.33
Shandong	706.14	100.00	33.47	42.02	6.82	17.69
Liaoning	320.44	100.00	28.85	33.33	4.64	33.02
Fujian	164.14	100.00	28.15	27.69	19.45	24.71
Hebei	416.26	100.00	19.43	24.48	23.07	33.02
Guangxi	60.52	100.00	30.26	9.67	13.16	46.91
<b>Central Region</b>	<b>1544.46</b>	<b>100.00</b>	<b>27.87</b>	<b>22.88</b>	<b>10.53</b>	<b>38.72</b>
Heilongjiang	115.58	100.00	28.85	19.12	3.02	49.01
Jiling	109.76	100.00	23.47	20.84	4.71	51.01
Inner Mongolia	35.54	100.00	27.25	13.73	5.61	53.41
Anhui	209.50	100.00	32.34	14.56	12.79	40.13
Jiangxi	97.26	100.00	35.21	21.70	11.74	31.75
Henan	398.24	100.00	14.61	22.70	19.97	42.65
Hubei	246.15	100.00	36.79	22.76	6.01	28.32
Hunan	199.24	100.00	38.94	28.88	5.17	34.88
Shanxi	133.16	100.00	25.01	21.02	6.94	31.82
<b>Western Region</b>	<b>622.48</b>	<b>100.00</b>	<b>34.62</b>	<b>36.23</b>	<b>9.02</b>	<b>38.84</b>
Sichuan	339.48	100.00	39.43	17.53	9.17	37.15
Yunnan	47.23	100.00	31.82	14.25	4.94	28.30
Guizhou	33.01	100.00	26.85	34.95	8.47	57.72
Shanxi	110.02	100.00	21.64	6.95	10.66	40.56
Gansu	47.11	100.00	36.87	27.14	11.42	36.59
Qinghai	4.52	100.00	31.42	15.12	9.98	40.07
Ningxia	10.72	100.00	37.30	18.53	3.02	51.18
Xinjiang	17.71	100.00	41.61	10.72	1.75	45.92
Tibet	1.37	100.00	42.63	13.63	9.70	34.04
Hainan	11.26	100.00	28.44	9.73	14.36	48.43

Source: Agricultural Publishing House 1989.

Note: The conversion rate between the U.S. dollar and RMB yuan in 1988 was 3.75



In the Western Region, because of the backwardness in economic development, the collective economy run by Communes and Brigades was very poor. After the disintegration of the People's Commune, off-farm initiatives were taken up by peasant households or individuals themselves. For example, in poverty-ridden areas such as Inner Mongolia, Xinjiang, Guizhou, and Ningxia, the output value produced by private enterprises accounting for more than 45 per cent of the total and in Guizhou Province the output value generated by the private enterprises is as high as 57 per cent of the total.

3. Off-farm employment is concentrated in mainly the secondary and tertiary sectors of the township enterprises in the Chinese countryside. But because of such differences as the level of economic development, the access to cities, the quality of personnel, and the ability for capital accumulation, the structure of off-farm employment differs from one region to another. Some interesting observations can be made from Table 1.6.
  - (a) The poorer the economy is, the lower the proportion of industry. For example, the proportional contribution of industry is much greater in the Eastern Region than in the Central and Western Regions, both in terms of employment and output value.
  - (b) The output value per worker is consistently greater in the Eastern Region than in the other two. In the case of industry, it is two times greater.
  - (c) Thirdly, in terms of the employment structure, construction as well as commerce and services are very important sectors for the Central and Western Regions.
  - (d) Because of the relatively higher output value per worker in the transport sector, it makes an important contribution to the economy in the Central and Western Regions.

Machinery, construction materials, and textile industries, the top three in terms of output value, are mainly located in the Eastern and Coastal Provinces. For instance, the rural machinery industry is mainly concentrated in Jiangsu, Zhejiang, Shanghai, Shandong, Liaoning, Guangdong, Hebei, Beijing, and Tianjin. Their output values account for 86 per cent of the total from the rural machinery industry. Rural textile industry is also mainly concentrated in these eight provinces, and their output value accounts for 90 per cent of all rural textile industry.

In addition, 80-90 per cent of the leather and garment industries are located in the Eastern Region. The Central Region and some parts of the Western Region are well known for such industries as food, paper-making, ceramics, fodder, and forestry. Mining is another industry that predominates in the Central and Western Regions and its output value accounts for 5.4 per cent of the whole rural industry.

4. Technical choices about off-farm employment are dependent upon the availability of funds, credits, and availability of technology. Generally speaking, enterprises run by townships and villages tend to be large scale. They use more advanced technologies and are more productive. It is apparent, as shown in Table 1.7, that the average number of workers employed per enterprise in the Eastern Region is greater by 2.1 times the average output value, industrial by 4.7 times, and the average output value per worker by 2.1 times when compared with that in the Western Region. Obviously, the technical level and the productivity are much higher in the Eastern Region than in the Central and Western Regions.

**Table 1.6: The Distribution of Township Enterprise Workers  
by Sectors and by Regions (1988)**

	Agriculture		Industry		Construction		Transportation		Commerce	
	Q	%	Q	%	Q	%	Q	%	Q	%
<b>Employment (million)</b>										
National Total	2.50	2.6	57.03	59.7	14.85	15.6	6.84	7.21	4.23	14.9
Eastern Region	1.12	2.2	33.47	66.9	6.71	13.4	2.88	5.8	5.88	11.8
Central Region	1.01	3.3	16.55	53.7	5.15	16.7	2.81	9.1	5.33	17.3
Western Region	0.38	2.6	7.02	48.2	2.99	20.5	1.16	8.0	3.02	20.7
<b>Output Value (billion yuan)</b>										
National Total	11.53	1.8	452.90	69.7	82.78	12.7	47.33	7.3	54.92	8.5
Eastern Region	6.81	1.6	335.01	77.4	42.80	9.9	21.10	4.9	27.08	6.3
Central Region	3.87	2.5	85.57	55.4	26.10	16.9	19.37	12.5	19.50	12.7
Western Region	0.85	1.4	32.32	51.9	13.88	2.3	6.86	11.0	8.34	13.4

Source: *Statistical Abstract of Chinese Township Enterprises*, edited by the Township Enterprise Bureau of the Ministry of Agriculture, 1989.

Note: Same as in Table 1.5.



**Table 1.7 : The Regional Differences in the Scale of Township Enterprises (1985)**

	Agriculture	Industry	Construction	Transportation	Commerce
<u>Average Number of Workers Per Enterprise</u>					
National Total	10.7	7.4	15.5	1.8	1.9
Eastern Region	13.1	10.3	19.7	1.9	2.7
Central Region	8.9	5.5	11.1	1.8	2.7
Western Region	10.7	4.8	19.9	1.6	2.3
<u>Average Output Value per Enterprise (thousand yuan)</u>					
National Total	49	59	87	13	7
Eastern Region	79	104	126	15	13
Central Region	35	28	59	12	10
Western Region	24	22	93	10	6

Source : *Statistical Abstract of Chinese Township Enterprises*, edited by the Township Enterprise Bureau of the Ministry of Agriculture, 1989.

Note : Same as in Table 1.5.

### Introduction to the Hengduan Mountain Region in Sichuan Province

The Hengduan Mountain area of Sichuan Province, covered by this paper, includes three autonomous prefectures (Ganzi, Aba, Liangshan) and one municipality (Panzhihua). It covers an area of 0.306 million sq km with a rural population of 4.86 million in 1988, accounting for 53.1 per cent and 5.4 per cent of the total area and the total population of the province respectively. The administrative divisions include 49 counties, 1 autonomous county, 3 urban districts, and 1 city under the prefecture's jurisdiction (Table 1.8).

**Table 1.8 : Administrative Divisions in West Sichuan**

Autonomous Prefectures & Municipality	Ordinary Counties	Autono-mous County	Urban Districts	City under Jurisdiction of the Prefecture	Towns	Townships
Total Number	49	1	3	1	66	121
Aba	13	0	0	0	17	218
Ganzi	18	0	0	0	16	338
Liangshan	16	1	0	1	29	688
Panzhihua	2	0	3	0	4	77

Source : China Statistics Publishing House 1988a.



## *Physical Features*

Western Sichuan is a part of the Qinghai-Xizang Plateau. The elevation in most of the area is over 3,000m to 4,000m and the climate is usually cold. Diversity is a prominent characteristic of the area. Firstly, the bioclimatic variation is apparent when moving from the low to the high elevations. At low elevation, the conditions are subtropical in nature. As the elevation rises, a frigid temperate belt predominates, finally culminating into a permanent snowbelt. Microclimatic belts with corresponding flora and fauna within a wide variety of topographies give an aura of "four seasons on one mountain and different climates within a small area" (Table 1.9). Secondly, physical conditions undergo obvious changes from south to north-west. We can divide the study area into four agro-ecological zones: (I) a high plateau-pasture zone in the Northwest, (II) a zone of high mountains and gorges with forests and crops in the East and Centre (III) middle-sized mountains and broad valleys with grains and tropical crops in the South-west, and (IV) middle-sized mountains and upland-crops and forests in the South-east (Figure 1.1). Thirdly, there are a lot of resource potentials waiting to be exploited. These potentials are reflected in terms of their varieties, quantities, and amounts per capital (Tables 1.10 and 1.11). Hydropower, gold mines, copper mines, iron mines, silver, zinc, rare metals and non-ferrous metals, tropical crops, and Chinese herbs abound in the area.

Within Western Sichuan, those counties and cities which are relatively more developed are concentrated in the eastern part, close to the Sichuan Basin. Therefore, West Sichuan has two characteristics: economically it is linked to the Sichuan Basin in the east and culturally it is more similar to communities in the Qinghai-Xizang (Tibet) Plateau in the west. The region is the home of many minority nationalities, e.g., Tibetans, *Yi*, *Qiang*, *Hui*, Mongolian and others (Table 1.12). Generally speaking their population distribution is not even (Table 1.13) and they are concentrated in small basins, river valleys, and on both sides of the railway and highways.

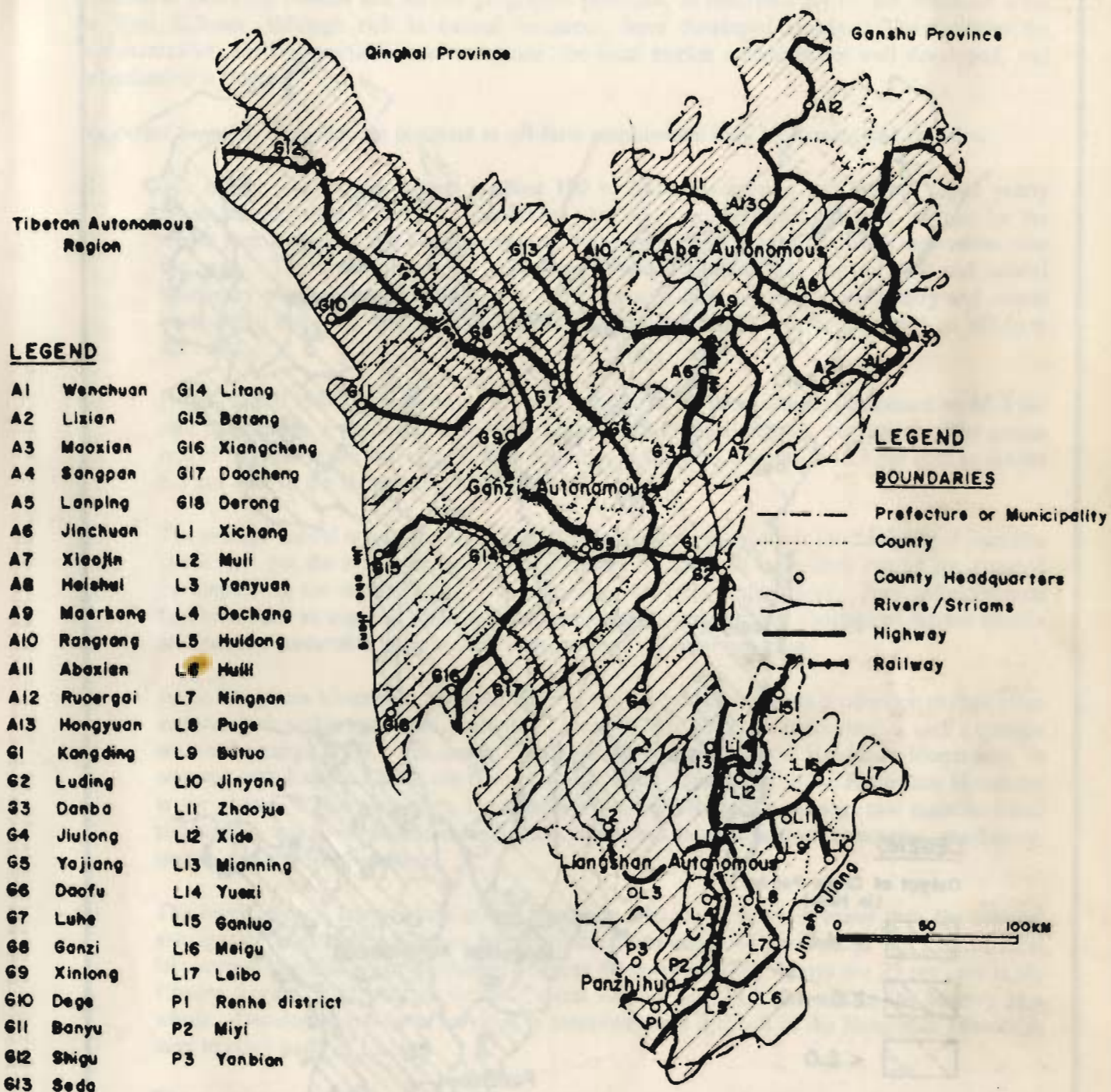
About four million people (approximately 82%) are involved in agriculture and 0.4 million (8%) in animal husbandry. Those engaged in crop production are distributed throughout the mountain areas and river valleys and those involved in animal husbandry are mainly located in the plateau of North-western Sichuan. Agro-based cottage industries are concentrated in the agricultural areas.

## *Social and Economic Development*

Western Sichuan is a large area where economic development is relatively poor. It has made progress in social reform and economic development since 1949, but the level of development is still lower than in other parts of Sichuan Province and much lower than that in China as a whole. Many resources have not been exploited properly or adequately. The gross output value of industry and agriculture and the per capita income are lower than national average. It is clearly an underdeveloped area. Cultivable land, forests, pasture, and other resources are greater in terms of per capita figures but the yield in agriculture, especially in grain production, is much lower than in other places and cannot even meet the food requirements of local residents. Except for Panzhihua municipality, where industry is dominant, agriculture is the largest source of income. Logging and livestock also play very important roles in income generation. Proportionately their contribution is larger than in Sichuan Province as a whole (Tables 1.14, 1.15, and 1.16 and Figure 1 and 2).



Figure 1.1: Administrative Divisions And Agro-ecological Zones of West Sichuan



High Plateau Pasture Zone of North-Western Sichuan

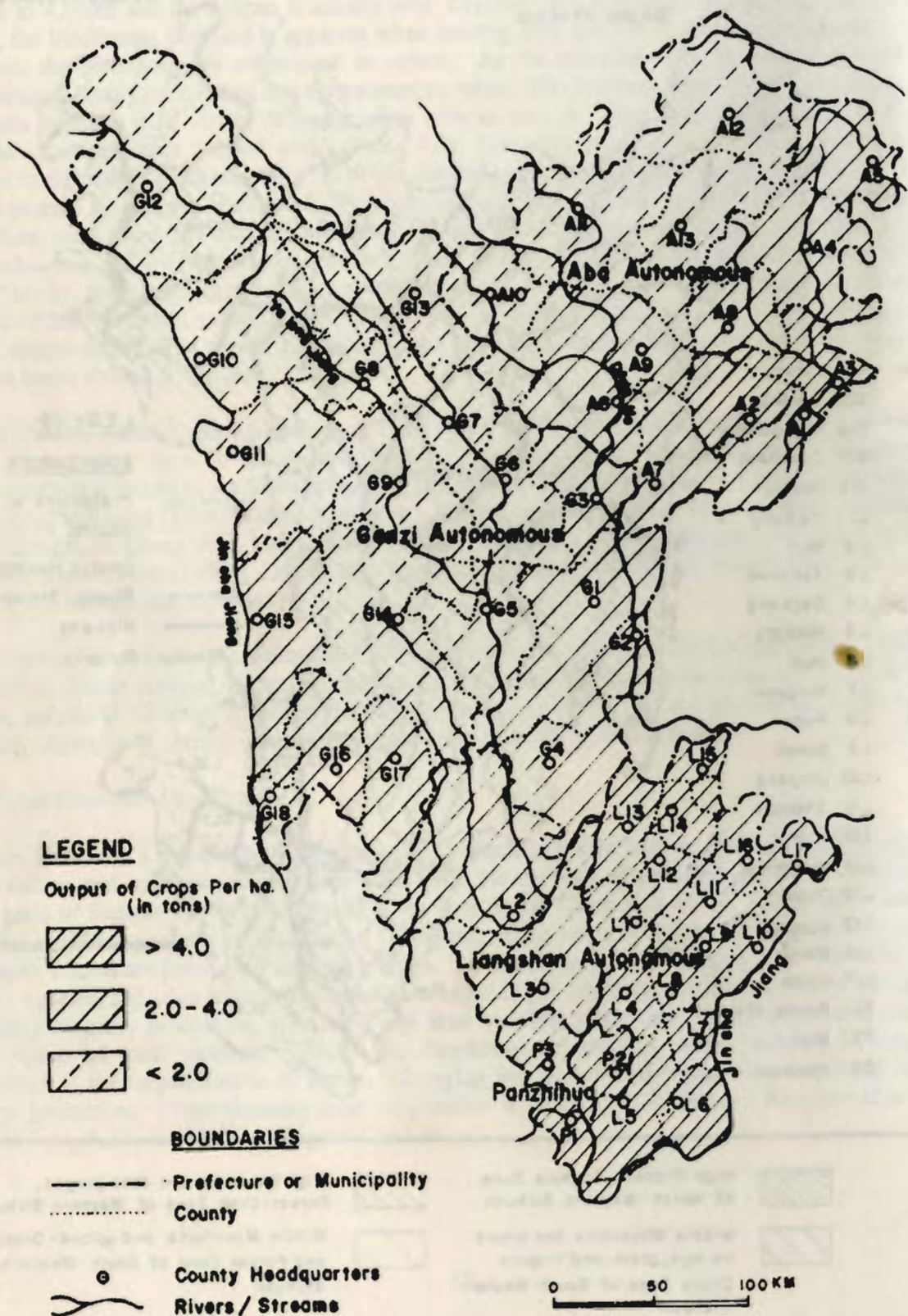
Middle Mountains and broad Valleys, grain and tropical Crops Zone of South-Western Sichuan

High Mountain and deep gorges, Forest-Crop Zone of Western Sichuan

Middle Mountains and upland-Crops and Forest Zone of South-Western Sichuan



**Figure 1.2 : Regional Variations in Crop Production,  
(Output Per hectare)**





### *A Summary of Off-Farm Employment Features in the Hengduan Mountain Region*

Because of historical reasons and natural geographic positions, as described above, the mountain areas in West Sichuan, although rich in natural resources, have developed slowly. The facilities for communication and transportation are inadequate, the local market system is not well developed, and urbanisation is limited.

Important characteristics that are pertinent to off-farm employment may be summarised as below.

- (1) The output of grain per person is about 100 to 200 kilogrammes, and the per capita yearly income is 200 *yuan*. There are even some very poor people whose grain and income for the whole year are below 100 kilogrammes and 200 *yuan*; hardly enough to sustain themselves over the year. The area suitable for cultivation is much smaller than the forestry and animal husbandry area. Although some surplus farm labourers may be engaged in forestry and animal husbandry, there are still a large number of rural labourers who are in need of off-farm activities.
- (2) From 1978 to 1984, the proportion of those engaged in off-farm activities increased by 68.3 per cent in China as a whole, compared to 9.6 per cent in the Hengduan Mountains. The annual rate of increase in the share of off-farm activities in China as a whole is 16.1 per cent as against 6.5 per cent in the Hengduan Mountains.
- (3) The average capital input per person from the State and the Province in the Hengduan Mountains is not low, but the available funds are not enough to carry out large-scale capital construction for improving the economy and providing more off-farm employment. Poor infrastructural facilities, such as unpaved roads, poor communication systems, and shortage of market centres are also not favourable to promotion of large-scale off-farm activities.
- (4) In the Hengduan Mountains, the main transfer mechanism is from grain production to cash crops and livestock within agricultural activities. From 1978 to 1985, the proportion of such a transfer was in the range of 59.1 per cent in China and 42.4 per cent in the Hengduan Mountains. In contrast with Eastern China, the transfer to industrial occupations in the Hengduan Mountains is very low. Within industries, the activities are concentrated in mining, raw material-based production, and livestock-based production rather than in construction, commerce, machinery, textile, and export processing.
- (5) The level of rural labour skills in the Hengduan Mountains is much lower than the national average. For example, illiterate labourers constitute about 40 per cent of the total of rural labourers in the Hengduan Mountains whereas the corresponding figures are 25 per cent in the Eastern Region, 27.7 per cent in the Central Region, and 29.2 per cent in the country as a whole. Developing off-farm activities is therefore more difficult in the Hengduan Mountains than in other parts of China.
- (6) The proportion of full-time, off-farm employees engaged in rural industries and tertiary activities is less than 30 per cent. The remaining 70 per cent are occupied on a seasonal basis and are engaged in multiple activities. (In Eastern China, the permanent workers amount to 79.7 per cent of the total labourers.) In addition, the scale of activities is relatively smaller. Sixty per cent of Sichuan's rural enterprises are owned by townships and villages. In the Hengduan

Mountains, the enterprises run by household groups and individual households account for 64.1 per cent of the total enterprises in terms of the number of labourers employed. The average employee per enterprise is only 3.6 people; fixed assets are only 6,507 *yuan* for each enterprise.

More details on these features will be described in subsequent chapters.



Table 1.9 : Vertical Zonation and Its Characteristics in West Sichuan

Regions	Altitude (m)	Annual average temperature (°C)	Annual accumulative temperature of > 10° C (°C)	Landscape types	Plant cover	No. of crops	Major crops and other land resources
South-west Sichuan	600-1300	19-21	6,800-7,500	Subtropical dry hot valleys	Bush with sparse trees	3 crops/year	Rice, tropical crops
(Panzhihua and Liangshan)	1200-1800 (Yalongjiang Valley)	15-19	4,800-6,800	Subtropical broad valleys	Evergreen broad-leaved forest	2 crops/year	Rice, wheat, oilseeds, vegetables,
	1200-2400 (Jinsajiang Valley)	13-19	3,600-4,800	Subtropical and temperate hills	Deciduous broad-leaved forest	3 crops/2 years	Rice, maize, wheat, fruits
	> 2400	< 13	< 3600	Temperate and cold mountains	Coniferous broadleaved forest	1 crop/year	Buckwheat, potatoes, livestock, forest products
North-west Sichuan	> 1800-2600	12-15	3,000-5,000	Subtropical and temperate river valleys	Deciduous forest	2 crops/2 years	Maize, winter wheat, livestock
(Aba and Ganzi)	> 1800-2800	8-11	2,300-3,000	Temperate mountains, gorges	Coniferous broad-leaved forest	3 crops/2 years	Spring wheat, maize, (Aba) livestock
	2800-3000	2-7	900-1,800	Temperate high plateau, mountain	Coniferous forest, high mountain bushes, pastures	1 crop/year	Spring wheat, highland barley, peas, livestock
	> 4000	< 0	< 300	Cold mountain plateau			Livestock

Source : Chen Guojie 1990.

Table 1.10 : Land Use in West Sichuan

Regions	Cultivated Area		Forest Area ('000 ha)						Pasture ('000 ha)			
	Amount ( <sup>'000</sup> ha)	%	Well preserved forest		Shrubs	Sparse woods	Young forest	Deteriorated forest	Total		Natural condition	Protected
			Amount	%					Amount	%		
Panzhihua	49.1	0.1	305.5	3.2	61.9	65.2	3.6	10.9	191.0	1.1	183.3	6.9
Aba	99.3	1.1	1,427.1	15.0	1,133.9	286.7	85.6	81.1	4,217.3	23.5	4,191.3	15.6
Ganzi	95.5	1.1	1,771.8	18.7	1,934.5	267.3	13.8	143.7	9,016.5	50.3	8,978.6	35.7
Liangshan	595.2	6.7	1,731.7	17.6	901.5	541.3	39.4	63.9	1809.8	10.1	1,804.4	-
West Sichuan	839.1	9.4	5,176.1	54.5	4,031.6	1,160.5	142.4	299.6	15,234.6	85.0	15,157.6	58.2
Sichuan	8,907.5	100.00	9,443.3	100.0	5,696.3	2,446.2	672.1	822.1	17933.8	100.0	17,790.2	121.9
												21.8

Regions	Water Resources (Million m <sup>3</sup> )				Surface Water			Fishing Area			Accumulated Log (Million m <sup>3</sup> )	
	Total	%	Available water	%	Area ( <sup>'000</sup> ha)	%	Unutilised area	Utilised rate (%)	Total	%	Total	%
Panzhihua	4,946	1.5	530	0.7	2.0	0.3	937	47.8	34.7	2.5	34.7	2.5
Aba	39,550	12.3	3,602	4.6	11.8	2.0	6	0.1	385.4	27.6	385.4	27.6
Ganzi	66,848	20.7	18,844	23.9	5.5	0.9	11	0.2	436.6	31.2	436.6	31.2
Liangshan	38,080	11.8	2,843	3.6	41.1	6.8	9,375	22.8	230.0	16.4	230.0	16.4
West Sichuan	149,424	46.3	25,819	32.8	60.4	10.0	10,929	17.1	1,086.7	77.7	1,086.7	77.7
Sichuan	322,473	100	78,717	100	606.6	100	255,386	12.2	1,398.3	100.0	1,398.3	100.0

Source: Office of the Committee for Agricultural Regionalisation in Sichuan, 1987.



Table 1.11: Comparison of Major Resource Availability Per Capita (1988)

	Cultivated land (ha)	Forest (ha)	Accumulated timber volume (m <sup>3</sup> )	Large animals (number)	Water resources quantity (m <sup>3</sup> )	Pasture (ha)	Forest cover (%)
Panzhihua	0.06	0.36	40.94	1.03	5,835	0.23	49.5
Aba	0.13	1.93	522.37	4.23	53,603	5.72	31.2
Ganzi	0.12	2.24	551.67	5.36	84,469	11.39	27.9
Liangshan	0.18	0.51	67.87	2.03	11,239	0.53	25.4
W.Sichuan	0.15	0.90	188.44	2.71	25,919	2.24	28.6
Sichuan	0.06	0.09	13.64	1.27	3,145	0.17	12.1
China	0.09	0.11	8.35	0.83	2,517	0.25	12.0

Source : (1) Office of the Committee for Agricultural Regionalization in Sichuan, 1987  
(2) Handbook of Natural Resources in China, published by the Press House of Sciences, 1990.

**Table 1.12: Population of Minority Nationalities in West Sichuan**

Name of Nationalities	Panzhihua		Aba		Ganzi		Liangshan	
	1982	1964	1982	1964	1982	1964	1982	
Han	732,680	227,063	301,762	125,488	188,183	1,132,768	1,799,863	
Tibetan	119	197,259	306,117	369,101	554,436	27,612	44,651	
Yi	632,680	12	26	9,898	16,632	799,078	1,336,428	
Miao	2,194	41	63	41	30	5,040	8,145	
Qiang	1	48,261	98,400	354	1,091	11	29	
Hui	3,030	10,983	18,575	802	1,235	8,146	13,394	
Lisu	7,121	0	0	0	0	3,616	6,609	
Mongolian	172	10	39	6	24	11,784	3,460	
Bu Yi	45	6	11	5	2	307	3,460	
Naxi	2,175	2	0	47	622	2,186	10,425	
Zhuang	512	10	37	1	7	2,676	805	
Tai	0	0	0	1	4	887	1,825	
<b>TOTAL</b>	<b>1,380,729</b>	<b>403,647</b>	<b>725,030</b>	<b>505,744</b>	<b>762,266</b>	<b>1,994,111</b>	<b>3,229,093</b>	

Source: 1. Population Yearbook of Sichuan, published by the Press House of Sichuan's Academy of Social Sciences, 1988.

**Table 1.13: Population Density and Natural Growth Rate**

	Area (sq km)	Population	Population density (persons/km <sup>2</sup> )	Birth rate per thousand	Death rate per thousand	Natural growth rate per thousand
Panzhihua	7,434	847,694	114	6.2	2.3	3.9
Aba	82,840	737,828	9	19.0	7.0	12.0
Ganzi	147,035	791,389	5	16.7	8.6	8.1
Liangshan	80,115	3,388,211	56	20.4	8.1	12.3
West Sichuan	297,425	5,765,122	19	17.6	7.2	10.4
Sichuan	565,798	102,535,319	190	21.3	6.8	14.5
China	9,563,900	1,065,290,000	111	20.5	6.4	14.1

Source: Population Yearbook of Sichuan, published by the Press House of Sichuan's Academy of Social Sciences, 1988.



Table 1.14: Comparison of Output Values in Different Sectors of the Economy in West Sichuan

Regions	Agriculture		Industry		Construction		Transportation		Commerce		Total	
	Output Value	%	Output Value	%	Output Value	%	Output Value	%	Output Value	%	Value	%
Panzhihua	12,572	11.9	73,922	69.8	10,029	9.5	2,768	2.6	6,581	6.2	105,872	100
Aba	26,204	48.2	18,468	34.0	3,819	7.0	1,235	4.1	3,661	6.7	54,387	100
Ganzi	26,205	55.9	12,678	27.1	3,280	7.0	1,155	2.5	3,521	7.5	46,839	100
Liangshan	81,237	56.2	35,722	24.7	9,408	6.5	6,555	4.5	11,626	8.1	144,548	100
West Sichuan	146,218	41.6	140,790	40.0	26,536	7.5	12,713	3.6	25,389	7.2	351,646	100
Sichuan	2,362,798	46.0	1,866,805	36.3	302,835	5.9	138,988	2.7	467,539	9.1	5,138,975	100
China	272,000,000	34.5	357,300,000	45.3	51,400,000	6.5	30,800,000	3.9	77,200,000	9.8	78,700,000	100

Source: Statistical Yearbook of Sichuan Province, 1988.

Note: The conversion rate between the U.S. dollar and RMB yuan in 1986 was 3.72.

**Table 1.15: Comparison of Selected Economic Indicators per Capita (1987)**

Unit : *Yuan*

	Total output value (1986)	Gross output value of industry and agriculture	Gross output value of agriculture	Gross output value of industry	Total value of retail sales	Grain production (Kg)
Panzhihua	1,427	1,020	148	872	646	188
Aba	739	605	355	250	425	293
Ganzi	594	491	331	160	410	221
Liangshan	429	344	239	105	263	359
West Sichuan	558	498	254	244	354	307
Sichuan	512	1,066	372	694	356	375
China	746	1,711	433	1,278	539	384

Source: 1. Statistical Yearbook of Sichuan Province, 1988.  
2. Handbook of Natural Resources in China, published by the Press House of Sciences, 1990.

Note: The conversion rate between U.S. dollar and RMB *yuan* was 3.72 in 1987.



Table 1.16: Total Output Value of Agriculture by Sector (1987)

Unit: 100 million yuan

Regions	Total of Agriculture		Crops		Forest		Livestock		Sideline Production		Fishing	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Panzhihua	1.33	100	0.76	57.1	0.10	7.5	0.35	26.3	0.11	8.3	0.01	0.8
Aba	2.77	100	0.92	33.2	0.20	7.2	1.28	46.2	0.37	13.4	-	-
Ganzi	2.88	100	0.68	23.6	0.13	4.5	1.63	56.6	0.44	15.3	-	-
Liangshan	9.03	100	5.06	56.0	0.71	7.9	2.19	24.3	1.04	11.5	0.03	0.3
West Sichuan	16.01	100	7.42	46.3	1.14	7.1	5.45	34.0	1.96	12.2	0.04	0.2
Sichuan	289.97	100	175.27	60.5	14.10	4.9	80.67	27.8	17.23	5.9	2.70	0.9
China	4,675.70	100	2,638.15	60.7	219.76	4.7	1,066.06	22.8	327.30	7.0	224.43	4.8

Source: 1. Yearbook of Sichuan Province, 1988.

2. Handbook of Natural Resources in China, published by the Press House of Sciences, 1990.

Note: The same as in Table 1.13.

## STRUCTURE AND TRANSFORMATION OF THE LABOUR FORCE

### Size, Growth, and Density of Population

Since 1949, the economy and people's living conditions have improved significantly although at a gradual pace. The population has grown rapidly, mainly because of a lower death rate, from 2,979,626 in 1950 to 6,208,944 in 1990 (see Table 2.1). The mean annual growth rate is 1.85 per cent. The proportion of the West Sichuan population to the provincial population has risen from 5.11 per cent in 1950 to 5.79 per cent in 1990. In general, the population, both in terms of the actual number and density, is greater in the south than in the north and similarly so in the east compared to the west. The population in the counties of Liangshan and Panzhihua, accordingly, exceeds 100,000; whereas in Ganzi and Aba it is less than 100,000 (see Table 2.2). Huili in Liangshan Prefecture has the highest population (382,000) and Derong in Ganzi, the lowest (14,668).

### Age and Sex Breakdowns

At present, the detailed information by prefecture in the fourth census (1990) is not available to the public. So we are obliged to use the statistics from the third census (1982) and the one per cent sample survey of Sichuan from July 1, 1987, to analyse the age and sex breakdowns. In terms of population density, the highest is in Panzhihua (217/km<sup>2</sup>) and the lowest (3/km<sup>2</sup>) in Shiqu, Litang of Ganzi, and Hongyuan of Aba prefectures (See Figure 2.1 for details).

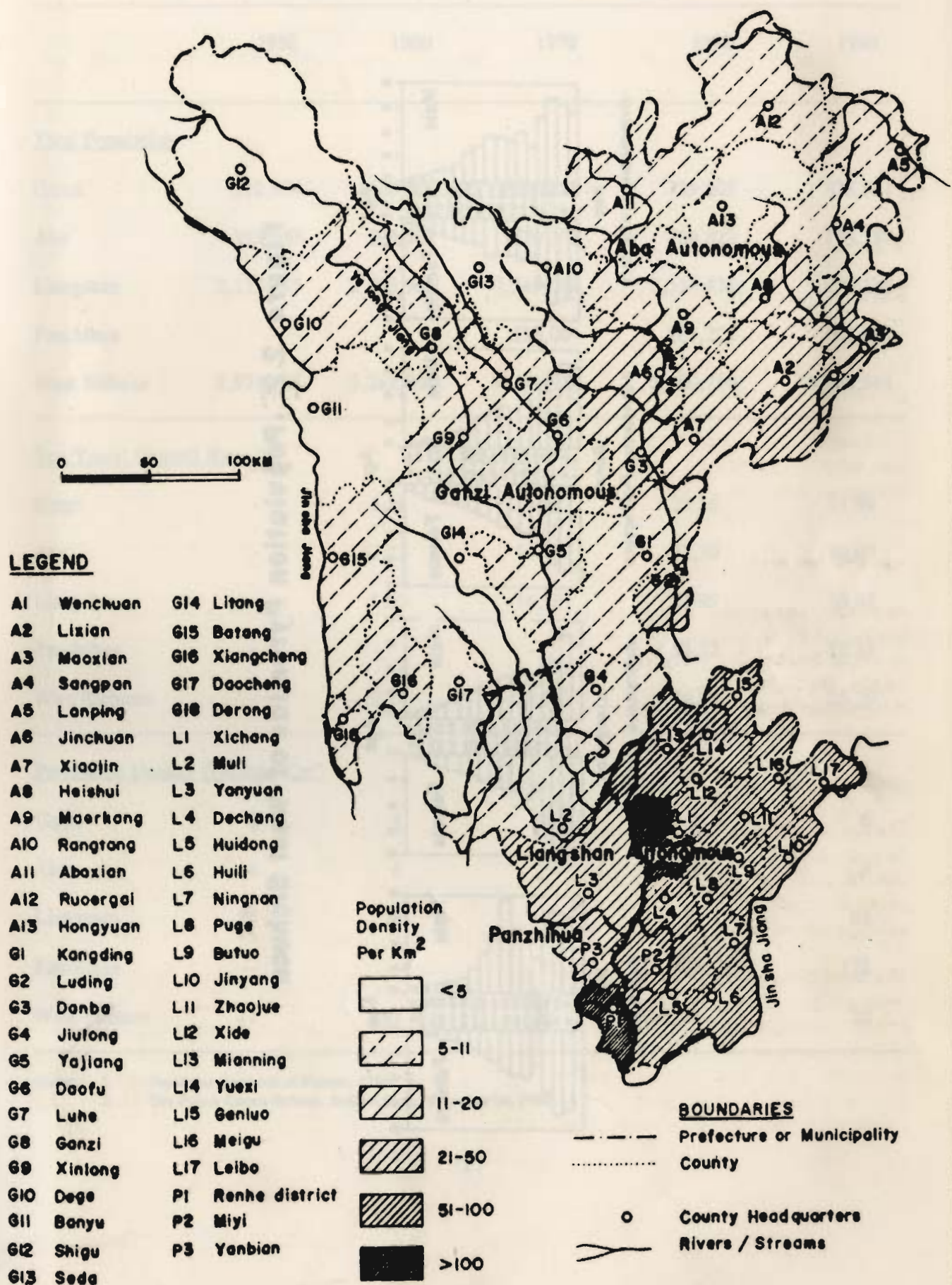
#### *Age Breakdown*

The age breakdown of West Sichuan is shown in Table 2.2. The table shows that the population below 14 years accounted for 38.59 per cent in 1982 and 33.70 per cent in 1987. The percentage of people over 60 years old was 6.53 per cent in 1982 and 6.50 per cent in 1987. The ratio of the old to the young is about 1:6. This indicates that the age balance in West Sichuan is in favour of the young although the percentage of older people is increasing.

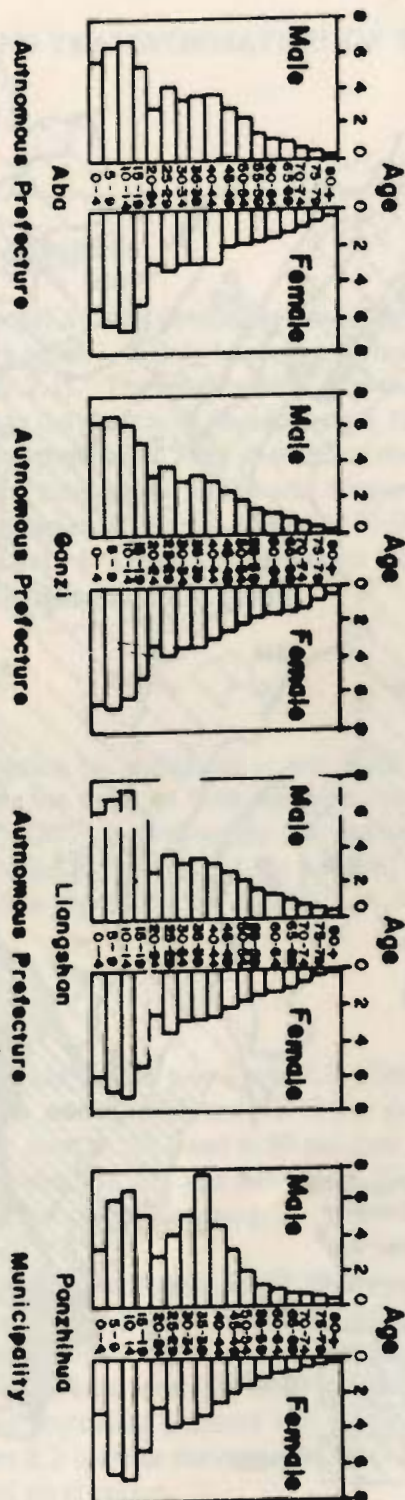
The population between 15 to 64 years accounted for 57.29 per cent and 62.1 per cent in 1982 and 1987 respectively. The proportion of young persons within the age range is also large. So there is high pressure on employment because of the size of the young population. Meanwhile, the number of women of child-bearing age (from 15 to 49 years) was 1,293,429 in 1982, constituting 23.34 per cent of the total population. This shows that the population pressure will continue in the coming years because of high birth rates. Table 2.3 and Figure 2.2 indicate the considerable difference in the age structure between the industrial city and the backward rural region.



Figure 2.1: Population Density, 1985 (Persons / Km<sup>2</sup>)



**Figure 2.2: Population Pyramids of West Sichuan**





**Table 2.1: Size, Growth, and Density of the Population in West Sichuan**

	1950	1960	1970	1980	1990
<b><u>Total Population</u></b>					
Ganzi	512,934	546,541	600,218	739,803	828,531
Aba	353,053	502,301	576,303	704,823	775,780
Liangshan	2,113,639	2,233,965	2,549,013	3,134,933	3,656,536
Panzhihua	-	-	526,004	801,221	948,097
West Sichuan	2,979,626	3,282,807	4,251,538	5,380,780	6,208,944
<b><u>Ten Years' Growth Rate (%)</u></b>					
Ganzi	-	6.55	9.82	23.26	11.99
Aba	-	42.27	14.73	22.30	10.07
Liangshan	-	5.69	14.10	22.99	16.64
Panzhihua	-	-	-	52.32	18.33
West Sichuan	-	10.18	29.51	26.56	15.39
<b><u>Population Density (Persons/Km<sup>2</sup>)</u></b>					
Ganzi	3	4	4	5	6
Aba	4	6	7	9	9
Liangshan	35	37	42	52	61
Panzhihua	-	-	71	108	128
West Sichuan	11	11	14	18	20

Sources: 1. Population Yearbook of Sichuan, 1989.  
 2. The Fourth Census Bulletin, *Sichuan Daily*, November 14, 1990.

**Table 2.2: Age Breakdown in West Sichuan**

(Unit: Per Cent of the Total Population)

	0-9		10-14		15-59		60-64		> 65	
	1982	1987	1982	1987	1982	1987	1982	1987	1982	1987
Ganzi	25.54	21.7	12.40	13.2	55.12	56.8	2.82	3.1	4.72	5.1
Aba	24.07	21.3	13.13	13.8	55.45	58.0	2.76	2.1	4.59	4.8
Liangshan	26.07	24.2	14.51	13.8	52.90	55.2	2.40	2.3	4.12	4.4
Panzhihua	18.94	10.8	13.54	13.1	62.64	71.5	1.75	1.7	3.13	3.0
W. Sichuan	24.69	20.2	13.90	13.5	54.88	59.8	2.41	2.3	4.12	4.2

Sources: 1. The Third Census of Sichuan (1982), The Census Office of Sichuan, 1984.

2. The Sampling Survey of One Per Cent Population in Sichuan (1987). China Statistics Publishing House, 1988.

**Table 2.3: Age and Sex Breakdowns in the Three Prefectures and Panzhihua Municipality**

(Unit: Per Cent of the Total Population)

		0-9		10-14		15-59		60-64		>65		Total	
		1982	1987	1982	1987	1982	1987	1982	1987	1982	1987	1982	1987
Three Prefectures	Male	13.06	11.78	7.09	6.88	28.22	28.25	1.22	1.21	1.85	2.00	51.44	50.12
	Female	12.61	11.32	6.86	6.83	25.33	27.86	1.29	1.21	2.47	2.66	48.56	49.88
Panzhihua	Male	9.70	5.47	6.91	6.97	36.97	39.70	0.87	0.99	1.39	1.33	55.84	54.22
	Female	9.24	5.29	6.63	6.36	25.48	31.77	0.89	0.70	1.92	1.66	44.16	45.78

Sources: Same as in Table 2.2.



The young below 14 and the old above 60 are significantly lower in Panzhihua. Also the male labourers outnumber the female labourers by about 12 per cent, compared to 3 per cent in the rural areas.

### *Sex Breakdown*

In the 37 years from 1950 to 1987, the highest proportion of men to women was 117:100 in 1966 (Table 2.4). At that time, a great number of male employees migrated to Panzhihua municipality because of the construction of Panzhihua Iron and Steel Company. The lowest proportion was 91:100 in 1950, because many male youths died during the war. From 1975 to 1987, the proportion of men to women had dropped gradually while the migration into Panzhihua had stabilised. We have already mentioned above the larger proportion of men in Panzhihua. Another important feature to note is the relatively higher proportion of males in Aba Prefecture because of the logging industry there (Table 2.5).

### **Urban and Rural Distribution of the Population**

In the vast land of West Sichuan, there are only two cities, Panzhihua Municipality and Xichang City. Panzhihua is a new industrial and mining municipality which came into prominence because of the iron mine. It was formally promoted to the status of a municipality in 1965. In 1987, it had a population of 383,833 (non-agricultural I.D. holders). Xichang is the capital of Liangshan Prefecture. It is a small city with a population of 124,294 (non-agricultural I.D. holders). In addition, there are 66 towns in West Sichuan, and the total population in towns with non-agricultural I.D.s is 306,866.

Table 2.6 shows the change in the urban population in West Sichuan. In 1954, it was 159,254, making up 5.26 per cent of the total population. By 1987, this had reached 1,233,855, making up 21.14 per cent of the total population. The change from 1950 to 1987 can be divided into three stages. The first stage was the period from 1950 to 1960. It is a slow growth stage except for Aba. A large number of the population with non-agricultural I.D.s migrated to Aba Prefecture to engage in forestry and the urban population grew to 16.89 per cent of the total population in 1958. The second stage, from 1961 to 1975, was of an uncertain nature, caused by the economic fluctuation from 1962 onwards. Construction on a large scale in Panzhihua municipality since 1964 led to the transfer of a large population, which led to a rapid increase in the urban population. The third stage can be subdivided into two parts. The first, from 1975 to 1982, was the steady growth period; the second, from 1982 to 1987, was the rapid growth period. In the short five years' period, the city and town population rose from 16.05 per cent in 1982 to 21.14 per cent in 1987. There were two factors that contributed to this. One was the natural growth rate of the population, another was the change in administrative divisions. In the second case, although the urban population increased, the proportion of the population with non-agricultural I.D.s. decreased significantly.

The proportion of the urban population with non-agricultural I.D.s is 62.35 per cent in the cities and 37.65 per cent in the towns. This means that the urban population with non-agricultural I.D.s is mainly concentrated in Panzhihua and Xichang and is engaged in industry, commerce, and other urban off-farm economic activities. This also shows that the development of township enterprises is at a low level and the scale of off-farm employment in West Sichuan is still on a small scale.

**Table 2.4: Sex Breakdown of the Population in West Sichuan**

	1950	1954	1964	1966	1975	1982	1987
Percentage of Male Population	47.65	50.44	51.15	53.83	52.34	51.97	51.77
<u>Percentage of Female Population</u>	52.35	49.56	48.85	46.17	47.66	48.03	48.23
Male to Female Ratio (Female = 100)	91	102	105	117	110	108	107

Source: Population Yearbook of Sichuan, 1989.

**Table 2.5: Proportion of Males to Females**

(Unit: Females = 100)

	1953	1964	1982	1987
Panzhihua	-	104	128	119
Aba	98	115	112	108
Ganzi	-	96	102	102

Source: Population Yearbook of Sichuan, 1989.



**Table 2.6: Structure and Change in the Urban Population**

		1954	1957	1962	1964	1971	1975	1982	1985	1987
Ganzi	1	22,530	22,499	66,014	19,355	23,483	24,709	48,176	92,063	97,674
	2	4.22	4.27	13.26	3.79	3.84	3.69	6.30	11.70	12.22
	3	12,439	14,753	54,102	191,156	23,473	24,709	44,951	69,285	60,185
	4	55.21	65.57	81.96	98.97	99.96	100	93.31	75.26	61.62
Aba	1	32,877	75,756	76,945	37,654	51,377	58,206	76,486	96,188	101,135
	2	8.24	11.89	16.61	7.72	8.61	8.89	11.51	13.11	13.68
	3	19,057	61,371	66,871	30,260	48,482	56,755	73,817	79,164	81,709
	4	57.96	81.01	86.92	80.36	94.37	97.51	96.51	82.30	80.79
Liangshan	1	103,847	119,424	140,753	92,350	160,517	167,624	240,989	392,955	460,139
	2	4.95	5.45	7.23	4.51	6.11	5.75	7.40	11.74	13.39
	3	76,819	94,172	109,757	76,687	138,953	141,228	166,794	227,602	275,191
	4	73.97	78.86	77.98	83.04	86.57	84.25	69.21	57.92	59.81
Panzhihua	1	-	-	-	-	321,466	431,985	526,791	564,581	574,907
	2	-	-	-	-	56.56	60.84	64.76	66.49	66.50
	3	-	-	-	-	218,020	291,835	353,418	393,382	397,935
	4	-	-	-	-	67.85	67.56	61.09	69.68	69.23
West Sichuan	1	159,245	217,679	283,712	149,359	556,843	682,524	892,442	1,145,787	1,233,855
	2	5.26	6.87	9.18	4.61	12.64	13.79	16.05	20.04	21.14
	3	116,562	170,296	230,730	126,103	428,928	514,527	638,980	769,433	785,020
	4	69.45	78.24	81.33	84.44	77.03	75.39	71.60	67.15	63.62

Source: Population Yearbook of Sichuan, 1989.

- Note:
1. Urban population of the region.
  2. Percentage of the urban population compared to the total population.
  3. Urban population with non-agricultural I.Ds.
  4. Percentage of the urban population with non-agricultural I.Ds compared to the total urban population.

## Structure of Labour Force and Employment

### *Occupational Structure*

Here also we use the data of the third census (1982) and the one per cent sample survey of 1987. According to the occupational classification of China, the employed population can be classified into eight types: (a) professional staff and technicians, (b) officials in State organisations, party organisations, enterprises, and educational institutions, (c) office workers, (d) employees in commerce, (e) employees in the services' sector, (f) labourers in agriculture, (g) workers in manufacturing and transportation, and (h) others.

On July 1, 1987, according to the sample survey, the sample population in West Sichuan over 15 years of age was 24,364. Of these 19,598 people (80.44%) were employed. According to the 1982 Census, the employed population was 2,889,356 (see Table 2.7), making up 84.89 per cent of the total working population. The 1987 employment rate is thus lower by 4.45 per cent. Agricultural labourers constituted



the largest proportion of the employed population (74.25%) in 1987 and (77.08%) in 1982. If Panzhihua municipality is excluded, the proportion is even higher (90.40% and 83.75% respectively). The predominance of agriculture in the three prefectures is indicative of the difficulty in promoting off-farm employment. In Panzhihua, the high rate of 33.18 per cent of the workers engaged in manufacturing and transportation (compared to 2.78 per cent in the three prefectures) is characteristic of an industrial and mining area. The backward economy in West Sichuan is further reinforced by the relatively small proportion of the first rate categories of employment (10.16% in 1987). This is even lower in the three prefectures (4.81% in 1987). Panzhihua, with 25.40, is considerably better off from this perspective. Commerce and services in West Sichuan are also less developed. These sectors in Panzhihua occupied only 13.20 per cent in 1987, far lower than in other cities of the same scale.

Comparing the occupational structure in 1982 and 1987 (see Table 2.7), we found a puzzling phenomenon. In Panzhihua, the change in occupational structure conforms to the general trend of social and economic development. Accordingly, the proportion of labourers in tertiary activities is increasing, while in the primary sector it is decreasing. The change in the three prefectures is, however, reversed. The percentage of professional staff and technicians decreased from 4.63 per cent in 1982 to 2.28 per cent in 1987, while the percentage of agricultural labourers increased from 83.15 per cent in 1982 to 90.40 per cent in 1987. Three factors may be responsible for the change. The first important factor may be the difference in the statistical method. The data in 1982 was collected by census, and the data in 1987 was based on the 1 per cent sample survey. The second factor may be that many professional staff, technicians, and officials were transferred out of the three prefectures. The third factor may be that many rural youths who entered into the labour force could not find any off-farm jobs and had to return to farming activities.

### *Gender Implications*

In West Sichuan, as shown in Table 2.8, women, more so than men, are largely concentrated in agricultural activities (85.14% in 1982 and 79.85% in 1987) and only peripherally in manufacturing and transportation (5.6% in 1982 and 5.63% in 1987). Comparing the position of men and women (Table 2.9), the only sectors where women have an edge over men are in commerce and services. Here the proportion of women's involvement has steadily increased from 1982 to 1987. In agriculture, the workers are almost equally divided. In the remaining occupations, men are predominant. The ratio among officials of State organisations, party organisations, and enterprises and institutions is in the range of 9:1; and among office workers, as well as workers in manufacturing and transportation, it is in the range of about 3:1.

Among professional staff and technicians, women and men were almost equal in proportion in 1987. This is an improvement from 1982 when the proportion of women was only 39.33 per cent compared to men. Many female college students were dispatched to the region and this contributed to the increase. This shows that, in China, the educational level achieved by women is really significant. On the contrary, the decrease in the proportion of officials in state organs and party organisations implies that it is necessary to improve the training and promotion of female cadres. It also reflects the fact that women's interest in participating in government and political affairs is weak and that their social position needs to be raised.

Comparing the women's employment position between 1982 and 1987, we found that in Panzhihua the change in the women's occupational structure is "positive". The rates of women employees in secondary



Table 2.7: Occupational Structure of the Employed Population in West Sichuan

Occupations	Three Prefectures				Panzhuhua				West Sichuan			
	Number		Per cent		Number		Per cent		Number		Per cent	
	1982 Census	1987	1982 (Sample Survey)	1987	1982 Census	1987	1982 (Sample Survey)	1987	1982 Census	1987	1982 (Sample Survey)	1987
Professional staff and technicians	112,002	331	4.63	2.28	37,506	672	7.98	13.20	149,508	1,003	5.17	5.12
Officials of State organisations, party organisa- tions, enterprises, and institutions	38,924	173	1.61	1.19	12,909	276	2.75	5.42	51,833	449	1.79	2.29
Office workers and employees	37,547	194	1.55	1.34	17,097	345	3.64	6.78	54,644	539	1.89	2.75
Employees in commerce	20,064	130	0.93	0.90	8,604	329	1.83	6.40	28,668	459	0.99	2.34
Employees in the services' sector	33,310	162	1.38	1.12	22,465	343	4.78	6.74	55,775	8,505	1.93	2.58
Agricultural labourers	2,011,474	12,115	83.15	90.40	215,775	1,436	45.88	28.21	2,227,229	14,551	77.08	74.25
Workers in manufacturing and transportation	164,627	403	6.80	2.78	154,868	1,689	32.93	33.18	319,395	2,092	11.05	10.67
Others	1,264	0	0.05	0	1,040	0	0.22	0	2,304	0	0.08	0
Total	2,419,112	14,508	100.00	100.00	470,264	5,090	100.00	100.00	2,889,356	19,598	100.00	100.00

Sources: 1. Census Office of Sichuan 1984.  
2. China Statistics Publishing House 1988.

**Table 2.8: Occupational Structure of the Employed Female Population**

	Three Prefectures		Panzhihua		W. Sichuan	
	1982	1987	1982	1987	1982	1987
Professional staff and technicians	3.70	1.65	9.64	17.92	4.52	5.42
Officials in State organs, Party organisations, enterprises, and institutions	0.34	0.10	0.46	1.38	0.35	0.39
Office workers	0.74	0.82	2.37	5.13	0.97	1.81
Employees in commerce	1.01	1.13	2.94	11.03	1.28	3.49
Employees in services	1.35	1.00	6.33	11.41	2.05	3.41
Agricultural labourers	89.25	93.81	59.73	33.75	85.14	79.85
Workers in manufacturing and transportation	3.56	1.48	18.26	19.79	5.61	5.63
Others	0.05	0.00	0.27	0.00	0.08	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00

Sources: 1. Census Office of Sichuan 1984.  
2. China Statistics Publishing House 1988.

and tertiary sectors increased, while the rate of women labourers in agriculture decreased from 59.73 per cent in 1982 to 33.75 per cent in 1987 (See Table 2.9). It should be noted that the rate of female professional staff and technicians to the total of employed females increased from 9.64 per cent in 1982 to 17.92 per cent in 1987 and the rate of female officials increased from 0.46 per cent to 1.38 per cent. This shows that in urban areas, women's social status has greatly improved. On the contrary, in the three prefectures, the change is "negative". The female labourers in agriculture increased from 89.25 per cent in 1982 to 93.81 per cent in 1987, while female professional staff and technicians decreased from 3.70 per cent to 1.65 per cent and female officials decreased from 0.34 per cent to 0.10 per cent. This shows the urgent need for promotion of female's off-farm opportunities and improvement of female education and social and economic conditions in backward rural areas.

### *Magnitude of Unemployment and Underemployment*

According to the sample survey of 1987, the employed population was 80.44 per cent. In 1982, it was 84.89 per cent. The unemployed population is in the range of about half a million (see Table 2.10). Those engaged in housework constitute 48.29 per cent, nearly half of the unemployed population. School students and retired workers constitute 17.15 per cent and 4.82 per cent respectively. Labourers who



Table 2.9: Gender Differences in the Occupational Structure

	Three Prefectures				Panzhihua				West Sichuan			
	Male		Female		Male		Female		Male		Female	
	1982	1987	1982	1987	1982	1987	1982	1987	1982	1987	1982	1987
Professional staff and technicians	63.08	65.56	36.92	34.44	53.47	43.96	46.53	56.04	60.67	51.65	39.33	48.95
Officials of State organs, Party organisations, enterprises, and institutions	90.30	96.53	9.70	3.47	93.59	89.49	6.41	10.51	91.11	92.20	8.89	7.80
Office workers	77.98	71.13	22.02	28.87	74.94	68.70	25.06	31.30	77.03	69.57	22.57	30.43
Employees in commerce	43.64	35.38	56.36	64.62	38.04	29.48	61.96	70.52	41.96	31.15	58.04	68.85
Employees in the service sectors	54.59	57.41	45.41	42.59	48.96	30.03	51.04	69.97	52.32	38.81	47.68	61.19
Agricultural labourers	50.36	50.26	49.64	49.74	49.90	50.56	50.10	49.44	50.32	50.29	49.68	49.71
Workers in manufacturing and transportation	75.80	74.69	24.20	25.31	78.65	75.84	21.35	24.16	77.18	75.62	22.82	24.38
Others	55.22	0	44.78	0	52.98	0	47.02	0	54.21	0	45.79	0

Sources: 1. Census Office of Sichuan 1984.  
2. China Statistics Publishing House 1988.

**Table 2.10: The Structure of the Unemployed Population**

	Aba		Ganzi		Liangshan		Panzhihua		West Sichuan	
	1982 Census	1987 (Sample Survey)	1982 Census	1987 (Sample Survey)	1982 Census	1987 (Sample Survey)	1982 Census	1987 (Sample Survey)	1982 Census	1987 (Sample Survey)
Total	85,090	689	85,365	669	263,841	1,788	80,102	1,621	514,398	4,767
Students	17,248	130	11,477	87	39,315	372	20,202	622	88,242	1,211
Engaged in Housework	39,215	341	43,278	343	131,337	767	34,550	425	248,380	1,876
Waiting for entrance to high school	2,036	19	1,026	24	5,942	23	2,111	136	11,115	202
Waiting for State assignment	60	0	10	0	66	20	559	48	695	48
Urban unemployed	2,527	35	1,553	10	7,124	72	3,036	79	14,240	196
Retired	4,750	93	3,004	48	12,187	127	4,841	211	24,782	429
Others	19,254	121	25,017	157	67,870	427	14,803	100	126,944	805

Sources: 1. Census Office of Sichuan 1984.

2. China Statistics Publishing House 1988.

are absolutely unemployed are very few in both urban and rural areas. Most of the workers who are engaged in agriculture are, however, underemployed. The surplus labour force is estimated to be about one-third of the total rural labour force in West Sichuan. Based on the sample survey of 1987, there were 0.07 per cent of the total population waiting for employment.

### *Transformation of the Labour Force Structure*

Here we emphasise the transformation processes from 1950 onwards from the point view of the rural labour force. The transformation is from cropping to other farming activities and secondly to rural off-farm activities. Another item of concern is the migration from the countryside to cities and towns.

From 1952 to 1962, the rural labourers were reduced from 96.82 per cent to 86.60 per cent (Table 2.11). Subsequently, from 1962 to 1988, the rural labour force structure in West Sichuan had undergone no substantive change. During the ten-year period of the cultural revolution, all channels of transfer were blocked. There was even a reverse flow of labour force whereby many cadres and intellectuals were transferred from the city or town to the countryside on political grounds.



**Table 2.11: The Change in Rural Labour Force Structure in West Sichuan**

Year	Total Social Labourers	Urban Labourers	Rural Labourers	Per Cent Rural Labourers
1952	1,190,164	38,812	1,151,352	96.74
1962	1,455,165	194,539	1,260,626	86.63
1970	1,872,850	291,534	1,581,316	84.43
1975	2,000,751	338,566	1,662,185	83.08
1980	2,187,904	419,905	1,767,999	80.81
1982	2,353,223	431,975	1,921,248	81.64
1985	2,518,673	438,158	2,080,515	82.60
1988	2,837,718	438,969	2,398,749	84.53

Note: (1) Social labourers are those engaged in a certain activity and who receive reward or income.

Source: Sichuan Nationalities Affairs' Commission and Sichuan Statistical Bureau 1988.

The percentage of rural labourers has more or less remained in the range of 80 to 86 per cent from 1962 to 1985. The agricultural economy is still primitive and manual labour has a dominant position. Agricultural labour productivity has not risen for a long time. Among the three prefectures, cropping has been dominant in Liangshan and, in Ganzi and Aba, cropping and animal husbandry occupy important positions.

Following the introduction of the Responsibility System in 1978, the percentage of agricultural labourers increased from 96.33 per cent to a maximum of 98.50 per cent in 1981. This was largely due to the incentives provided by the economic reform that encouraged farm households to get individual contracts and retain a large part of the benefits. Subsequently it went down to 96.46 per cent in 1984, indicating a saturation point that was reached. The other sectors have proportionately increased, albeit on a small scale. Some notable, though relatively small, changes can be observed in Table 2.12. The two sectors that have become prominent in this respect are transportation (from 0.1 % in 1980 to 0.58% in 1985) and commerce and services (from 0.04 per cent in 1980 to 0.51 per cent in 1985). There are indications that they are still increasing. The growth in industries and construction has also been on the rise, especially from 1983 onwards.

**Table 2.12: Rural Labour Force Structure of West Sichuan**

	1978	1980	1981	1982	1983	1984	1985
<b>Total rural labour force</b>	<b>1,672,429</b>	<b>1,767,797</b>	<b>1,843,157</b>	<b>1,921,450</b>	<b>1,960,409</b>	<b>1,995,532</b>	<b>2,033,292</b>
<b>Per cent</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
1. Agriculture	1,611,026	1,733,031	1,815,516	1,891,930	1,927,340	1,938,733	1,961,345
Per Cent	96.33	98.05	98.50	98.31	98.31	97.15	96.46
2. Township industries	19,410	17,745	14,345	12,498	10,524	13,046	18,414
Per Cent	1.16	1.00	0.78	0.65	0.54	0.65	0.91
3. Construction	5,056	2,498	864	1,865	2,122	3,476	6,847
Per Cent	0.30	0.14	0.05	0.10	0.11	0.17	0.34
4. Transportation and communication	3,537	1,746	1,641	2,394	3,958	7,988	11,812
Per Cent	0.21	0.10	0.09	0.12	0.20	0.40	0.58
5. Commerce and services	1,136	750	812	1,578	3,088	8,184	10,445
Per Cent	0.08	0.04	0.04	0.08	0.15	0.42	0.51
6. Education, health etc.	18,651	6,812	4,765	6,793	6,667	7,349	8,441
Per Cent	1.12	0.39	0.26	0.35	0.34	0.37	0.42
7. Scientific research	4	50	55	52	335	260	466
Per Cent	0.00	0.00	0.00	0.00	0.02	0.01	0.02
8. Social management	974	730	668	715	1,193	4,051	3,711
Per Cent	0.06	0.04	0.04	0.04	0.06	0.20	0.18
9. Temporary migrants	5,804	4,161	3,457	2,515	2,757	5,585	2,459
Per Cent	0.35	0.24	0.19	0.13	0.14	0.28	0.12
10. Other activities	6,831	1,521	1,079	1,110	2,425	6,760	9,352
Per Cent	0.41	0.09	0.06	0.06	0.12	0.34	0.46

Note: (1) Agriculture consists of farming, animal husbandry, forestry, sideline production, and fishery.  
(2) Data from Panzhihua Municipality have not been included in the data.

Source: Sichuan Nationalities' Affairs' Commission and Sichuan Statistical Bureau 1988.



To conclude, the structural change of the labour force from 1950 to now can be divided into three stages. The first stage was from 1950 to 1957. At this stage, the structure of the rural labour force was basically steady, and the change from farming into non-farming activities was very slight. Nevertheless, quite a number of farmers flowed into the city or town because the government began industrial construction on a large scale and did not restrict the flow of population from countryside to city or town. At that time, the employees in industry mainly came from the rural areas.

The second stage was from 1958 to 1978. At this stage, the transformation in rural areas was seriously confined and the structure of the rural labour force was abnormally steady. Over 20 years, the rural labour force was concentrated in cropping activities which were dominated by grain production. The out-migration from the rural areas was seriously reduced. The net flow was into the rural areas from outside (see Table 2.13). In the initial stage from 1958 to 1960 (the "Great Leap Forward") there was a continuation of migration from rural to urban areas. This was subsequently reversed. The *Shang Shan Xia Xiang* movement (educated urban youth going to work in the countryside and in the mountain areas) from 1968 to 1977 was another important reason for the reverse migration.

The third stage is from 1980 to the present. Since the rural economic reforms in 1980, the structure of the social labour force in West Sichuan has conformed to the law of economic development as indicated directly by the development of township enterprises. The rural surplus labour force has begun to move again from rural into urban areas. The government has recently been trying to regulate the movement in accordance with the absorbing capability of urban areas. The "*Zi Li Kou Liang Ren Kou*" (population with non-agricultural I.Ds but without State rations of grain and edible oil) is an example of the regulatory mechanism.

### *Patterns of Rural Migration*

The migration of the population from West Sichuan took place on a large scale and was directly affected by the social and economic conditions. During the period from 1956 to 1960 in Aba and Ganzi, there was a great number of immigrants, mainly due to forest exploitation. The net number of immigrants into Aba was 94,788 and into Ganzi 34,481 (see Table 2.11). In Liangshan, the net numbers of immigrants were still greater (up to 116,386). From 1961-1965, because of serious difficulties with the economy in Aba and Ganzi, there was a net emigration in the range of 40,468 from Aba and 10,919 from Ganzi. From 1966 to 1976, the immigrants exceeded the emigrants in West Sichuan. From 1976 to 1980, a great number of officials and cadres retired and moved out of the three prefectures to other relatively developed areas. From 1961 to 1985, in Panzhihua, there had been large-scale immigration because of the Panzhihua Project. The total net immigration during the period was 276,699. In 1986 and 1987 a large number of professional staff and technicians migrated out of Panzhihua to more developed regions. This accounts for the net emigration of 1,692. The process of migration at different stages is summarised in Table 2.14.

### *Typical Labour Demand Profile in Agriculture and Its Implications for Off-farm Activities*

Farming activities are seasonal in nature. Planting and harvesting are extremely busy periods when a large number of labourers are required. Usually, the family's own labour force is not enough, so farmers have to exchange labour. At the same time, the employees in township enterprises generally come back to the countryside to help their family in the farmwork. During the slack season, only a small number of labourers is needed. Usually, the farm labourers have to go out to seek jobs. The seasonal change in labour affects off-farm activities and the nature of seasonal migration.

Table 2.13: Population Migration at Prefecture-Level in West Sichuan

	Aba			Ganzi			Liangshan			Panzhihua		
	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	Net
1956-1960	172,358	77,570	94,788	91,401	56,920	34,481	444,303	327,917	116,386	-	-	-
1961-1965	133,727	174,195	-40,468	73,946	89,865	-10,919	556,285	535,960	535,960	20,325	65,671	28,247
1966-1970	24,064	23,035	3,029	19,075	16,131	2,844	24,418	162,083	82,335	145,426	57,280	88,146
1971-1975	100,121	94,332	5,789	65,488	59,864	5,624	351,825	358,481	-6,656	173,806	8,3074	90,832
1956-1980	35,672	103,996	-8,324	81,674	82,260	-586	367,957	379,343	-11,386	118,634	72,247	46,387
1981-1985	101,808	119,035	-17,227	91,792	9,0792	862	391,821	373,510	18,311	87,147	6,4060	23,087
1986-1987	30,576	43,032	-12,456	36,646	37,482	-836	136,778	131,805	4,973	33,074	-34,766	1,692

Source: Population Yearbook of Sichuan 1989.



**Table 2.14: Migration Pattern from Rural to Urban Areas in West Sichuan**

Migration Type	:	Not Applicable	Rural to Rural	Seasonal	Commuter	Semi-permanent	Permanent
Occupational Status	:	Farming job farmer	Multiple job farmer	Multiple Gong*	<i>Nong Min Gong</i>	<i>Nong Min Fei</i>	<i>Nong Zhuan</i>
Occupational Activity	:	Agriculture and rural off-farm sector	Agriculture and off-farm sector	Urban off-farm sector	Urban off-farm sector	Urban off-farm sector	Urban
Grain Supply	:	From contracted land	From contracted land	From contracted land	From contracted land higher price	From state supply at government price	From State ration at government price
Residential Status	:	Rural resident with agricultural I.D.	Rural resident with agricultural I.D.	Rural resident with agricultural I.D.	Rural resident with agricultural I.D.	<i>Zhi Li Kou Liang Ren Kou</i>	urban resident
Working Place	:	country-side	country-side or town	country-side, city	city or town	city or town	city or town
House Status	:	self built or bought	self built or bought	self built or bought	self built or bought	self built or bought units	Allocated by concerned
Implications of Migration	:	- <i>Bu Li Tu Bu Li Xiang</i>	<i>Li Tu Bu Li Xiang</i>	<i>Li Tu Bu Li Xiang</i>	<i>Li Tu You Li Xiang</i>	<i>Li Tu You Li Xiang</i>	

**Glossary :**

*Nong Min Gong*: All workers with agricultural I.Ds.

*Nong Zhuan Fei*: Agricultural I.D. holders converted to non-agricultural I.D. holders.

*Zhi Li Kou Liang Ren Kou*: Farmers who retain their land in the countryside, work in the city or town, and do not receive a State ration of grains and edible oil.

*Bu Li Tu Bu Li Xiang*: Farmers who do not leave the land, get employment in the rural area, and reside in the rural area.

*Li Tu Bu Li Xiang*: Farmers who leave the land and get employment in the urban area but reside still in the rural area.

*Li Tu You Li Xiang*: Farmers who leave the land, get employment in the urban area, and live in the urban area.

\* *Gong*: a day's work

Table 2.15 is an example of labour demand in Bingli Village, Wechuan County, Aba Prefecture. Horticulture is an important component of the farming system here. Two busy farming seasons are apparent every year. One is the "spring sowing season" and another is the "winter harvesting season". Spring sowing season is in April. The main activity at this time is to plant maize and soybean which are both staple crops. Winter harvesting season is from the tenth of September to the tenth of October. The main activity during this period is to pick and sell apples and to harvest maize. The winter harvesting season is relatively more busy. Almost all households have inadequate labour. Consequently, exchange of labour becomes popular among farm households. What is important to note in Table 2.15 is that the farm household fits in other activities when it is not busy with its "principal tasks". Animal husbandry, forestry, and mining are thus integrated into their annual schedule. From this point of view, as long as agriculture remains the primary source of subsistence, it is essential to identify the best mechanisms to intervene during the "slack seasons" if off-farm opportunities are to be promoted.

### Demographic Prognosis

From 1950 to 1990, the average annual growth rate in West Sichuan was 1.85 per cent. This is relatively more rapid than in other parts of China. The main reason for this is the predominance of minority nationalities in West Sichuan, except in Panzhihua. The family planning policy is not as strict for minority nationalities as for the *Han* people. Child-bearing starts at a younger age and the fertility rate is high. As shown in Table 2.16, the number of families with more than three children is very large. The more recent growth rate of the population is 1.63 per cent in Liangshan, 1.54 per cent in Aba, and 1.10 per cent in Ganzi, which are all higher than the average for Sichuan (see Table 2.2). The rapid growth in population has been exerting tremendous pressure on the natural resources, especially on land resources. The cultivated land per capita in the three prefectures has decreased from 0.14 ha in 1950 to 0.10 ha in 1987 and the land per labourer has decreased from 0.43 ha in 1960 to 0.22 ha in 1987.



Table 2.15: Seasonal Agricultural Labour Demand in Bingli Village, Wenchuan County

Month	Cropping	Horticulture	Animal Husbandry	Forestry	Main O.F.A.
Jan.	Preparing land, field management, wheat planting	Preparing land, manuring, controlling diseases & pests	Buying newborn pigs	Guarding forest	Making ditches for fruit trees
Feb.	same as Jan.	Pruning, watering	Feeding	Same as Jan.	Spring festival
Mar.	Purchase of maize seed, manuring, preparing soil, potato planting	Spraying lime	Same as Feb.	Planting	Mining
Apr.	Manuring, planting maize and beans	Maintaining ditches, controlling diseases and pests	Same as Feb.	Same as March.	-
May	Weeding in maize land, manuring, sowing spring buckwheat	Pruning, controlling diseases and pests	Same as Feb.	Guarding forest	Mining
Jun.	Field management of maize and bean	Same as May	Cutting grass for live-stock, cattle grazing	Guarding forest	Mining
Jul.	Gathering potatoes, second weeding in maize, manuring, sowing fall buckwheat	Guarding orchards	Same as June.	Guarding forest	Mining
Aug.	Harvesting beans and spring buckwheat	Guarding orchards	Same as June.	Guarding forest	Mining
Sep.	Harvesting and storing spring buckwheat	Guarding orchards	Same as June.	Guarding forest	Mining
Oct.	Harvesting and storing maize, soybeans, and fall buckwheat, sowing wheat, manuring	Picking and selling apples and Chinese prickly ash, management of orchards	Feeding	Guarding forest	-
Nov.	Preparing land	Same as Oct.	Feeding	Guarding forest	Mining
Dec.	Slack season	Slack season	Slaughtering for pork	Guarding forest	-

**Table 2.16: Number of Children Among *Zhang* and *Yi* Families in West Sichuan (1987)**

*Unit: Per Cent*

Minority nationality	One-child families	Two-children families	Families with three children or more
<i>Zhang</i>	39.7	29.6	30.7
<i>Yi</i>	20.4	20.2	59.4



## CURRENT STATE OF OFF-FARM EMPLOYMENT

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### Nature of Off-farm Employment

The pattern of off-farm employment (OFE) is different because of different conditions and because of the different strategies of farmers. Some farmers carry out off-farm activities permanently; others do so only seasonally. Some farmers find off-farm jobs outside local areas, others hold them within local areas. We can thus group off-farm employment into four patterns. The first pattern is with respect to OFE within local areas seasonally. These labourers often carry out farm activities concurrently. The second one relates to permanent OFE within local areas. Most of the labourers who work in rural enterprises belong to this pattern. The third one is seasonal OFE outside local areas. This kind of labourer also does farm work concurrently. Often they carry out off-farm activities in cities or towns during slack seasons, and come back to do farm work during peak seasons. The last pattern concerns permanent OFE outside local areas. These labourers often transfer their contracted land to other farmers and find a permanent off-farm job outside the local areas.

The first pattern of OFE is predominant in the Hengduan Mountain Region of Sichuan Province. Most of the off-farm labour force still devote part of their time to traditional agriculture. It is estimated that more than 70 per cent of the off-farm labourers in the Hengduan Mountain Area hold down farm jobs concurrently. Labourers who work in individually-run enterprises form the largest proportion of this category.

### Main Features of Off-farm Employment

- (1) Off-farm employment has made considerable progress during the past decade. Off-farm employment means employment in township enterprises which includes industry, transportation, construction, and tertiary sectors (including trade, catering, and services). With the introduction and spread of the Household Contract Responsibility System and a series of other policies favourable to off-farm employment, the non-farm sectors have made great achievements, particularly since 1978. The labour force employed in non-farm occupations reached \$ 461.7 million, nearly eight times as much as in 1980. More details are shown in Table 3.1.

With the increase in employment, the productivity level (output value per labourer), in both individually-run and collectively-run (including township-run and village-run) enterprises, has also been increasing (Table 3.2). The reasons for the concurrent increase of both employment level and productivity levels are as follows. First, off-farm employment in the Hengduan Mountains of Sichuan Province is still in the initial stages. Both the policy environment and

**Table 3.1: Employment and Output Value of Off-farm Sectors in West Sichuan**

	1980	1985	1988
Number of off-farm labourers (million)	0.063	0.180	0.258
Proportion of total rural labourers (%)	3.2	7.9	10.6
Output value of off-farm sector (\$ million)	59.52	33.0	461.7
Proportion of total rural output (%)	7.9	18.8	29.4

Source: Statistics on Township Enterprises of Sichuan Province, 1989.

- Note:
- (a) All the figures of output value used in Chapter 3 are calculated at fixed prices using the 1980 values. The conversion rate between the U.S. dollar and RMB yuan in 1980 was 1.53.
  - (b) The off-farm sector didn't include enterprises under the village level category in 1980.
  - (c) Output value does not include the public sector.
  - (d) The number of off-farm labourers in this table includes those engaged in the public sector. If the public sector is excluded, the figures are 0.051, 0.161, and 0.224 in 1980, 1985, and 1988 respectively. Since the figures for the public output value are not available, the figure for non-farm labourers used in the following analysis does not contain the public sector either.
  - (e) Rural labourers can be divided into four groups by major occupations, namely, (i) permanent farm-workers; (ii) permanent off-farm workers but still engaged in farm activities (iii) labourers who take off-farm as their principal occupation and concurrently engage in farm activities; (iv) labourers who take farming as their main occupation and concurrently engage in off-farm activities. In Table 2.12, the off-farm labourers only include (ii) and (iii), while in this table, (iv) is also included. So the figure in this table is higher than that in Table 2.12. This is also true for Table 3.9.

internal conditions for off-farm activities have been increasingly favourable. On the one hand, a series of favourable terms for loans and taxation have been provided. This has brought about a large profit margin in off-farm activities. On the other hand, the labourers engaged in off-farm activities have become increasingly more skilled and experienced through practice and study, both at the technical and management levels.

Second, the economic management system of off-farm employment has been instrumental in increasing productivity. Township enterprises are based on the market economy, while State-owned ones are based on the planned economy. This means that most of the off-farm enterprises must assume sole responsibility for the profits or losses, and enterprises have to compete with each other for existence and development. This has led to an increase in productivity for the entire off-farm sector.



**Table 3.2: Off-farm Employment, Output Value, and Productivity at Different Levels of Ownership**

Ownership level	Items	1985	1986	1987	1988
Village level and above	No. of Labourers ('000)	77.0	78.1	80.8	79.9
	Output value (\$ million)	145.4	172.0	193.4	245.2
	Output value/labourer (\$ '000)	1.89	2.20	2.39	3.07
Below village level	No. of Labourers ('000)	83.5	114.3	129.3	144.5
	Output value (\$ million)	87.6	143.5	181.9	216.5
	Output value/labourer (\$ '000)	1.05	1.25	1.41	1.50

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

- (2) The off-farm employment level is still low. Although off-farm employment in the Hengduan Mountains has been developing at a rapid rate during past years, it still remains at a low level. Furthermore, both the level of employment and income are much lower than the national and provincial average. Also, productivity is very low when compared with Sichuan and China. The 1988 output value per labourer in this region is only 0.63 times and 0.59 times that of the provincial and national average (Table 3.3).
- (3) Individually-run enterprises (namely, the enterprises below village level, including enterprises run by households and household teams) are very prominent off-farm activities. In 1988, 64.4 per cent of the off-farm labour force were employed in individually-run enterprises, an increase of 12.4 per cent over 1985. In fact, individually-run enterprises have made a much greater contribution to the growth of the entire off-farm sector than enterprises at village level and above. The growth rate in employment from 1985 to 1988 in individually-run enterprises was 73 per cent whereas, in enterprises at village level and above, the corresponding rate was only 3.8 per cent. Similarly, the corresponding growth rates in output value are 147 per cent vs 69 per cent. More details are shown in Table 3.4.

**Table 3.3: Comparison of Averages of Off-farm Employment, Output Value, and Productivity in Sichuan and China (1988)**

	Hengduan Mt.	Sichuan	China
Proportion of rural off-farm labourers (%)	10.6	19.4	29.3
Proportion of rural off-farm output value (%)	29.4	53.7	58.1
Output value per labourer ('000 \$)	2.06	3.27	3.52

Source: Statistics of Township Enterprises of Sichuan, Province, 1989.

**Table 3.4: The Structure of Employment and Output Value in the Off-farm Sector at Different Levels of Ownership**

	Ownership levels	Units	1985	1986	1987	1988
No. of Labourers	Village level and above	'000	77.0	78.2	81.2	79.9
		%	48.0	40.6	38.5	35.6
	Below village level	'000	83.5	114.3	129.3	144.5
		%	52.0	59.4	61.5	64.4
	Total	'000	160.5	192.5	210.5	224.4
		%	100.0	100.0	100.0	100.0
Output value	Village level and above	\$ million	145.4	172.0	193.5	245.2
		%	62.4	54.5	53.5	53.1
	Below village level	\$ million	87.6	143.5	181.9	216.5
		%	37.6	45.5	46.5	46.9
	Total	\$ million	233.0	315.5	375.4	461.7
		%	100.0	100.0	100.0	100.0

Source: Statistics of Township Enterprises of Sichuan Province, 1989.



What needs to be further noted is the productivity level of off-farm activities at each level. As shown in Table 3.2, the productivity of below-village level enterprises has been lower than that of enterprises at village level and above. This is true in all the sectors, although the proportions are different (see Table 3.5). In spite of this, the below-village enterprises have been growing rapidly. It seems that the scale of employment in off-farm activities has been increasing without giving due consideration to productivity. However, the indicator (output value per labourer) does not reflect the situations under which different activities operate. In the Hengduan Mountains of Sichuan Province, most of the labourers engaged in individually-run enterprises are still involved in farm and other activities, while those in township and village enterprises have just a single job. The average time per labourer spent on the same activity is lower in individually-run enterprises than in village and township enterprises. Also the higher technology and management levels in bigger enterprises lead to higher productivity levels. Still the difference in work time is a more important factor in this region. Unfortunately, we are not able to analyse this further because of the lack of data.

**Table 3.5: Productivity of Different Off-Farm Sectors (1988)**

(Unit : \$ '000/labourer)

Items	Village level and above	Below village level
Industry	2.90	1.05
Transportation	4.79	2.97
Construction	4.00	1.47
Tertiary Sector	2.88	1.31

- (4) Rural industry is the main employment-generating sector. As shown in Table 3.6, rural industry has formed the most important source of employment and income in the Hengduan Mountains during past years. However, construction, transportation, service, and other tertiary sectors have shown greater potential for expansion. From 1980 to 1988, the proportion of the industrial sector has been steadily declining, while others are increasing in terms of both employment and income. However, the actual number of employed people and the output value in rural industry have been increasing. In 1988, the industrial sector still generated 58.9 per cent of the total employment and 55.4 per cent of the total output value, much higher than any other off-farm sector.

However, the productivity level of industry is not the highest in this region. As shown in Table 3.7, the transportation and the construction sector enjoy the highest and the second highest status in terms of output value per labourer, while industry comes as poor third. Over the past eight years, as already noted above, the productivity level in all the sectors has been increasing. The tertiary sectors provide a slight exception. The figure for 1985 was lower than in 1980.

**Table 3.6: Employment and Output Value of Different Off-farm Sectors in Different Years**

		Unit	1985	1986	1987
All Sectors	No. of Labourers	'000	51.4	160.5	224.4
		%	100.0	100.0	100.0
	Output Value	\$ million	59.5	233.0	461.7
		%	100.0	100.0	100.0
Industry	No. of Labourers	'000	44.6	103.1	132.2
		%	86.9	64.2	58.9
	Output Value	\$ million	50.8	135.1	255.6
		%	85.7	57.5	55.4
Transportation	No. of Labourers	'000	1.96	18.2	27.9
		%	3.8	11.4	12.5
	Output Value	\$ million	4.1	43.6	85.6
		%	4.5	12.6	10.7
Construction	No. of Labourers	'000	3.36	11.9	16.2
		%	6.5	7.4	7.2
	Output Value	\$ million	2.7	29.5	49.3
		%	4.5	12.6	10.7
Tertiary sector	No. of Labourers	'000	1.45	27.3	48.1
		%	2.8	17.0	21.4
	Output Value	\$ million	1.7	26.3	71.2
		%	2.9	11.3	15.4

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

Note: a) The tertiary sector includes commerce, catering, services, etc.  
b) The data do not include the public sector.



**Table 3.7: The Productivity of Different Off-farm Sectors  
in Different Years**

	Productivity (\$ '000/labourer)		
	1980	1985	1988
Industry	1.14	1.30	1.93
Transportation	2.12	2.37	2.06
Construction	0.80	2.47	3.03
Tertiary Sector	1.19	0.97	1.48

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

There is a reason for this decrease. Off-farm enterprises did not exist below the village level until 1980. Soon afterwards, when they were introduced, the productivity difference between below-village and above-village levels was in the ratio of 1.05:1.89. This was apparently reflected in a dramatic way in the tertiary sectors. But the trends have improved and the 1988 figure (\$ 1,480/labourer) exceeds the productivity value of 1980 (\$ 1,190/labourer).

- (5) Except for Panzhihua Municipality, the regional variation of off-farm employment in the rural areas of West Sichuan is not large. Both Tables 3.8 and 3.9 indicate that the three prefectures are very similar in terms of employment structure, productivity level, and output value. First, in all the three prefectures, the most prominent employment-generating sector is industry. Tertiary sectors come second, followed by transportation and construction. Second, the proportions of employment and output value in the three regions are very close to each other. Third, the productivity disparity in the entire off-farm activity is also not great, although it is greater for Aba.

Panzhihua Municipality is, however, an exception. First, the structure of employment is different. Although industry is still the most important, the second in line is construction; the tertiary sector is third, and transportation the last. Second, the levels of productivity, employment, and output value in this region are much higher than in the other three regions. A greater level of urbanisation, more advanced industries (including state-owned industry), and better infrastructural facilities have contributed to more rapid development of off-farm employment in Panzhihua Municipality.

**Table 3.8: The Structure of Employment and Output Value in Off-farm Sectors in Different Regions of West Sichuan (1988)**

		Unit	Aba	Ganzi	Liangshan	Panzhihua
All Sectors	No. of Labourers	'000	28.6	33.1	128.8	33.9
	Output Value	(\$ million)	60.7	64.4	225.1	111.5
Industry	No. of Labourers	Per cent	55.7	60.0	57.5	65.6
	Output Value	Per cent	43.6	55.2	56.9	58.7
Transportation	No. of Labourers	Per cent	14.4	13.8	12.6	9.0
	Output Value	Per cent	27.5	18.7	17.1	16.3
Construction	No. of Labourers	Per cent	7.8	5.2	5.9	14.0
	Output Value	Per cent	10.8	6.4	8.4	17.9
Tertiary Sector	No. of Labourers	Per cent	22.1	21.0	24.0	11.4
	Output Value	Per cent	18.1	19.7	17.6	7.1

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

Note: a) The tertiary sector includes commerce, catering, service, etc.  
b) The total does not include the output value of public sector activities.

**Table 3.9: The Level of Employment, Output Value, and Productivity of Off-farm Sectors in Different Regions of the Hengduan Mountains (1988)**

Items	Aba	Ganzi	Liangshan	Panzhihua
Proportion of off-farm labourers (%)	9.7	9.7	8.2	15.6
Proportion of off-farm output value (%)	24.8	23.9	26.3	56.2
Output value per labourer ('000 yuan)	3.25	2.97	2.67	5.0

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

Note: See note (e) in Table 3.1



According to the output value per capita of each county, the off-farm activity can be grouped into three categories namely, higher than 250 *yuan* (\$ 163), between 100 *yuan* (\$ 65) and 250 *yuan* (\$ 163), and less than 100 *yuan* (\$ 65). In 1988, there were 6 counties or districts with an output value per capita higher than 250 *yuan*, in which Renhe District of Panzhihua Municipality had the highest output value per capita of 680.1 *yuan* (\$ 445) in the Hengduan Mountains, but it occupied only the thirty-third position in Sichuan Province. Twenty-six counties had an output value per capita between 100 *yuan* and 250 *yuan* and 19 counties less than 100 *yuan*. Zhou Jue, Meigu, Rangtang, and Shifu recorded less than 50 *yuan* (\$33). More details are shown in Figure 3.1. This figure also shows us the clear linkage of off-farm employment with the economic basis, level of industrialisation, infrastructural facilities, etc. All the counties or districts, except Derong, with high output values per capita, enjoy a better economic basis, higher level of industrialisation and urbanisation, and better access to transportation. Most of the counties with the lowest levels of off-farm employment are located in remote areas and have poor economies, few infrastructural facilities, and a low quality of education and skills.

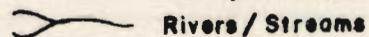
### **Rural Industry and Its Linkages**

Rural industries have been the most important source of off-farm employment and income in the Hengduan Mountains. In 1988, the total labour force employed in rural industries reached 0.132 million, accounting for 58.9 per cent of the total non-farm labourers. The output value of industry was 391 million *yuan*, 55.4 per cent of the total. However, from 1980 to 1988, the proportional contributions from the industrial sector declined in terms of employment and income (Figure 3.2). Among rural industries, heavy industries, particularly the extractive industry (including mining and forest felling), are predominant. In 1985, heavy industry in the three prefectures of Liangshan, Ganzi, and Aba took up 64.1 per cent of the employment and 69.1 per cent of the output value within the sector. Another 35.9 per cent of the employment and 32.9 per cent of the output value were due to light industries producing mostly agro-based products. More details are shown in Table 3.10. In 1988, employment in individually-run industries amounted to 52.2 per cent, but the total output value was only 28.3 per cent. Township-run industries had the largest outputs (64%). Light industries more than heavy ones are prominent in individually-run industries. In township and village-run industries, heavy ones predominate. More details are shown in Table 3.11.

Natural resources have provided an important basis for the development of rural industry. Most of the industries are based on local raw materials. There are five kinds of resource which are prominent in the Hengduan Mountains of Sichuan Province: mineral resources, forest resources, water power, livestock, and horticulture. Accordingly, mining, logging, hydro-electric power generation, and agro-based processing industries are predominant in this region.

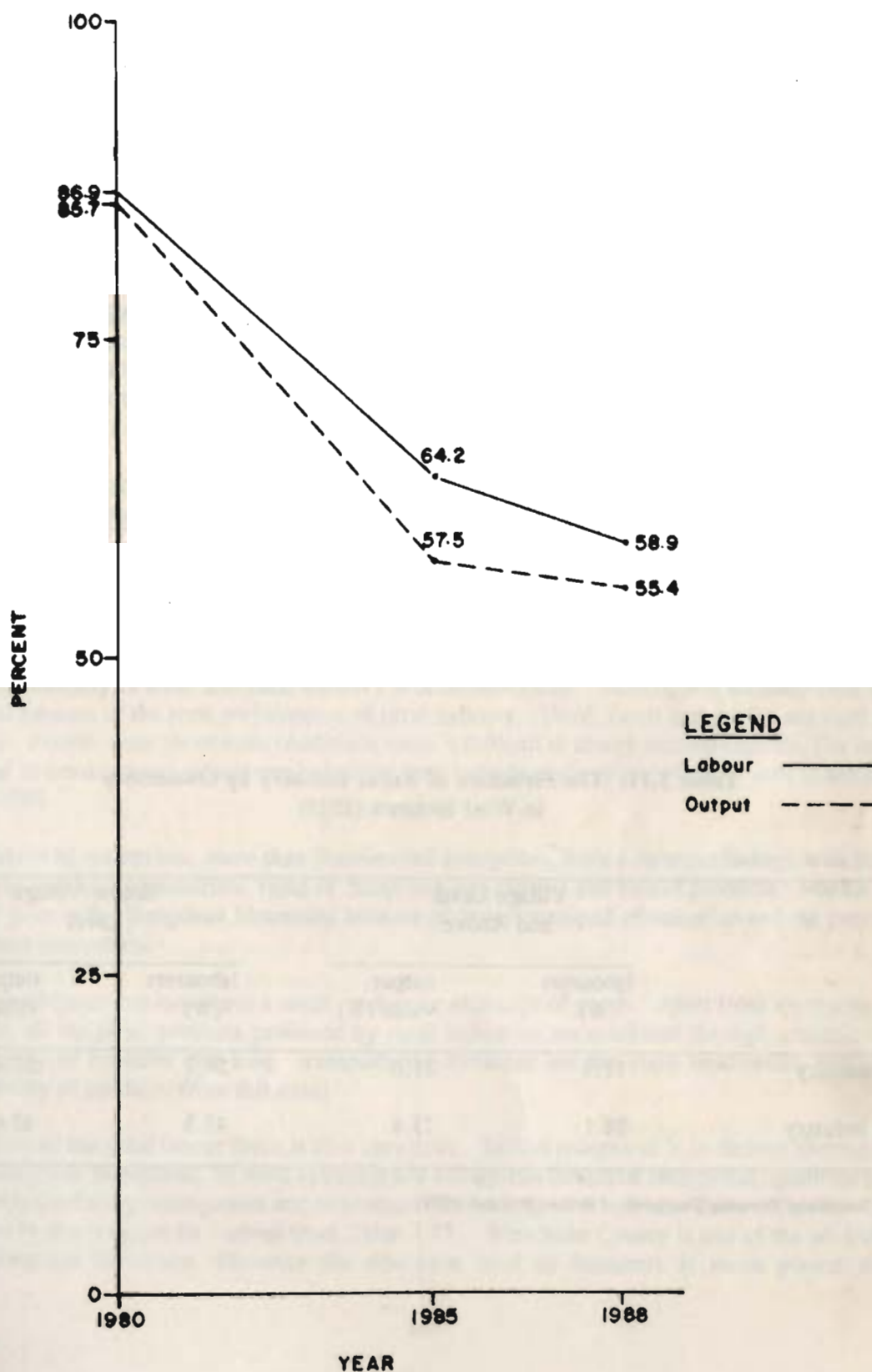
The linkage of industry with policy is reflected mainly in two aspects. The first aspect concerns a series of favourable policies on rural industry that have been adopted during the last decade. These include preferential treatment in capital taxation and loan. Before 1980, rural industry witnessed a very slow pace of development, even stagnancy, due to policy restrictions. For example, Ganzi Prefecture had only 38 rural industrial enterprises until 1977; the figure boomed to 3,761 by 1988. The positive effect on rural industry has also been greater than on collectively-run township industries. While the number of rural industries has been rising fast, that of collectively-run township industries has been falling. For example, the number in Ganzi Prefecture was reduced from 82 in 1981 to 50 in 1988. The second aspect concerns the fact that the instability of policy has imposed negative impacts. For example, the preferential treatment regarding loans to rural industry stopped in 1988. The shortage of capital has now been felt keenly in industrial enterprises.







**Figure 3.2: Percentage of Labourers and Output Value in Rural Industries**



**Table 3.10: The Structure of Employment and the Output Value of Rural Industry in the Three Prefectures of West Sichuan (1989)**

	Labourers (%)	Output value (%)
<u>Light Industry</u>	<u>35.9</u>	<u>32.9</u>
Agro-based	27.0	27.8
Nonagro-based	8.9	5.1
<u>Heavy Industry</u>	<u>64.1</u>	<u>67.1</u>
Extractive type	40.8	39.4
Raw material based	6.7	13.6
Processing	16.6	14.1

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

Note: "Light Industry" includes products that are meant for satisfying subsistence needs. Depending upon the raw materials used an industry may be "agro-based" or "non agro-based". "Heavy Industry" is grouped into three types: extractive industries (obtaining raw materials directly from the natural world), raw material-based industries (preliminary processing of the products from extractive industry), and processing industries (further processing on the products of raw material-based industry).

**Table 3.11: The Structure of Rural Industry by Ownership in West Sichuan (1989)**

Items	Village Level and Above		Below Village Level	
	labourers (%)	output value (%)	labourers (%)	output value (%)
Light industry	11.9	21.6	56.7	57.4
Heavy industry	88.1	73.4	43.3	42.6

Source: Statistics of Township Enterprises of Sichuan Province, 1989.



Rural industry has very strong linkages with the development of small towns and infrastructure. The Hengduan Mountains are the least urbanised in Sichuan Province. There are only two cities and 54 county-level towns, accounting for 8.1 per cent of the provincial urban population. The average distance between towns in this region is six times that of the provincial average. Transportation facilities are also inadequate. Road transportation, as the main means of transportation in this region, is of poor quality and the road density is very low. It is estimated that 25 per cent of the townships are still not linked by roads. Lack of towns and an inadequate infrastructure have thus become the main constraints to the development of rural industries. Because of these constraints rural industrial development has been affected in the following ways: (a) only counties such as Wenchuan, Xichang, and Luding are more urbanised, have better access to roads, and have more advanced and larger-scale rural industries; (b) most of the mineral deposits in the remote areas of this region remain unexploited; and (c) the efficiency of investment is very poor.

There are mainly three sources of capital for rural industry: self-collected capital, bank loans, and government aid funds. Between 1986 to 1988, about 113.24 million *yuan* was invested in fixed assets in township and village-run industries. Of these, bank loans contributed the largest portion (42.1%), self-collected capital, 40.6 per cent, and government aid funds, 17.3 per cent. From 1988 onwards, self-collected capital has become the main source (55.2%) (because of the State's austerity policy) and the second being bank loans (31.8%).

Shortage of capital has been a big problem for economic development in this region. The investment in fixed assets in township and village-run industries in the Hengduan Mountains was only 3.2 per cent of the provincial total. The number of industrial projects at village level and above was 122 in 1988, only 2.5 per cent of the provincial total. The disparity between the Hengduan Mountains, Sichuan, and Chengdu Municipality are shown in Table 3.12. Lack of capital has inhibited the establishments, expansion, and updating of many rural industrial enterprises. Some rural industries have even ceased operation because of the lack of running capital. Four factors are accountable for the lack of capital. First, the economy is weak and rural industry is underdeveloped. Second, self accumulation of capital is limited because of the poor performance of rural industry. Third, funds and profits are used for other purposes. Fourth, poor investment conditions make it difficult to absorb outside capital. The investment of capital in township and village-run industries from outside made up only 6.1 per cent of the provincial total in 1988.

Rural industrial enterprises, more than State-owned enterprises, have a stronger linkage with the market system for purchase of materials, input of manpower and capital, and sale of products. Market facilities are very poor in the Hengduan Mountains because of underdeveloped urbanisation and the prevalence of subsistence economies.

Some townships do not even have a small market for exchange of goods. Apart from electricity, timber, and gold, all the other products produced by rural industries are marketed through unstable channels. Poor quality of products and long transportation distances are the main weaknesses that affect the marketability of products from this area.

The quality of the rural labour force is also very poor. Skilled manpower is in serious shortage in most of the Hengduan Mountains. In most township and village-run industrial enterprises, qualified personnel in all fields (including management and techniques) are lacking. A rough idea about the skills of off-farm labourers in this area can be derived from Table 3.13. Wenchuan County is one of the advanced areas in the Hengduan Mountains. However the education level of labourers is much poorer than the



**Table 3.12: Investment in Fixed Assets and Productivity in Industrial Enterprises at Village Level and Above in Different Areas (1988)**

	No. of projects (No. per prefecture or municipality)	Investment on fixed assets (million <i>yuan</i> per prefecture or municipality)	Fixed assets' increment (million <i>yuan</i> per prefecture or municipality)	Productivity ( <i>'000 yuan</i> per labourer)
Hengduan Mts.	31	9.2	6.7	4.4
Sichuan	232	75.2	40.0	10.8
Chengdu	1,086	208.2	14.9	14.9

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

Note: There are 21 prefectures or municipalities in Sichuan Province, Chengdu Municipality enjoys the highest level of rural industrial activities.

**Table 3.13: Educational Qualifications of Off-farm Labourers in Township and Village-run Industrial Enterprises**

	Maoxian	Wenchuan	Sichuan
Number of Labourers	949	2,906	1,689,575
College Level (%)	0.0	0.03	0.20
High school Level (%)	9.1	9.46	14.70
Junior/Middle School Level (%)	23.3	46.21	46.10
Primary School Level (%)	67.6	44.30	39.00
Technicians (%)	0.0	2.40	3.70

Source: Statistics of Township Enterprises of Sichuan Province, 1989.



provincial average. Maoxian County, which has middle level rural industries, has an even more serious shortage of qualified personnel.

Shortage of skilled manpower has important effects on rural industry. It has led to: (a) more extractive industry and less manufacturing, (b) low level of mechanisation, (c) low economic profit because of poor management and low technical levels.

There are mainly three ways for labourers to obtain the necessary knowledge and skills to run industrial enterprises: first, by inviting technicians or retired workers from relevant large-scale enterprises to run training classes or provide technological consultation; second, by sending people to large-scale enterprises or colleges to learn first, and then using them to train others; third, by learning from the local people who have special skills. The third way is very popular in both enterprises which were founded earlier on and individually-run enterprises. In addition, some relevant departments have helped train employees in rural industrial enterprises.

Rural industries have made a positive impact on several economic sectors. First, they provide certain assistance for agricultural development. Second, the extractive industry has been providing raw materials for State-owned manufacturing industries. Third, the agro-based industries have been instrumental in enhancing the productive use of agricultural products through processing of agricultural commodities. Fourth, rural hydro-electric power stations have been supplying electricity to various economic sectors in both rural and urban areas.

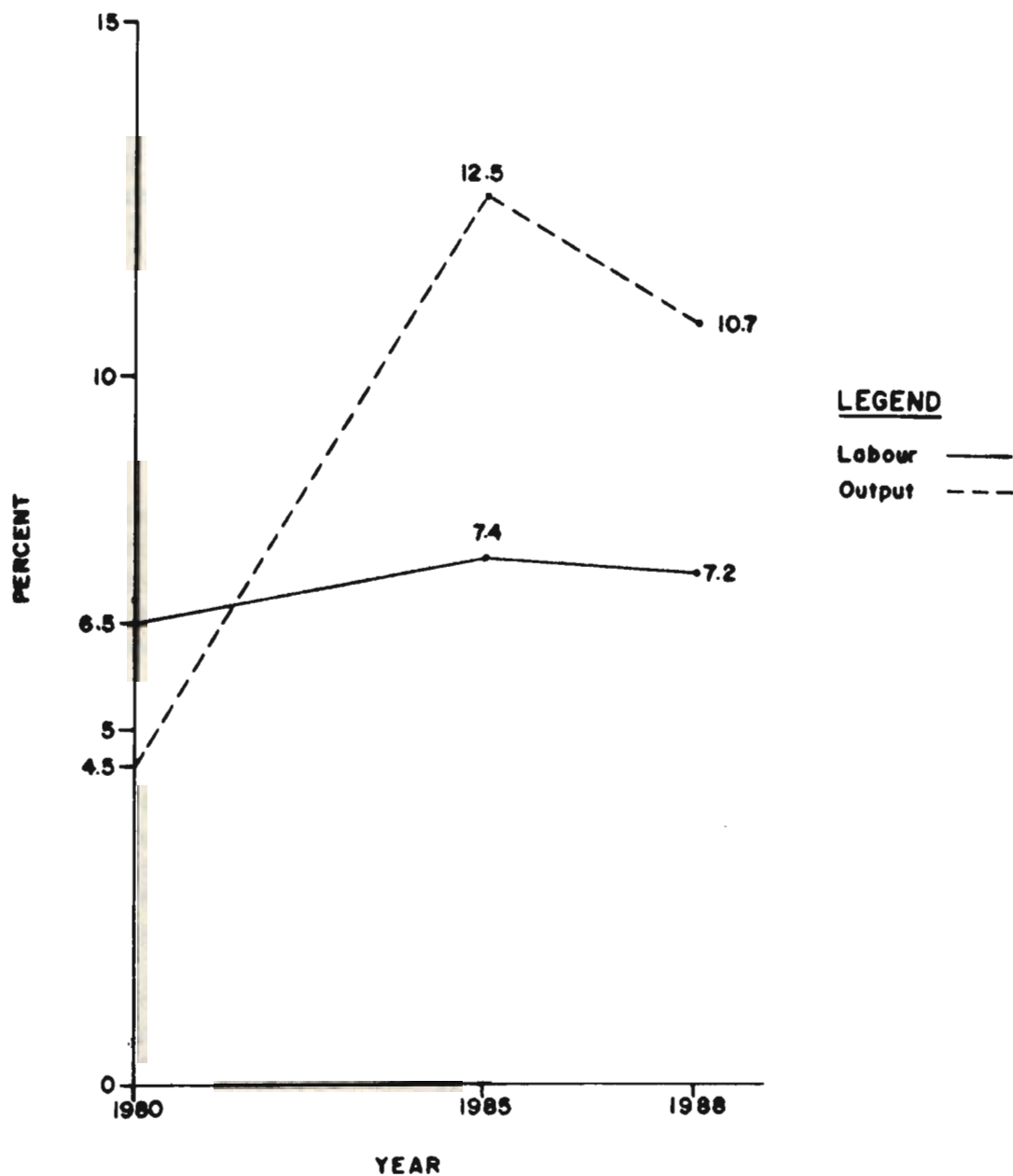
Some rural industries have, however, caused negative impacts on the environment because of inappropriate use of resources. For example, deforestation has been aggravated through excessive felling by some logging enterprises. Secondly, mudflows, landslides, and soil erosion have been aggravated by careless mining. Thirdly, environmental pollution has become more serious as a result of scarcity of funds and inadequate equipment for dealing with pollutants discharged by most industrial enterprises.

### **Construction and Its Linkages**

The levels of employment and output in construction grew rapidly between 1980 and 1985 and became subsequently stable after 1985 (Figure 3.3). The magnitude of employment reached 16 thousand in 1988, 7.2 per cent of the total employed in off-farm activities. The figures were 12 thousand and 7.4 per cent in 1985 and 3 thousand and 6.5 per cent in 1980. The output value was 75.4 million *yuan*, 10.7 per cent of the total, and it was 4 million *yuan* in 1980 and 4.5 million *yuan* in 1985.

Construction enterprises are mostly run by townships in this region. There were, 9,557 labourers engaged in such activities in 1988, accounting for 59.7 per cent of the total employees in rural construction. Their output value was 59.6 million *yuan*, 79.0 per cent of the total. Individually-run enterprises are also significant as they accounted for 38.1 per cent of the total employment and 18.5 per cent of output value in rural construction (1988). Village-run construction enterprises contributed only 2.2 per cent of employment and 2.5 per cent of output value within this sector.

**Figure 3.3: Percentage of Labourers and Output Value in the Construction Sector**





The macro-economic policy has close linkages with construction. The rural construction sector boomed when, during the last decade, the State and local governments adopted the policy to speed up basic construction. When the policy was subsequently changed, the sector also declined. Secondly, the farmers' demand for improved housing conditions has been increasing due to the increase in their income. This is one of the main factors which promoted the development of individually-run construction enterprises in this region. Thirdly, construction activities are relatively small scale and require only small investments, but the returns are high. This is another reason for the growth of the construction sector between 1980 and 1985. Fourthly, the skills needed for construction activities in rural areas are not complicated for the time being. Most of the people learn the skill through on-the-job training. In township-run construction enterprises some formal training classes are given. Generally speaking, the technical level of construction in this region is lower than in other regions of Sichuan Province. This has become one of the main constraints in getting jobs outside the region. In 1988, there were 0.17 million rural builders in Sichuan who found jobs outside the province, but none of them were from the Hengduan Mountain Region. There were, however, 7,269 rural builders in 1988, who carried out activities in cities and towns within the region. This accounted for 45.4 per cent of the total number of rural builders.

### **Transportation and Its Linkages**

Rural transportation in this region has achieved tremendous progress during the last decade (Figure 3.4). In 1988, the employees in transportation reached the 28 thousand level, accounting for 12.5 per cent of total employees in the off-farm sector. This figure was 3.8 per cent in 1980. Its output value was 131 million *yuan*, 18.5 per cent of the total. The corresponding values in 1980 were 6.2 million *yuan* and 6.9 per cent whereas in 1985 they were 67 million *yuan* and 18.5 per cent.

Individually-run transportation dominates the Hengduan Mountains of Sichuan. Its employees were responsible for 95.3 per cent of the entire rural transportation and their output value was 92.6 per cent of the sector. In fact, individually-run transportation is the only sector that has contributed to growth. Township-run and village-run transportation services have been declining. According to statistics, the number of labourers employed in township-run and village-run transportation services were reduced by 40 per cent from 1980 to 1988.

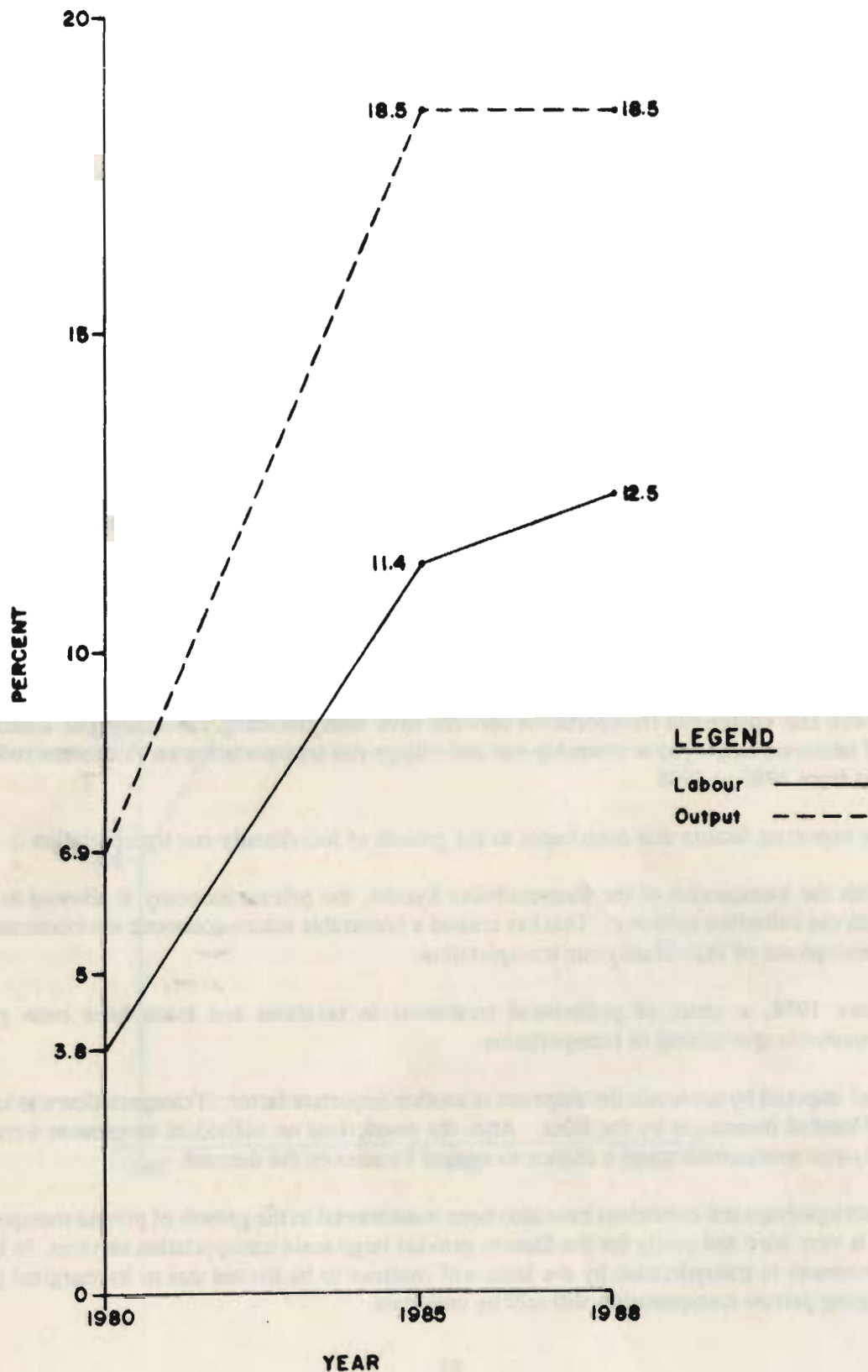
One of the important factors that contributes to the growth of individually-run transportation is policy.

- (a) With the introduction of the Responsibility System, the private economy is allowed to coexist with the collective economy. This has created a favourable macro-economic environment for the development of individually-run transportation.
- (b) Since 1978, a series of preferential treatments in taxations and loans have been given to households specialising in transportation.

The demand imposed by economic development is another important factor. Transportation was inhibited because of limited investment by the State. After the restrictions on individual investment were lifted, individually-run transportation had a chance to expand because of the demand.

The difficult topographical conditions have also been instrumental in the growth of private transportation, because it is very hard and costly for the State to provide large-scale transportation services. In the near future, investment in transportation by the State will continue to be limited due to its marginal position. So, developing private transportation will still be important.

**Figure 3.4: Percentage of Labourers and Output Value in the Transportation Sector**





There are two sources of capital for initiating private transportation, i.e., bank loans and self-collected capital (including private loans). Since developing transportation needs an amount of investment which is often beyond the capacity of a household, bank loans and private loans are usually the main sources of capital. However, the risk of carrying out the transportation activity is not high because of its high profitability.

The skill required for private transportation is not high. Most farmers with primary school education can manage a private transportation enterprise quite well.

Rural transportation has linkages with almost all the economic sectors. It has provided services not only to rural industry and agriculture, but also to some State-owned enterprises.

There are mainly two constraints in rural transportation. One is the limited oil supply. Oil consumption by the vehicle is higher in this region because of the slopes. Notwithstanding, the oil ration per vehicle, supplied by the provincial department, is the same as in the plains. Every year, there are many vehicles which cannot operate fully because of the shortage of oil. Another constraint is the limited traffic capacity of the poor-quality roads and the relatively small number of passengers.

### **The Tertiary Sector and Its Linkages**

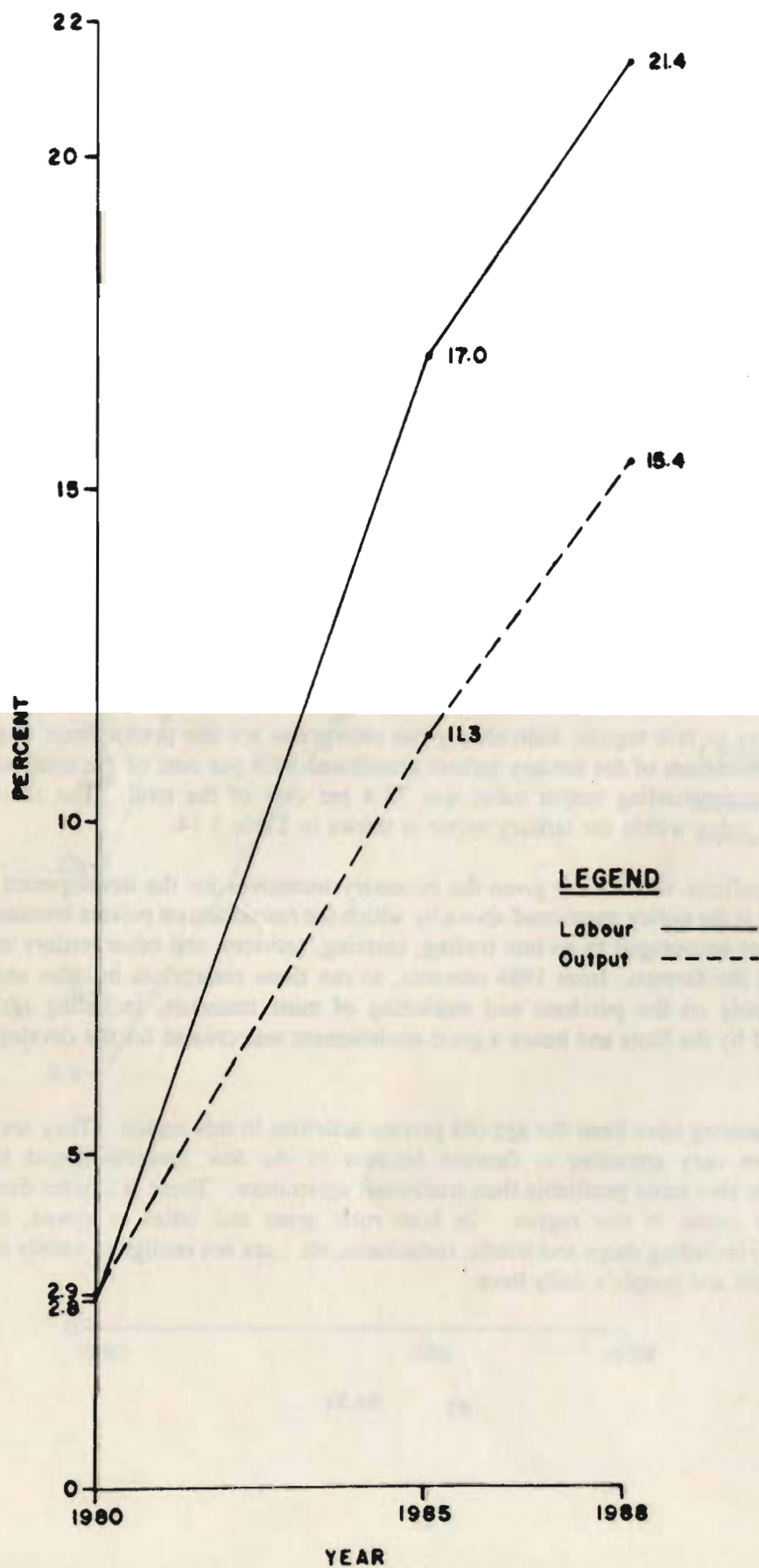
The rural tertiary sectors include trade, catering, services, and others. With the development of the rural and the urban economy, the tertiary sector has been increasing at a rapid rate since 1980 (Figure 3.5). The number of labourers employed in the tertiary sector was 48 thousand in 1988, 21.4 per cent of the total in off-farm sectors. The figures were 1.5 thousand and 2.8 per cent in 1980. Its output value was 109 million *yuan*, 15.4 per cent of the total, compared to 2.6 million *yuan* and 2.9 per cent in 1980.

In all the tertiary sectors in this region, individually-run enterprises are the predominant ones. The employees in private enterprises of the tertiary sectors constituted 88.9 per cent of the total within the sector in 1988. The corresponding output value was 78.4 per cent of the total. The share of the employment and output value within the tertiary sector is shown in Table 3.14.

There are mainly two policies which have given the necessary incentives for the development of rural tertiary activities. One is the policy mentioned above by which the restriction on private investment was lifted. The farmers were encouraged to go into trading, catering, services, and other tertiary activities. Another policy allowed the farmers, from 1984 onwards, to run these enterprises in cities and towns. In addition, the monopoly on the purchase and marketing of most materials, including agricultural products, was rescinded by the State and hence a good environment was created for the development of the rural tertiary sector.

Small businesses and catering have been the age-old private activities in this region. They are suitable for this region and are very attractive to farmers because of the low investment and low skill requirements. They are also more profitable than traditional agriculture. There is a great demand for developing the tertiary sector in this region. In both rural areas and cities or towns, the basic infrastructural facilities, including shops and hotels, restaurants, etc., are not enough to satisfy the needs of economic development and people's daily lives.

**Figure 3.5: Percentage of Labourer and Output Value in the Tertlary Sector**





**Table 3.14: The Structure of Employment and Output Value in the Tertiary Sector in the Hengduan Mountain Region of Sichuan in 1988**

	Labourers (%)	Output Value (%)
Tertiary Sector Total	100.0	100.0
Trade	30.6	39.2
Catering	14.7	19.7
Service	39.3	24.3
Others	15.4	16.8

Source: Statistics of Township Enterprises of Sichuan Province, 1989.

It is worth noting that tourism, which is included in the service sector, has great potential in some areas. Jiuzhaigou, Hailuoguo, and Huanglong Temple located in Ganzi and Aba prefectures are beautiful scenic spots. The natural conditions and social customs of minority nationalities are also valuable in tourism. However, the sector is highly underdeveloped and hotels, restaurants, and shops catering to tourists are insufficient. Lack of data in terms of rural labourers employed in tourism and the income generated in the sector prevent us from making a systematic analysis. The following example may give a rough idea about the role of tourism in the employment and income of rural farmers. The Jiuzhaigou Area recorded an average income of only 200 *yuan* per capita in 1982, lower than the local county average. After the Jiuzhaigou Tourism Management Bureau was set up in 1984, tourism has become an important sector in this area. A large number of local farmers has taken part in tourism-related activities. The average income has subsequently increased rapidly. The income was 600 *yuan* per capita in 1987, much higher than the provincial average.

### **Employment within Agriculture**

Off-farm activities within agriculture have been an important aspect of household activities in the Hengduan Mountains. This region is one of the five largest pastoral regions and one of the three largest forest regions in China. It is also an important source of fruits and wild plants in Sichuan Province. Thanks to the favourable macro-economic environment, the diversification of agriculture, including livestock, horticulture, sideline production, and cash crop production have achieved great progress in the last decade. In 1988, the output value of diversified activities in the Hengduan Mountains of Sichuan reached 1.13 billion *yuan*, accounting for 66.7 per cent of the total output value of agriculture. The corresponding figures were 63.6 per cent and 54.6 per cent in 1985 and 1980 respectively. The diversified economy has become one of the main reasons for increases in farmers' incomes. For example, the total output value in the region increased by 498 million *yuan* from 1985 to 1988, of which

147 million *yuan* came from diversified agricultural activities. The number of labourers who were engaged in these activities has also increased to a considerable degree. Unfortunately, we are not able to make an analysis on these aspects in depth because of the lack of adequate information and data.

### *Livestock and Its Linkages*

Livestock is one of the dominant activities within agriculture, especially in Ganzi and Aba prefectures. It is estimated that it is predominant in about 60 per cent of the counties in these two prefectures. Cows and sheep are the main animals raised here. The number of cows reached 4.14 million head in 1987, accounting for 42.6 per cent of the provincial total. The sheep reached 2.83 million head, 32 per cent of the provincial total. However, the meat output provided by these two regions is very low, only 52.3 million kg or 1.6 per cent of the provincial total. More details are shown in Table 3.15. The labour force engaged in livestock-raising in Ganzi and Aba was recorded to be 0.14 million in 1985, accounting for 23.6 per cent of the total in the province. Livestock is one of the main sources of income. For example, 32 per cent of the net income of the households in Ganzi Prefecture was from the livestock sector in 1988.

**Table 3.15: Livestock and Meat Output in Different Regions of Sichuan (1987)**

	Large animals (million head)		Sheep (million head)	Pigs for rearing (million head)	Pigs for sale (million head)	Output of meat (million kg)
	Total	Cows				
Panzhihua	0.84	0.12	0.35	0.38	0.18	14.5
Aba	1.80	1.66	1.04	0.29	0.18	14.5
Ganzi	2.68	2.48	1.79	0.25	0.12	27.2
Liangshan	0.97	0.82	3.44	2.49	1.16	84.7
W. Sichuan	5.59	5.08	6.62	3.41	1.64	151.5
Sichuan	10.30	9.70	8.85	62.03	51.11	3,360.1

Source: Statistics of the Rural Economy of Sichuan, 1987.

Note: The output of meat is derived from pigs, sheep, and cows.



In the crop-dominated areas, mainly Liangshan and Panzhihua, the main animals reared are pigs and sheep. The number of pigs reared here was 2.87 million head in 1987, accounting for 84.5 per cent of the total in the Hengduan Mountains, but for only 4.6 per cent of the provincial total. The sheep, 3.78 million head, constituted a share of 42.7 per cent of the provincial total. The livestock economy in these two regions was characterised by self-sufficiency before 1978. The main purpose of raising animals was to meet the farmers' demand for meat and manure. However, household specialisation in livestock-raising emerged after 1978. The number of households involved was 613 in 1988. Many other households also provide pigs and poultry for marketing. Table 3.15 shows that the number of pigs for sale in Liangshan and Panzhihua reached 1.34 million head, accounting for 46.6 per cent of those reached. According to statistics, the number of pigs and poultry sold increased from 15 per cent in 1978 to 45 per cent in 1988 in Liangshan Prefecture. In addition, in some eastern counties of Ganzi and Aba, market-oriented pig-raising has been established and has expanded.

Policies that have imposed significant impacts on livestock raising include the following.

- (a) In 1980, the provincial government adopted a policy of linking forestry and livestock to develop a diversified economy and thereby ensure the all-round development of agriculture in the three prefectures of Liangshan, Ganzi, and Aba. This policy encouraged farmers to develop livestock.
- (b) In accordance with the Responsibility System, the collectively-owned livestock was divided among, individual households in Ganzi and Aba prefectures from 1980. It improved the farmers' initiatives in livestock raising.
- (c) The State prices for livestock products were raised after 1978 and the State permitted livestock products to be marketed within and outside the Hengduan Mountains after 1985. The livestock raiser has benefitted a lot from this study.

The vast grasslands provide a good basis for the development of livestock. It is estimated that the grassland in the Hengduan Mountains of Sichuan amounts to 80 per cent of the provincial total. The Northwest Prairie, with varied and high-quality grasses, is one of the largest in China. In crop-dominated areas, agricultural products and by-products also provide a good basis for livestock and farmers are very experienced in pig-raising and poultry-raising.

The marketing linkages of livestock have been strengthened since 1980. The State purchasing station was the only channel for livestock trade before 1980. However, some collectively-owned and private commercial organisations began to take part in the marketing of livestock products from 1980 onwards. By 1985, all the relevant business organisations (State-run, collectively-run, or individually-run), within or outside the Hengduan Mountains, could purchase and sell livestock products at the market price. Livestock products, including yak and sheep, have found a big market in Northern China and Sichuan Province, while pigs, and poultry are mainly marketed within the Hengduan Mountain Region. At present, the residents' demand for pig and poultry have still not been satisfied in Ganzi and Aba prefectures. Even in Eastern Ganzi and Aba, where pig-raising and poultry-raising have reached a sizeable scale, about 80 per cent of the pig and poultry consumption is met by local supplies.

The forward and backward linkages of the sector are still weak. On one hand, the service systems for livestock commodity production, such as seed multiplication, feed processing, epidemic prevention, preservation, and transportation are not well developed. On the other hand, the processing of livestock products is still limited. All the related processes including wool spinning, leather tanning, and meat and



milk processing are in the early stages. The commercialisation rate of livestock in Ganzi and Aba prefectures was only 10 per cent in 1988.

Livestock development has caused some negative impacts on the environment. Some investigations indicate that the degradation of grassland in this region has become more and more serious. For example, yield per *mu* of grassland in the Northwest Prairie of Sichuan has decreased about 20 per cent compared with the level in 1960. The factors responsible for that include: (a) overgrazing caused by a rapid increase of livestock and little investment in grassland management; (b) new pasture management systems not set up after the livestock were divided among the households. This has led to poor protection of pastures.

### *Horticulture and Its Linkages*

Horticulture has shown great prospects during the last decade. Fruit growing has become an important activity in the Hengduan Mountain Region of Sichuan. Sericulture, pepper growing, and vegetable growing have also gained prominence in some parts of the region. Fruit growing has grown rapidly and the industry was 3.8 times greater in 1988 than it was in 1980. This constitutes 11.3 per cent of the provincial total. Apples, the main fruit in the Hengduan Mountains, had an output of 31.3 million kg accounting for one third of the total output of fruits in this region and half of the total output of apples in the entire province. Liangshan Prefecture had the highest share in the output of both fruits and apples. More details are shown in Table 3.16.

The commercialisation of fruit growing has developed only to a limited extent in the Hengduan Mountains. There were 212.5 thousand *mu* (14.2 thousand ha) of fruit produced commercially in Liangshan Prefecture in 1987, accounting for 38.9 per cent of the total area under fruit in this prefecture. Maoxian County has been listed as a State-level centre for commercialised fruit production while Xiajin and Jinchuan are province-level centres. Horticulture has become an important source of income, especially in some counties. For example, three of the twelve rural enterprises in Maoxian County had yearly outputs exceeding 200 thousand *yuan* and were horticulture based. The combined output of the three enterprises was 800 thousand *yuan* and they employed 420 labourers. They accounted for 72 per cent and 65 per cent of the output and employment respectively of all the agriculture-based enterprises. In 1988, there were about 600 households specialising in horticulture in the Hengduan Mountain Region of Sichuan Province.

There are mainly three policies which have contributed to the growth of horticulture since 1980.

1. Encouragement to farmers to carry out diversified activities. In order to guarantee the implementation of this policy, the local governments organised farmers to convert cultivated mountain slopes from crop use to horticultural use. About 100 thousand *mu* (6.7 thousand ha) of mountain slopes were thus converted to horticultural use between 1980 and 1988 in Aba Prefecture.
2. Encouragement to farmers to develop market-oriented horticulture. State-owned and collectively-owned barren hills and wastelands were leased to households under a contract term of over 30 years.



**Table 3.16: Output of Fruits in Different Regions (1988)**

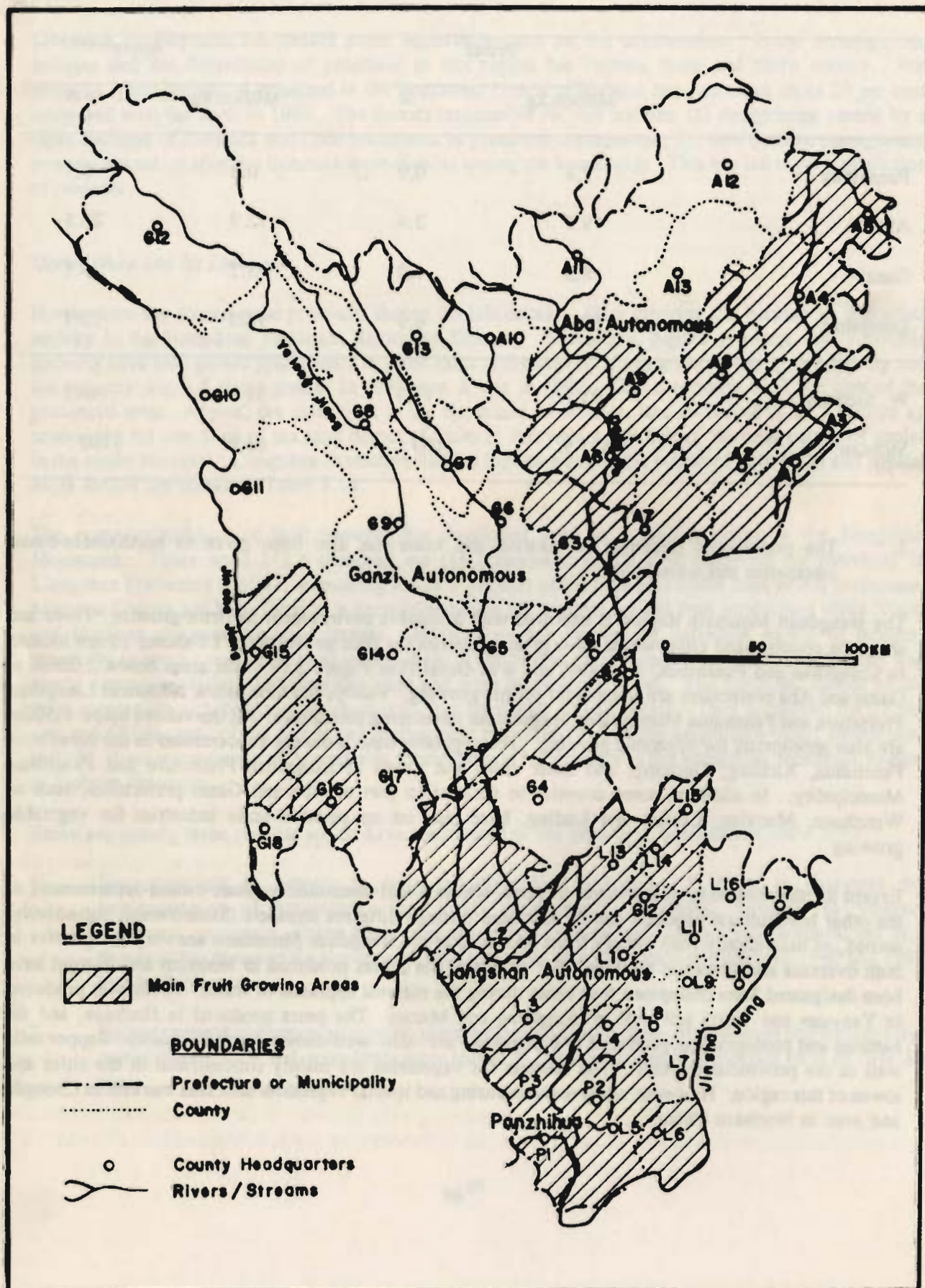
	Fruits		Apple	
	Million kg	%	Million kg	%
Panzhihua	7.4	0.9	0.3	0.5
Aba	19.9	2.4	12.9	20.5
Ganzi	8.5	1.0	3.2	5.1
Liangshan	57.3	6.9	14.9	23.7
W. Sichuan	93.1	11.3	31.3	49.7
Sichuan	827.5	100	63.0	100

3. The preferential treatment in taxation and loans has also been given to horticulture-based enterprises and households.

The Hengduan Mountain Region is endowed with a suitable environment for fruit-growing. There are about 26 counties and cities which have great potentials for fruit production. Of those, 13 are located in Liangshan and Panzhihua, 9 in Aba, and 4 in Ganzi (See Figure 3.6). Hill areas below 2,200m in Ganzi and Aba prefectures are suitable for pepper growing. Valleys and hills below 1,800m in Liangshan Prefecture and Panzhihua Municipality are good for developing sericulture. All the valleys below 1,500m are also appropriate for vegetable growing. The vegetable base is mainly concentrated in the suburbs of Panzhihua, Xichang, Dechang, and other cities and towns in Liangshan Prefecture and Panzhihua Municipality. In addition, some counties in the eastern part of Aba and Ganzi prefectures, such as Wenchuan, Maoxian, Lixian, and Luding, have also set up sizeable scale industries for vegetable growing.

Except for the marketing of silkworm cocoons, which is still controlled by State-owned departments, all the other horticultural products can be marketed through different channels (State-owned, collectively-owned, or individually-run). Many fruits produced in the Hengduan Mountains are very competitive in both overseas and domestic markets. For example, the apples produced in Maoxian and Xiaojin have been designated State champions four times during the national appraisal of fruits. The apples produced in Yanyuan and Yuexi sell well in Hongkong and Macao. The pears produced in Jinchuan, and the bananas and pomegranates produced in Liangshan, are also well-known for their quality. Pepper sells well in the provincial markets. The markets for vegetables are mainly concentrated in the cities and towns of this region. However, some early-maturing and special vegetables also find markets in Chengdu and even in Northern China.

**Figure 3.6 : Main Fruit Growing Areas in the Hengduan Mountains of Sichuan**





The forward and backward linkages for horticulture are still weak. On the one hand, the services available for horticulture from cultivation to preservation are not well developed. On the other hand, the rapid expansion of fruit production and other horticultural productions has not been accompanied by corresponding expansions in fruit-based processing. There are two reasons for this. First, fruit production has still not fully met the residents' requirements for fresh fruits. Second, some areas lack the necessary capital or technology for fruit processing. For example, the shortage of capital has prevented Maoxian County from setting up a fruit processing industry. The fruit-canning factory in Wenchuan, one of the two rural enterprises with a fixed asset of over one million *yuan*, ceased operating in 1990. It was unable to bring out good quality products because of poor technology.

### *Sideline Production and Its Linkages*

The main sideline activity in the Hengduan Mountain Region is collection of wild plants, and this is mainly concentrated in Ganzi and Aba prefectures. Sideline production has played an important role in providing income and employment opportunities to households in these two prefectures. In 1988, the percentage output value of sideline production was 16.3 per cent of the total agricultural output, much higher than the provincial average (6.3 per cent). Collection of wild plants has been a traditional off-farm activity in Ganzi and Aba. In some areas, these are the only market-oriented activities. For example, the income from the collection of pine mushrooms was 24.66 million *yuan* in Ganzi in 1988. This means 188.2 *yuan* for each household.

The policy of encouraging diversified activities, as adopted by the provincial government in 1980, has also provided a positive impact on the development of sideline production. When the State monopoly for purchasing and marketing of all specialised local products (except musk) was rescinded in 1985, the farmers perceived this as a crucial incentive to exploit wild plant resources.

Ganzi and Aba prefectures are very rich in these resources. Investigations show that about 3,000 species of wild plants are widely dispersed throughout these two areas. They are the main sources of wild plants (especially medicinal herbs) in Sichuan Province. The State-owned departments monopolised the purchase and marketing of wild plants before 1985. Subsequently, business organisations at all levels, (including private pedlars) have been allowed to purchase and market all wild plants (except musk). Some of the products, especially medicinal herbs, are very competitive in both overseas and domestic markets.

The collection of wild plants is very attractive to local farmers because of its low cost, high profit, and the simple skills required. Generally speaking, the processing of wild plants is very poor because of lack of techniques, equipment, and skilled persons. However, some techniques which are suitable for this region have been recently introduced and have been successful. For example, the technique of processing edible mushrooms in Ganzi Prefecture accelerated the exploitation of pine mushrooms from 1986 onwards, and they have become one of the main goods for export from Ganzi Prefecture. Inappropriate and excessive exploitation of wild plants has become very serious in some areas. This has led to degradation of resources. Investigations show that some rare medicinal herbs, such as *Fritillaria thunbergii* and *Cordyceps sinensis*, are disappearing rapidly.

### *Cash Crops and Their Linkages*

Cash crop production is mainly distributed throughout Panzhihua Municipality and Liangshan Prefecture. Since 1978, cash crop production has grown but less so than the other activities described above. The area under cash crops was 5.9 per cent of the total cultivated area in Panzhihua and Liangshan in 1988,



only 1.15 per cent more than in 1978. The cash crops which have market potential are sugar and flue-cured tobacco. The yield of sugar in these two areas was 577.2 million kg in 1988, accounting for 24.4 per cent of the provincial total; the tobacco yield was 10.8 million kg, 5.8 per cent of the provincial total.

The valleys of the Jinshajiang River and the Anninghe River are suitable for sugarcane growing, while Butuo County and Zhaojue County are suitable for growing sugar beets. The total land area suitable for sugarcane growing in Panzhihua and Liangshan was 0.35 million *mu* (23.3 thousand ha), 4 times as much as the area where it is currently grown. Flue-cured tobacco, mainly grown in the counties of Huili, Huidong, Puge, and Ningnan, is of very high quality.

The market linkages of cash crops are limited within the Hengduan Mountain Region. Sugar crops are mainly purchased by local sugar refineries. At present, production cannot even meet the needs of these local sugar refineries. The expansion of tobacco growing has resulted in the establishment of the cigarette industry in Xichang in 1984. The production and marketing of tobacco have maintained a good balance in this region since 1984.

### Conclusions and Prognoses

- (1) During the past few years, both off-farm employment and employment in non-traditional agriculture have made great progress. However, they are still in the initial stages in this region and are much less advanced than in the provincial and national areas as a whole.
- (2) Generally speaking, the intra-regional disparity of OFE in the Hengduan Mountains of Sichuan is not wide. Panzhihua Municipality is an exception and is of a much higher level in terms of employment, income, and productivity due to its better infrastructural facilities and higher levels of urbanisation and industrialisation. The OFE level in the three prefectures is much lower.
- (3) Individually-run enterprises predominate in this region. Lower investment, lower skill requirements, and greater flexibility are the main reasons for the growth in individually-run enterprises. Given the constraints in capital, skilled manpower, and infrastructural facilities, individually-run enterprises are much more suitable for most of this region and will continue to play a leading role in rural off-farm employment in the future.
- (4) Among the various sectors, industry has been the most important source of employment and income, but its proportion has been declining in terms of both employment and income during the past few years. The outcome per labourer is not as high as in some other sectors. Among the industries, extractive activities including mining and logging, are the prominent ones. Resource advantages have provided the base for these rural industries in this region. Transportation has made great progress because of its higher return, lower skill requirements, and increasing demand. The tertiary sectors have also experienced tremendous growth in the past decade. Although the output per labourer in tertiary activities is the lowest among all sectors, they are still very attractive to farmers because of low investment and low skill requirements. Low cost and high return have contributed to the growth of construction. Favourable policies have been the most important factor for the development of all off-farm sectors. Within agriculture, diversification of activities is showing appreciable results.



- (5) There are three shortcomings to OFE in this region. First, the levels of output per labourer in the prominent sectors are lower than the provincial and national averages. Second, the forward and backward linkages with the farming system are very weak. Third, some off-farm activities have brought damage to the environment and the resource base. In order to ease these shortcomings and make OFE more suitable and sustainable, we suggest the following measures.
- (a) Local governments should make further efforts to help improve the external and internal conditions for OFE development by providing better services for each activity and by helping the farmers improve their skills. Each enterprise should also pay more attention to raising the technology level and management level so as to promote greater productivity.
  - (b) Urgent measures should be taken to protect the resource base, including mines, forests, grasslands, and wild plants. Appropriate adjustments should be made for these, for example, in the surveying of mineral resources and the planning of mineral exploitation, to avoid careless extraction; and in the promotion of processed forest products.
  - (c) In order to strengthen the linkages of off-farm activities with the farming system, agro-based processing should be improved through improvements in infrastructural facilities and through creation of better conditions to absorb more capital and technology from outside.

## POLICY REVIEW

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### Historical Evolution of the Chinese Rural Employment Policy

If we look into the large population flows between cities and the countryside, and the distribution of the rural labour force in the productive sectors, we can find clues to the rural employment policy. The changes in the Chinese rural employment policy are directly influenced by the State's economic policies. We can thus divide the changes into four stages.

The first stage was the period from 1950 to 1956. In this stage, national economic development was gradual. In the countryside, private ownership was transformed into collective ownership and the agricultural producers were grouped into cooperatives. The rural employment policy at this stage had the following characteristics.

- (1) All rural peasants were organised into cooperatives in 1953. They had to contribute their voluntary labour to tasks assigned by the cooperative. They also had to hand over farm products to the cooperative which in turn paid taxes to the State. Under this situation, the status of the individual peasant was that of a "quasi-commune member".
- (2) The number of commercial workers in the rural area was sharply reduced in 1954. The products of the peasants had to be sold to shops appointed by the State, and only those products that were not planned products could be sold and bought in the free markets.
- (3) The registration of urban households was strictly enforced and their grain consumption was tightly controlled by the State. All urban enterprises, State institutions, army, and other such organisations were instructed to first consider urban residents to the recruitment of permanent workers. They had to make contracts with the rural agricultural cooperatives on a planned allocation basis before they could recruit rural workers.

During this stage, the off-farm labour force was mainly transferred to the urban area. During the First Five-Year Plan period (1953-1957), 1.65 million off-farm labourers were thus transferred to State enterprises and institutions annually. In the same period, the non-agricultural labour force increased from 9.26 million in 1952 to 9.57 million in 1957. Towards the end of this stage, employment opportunities decreased and the population pressures increased in the cities. The Government then adopted the strict policy of restricting the flow from rural areas to urban areas.

The second stage was from 1958 to 1965. During this stage, the "Great Leap Forward" and the "People's Commune" were launched throughout China. In the second half of this stage, the economic situation worsened and the Government had to reduce the scale of capital construction. In the countryside, the management of the People's Commune was decentralised and the responsibility was



divided among production teams. During this stage, off-farm employment in China experienced many ups and downs. In 1959, compared to 1952, the net increase of the off-farm labour force was 64.90 million, of which 39.49 million were in cities, accounting for 60.8 per cent, and 25.41 million in the countryside, accounting for 39.2 per cent (the labour force working in the enterprises run by communes and brigades numbered 18 million). From 1960 to 1962, 11.31 million urban residents were transferred back to the countryside annually and, during the same time period, the non-agricultural labour force in the countryside decreased sharply to 0.71 million in 1963. During this period, the rural employment policy took the following course.

- (1) Individual ownership was banned in the countryside and collective ownership, as represented by the People's Commune became the only driving force of the rural economy in 1958. The Commune members were allowed to undertake sideline production, in a very limited sense, during their spare time. Such activities included hunting, fishing, processing, silkworm breeding, beekeeping, weaving, embroidery, and sewing activities. Even these activities had to be approved by collective management.
- (2) All commercial activities were regularised by the supply and marketing cooperatives. The peasants could sell their products and buy only needed goods at the market. The market prices were fixed to the same as those in the State shops. Commune members were not allowed to abandon agriculture and adopt a market economy. In 1963, with the recovery of the national economy, the Government allowed commune members to undertake short distance transport of seasonal products only for marketing - and that too only during the slack season and under the jurisdiction of the production team.
- (3) According to the regulations, the labour force engaged in agricultural production in the People's Commune could not be less than 80 per cent. Those involved in industry, transportation, capital construction (mainly on the farmland), education, health, and services could not exceed 20 per cent of the total labour force. With the deterioration of the national economy, the Government stipulated in 1959 that all urban enterprises must stop recruiting new permanent workers and part-time workers and reduce their staff in order to strengthen agricultural production. As a result, huge numbers of the rural population, who once worked in cities, were transferred back to the countryside.
- (4) The People's Commune could set up enterprises to undertake rural industrial activities, including farm machine repairing. The policy directive was to use local materials for production and to market within the local community. Funds and labour forces were provided by the People's Commune on an equal basis. In 1962, with the worsening of the national economy, the Government once again changed the policy and stipulated that the People's Commune and Brigades had better not set up enterprises, except for the processing of the rural farm products. Rural handicraftsmen, and peasants who had some special skills were also encouraged to devote themselves to handicrafts' production.

The period between 1966 to 1979 was the third stage, and during this time the "Cultural Revolution" took place in China. The national economy suffered a lot, and the rigid Commune System controlled the rural non-agricultural activities even more tightly. Individual non-agricultural undertakings such as commerce, transport, and family sideline production were restricted and in many cases abolished. Only the Commune- and Brigade-run enterprises could operate under the direction and management of the People's Commune. These enterprises depended mainly upon the use of local raw materials to develop small-scale



farm machinery, steel plants, power stations, fertiliser plants and coal mines for local production and consumption. The relatively independent Handicraftsmen's Cooperatives were brought under the control of Communes and Brigades. In the late 1970s, the undertaking was extended to farm forestry, fruit orchards, tea plantation, medicinal products, and aquatic products. In some areas where conditions were favourable, the Commune- and Brigade-run enterprises could manufacture some industrial parts for urban industry, could organise construction and transportation activities, and also could produce traditional handicrafts for export. During this stage, off-farm employment stagnated, for the most part, except for a few sectors. These were mainly concentrated within the rural area. In 1978, the total of the rural non-agricultural labour force was 31.49 million, of which 22.18 million were engaged in the Commune- and Brigade-run enterprises.

The fourth stage was from 1980 to 1989. During this stage, under economic reforms and the open policy, the Chinese national economy experienced rapid growth. The rural economic management system changed from a centralised to a more flexible and highly productive Contract Responsibility System. This has been the most dynamic stage in Chinese off-farm employment since the founding of New China. In 1988, there were about 120 million labourers who were working in non-agricultural sectors. Of these 92.95 million were working in township enterprises. The relevant features of the rural employment policies are as follows.

- (1) The peasant households were encouraged and supported to undertake family sideline production. Land under the cooperative was subcontracted to them and they were allowed to participate in specialised family operations. Peasants could voluntarily take part in or organise different forms or scales of specialised cooperatives and technical associations.
- (2) The rural free market was restored and developed, and the peasants were free to haul goods over long or short distances as long as commodity circulation was kept within the limits permitted by law. After fulfilling the state-fixed purchase quotas, the peasants could sell all of the remaining farm products in the free market.
- (3) The agricultural structure was readjusted and peasants were encouraged to engage in diversified activities including crops, forestry, animal husbandry, fisheries, and sideline production. The rural industrial structure and the rural credit system were also restructured to support post-production activities such as processing, storing, transporting, and marketing of farm products. Preferential treatment for loans and taxation was provided to rural mining and other production activities based on local resource exploitation.
- (4) In 1984, the Commune- and Brigade-run enterprises were renamed Township Enterprises, and their important role in developing the rural economy was affirmed. Accordingly the Government made a series of policies favourable to the development of township enterprises.
- (5) The transfer of technology and the flow of qualified scientists and technicians from urban areas were encouraged. Some peasants engaged in industry, commerce, and service sectors were allowed to settle down in towns if they could manage their own grain supplies. Urban technicians and managerial personnel were encouraged to take contracts and manage the township enterprises, train the workers, or even to work in the township enterprises. If urban technicians or managerial personnel went to work in township enterprises, they could still retain urban household registration. Peasants were allowed to move between rural areas, or between urban and rural areas), and change their economic undertakings and jobs.



## Main Policies Affecting Off-farm Employment in China

### *Policies Before the Eighties*

- (1) The Policy and Strategy for Developing Heavy Industry. From the First Five Year Plan to the Fifth Five-Year Plan, capital investment was concentrated on heavy industry while light industry was very short of investment. Heavy industrial investment accounted for 46.7 per cent of the total; agriculture, 10.8 per cent; and light industry only 5.6 per cent. Heavy industry held higher fixed assets but absorbed fewer employees in terms of employees per unit of assets. Light industry, especially the kind that depends on agricultural products as raw materials, could absorb more off-farm labourers. Raising agricultural efficiency required that much of the surplus labour force was shifted from agriculture into off-farm employment. The development of China's heavy industry had neither created enough job opportunities for surplus rural labourers nor absorbed all the urban labour force. On the contrary, it created a dual structure. China's value of fixed asset per person in industry increased 60 times from 1950 to 1988, at the rate of 12.1 per cent per year, and the output value per person increased by 7.9 times, at the rate of 6.2 per cent per year. The number of employees in industries, however, increased by only 6.5 times from 1952 to 1988. Theoretically, industry should have absorbed a labour force of 16.44 million, but actually, it absorbed only 8.415 million. In 1988, China had an agricultural labour force of 330 million accounting for 57.5 per cent of the total, 3.3 times greater than in industry.
- (2) Population Policy. Before the sixties, China had not carried out family planning. On the contrary, the top leaders criticised the theory and also those who advocated population control. They went along with the notion of "*more people, higher enthusiasm, more benefit for doing things*". Accordingly, the population increased rapidly and the cultivated land per person decreased as shown in Table 4.1. The comparison with the world average is shown in Table 4.2. Girls born in the late 1960s and early 1970s, a baby boom period, will therefore reach child-bearing age in the 1990s. Following the growth patterns over the past decade, the Chinese population growth is expected to increase to 1.3 billion by the year 2000. The total labour force is expected to increase to 650 million, 100 million more than in 1989. It is clear that the increment of the rural labour force surplus is positively related to the increase of population. The gap between the supply of and the demand for jobs has widened as a result of uncontrolled population growth.
- (3) Policies Separating City from Village. For a long time, policies were adopted to strictly control the influx of farmers into urban areas. Urban inhabitants had non-agricultural identification which gives them the privilege of receiving rations of State-supplied grain, edible oil, electricity, housing, and off-farm employment opportunities. Most rural inhabitants had to stay in the countryside and had to grow their own food.
- (4) The Commune System and Related Policies. Under the commune system, the following are the reasons that restricted off-farm activities.
  - (a) Low productivity in agriculture gave people the wrong impression that China had no surplus labour force or unemployment.

**Table 4.1: Changes in China's Cultivated Land Pattern (1952-1987)**

Year	Total Cultivated Area (million ha)	Cultivated Area Per Person (ha)	Cultivated Area Per Labourer (ha)
1952	108.0	0.19	0.62
1955	110.2	0.18	0.66
1960	104.9	0.16	0.62
1965	103.6	0.14	0.44
1970	101.1	0.12	0.36
1975	99.7	0.11	0.34
1980	99.3	0.10	0.34
1985	97.7	0.09	0.31
1987	95.9	0.09	0.30

Source: Chinese Science News, 1990.

**Table 4.2: Comparison of China's Natural Resources with the World Average (1986)**

Item	Cultivated area per capita (ha/person)	Forest Area per capita (ha/person)	Timber production per capita (cubic metre/person)	Grassland per capita (ha/person)	Water Resource per capita (cubic metre/person)
World Average 8,300		0.28	0.83	63.08	0.64
China	0.09	0.12	9.76	0.21	2,600

Source: Chinese Science News, 1990



- (b) All the labour force had to be managed by the Collective or the State. Farmers were not allowed to move out or find jobs freely. Jobs were assigned to individuals and they had little choice in the matter.
- (c) The State monopolised the purchasing and marketing of agricultural products. It banned farmers from leaving agricultural activities and taking up trade or other off-farm jobs. Those who took off-farm jobs or activities were punished, even sent to jails.
- (d) Farmers concentrated their activities mainly on grain production and were restricted from involvement in cash crop and sideline production.

### *Policies During the Eighties*

After 1978, especially in the eighties, China's development strategy and related policies greatly changed. We have summarised the main points below.

- (1) Rural Responsibility System. This system and its related policies are distinctly different from those of the commune system. The implementation of the policy has enhanced agricultural productivity and revealed the nature of the surplus labour force as evidenced by low productivity (efficiency). The policy encourages households to undertake specialised productive activities and thereby accelerate agricultural growth. It has created favourable conditions for transforming traditional agriculture into a new pattern.
- (2) The Economic Reforms and Opening Up to the Outside World. This broke the domination of State monopolies on trade and pricing. The policy combines the planned economy with the market economy. It allows farmers to engage in industry, trade activities, and resettlement, even to receive investments from the outside world. In 1984, farmers were allowed to go to cities and towns for off-farm activities, on condition that they arranged for their own housing and rations.
- (3) Encouragement for Rural Enterprise Development. Private and collective groups were not only allowed to initiate and run local enterprises, but also given preferential loans and taxation privileges. The co-existence of State-owned and non State-owned enterprises has been pursued as a principle of the economic reform. Rural enterprises have boomed all over the country. By the end of 1989, township enterprises had created more than 93 million industrial jobs, with a State investment of 186 million yuan (\$ 39.5 million). In September 1990, the number of employees in the 18 million township enterprises had increased to more than 100 million.
- (4) Support to Minority Nationalities. The current policies encourage minority nationalities to develop their own industries by giving preferential terms of investment, loan, and technical assistance. More details are given in the following section.



## *Policies Pertaining to West Sichuan*

Since the eighties, a series of profitable, off-farm employment policies has been implemented in the Hengduan Mountains of Sichuan.

- (1) Policy Incentive to Break the Traditional Agricultural Pattern. After 1980, the policy of grain production as the dominant activity was changed. Instead, the new policy encouraged comprehensive development that included crops, forests, animal husbandry, sideline production, and fisheries. Efforts were made to increase the output of cash crops, horticulture, livestock, forestry, and specialised local products. From 1979 to 1981, private forest rights were given and 4 million *mu* (267 thousand ha) of forest lands were legally handed over to individuals and production teams. Since 1985, State monopolies on the marketing and trading of agricultural products, animal products, and specialised local products have been discarded, except for timber and musk. At the same time, agricultural products were freely sold at prices determined by the market. The contract term on land use for planting fruits and forests was for up to 30 years. From 1981 to 1989, timber products were given tax-free status.
- (2) Preferential Policies for the Development of Rural Enterprises in West Sichuan. Collective enterprises that are being constructed in West Sichuan are no longer restricted by the State capital construction target. The projects with investments of less than one million *yuan* of fixed assets or less than half a million *yuan* of operating expenses can be approved by the prefecture government (without approval from the Province or the State). The township enterprises below county level with incomes of less than 3000 *yuan* per annum and those above county level with incomes of less than 1000 *yuan* per annum are given duty-free status for two years. Rural enterprises need to pay only half of the usual tax to the Government. Since the beginning of 1984, all rural enterprises below county level have been exempted from industrial, commercial, and income taxes for three years.
- (3) Training of Scientific and Technical Personnel. From May 1985, onwards all employees who graduated from the university, college, or technical school, and who want to work in the Hengduan Mountain Area, are exempt from probation (generally one year in China) and given full allowances. Since the beginning of 1984, all technicians working in the Hengduan Mountains get an additional allowance of six to fifteen *yuan* per month. Furthermore, since September 1984, all personnel who graduated from universities, colleges, or technical schools enjoy a salary grade which is one step higher than in other areas of China. New students from West Sichuan who want to enroll at the university enjoy an advantage of 40 marks over other students.
- (4) Special Financial Policy. Since 1980, the State started a special fund to support undeveloped areas and has been providing 10 million *yuan* per annum to West Sichuan. The State Planning Commission allocated \$ 3 million in foreign currency per annum to help them develop the economy. Since 1986, the Sichuan Provincial Government has, similarly, allocated 126.66 million *yuan* per annum. Since 1988, the provincial bank has set aside 20 million *yuan* each year for low interest loans to West Sichuan. The Provincial Planning Commission has allocated 1.6 million *yuan* to the region for assistance in local construction. The income from the production of gold in West Sichuan is distributed in such a way that 40



per cent goes to the province, 20 per cent to the prefecture, and 40 per cent to the county where it is produced.

- (5) Encouraging Investment from Other Places. The Sichuan Provincial Government has made a special regulation that projects in which other provinces invest (e.g., in mineral ore exploration, energy production, and transportation) are exempt from taxation for four years.

### *An Assessment of China's Policies*

- (1) For a long time, China's policy-making did not result from scientific research or democratic decision making. It was, instead, the product of subjective will, especially that of a few main leaders. The situation is now changing.
- (2) The same policy was usually applied to the whole country without considering the variations in different regions. Thus the policies for the Hengduan Mountains on off-farm employment were no different from general state policies.
- (3) Policies changed very frequently. A typical example pertains to how city inhabitants were moved back to rural areas on three occasions. It happened between 1960 to 1962 when the number of urban employees decreased by 16.48 million and the urban population by 24.60 million. A second event took place between 1969 to 1971. About 17 million urbanities (most of them students) were sent to the countryside. The third movement was between 1988 to 1989. Ten million off-farm employees were forced back to their agricultural jobs.
- (4) The policies usually lacked standardisation and systematisation. Most of them were dictated by politics and other such matters.
- (5) The Ministry and Department of Labour and Personnel usually paid more attention to urban employment than to rural employment.

### **Programmes and Projects Related to Off-farm Employment**

The State and local governments have organised a series of programmes and projects in the Hengduan Mountains of Sichuan Province. Some of these are aimed at alleviating poverty and others towards promoting commercialisation to enhance both employment and income levels. The main programmes and projects which are related to OFE are as follows.

- (1) Capital Assistance Programmes. In 1980, the State Government had established a "development fund for underdeveloped areas". About 10 million *yuan* was distributed to this region each year. In 1986, the "Special Development Fund for Liangshan, Ganzi, and Aba Prefectures" was set up. The total fund amounted to 120 million *yuan* each year. The capital was thus invested in the development of the economy and in education, science, and technology. Off-farm sectors got a large share of this. For example, a total of 13.2 million *yuan* per year (9% of the total) was invested in the off-farm sectors in Ganzi Prefecture between 1980 to 1988.



- (2) **Spark Programme.** This programme has been carried out in Sichuan Province from 1986. Liangshan Prefecture and Panzhihua Municipality were chosen as two key areas for demonstration of the programme. The purpose of the programme was to promote a rural commodity economy through advanced and practical techniques. Diversified agricultural activities and off-farm activities were the main targets. Specific programmes included the production of subtropical fruits, semi-soft fur, exploitation of small mineral deposits, and others. About 80 per cent of the programmes have been carried out in township enterprises. There are also 11 Spark Programmes which have been conducted in Ganzi Prefecture since 1986. The Spark Programmes have helped improve the technical level and economic efficiency of off-farm sectors in the demonstration areas. According to statistics, the Spark Programmes realised a profit of 62.8 million *yuan* in Ganzi Prefecture between 1986 and 1988, and thousands of farmers received training in the implementation of the programmes during this period.
- (3) **Anti-poverty Programme.** In order to alleviate poverty in some areas of the region, the State government distributed loans of 10 million *yuan* at low interest rates from 1988 onwards to the counties of Zhaojue, Butuo, Jingyang, and Meigu in Liangshan Prefecture. In 1989, the Provincial Government listed another 3 counties (Rangtang, Derong, and Maoxian) from this region as key poverty counties and arranged an additional loan of 10 million *yuan* at low interest rates. The anti-poverty programme has helped the development of OFE in the poverty areas as follows.
- (a) Providing funds for the establishment of the commodity base in livestock, fruit production, and processing of local products.
  - (b) Providing assistance for rural enterprises. Some relevant departments provide training to the employees. For example, Fengyi Gelatin Plant, the main rural enterprise in Maoxian County, was one of the rural enterprises which was set up with the anti-poverty fund. Technical assistance was provided by the Minority Nationality Committee of Sichuan Province.

### Implications of Policies and Programmes in the Mountains

The main implications of policies and programmes, with respect to objective conditions in the mountains, are summarised in Table 4.3. As shown in the Table, the policies and programmes related to OFE have brought both positive and negative impacts. We take the policy of "*encouraging the comprehensive development of agriculture*" as an example. Diversified agricultural activities were limited in this region before 1980. This policy has led to the tremendous growth of diversified activities including livestock, horticulture, sideline activities, and cash crop production. With the implementation of the policy, resources such as grasslands (especially the grasslands in remote areas) have been used more fully. It has also led to better use of the slope lands. A lot of these, originally under crop cultivation, have been converted for horticultural purposes. This has not only promoted the productivity of slope lands but also led to the degradation of some resources. For example, some of the wild plants have suffered serious damage due to over use and irrational use. The programmes also have other effects. For example, after the capital assistance programme and the anti-poverty programme were carried out in the region, a large amount of capital from outside was transferred into this region, and some of it has brought more



advanced technology to agriculture and off-farm enterprises. Some of the poor counties have achieved great progress in OFE as a result. Meanwhile, the negative effects have also appeared. During our investigation in Wenchuan, Lixian, Maoxian, and other areas, we found that some rural enterprises pay more attention to getting funds from the relevant government departments than to collecting capital from other sources. It has also brought some negative effects regarding the efficiency of capital utilisation in some enterprises.

**Table 4.3: Responsiveness and Sustainability Implications of Current Policies and Programmes**

Policies or Programmes	Positive Effects on Sustainability	Negative Effects on Sustainability
Responsibility System	Improvement of farmer's initiative in off-farm activities; more independence in making use of resources, manpower, and capital.	Decline of collective self-help functions.
Encouraging a comprehensive agricultural base.	Inducement for fuller use of the diversities and riches of- or irrational use.	Degradation of some development of resources due to over use the resource
Preferential treatment for township enterprises	Alleviation of the pressure of increasing population on land; enhancement of rural economy; more opportunities for linking with the outside economy.	Damage to environmental resources due to heavy extraction of resources and poor protection of the environment; less inputs to traditional agriculture.
Allowing the farmers to go to cities and town for off-farm activities	More opportunities for improvement of employment and income; closer integration with the mainstream; alleviation of pressure on mountain resources.	Better educated manpower move out of the countryside.
Encouraging investment from the outside	Inducement for fuller use of 'niche' through investment and technology transfer from better-off areas.	Greater pressure on fragile resources.
Capital Assistance Programme	Transfer of outside capital to ease the shortage of capital for developing the commodity economy; closer linkages with the outside.	More dependency on the outside; decline of local self-help functions.
Spark Programme	Transfer of advanced and practical techniques to reduce the constraints concerning technology.	
Anti-poverty Programme	Reduction of gap between poverty-stricken areas and better-off areas through gainful activities; more opportunities for poor people.	More dependency on external assistance.

## ANALYSIS OF MAJOR TYPES OF OFF-FARM EMPLOYMENT

As mentioned in Chapter Three, development of off-farm occupations in Western Sichuan is still in the primary stages. Mining and logging are prominent off-farm activities and diversification, such as agricultural and sideline production, provides potential off-farm activities, specifically in horticultural development and food processing. For mining, logging, horticultural development, and food processing, some further analyses are given below.

### Rural Mining Industries

#### *Environmental and Resource Base*

The region is one of the most mineral rich districts in China. The minerals include iron, vanadium, titanium, gold, silver, lead, zinc, copper, manganese, and lithium. Also it is a rich source of non-metallic minerals such as mica, asbestos, gypsum, marble, granite, limestone, and peat. These resources provide a substantial base for the development of rural mining industries. Current activities include the mining of gold, lead, zinc ore, copper ore, and iron ore and the quarrying of marble, granite, and other building materials. Rural mining industries have developed rapidly since 1978 and have become a predominant off-farm sector. In Aba and Ganzi prefectures, rural mining constitutes about 85 per cent of the total mining enterprises, and the output of some major products increased rapidly between 1978 and 1987 (see Table 5.1).

**Table 5.1: Main Products in Rural Mining Industries in Aba and Ganzi Prefectures, 1978-1987**

	1978	1980	1985	1987
Gold (Kg)	8	80	90	216
Lead and Zinc Ore (ton)	300	2,476	607	4,249
Copper Ore (ton)	0	0	0	9,947
Manganese Ore (ton)	0	0	4,800	1,700
Coal (ton)	4,801	7,001	14,686	18,240

Source: Liu Zhongong, Chen Guojie, et al. 1990.



In general, rural mining industries operate on a small scale. Yet mining and quarrying have affected the environment in a number of ways. To a certain extent, this is due to carelessness and the absence of proper techniques and appropriate equipment. Because of the quarrying of marble, granite, and other building stones near roads and streams, for example, plant covers are destroyed severely, often causing flood, debris flow, and landslides. In addition, solid waste, waste water, and dust from rural mining industries (such as lead and zinc mines and copper mines) have polluted the mountain environment and caused some damage to miners' health.

In Aba and Ganzi prefectures, 19 projects have been planned. By the end of this century an investment of 29.5 million *yuan* will produce annually 209.37 kilogrammes of gold; 73,000 tons of copper ore; 50,000 tons of manganese ore; 100 tons of chromite copper ore; 3,000 cubic metres of granite; 3,000 cubic metres of marble; 700 tons of mica flakes; and 2,000 tons of carbide. The total of annual returns is in the range of 7 million *yuan*. At the same time, rural mining industries must be planned and managed well. The local governments should take proper measures for conservation of the environment and resources.

### *Demographic and Spatial Implications*

The region is the most sparsely populated area in Sichuan Province. Most rural mining industries are developed in areas where the mineral resources are rich but where the population density is small. During Spring and Summer, there is a significant conflict in the demand for labour between farm work and mining activities. A majority of the labourers cease mining activities to do farm work. Because of insufficient labour it is difficult to develop rural mining industries on a large scale. Except for gold mining, for which tens of thousands of new settlers came from outside the region, other rural mining activities have not been affected by migration and population redistribution.

In the region, backward communication and transportation systems are the main constraints to development in rural mining industries. Except for Panzhihua City, Xichang City, and a few counties in Liangshan Prefecture lying near the Cheng-Kun railway, all other counties are accessible only by road. In Aba and Ganzi prefectures, the road density per 100 is only 4.7 and about 18 per cent of the towns and villages are located away from the road. In addition, the roads are of poor quality and are often blocked by floods, debris flows, landslides, and bad weather (such as snow, rain, and fog). The major markets for the products are in Chengdu City, Chongqing City, Panzhihua City and other cities. Apart from some counties in Liangshan Prefecture near Panzhihua City, the distance from the market is too far.

The infrastructure for electric power does not fully meet the need of rural mining industries, specifically during the low flow period of mountain streams. In Aba Prefecture, where electric power stations have been developed more rapidly than in other prefectures, the developed power capacity (0.124 million kilowatts) is only 1.7 per cent of the total potential. Power demand is greater than supply in all the counties except Lixian and Wenchuan. This restricts the development of rural mining industries, metallurgical industries, and even the primary processing of mineral products.

### *Employment Implications and Development Considerations*

The rural mining industry, one of the main sources of off-farm employment and income, accounts for one-fourth of the total output value and the total employment within rural industries. In Aba and Ganzi prefectures, the output value of rural mining industries increased from 2.64 million *yuan* to 25.79 million



yuan between 1978 and 1987. Table 5.2 shows the distribution of output value in Aba and Ganzi prefectures between 1978 and 1987. In Aba and Ganzi prefectures, it is projected that the output value of rural mining industries will increase by about 11.6 per cent each year during the period from 1990-2000. In the past 10 years, it increased by more than 25 per cent each year. This is not sustainable. According to the development plan, employment in rural mining industries in Western Sichuan should increase by 5-7 per cent each year during the same period.

**Table 5.2: The Output Value of Rural Mining Industries in Aba and Ganzi Prefectures between 1978 and 1987**

Unit: Million Yuan		
Year	1978	1987
Mining and Smelting of Metals	0.31	13.30
Coal Mining	0.30	0.84
Building Materials	2.03	11.65
Total	2.64	25.79

Source: Liu Zhongong, Chen Guojie et al. 1990.

There are some locational considerations regarding the development of rural mining industries. In areas near Panzhihua City and Xichang City, as well as along the valley of the Anninghe River, there is a great demand for such items as building materials, coal, and for the primary processing of mineral products. In other areas of Liangshan Prefecture, products having comparative advantage and development potential include iron ore, lead and zinc ore, copper ore, mineral coal, and building materials (e.g., cement, bricks, and tiles). Secondly, in Aba and Ganzi prefectures, important consideration should be given to the primary processing of mineral products in the southeastern area and mining of metallic and non-metallic minerals in the Middle and the Northwestern parts. The main products having a comparative advantage and development potential include gold, copper ore, lead and zinc ore, lithium ore, and building stones (e.g., marble and granite). Some reasonable plans for Aba and Ganzi prefectures are described below.

- (1) **Gold Mining.** The main potential regions include Baiyu, Litang, Seda, Daofu, Ganzi, Kangding, and Songpan counties where the annual yield of gold can increase by about 6.7 per cent each year and to about 500 kilogrammes in 2000.
- (2) **Other Metallic Minerals.** The important development items include copper mining in Jiulong County; lithium mining in Jinchuan, Maerkang, and Kangding counties; and manganese mining in Heishui County. The annual total output value of these metal minerals could increase by about 11.6 per cent each year and to about 75 million yuan in 2000.



- (3) Quarrying of Building Stones. The important areas include granite quarrying in Luding County and marble quarrying in Danbar, Xiaojin, and Lixian counties. The annual total output value of these building stones could increase by about 19.6 per cent each year and to 30 million *yuan* in 2000.

## Rural Logging Industries

### *Environmental and Resource Base*

The forest area in the region is one of the three largest in China. It is the largest base for timber production in Sichuan Province. The forest resources are mainly concentrated in the alpine regions of Aba and Ganzi prefectures with a small portion in Liangshan Prefecture. There are 7.88 million hectares of land under forest and, in 2.85 million hectares of this, logging operations can be carried out to produce 795.67 million cubic metres of timber. More details are shown in Table 5.3.

**Table 5.3: The Forest Resources in the Alpine Regions of Western Sichuan**

	Logging Area (million hectares)	Total volume of Timber (million cubic metres)
Young Forest	0.16	4.63
Mature Forest	0.36	41.90
Overmature Forest	2.33	749.14
Total	2.85	795.67

Source: Liu Qingquan, Gao Yutian et al. 1985.

The alpine forests in Western Sichuan are not only rich in tree species but also important for preserving water and soil. The main vegetation here is the dark coniferous type consisting of such species as *Abies*, *Picea*, *Tsuga*, *Pseudotsuga*, and *Keteleeria*. There are 11 species of *Picea*, 10 of *Abies*, 3 of *Tsuga*, 2 of *Keteleeria*, and 1 of *Pseudotsuga*. In this region, most of the forests are located in the upper valleys of the Mingjiang River, the Yalongjing River, and the Jinshajiang River. Because of steep mountains, deep valleys, and rapid water flows in this region, the forest plays an important role in preventing soil erosion. The forests are situated in the transitional zone of the southeastern moist area and the northwestern arid region and are even more significant for ecological protection. These alpine forests are also the key to maintaining the water balance in Sichuan Province and in the middle and lower valleys of the Yangtze River further downstream.



How to properly utilise the alpine forests in Western Sichuan is a matter of vital concern. The natural regeneration of the forests has to be balanced against the extraction of trees. Between 1980-1987, the output of timber in rural logging industries was up by 2.1 times. The annual forest felling now is about 40 per cent higher than the annual growth rates. As a result, the forest resources and the ecosystem are being damaged. In Aba and Ganzi prefectures, forest cover was reduced from 25 per cent in 1949 to 11.32 per cent in 1987. The endangered species of animals and plants amount to 10-20 per cent of the total species. At the current rate, forest resources in the region might be exhausted by the end of this century. The rapid decrease of the forest resources is evidenced by a number of indicators such as (a) decrease in the water conservation function, (b) rapid expansion of meadows and shrubs, (c) change of microclimates, and (d) increase of natural hazards. The area affected by loss of water and soil erosion is over 60 per cent of the total in Aba Prefecture and 63 per cent of the total in Liangshan Prefecture. Natural hazards, such as debris flow and landslides, have spread to over 36 counties and 2 cities. Therefore, the logging industries must be well planned and properly managed. The Water Conservation Regulations on the Upper Valleys of the Yangtze River (carried out by the Government) must be implemented strictly. The felling area must be limited to below 40 per cent of the total forest area. The annual yield of timber production must be reduced by half to two thirds and forestry, logging, and wood processing should be integrated.

Wood processing has great potential. In the region, only about 30-40 per cent of the forest resources are used and only 0.5 per cent of the wastes in logging are utilised. A variety of new products from wood processing can be developed. For example, processing one cubic metre of log into small-sized lumber can give a value added of 100-140 *yuan*. In addition, tree branches and other wastes caused by forest felling (which constitute about 15-20 per cent of the volume of the log), and excelsiors from wood processing (which amount to 30 per cent of the volume of the log) can be used to produce glued wood board, laminated fibre board, wood pulp and paper, ethanol, wood alcohol, wood tar, glucose, and glutamate. Development of these new products can not only generate additional income but also reduce the demand for timber.

### *Demographic and Spatial Implications and Linkages with the Farming System*

Rural logging is usually a seasonal off-farm activity. During busy farming seasons, there is a conflict in demand for labour between farm work and forest felling. The remote alpine regions contain overmature forests that have not been logged because of labour shortages. Backward communication and transportation networks are other constraints. In Aba and Ganzi prefectures, the export of timber takes up most of the road transportation facilities. In Liangshan Prefecture, floating logs are also transported by rivers.

Improper development of rural logging activities has caused some negative effects on forestry, farming, and livestock. In the early 1980s, rural logging activities were not managed well in many counties. The returns from investment were low; cutting and felling exceeded the planting rate, thereby causing a problem of sustainability; the cutting area was not extended to other districts and instead immature forests were cut. The ecosystemic balance was destroyed and this had adverse effects on agriculture and livestock. Now, the land with a slope of over 25 degrees is no longer used for cultivation and replanting has been initiated in such areas. In Liangshan, Aba, and Ganzi prefectures, between 1978-1985, the area annually increased 2 times, from 527 thousand *mu* to 1,077 thousand *mu*.



## *Employment Implications and Development Considerations*

At present, the rural logging industry is still one of the main sources of off-farm employment and income. It contributes about one sixth of the total output value and total employment in rural industries. In Aba and Ganzi prefectures, between 1980-1987, the output value of rural logging industries (including wood processing) increased from about 3 million *yuan* to 19.07 million *yuan*, and the output of timber increased from 77,508 cubic metres to 165,997 cubic metres. But this is not sustainable. In order to conserve forest resources and the ecosystem, as mentioned earlier, the annual timber production must be reduced by a half to two-thirds. In Aba and Ganzi prefectures, it is proposed that the total annual output from rural logging and wood-processing industries be increased by only about 9.6 per cent (which is about a half of the current rate of 19.3%). Two comprehensive wood-processing factories are being established in Maerkang and Rangtang counties. This would need 2.3 million *yuan* of investment to produce per annum 8,000 cubic metres of processed timber and obtain per annum 3 million *yuan* of output value and 0.6 million *yuan* of profit. Such processing activities should be further encouraged.

## **Horticultural Development**

### *Environmental and Resource Base*

Western Sichuan has distinct bioclimatic variations. Conditions change from subtropical at low elevations to tundra with permanent snow at higher elevations. There are generally 1,500-2,000 hours of sunshine per year and the heat distribution decreases from the low river valleys to the high mountains. The daily range of temperature is great and the annual range small, and this creates better conditions for photosynthesis. The small annual range promotes the stability of stenothermic species. In general, most of the land is cultivable and natural conditions are favourable.

Abundance and diversity of these natural resources provide a good basis for development of horticulture, including fruits, flowers, and vegetables. For example, *Michelia alba*, mangoes, grapes, *Tamarindus indica*, and mulberry for breeding silkworms cultivated in the subtropical valleys of the Jinshajiang River and the Anninghe River. Oranges, peaches, cherries, and bamboo (*Sinocalamus affinis*) are cultivated in Luding of the Daduhe River Valley. Apples, walnuts, and wild peppers (*Zanthoxylum simulans*) are cultivated in the middle or upper reaches of the Daduhe River and the Mingjiang River. The apples produced in Maoxian, Wenchuan, and Yuexi counties and the pears produced in Jinchuan County have won State and Provincial prizes. The mulberry plant flourishes throughout the river valleys of the subtropical zone, sustaining fresh leaf growth throughout the winter. As many as four or five generations of silkworm are bred every year, twice as many as in the Yangtze River Basin. The quality of silk is also very fine because of the excellent natural resources and conditions.

### *Linkages with Traditional Agriculture and Market(s)*

For a long time, the self-sufficient subsistence economy was the traditional pattern in the region. The cultivation of cereal crops was the main agricultural activity and horticultural development was at a low level, meant only for self-consumption. Since 1978, transition from a self-sufficient subsistence economy to one based on commodity production and marketing has become apparent. Traditional agriculture and land use patterns have undergone change. First, barren hills and wastelands have been used for growing apples, pears, vegetables, wild pepper, mulberry, *Michelia alba*, and other flowers. In addition, even cultivated areas, except for the ones kept for maintaining a specified level of cereal production are being



increasingly used for horticultural purposes and cash crop production. For example, in Aba Prefecture about 100 thousand *mu* of cultivated mountain slopes have been switched to horticultural production during the eight year period from 1980 to 1988. The growth in horticultural production between 1970 and 1985 production is given in detail in Table 5.4. The corresponding decrease in cereal crops, especially after 1980, is apparent from Table 5.5.

**Table 5.4: Horticultural Area in Liangshan, Aba, and Ganzi Prefectures, 1970-1985**

Unit: '000 ha

Year	Total	Mulberry	Tea	Fruits	Apples	Pears
1970	2.73	0.20	0.88	1.65	0.95	0.35
1975	5.99	0.05	1.07	4.87	3.38	0.77
1980	9.75	0.67	1.29	7.78	6.41	1.03
1985	12.45	1.84	1.84	8.77	6.80	1.23

Note: The area does not include those where only a few trees were planted.

Source: Statistics of the Rural Economy of Sichuan, 1987.

**Table 5.5: Area Under Various Crops in Liangshan, Aba, and Ganzi Prefectures, 1970-1985**

Unit: '000 ha

Year	Total	Cereal Crops	Cash Crops	Other Crops
1970	589.9	552.1	17.8	20.0
1975	627.7	575.9	22.7	29.1
1980	618.9	568.6	19.7	30.7
1985	597.1	522.5	30.5	44.1

Source: Statistics of the Rural Economy of Sichuan, 1987.

Although the production of cereals is still a predominant activity in agriculture, the prominence gained by horticulture and other crops (including cash crops) is evident from the change in the ratios from 1970 to 1985 as indicated in Table 5.6.



**Table 5.6: Ratios between the Areas under All Crops, Horticulture, Cereals and Other Crops, 1970-1985**

Year	All Crops : Horticulture	Cereal Crops : Other Crops
1970	216.4 : 1	14.6 : 1
1975	104.9 : 1	11.1 : 1
1980	63.5 : 1	11.3 : 1
1985	48.0 : 1	7.0 : 1

Source: Statistics of the Rural Economy of Sichuan, 1987.

Similarly, in Liangshan Prefecture, between 1978-1988, the sugarcane area increased from 50,000 *mu* to 83,000 *mu*, the tobacco area increased from 22,300 *mu* to 99,200 *mu*, and the area under fruits and other trees increased by 7.51 million *mu*. Moreover, although the area under cereal crops decreased, the actual output of cereal crops increased by 3 per cent per year and met the basic demands of the Prefecture. The change in output of various crops between 1978 and 1988 in Liangshan Prefecture is illustrated in Table 5.7.

**Table 5.7: The Output of Cereal Crops and Principal Cash Crops in Liangshan Prefecture, 1978 and 1988**

	Output in 1978 (tons)	Output in 1988 (tons)	Change 1978-1988 (%)	Average Annual Change (%)
All Cereal Crops	990.900	1,288,600	30	2.7
Roasted Tobacco	2,560	9,110	256	13.5
Sugarcane	144,100	377,800	162	10.1
Fresh Fruits	10,820	57,860	435	18.3
Dry Fruits	1,350	3,900	189	11.2
Cocoons	69	1,297	1,780	34.1

Source: Statistics of the Rural Economy of Sichuan, 1987.

Another case in point is the production of apples in Liangshan Prefecture. There was hardly any apple production on a large scale before 1980. Now there are large amounts of apples sold in Chengdu, Chongqing, and other cities. Table 5.8 shows the production of apples since 1970 in selected of Liangshan Prefecture.

**Table 5.8: The Production of Apples in Selected Counties of Liangshan Prefecture, 1970-1985**

Unit : tons

Year	Butuo	Puge	Xide	Yuexi	Yanyuan
1970	0.1	0.4	0.0	0.6	15.0
1975	177.5	5.2	8.4	212.5	174.9
1980	9.5	28.8	152.5	477.9	560.3
1983	475.8	154.9	273.2	1,323.0	1,805.3
1985	423.6	298.2	788.2	2,215.8	2,252.9

Source: Statistics of the Rural Economy of Sichuan, 1987.

Similarly, sericulture has comparative advantages in some counties of Liangshan Prefecture (see Table 5.9). In Ningnan County, the production of cocoons reached 800 tons in 1989, and a silk filature mill, with an output of 70 tons per year and 600 employees, has been built.

**Table 5.9: The Yield of Cocoons in Selected Counties of Liangshan Prefecture, 1970-1985**

Unit: tons

Year	Xichang	Huidong	Mianning	Ningnan
1970	0.3	1.3	24.6	0.3
1975	3.5	3.0	34.8	4.7
1980	10.6	10.5	43.6	76.2
1983	40.5	65.8	94.6	240.6
1985	79.5	119.3	94.4	405.9

Source: Statistics of Rural Economy of Sichuan, 1987.



Wild pepper is a famous native product in Western Sichuan. For a long time, it was collected in a traditional fashion. After 1980, wild pepper bushes were planted widely in the three prefectures of Liangshan, Aba, and Ganzi. Table 5.10 shows the increase in production of wild pepper in these three prefectures.

**Table 5.10: The Production of Wild Pepper in Liangshan, Aba, and Ganzi Prefectures, 1965-1985**

Unit: tons			
Year	Liangshan	Aba	Ganzi
1965	156.2	101.4	63.6
1970	48.8	172.1	91.6
1975	68.2	151.9	83.7
1980	271.6	125.9	99.1
1985	844.5	271.0	208.4

Source: Statistics of the Rural Economy of Sichuan, 1987.

The market is very important for the development of horticulture. Most horticultural products in West Sichuan are of good quality and are very competitive in the market. For example, large amounts of apples, pears, and peppers sell well in the provincial market because of their good quality. Apples produced in Yanyuan and Yeuxi counties are sold even in Hongkong and Macao. Some early-maturing and special vegetables find markets in Chengdu and even Northern China. At present, except for the marketing of cocoons, which is still controlled by State-owned commercial departments, all horticultural products can be marketed through different channels (including State-owned, collectively-owned, and individually-run business organisations). The fluctuation in market prices is, however, severe and quite frequent. The dissemination of market information is slow and information is difficult to come by. Incomes from horticulture are heavily affected by this process.

In addition, the major markets are too far away. Easily perishable goods such as apples, pears, bananas, grapes, and other fresh fruits and fresh vegetables are difficult and expensive to transport. In order to ease these shortcomings, the backward and forward linkages of horticulture, such as production and processing, packing, transportation, and marketing, must be developed in a more integrated fashion.



Although complete information on the employment implications of horticultural development in Western Sichuan is lacking, some cases show that horticulture has become an important source of off-farm employment and income within agriculture. In Maoxian County, in 1989, three horticulture-based enterprises generated 800 thousand *yuan* in outputs and employed 420 labourers, accounting for 72 per cent and 65 per cent respectively of the total due to agriculture-based enterprises. In Western Sichuan, there are about 600 households specialising in horticulture in 1988. Throughout the river valleys in the southern part of this region, almost every farming family grows bananas. The average annual income per family is 200-300 *yuan*, but in some families it is as much as 1,000 *yuan*. In Ningnan County, every family plants three trees or more of *Michelia alba*. After three years of growth, the trees yield more than 10 thousand flowers a year and bring in an income of over 200 *yuan*. After five years of growth, each tree yields 20 thousand flowers a year and brings an income of 400 *yuan*. In Luding and Maoxian counties, each family earns over 400 *yuan* on an average and some as much as 700-800 *yuan*, from wild pepper. Apples are now the most significant source of income for many peasants. In 1989, in Jinzhou Village of Maoxian County, two families which represented the higher and lower income groups in the village earned respectively 4,800 *yuan* and 2,500 *yuan* from apples accounting for 59.1 per cent and 48.2 per cent of the total income of the families. In the valleys of Ningnan and Miyi counties, the breeding of silkworms and the planting of *Michelia alba* and mango in the home garden fetch per family as much as 600-1,000 *yuan* annually. This is about 25-40 per cent of the total earnings from agriculture. Indeed horticulture is profitable and suitable for almost all families, especially for the poor or marginalised groups and women.

Horticulture has developed well and become very popular in Liangshan Prefecture and Panzhihua City. In Aba and Ganzi prefectures, production of apples, pears, wild peppers, and vegetables has even greater potential. Some important development targets for 1990-2000 are described in Table 5.11. It shows that apple production is expected to increase substantially (annual average increase of about 29 per cent and 44 per cent in Aba and Ganzi respectively). The corresponding increase in area coverage is, however, significantly lower, indicating that the yields per ha and per tree are to be increased by a significant amount by introducing improved techniques. The table also indicates a large increase in the production of pears and pepper but at a relatively smaller rate than apples.

Vegetable production is also being promoted. In 5 counties of Aba Prefecture (Wenchuan, Lixian, Maoxian, Jinchuan, and Maerkang), the area under vegetables in 1988 amounted to 1,490 ha (62% of the vegetable land in the Prefecture). By 1995, this will have increased to 2,330 ha yielding 12,150 tons and by 2000 to 3,330 ha and 18,100 tons.

In the marginalised or poor regions, the local governments are also offering support to develop and popularise horticulture by making funds available and by introducing new technological skills. For example, in the piedmont area of the Erlang Mountain in Tianguan County, the local government has taken the following successful measures to develop vegetable fern.

- (1) A professional body of 100 members was formed by the County's "Native Product Company" to be responsible for the production of vegetable fern.
- (2) A production plan, which assigned duties to every team member, was decided upon by the villagers before the plants were gathered.



Table 5.11: Horticultural Development Targets for the Year 2000

	Area to be covered			No. of trees to be planted			Expected Annual		
	'000 ha	Increase over 1990 level (%)	Average annual increase (%)	Million	Increase over 1990 level (%)	Average annual increase (%)	'000 tons	Increase over 1990 level (%)	Average annual increase (%)
<u>Apples</u>									
Aba <sup>1</sup>	13.3	25	2.3	10	49	4.1	125	1,150	28.8
Ganzi <sup>2</sup>	6.7	247	13.2	4.9	215	12.2	132	3,660	43.7
<u>Pears</u>									
Aba <sup>3</sup>	2.0	20	1.9	0.8	30	2.7	20	100	7.2
Ganzi <sup>4</sup>	NA	NA	NA	NA	NA	NA	20.5	430	18.2
<u>Pepper</u>									
Aba <sup>5</sup>	17.3	57	4.6	21	30	2.7	1.6	360	16.5
Ganzi <sup>6</sup>	1.3	230	12.7	NA	NA	NA	0.6	700	23.1

Notes:

- (1) Areas with potential include 9 counties: Maoxian, Wenchuan, Lixian, Xiaojin, Jinchuan, Maerkang, Lanping, Songpan, and Heishui.
- (2) Areas with potential include 4 counties: Batang, Xiangcheng, Danba, and Daofo.
- (3) Areas with potential include Jinchuan and Xiaojin counties.
- (4) Danba County is the potential area.
- (5) Potential areas include 6 counties: Wenchuan, Lixian, Maoxian, Heishui, Jinchuan, and Xiaojin.
- (6) Potential areas include Jiulong County, the lower valleys of the Jiulong River, and the Luding Area of Daduhe River.

- (3) Information about the project was disseminated to every household.
- (4) A training course in the techniques of gathering and processing, including demonstrations in the field, was organised. As a result of these measures, the "Native Product Company" was able to buy 30 tons of vegetable fern within a very short time. To give another example, the local government in Mianning County encouraged silkworm breeding by paying compensation for cocoon yields of less than 25 kilogrammes per sheet and engaging a technical advisor to instruct the Yi ethnic group in silkworm breeding. Lianhe Village of Mianning County had over 10,000 wild mulberry bushes that were not used to breed silkworms. The leaves were instead gathered to feed the pigs. After the government measures, there were 60 households that bred more than 40 sheets of silkworms. On an average the earning per household increased to 200 yuan. The other measures taken by the government of Mianning County were:
- (a) planting more mulberry bushes on barren and waste land under the guidance of the Agricultural Bureau to let every family have more than two sheets of silkworms; and
  - (b) building a silk filature mill to derive maximum economic benefits and increase off-farm employment.

The above examples indicate that strong support from the local government is very important in horticultural development and in the establishment of backward and forward linkages.

## **Rural Food-processing Industries**

### *Environmental and Resource Base*

In Western Sichuan, food processing industries are very prominent. They are mainly concentrated in processing of livestock products, grains and other cereal crops, sugarcane and other cash crops, fruits, edible mushrooms, and vegetables. Among them, the processing of livestock products is the most important. Also the processing of edible mushrooms has a comparative advantage.

The region is one of the five largest livestock-raising areas in China. There are 14.5 million ha of available grassland, or somewhat more than 73.8 per cent of the provincial total. Ganzi and Aba prefectures are especially important livestock areas. About 60 per cent of the counties in these two prefectures are primarily engaged in the livestock sector. In 1985, in Ganzi and Aba prefectures, there were 3.93 million head of cattle and 2.98 million head of sheep which accounted for 41 per cent and 30 per cent of the provincial total respectively. The annual yield of beef and mutton was 19,200 tons, about 30 per cent of the provincial total; and the annual yield of cow's milk was 153,750 tons, about 71 per cent of the provincial total. At present, the approach to livestock raising is backward and unsatisfactory. Overgrazed pasture land constitutes over 30 per cent of the total area. Similarly, degraded pastures amount to 20-30 per cent of the total area. Table 5.12 gives detailed information about the state of livestock overcrowding in Western Sichuan. Given the overcrowding situation, one alternative is to promote the processing of livestock products currently being carried out on a relatively small scale. This way, labourers engaged in livestock raising may be transferred to processing industries and the number of livestock may be reduced.



In the region, there is a rich variety of wild and domesticated mushrooms. Some well-known and rare species include glossy ganoderma (*Ganoderma lucidum*), black mushrooms (*Tremella fuciformis*), golden mushrooms (*Tremella mesenterica*), fragrant mushroom (*Lentinus edodes*), pine mushroom (*Tricholoma matsutake*), and morel (*Morchella esculenta*). Among them, species such as *Auricularia auricula*, *Tremella fuciformis*, and *lentinus edodes* can be cultivated. Farmers have already had a lot of experience in cultivating *Ganoderma lucidum*. Wild mushrooms, such as *Lentinus edodes* and *Tricholoma matsutake*, are an important resource throughout the three prefectures. In 1988, *Tricholoma matsutake* brought in a revenue of 80 million yuan in Ganzi Prefecture, and this averaged out at 100 yuan per capita. Because of the abundance of oak (*Quercus spp.*) and Yunnan pine forest, (*Pinus yunnanensis*) which are symbiotic with *Tricholoma matsutake*, the earnings per capita in Xiangcheng, Daocheng, Yajiang, and

**Table 5.12: The Livestock Resources in Western Sichuan**

	Ganzi	Aba	Liangshan
Usable Grassland (million ha)	8.32	3.86	1.99
Usable Fresh Grass Yield			
Total (million tons)	28.3	14.5	7.2
Yield (tons/ha)	3.40	3.76	3.62
Livestock Load (million of cattle)			
Theoretical Capability	2.98	1.53	0.76
Actual Number (in 1985)	3.00	1.87	1.62
Extent of Overcrowding (thousands of cattle)	21	344	857

Source: Zhou Shourong et al. 1989.

Jiulong counties were as high as 10,000 to 20,000 yuan. The processing of these mushrooms is also profitable and must be promoted because fresh mushrooms are more difficult to transport, store, and sell at a higher price.

In addition, a variety of good quality fruits, such as apples and pears, can be processed. Although, at present, fruit production has not fully met the market demand for fresh fruits, it is necessary to initiate gradually some rural industries for fruit processing in conjunction with the promotion of fruit production as mentioned in the previous section.

In Liangshan Prefecture, sugarcane, tobacco, and other fruits besides apples and pears (such as mangoes, bananas, grapes, peaches, plums, strawberries, and cherries) are cultivated. It would be advisable to develop industries for their processing.



## *Constraints in the Development of Rural Food-processing Industries*

Although rural food processing industries developed rapidly in the last decade in Western Sichuan, some constraints, such as their economies of scale, market risk, and levels of technology, should be specifically considered. Some small food-processing industries were developed without considering the economy of scale. Consequently, their productivities and economic benefits were usually lower. They cannot compete against the large State-owned industries. On the other hand, some were developed on too large a scale and they could not operate at full capacity because agricultural production in the area was not sufficient to meet the requirements. For example, in Liangshan Prefecture, although the annual production of sugarcane increased by about 3.6 times between 1978 and 1988, it was still not enough to run the local sugar refineries at full capacity. In addition, the seasonality in fruit production is also a big constraint in the development of food-processing industries. Secondly, the necessary capital and advanced techniques for rural food-processing are lacking, and the abundant resources alone have not generated a dynamic economy. In Aba and Ganzi prefectures, because of the shortage of capital, some planned factories, such as the one for fruit processing in Maoxian County, livestock products in Ruogai and Hongyuan counties, and starch and alcohol in Heishui County, had to be delayed. Due to the lack of advanced techniques, new products could not be developed and poor quality products could not be improved upon. In Ganzi Prefecture, for example, mushrooms other than *Tricholoma matsutake*, which abound in the area, could not be processed and stored because a suitable technology was not available. In another case, the Wenchuan Tinned Fruit Factory had to be closed down recently because of the poor quality of products and inappropriate technology.

Also, intense competition and fluctuations of the food market, especially in drinks and fruit products, make these industries very risky. The dissemination of market information in the region, as mentioned earlier, is slow and information is difficult to get. This makes food-processing industries in Western Sichuan quite challenging.

## *Development Considerations*

During the last decade, rural food industries developed more rapidly than other industries. In 1989, they contributed about four-fifths of the total output value and the total employment in rural agro-based industries and about one-fifth in rural industries. In Aba and Ganzi prefectures, between 1978-1987, the output value of rural food processing industries increased from 50 thousand *yuan* to 13.73 million *yuan*, and the share of the total output value of rural agro-based industries increased from 62.5 per cent to 80.5 per cent (see Table 5.13).

In Aba and Ganzi prefectures, the output value of rural food-processing industries increased by 86.6 per cent each year between 1978-1987. During 1990-2000, this rate of growth could not be sustained. It is expected that the rate will be about 16.6 per cent each year during this period. Some important development features between 1990-2000 in Aba and Ganzi prefectures are described below.

- (1) Livestock Products. Important development items include the processing of beef and mutton and the processing of cow's milk. Within the planned period, two new meat-packing plants will be built in Ruogai and Hongyuan counties. By 2000, the annual yield of meat-products will increase 8.1 times in comparison with 1985 and will reach 10 thousand tons.



**Table 5.13: The Output Value of Prominent Agro-based Industries in Aba and Ganzi Prefectures**

Unit: million yuan		
Sub-sectors	1978	1987
Food processing	0.05	13.73
Textile and Leather	0.03	1.66
Paper Products		0.001.66
Total	0.08	17.05

Source: Liu, Zhougong, Chen Guojie et al. 1990.

- (2) Starches. In these two prefectures, white potatoes, maize, and a variety of beans of high quality have been cultivated on a large scale. They can provide a substantial basis for the development of starch-and vermicelli-processing. Important items include white, potato-based starch-processing in Heishui County, broad bean-based starch-processing in Xiaojin County, and starch-processing in Kangding County. The annual yield of starches will reach 1,500 tons. Meanwhile, the production of alcohol and animal feed will also be developed.
- (3) Mushroom and Fruit Processing. The region is rich in *Tricholoma matsutake* and other edible mushrooms. *Tricholoma matsutake* is widely distributed in over 60 counties (Kangding, Yajiang, Daocheng, Xiangcheng, Derong, Batang, Jiulong, Xiaojin, and others). The annual production of salted *Tricholoma matsutake* was more than 1,100 tons in 1988 in Ganzi Prefecture and the total output value was 100 million yuan. Within the planned period, a factory producing new salted *Tricholoma matsutake* in Kangding County, and fully-equipped fruit-processing factories, in Xiaojin, Jinchuan and Wenchuan counties, will be built.

## ACTIVITY - LEVEL ANALYSIS OF SOME ENTERPRISES

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For activity-level analysis, we investigated three township enterprises in West Sichuan. They are Weizhou Cement Plant in Wenchuan County, Lixian Tibetan Printing House, and Nongjiale Hydropower Station in Lixian County. Assessments of the three enterprises are as follows.

### **Weizhou Cement Plant**

#### *Type and Size*

Weizhou Cement Plant in Wenchuan County was established jointly by Weizhou Township and Wenchuan County in 1977. It is a collective enterprise and is directed by the township. The manufacturing unit belongs to the heavy industry category. In the beginning, the production capacity was 7,000 tons per year. By 1988 it had increased to 12,000 tons per year. The plant had 22 managerial staff and 165 workers in 1989. The fixed assets of the plant were 396.1 million *yuan*, the output value was 103.3 million *yuan*, and the profit 12.6 million *yuan*.

#### *Organisation and Management*

At present, the cement plant is managed according to the Contract Responsibility System. The features of the system are described as below.

The County Administration Bureau for Township Enterprises (hereinafter referred to as ABOTE) makes a bid. Then the ABOTE or the Township Government signs a contract with an individual or a group of people for direct management of the enterprise. The contract includes such items as contract period (usually for three years) as well as rights, obligations, penalties, services, and so on. The key contents are the specification of the planned output value, the profit, and its distribution. Generally speaking, during the contract period, the contractor, namely the chief manager of the enterprise, has the full right to make decisions about production and personnel management. The contractor's personal qualities become one of the key factors for the success of the enterprise. Another key factor is the quality of officials at ABOTE or the Township Office.

Weizhou Cement Plant is controlled by both the Wenchuan ABOTE and Weizhou Township Government. The latter is the contractee, while the Director of the Plant is the contractor. After signing the contract, the Director becomes fully responsible for the production and management of the plant. He appointed the Assistant Directors who in turn nominated heads of five divisions and of one laboratory. The Director approved the nominees. All these appointments were reported to the County ABOTE and the Township Government.



Workers of the plants did not sign a contract with the Director when they first entered the plant. But they were required to hand over five hundred *yuan* as earnest money. If a worker causes any accident, his earnest money will be deducted. If he does not, it will be refunded when he leaves the plant. All the staff and workers of the plant possess agricultural I.Ds. They come from the nearby villages of Weizhou Township. Most of them carry out farming activities when they are not working in the factory.

### *Technical Innovation*

One of the key problems faced by the township enterprises was that their techniques were very old-fashioned and their technicians were not well-trained. There were mainly two approaches to technical improvement. One was to import technology and equipment from elsewhere. Another was to assign some employees to undertake the necessary technical training in a relevant institute. Weizhou Cement Plant had done both. In the beginning, there were no skilled workers. The plant therefore recruited some skilled workers who had worked in similar units elsewhere. Some of them were retired but skilled technicians. Meanwhile, the plant sent four employees to Jiangyou Cement School to learn the technology of cement production. In addition all the staff were given on-the-job training. By taking these measures, the plant fulfilled the basic technical requirements.

### *Marketing*

There is a big difference between township enterprises and urban enterprises. Generally speaking, urban enterprises, as the mainstay of the national economy, are guided directly by national economic planning. They operate basically within the planned economic system. A majority of the urban enterprises can procure the needed means of production at State prices. The sale of their products is also directed by the State. On the contrary, township enterprises have many disadvantages. They operate within the market economic system and get little help from the State. Township enterprises have to buy the needed means of production by themselves at market price and they also sell their products at market price. The township enterprises are thus guided by the "invisible hand". In some cases, the local government, through the concerned bureau, such as the Bureau of Goods and Materials and the Planning Committee, etc., supplies a certain amount of the critical inputs for production, especially to enterprises that are very important for the local economy.

At Weizhou Cement Plant, limestone, which is one of the main raw materials, comes from a nearby mine run by Bingle Village. Production the limestone mine is not uniform. In the busy season, the farmers are engaged in farming and cannot mine the limestone ore. This results in the closure of the cement plant and is the main constraint against successful operation.

Other raw materials, except coal, also come from nearby villages and the plant purchases them at market price. As Weizhou Cement Plant is an important enterprise for Wenchuan County, the Aba Prefecture Government and the Wenchuan County Government allot a part of the needed coal to the plant, via the Aba Bureau of Industry, at medium price (higher than the State price but lower than the market price). Other inputs are purchased at market price from Dujiangyan City.

The product of the plant is mainly sold locally and in nearby counties, i.e., Wenchuan, Lixian, and Maoxian. Some cement is also sent to Chengdu for sale. The selling price of cement is determined by the plant and approved by the County Bureau of Prices.

## *"Success and Failure" in the Mountain Context*

Indicators of "success" and "failure" of Weizhou Cement Plant are summarised in Table 6.1.

**Table 6.1: Indicators of "Success" and "Failure" of Weizhou Cement Plant in the Mountain Context**

Mountain Specificities	Implications of Mountain Conditions	Successful Operations	Failures
Inaccessibility	<ul style="list-style-type: none"> <li>o Isolation from main-stream</li> <li>o High cost of transport</li> <li>o Poor market access</li> <li>o Information gaps</li> <li>o Poor services</li> </ul>	<ul style="list-style-type: none"> <li>o Use of local raw materials, sale of products in local area</li> <li>o Full use of mass media</li> </ul>	<ul style="list-style-type: none"> <li>o Have to bring additional raw materials from outside</li> <li>o Low value and high bulk products</li> </ul>
Fragility	<ul style="list-style-type: none"> <li>o Limited possibilities for employment</li> <li>o Limited availability of resources</li> </ul>	<ul style="list-style-type: none"> <li>o Generation of off-farm employment</li> <li>o Use of available resources</li> </ul>	<ul style="list-style-type: none"> <li>o Inadequate measures for environmental protection</li> </ul>
Diversity	<ul style="list-style-type: none"> <li>o Potentials of a great variety of small off-farm activities</li> </ul>	<ul style="list-style-type: none"> <li>o Small-sized operation</li> </ul>	<ul style="list-style-type: none"> <li>o Output of a single product</li> </ul>
Niche	<ul style="list-style-type: none"> <li>o Possibilities of specialisation</li> </ul>	<ul style="list-style-type: none"> <li>o Use of local resources</li> </ul>	<ul style="list-style-type: none"> <li>o 'Niche' not fully utilised</li> </ul>
Marginality	<ul style="list-style-type: none"> <li>o Little support from outside</li> <li>o Limited resources</li> <li>o Dependence on common property</li> </ul>	<ul style="list-style-type: none"> <li>o Self-help</li> <li>o Close ties with local government</li> </ul>	<ul style="list-style-type: none"> <li>o High dependence on outside</li> <li>o Not much integration with local community</li> </ul>



## **Lixian Tibetan Printing House**

### *Type and Size*

Lixian Tibetan Printing House was established in 1986 by Lixian Buddhist Society and some other non-governmental organisations in response to the felt need to foster Tibetan culture. The initial investment of the establishment was 55,000 *yuan*. The other funds were collected from the local government, non-government organisations, and individuals. The printing house is a productive enterprise and belongs to the light industry sector. Tibetan Buddhist texts constitute the main output. Lixian Tibetan Printing House is a small enterprise in terms of the number of employees and the production scale. There are 180 staff members and workers (1990). Among them, 9 members are administrative staff, including one Director, one Vice Director, two Workshop Heads, two guards, and three accountants. All the others are workers, including 80 permanent employees and 90 semi-permanent employees. In 1990, according to the Director, the value of fixed assets was 900,000 *yuan*; the output value, 5 million *yuan*; and the profit, 750,000 *yuan*. Two years prior to this, the fixed assets amounted to only 600,000 *yuan*.

### *Organisation and Management*

Lixian Tibetan Printing House is managed by the Director under the Contract Responsibility System, Lixian ABOTE. The Director has full control over the daily operations. The House pays annually 5 per cent of the total profit value to Lixian ABOTE. Lixian ABOTE, in turn, provides considerable support and help. The House at present has two workshops and three divisions. Two additional workshops are being planned and will be built in the near future. Among the staff and workers, 30 employees hold non-agricultural I.Ds. The others are a part of the agricultural population. Most of them, apart from some semi-permanent employees, are not, however, engaged in farming activities. Wages of the employees are not fixed and vary greatly. Some can earn 35,000 *yuan* per month, others earn 10,000 *yuan*. The House provides medical insurance and retirement pensions to the employees. It also contributes to a public welfare fund, out of which donations have been made to a local school and also to other projects.

### *Technical Innovation*

Lixian Tibetan Printing House is a successful example in which technology and equipment were imported from outside. In the beginning, the employees did not know how to operate the offset printing press. Accordingly, the House made a partnership agreement with an advanced printing enterprise, the State-owned Quxian Printing House. According to the agreement, Quxian Printing House supplied offset printing equipment and skilled technicians to Lixian Printing House. The skilled technicians were responsible for the technical aspects of printing and for training the unskilled workers on the job. In this way, the House was able to solve the technical problems, and thereby contribute to its successful operation. In addition, the House had sent two employees to a printing college in Hang Zhou, Zhejiang Province, in Southeast China. Two employees were sent to Aba Vocational School to learn accounting. These trainees have become the backbone staff of the House. The House has introduced offset printing equipment and is going to start colour printing in the coming two to three years.

## Marketing

Paper, the main means for production, comes from outside Aba Prefecture, mainly from Chengdu. In 1990, the House used 1,000 tons of papers. The printed materials were sold mainly within the counties of Aba Prefecture. Some are sold in Qingshai Autonomous Region.

## Indicators of "Success" and "Failure"

Some indicators of "success and "failure" of the Printing House in the mountain context are listed in Table 6.2.

**Table 6.2: Indicators of "Success" and "Failure" of the Lixian Tibetan Printing House in the Mountain Context**

Mountain Specificities	Implications of Mountain Conditions	Successful Operations	Failures
Inaccessibility	<ul style="list-style-type: none"><li>o Isolation from mainstream</li><li>o High cost of transport</li><li>o Information gaps</li><li>o Poor service</li></ul>	<ul style="list-style-type: none"><li>o Sale of products in local area</li><li>o High value-low bulk products</li><li>o Full use of mass media</li><li>o Partnership with outside enterprises</li></ul>	<ul style="list-style-type: none"><li>o Need to get raw materials from outside</li></ul>
Fragility	<ul style="list-style-type: none"><li>o Off-farm employment pressure</li><li>o Limited supply of resources</li><li>o Environmental degradation</li></ul>	<ul style="list-style-type: none"><li>o Provision of off-farm employment opportunities</li></ul>	
Diversity	<ul style="list-style-type: none"><li>o Potentials of a great variety of small-scale off-farm activities</li></ul>	<ul style="list-style-type: none"><li>o Multiple products on a small scale</li></ul>	
Marginality	<ul style="list-style-type: none"><li>o Little support from outside</li><li>o Limited resources</li><li>o Dependent on common property</li></ul>	<ul style="list-style-type: none"><li>o Close ties with agriculture and local community</li></ul>	<ul style="list-style-type: none"><li>o High dependence on outside</li></ul>



## **Nongjiale Hydropower Station**

### *Type and Size*

Nongijiale hydropower station was established in 1979 by Nongijiale Township and began to generate electricity in 1981. The construction fund, totaling 970 thousand *yuan*, came from three sources. The first source (340 thousand *yuan*) was the money accumulated and collected from the Township. The second was the support fund from the Government (330 thousand *yuan*). The third source was the bank loan (300 thousand *yuan*). By 1990, the Power Station had paid back the bank loan. The hydropower station is a small one. Its capacity for electricity generation is 820 kilowatt and its fixed assets amount to 1.2 million *yuan*. In 1990, the Station had 28 permanent staff and workers. All of them were agricultural I.D. holders. The output value in 1990 was 210 thousand *yuan*. It is a collective enterprise and is run by Nongijiale Township.

### *Organisation and Management*

The hydropower station is run by a Board of Directors. There are 9 members in the Board and all of them come from Nongjiale Township. Most of them are township and village officials. Nongjiale Administration Committee for Township Enterprises is directly responsible for the management of the station.

### *Technical Innovation*

From the begining, the station recruited some people who were familiar with the basic operations of hydropower stations. They became the technical backbone of the station and were responsible for teaching others on the job.

### *Marketing*

The distribution of electricity is controlled by Lixian Electricity Bureau. Generally, electricity generated by the station is mainly for meeting the demand of residents in Lixian Town. Local residents have now partly substituted wood by electricity for cooking.

### *Indicators of "Success" and "Failure"*

Some indicators of "success" and "failure" of the Hydropower Station in the mountain context are listed in Table 6.3.

**Table 6.3: Indicators of the "Success" of Nongjiale Hydropower Station in the Mountain Context**

Mountain Specificities	Implications of Mountain Conditions	Successful Operations
Inaccessibility	<ul style="list-style-type: none"> <li>o Isolation from mainstream</li> <li>o High cost of transportation</li> </ul>	<ul style="list-style-type: none"> <li>o Sale of electricity in local area</li> <li>o Use of local resource</li> </ul>
Fragility	<ul style="list-style-type: none"> <li>o Limited supply of resources</li> <li>o Environmental degradation</li> </ul>	<ul style="list-style-type: none"> <li>o Substitution of wood by electricity</li> </ul>
Diversity	<ul style="list-style-type: none"> <li>o Potentials of a great variety of small-scale off-farm activities</li> </ul>	<ul style="list-style-type: none"> <li>o Small-sized operation</li> </ul>
'Niche'	<ul style="list-style-type: none"> <li>o Possibilities for specialisation resource</li> </ul>	<ul style="list-style-type: none"> <li>o Special product with local</li> </ul>
Marginality	<ul style="list-style-type: none"> <li>o Little support from outside</li> </ul>	<ul style="list-style-type: none"> <li>o Close ties with agriculture and local community</li> </ul>



## CRITICAL ISSUES AND OPTIONS IN OFF-FARM EMPLOYMENT SUMMARY AND CONCLUSIONS

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### Critical Issues

- (1) Since 1980, considerable progress in off-farm employment has been achieved in the Hengduan Mountains of Sichuan Province. The productivity level of off-farm enterprises has also been rising together with the increase in employment. However, compared with the plains' areas of Sichuan and the country as a whole, the OFE level in this region is still much lower and the conditions for OFE development here are generally less favourable. There is still a long way to go before the OFE level in the Hengduan Mountains is able to catch up with that in the plains.
- (2) Individually-run enterprises are very significant in the Hengduan Mountains and are increasing. The industrial sector is still the most important source of employment and income. Diversified activities within agriculture are also becoming important sources of employment and income. Given the economic weakness, low urbanisation and industrialisation, unskilled labourers, and lack of capital, the individually-run enterprises and the diversified activities are more suitable for this region. From this stand point, the extractive activities, which are mainly based on resource advantages, will maintain a leading position in the industrial sector in the near future. With the reduction of the constraints and the improvement of relevant conditions, the processing industry, based on both agro-products and other raw materials, will be strengthened.
- (3) Among the prominent off-farm activities, mining activities such as gold mining, copper mining, marble and granite quarrying, and others still have great potentials. The potential for logging is limited, because of the degradation of forest resources. In order to prevent the forests from further degradation, logging should be reduced and more attention should be paid to wood processing. Diversified activities have achieved substantial growth and have benefitted the farmers to a large extent and they will provide a good base for agro-based industries. In accordance with the diversity and 'niche' in this region the agro-based industries should focus more on the processing of livestock products, fruits, and wild plants.
- (4) Policies have undergone great changes and have imposed great impacts on OFE during the past decade. Generally speaking, most of the policies were not favourable to OFE before 1980. However, since 1980, both the national government and the local governments have adopted a series of preferential policies for OFE. There is a lot of evidence that the policies have played a very important role for the development of OFE. Meanwhile, many programmes related to OFE have been carried out in this region and have favourably influenced OFE. However, policy and programme constraints still exist.

- (a) The macro-economic system still favours State-owned off-farm enterprises. The purchase of production materials and the sale of products in relation to off-farm enterprises have not been given proper attention in the State planning exercises.
  - (b) The policy for rural employment is incomplete and limited.
  - (c) The programmes directly related to mountain OFE are very few in number.
- (5) Off-farm employment has brought both positive and negative effects on the mountain economy and the environment. The positive effects are enumerated below.
- (1) It has created considerable employment to offset the phenomenon of the surplus labour force.
  - (2) It has brought economic profit to many farm households and has helped improve the farmers' living standard.
  - (3) It has led to fuller use of diversity and 'niche' provided by the resource base.
  - (4) It has made contributions to the development of agriculture and State-owned enterprises by providing forward and backward linkages.
  - (5) It has provided more opportunities for the mountain communities to interact with the outside. The negative effects are as follows.
    - (a) It has caused serious damage in the mountain environment and to its fragile resource base.
    - (b) It has weakened traditional agriculture because of the flight of capital and skilled manpower from agriculture to off-farm activities.
    - (c) It has enlarged the gap between the rich and the poor, since the main beneficiaries of OFE in this region are not the poorer groups but the richer ones.

## **Options and Strategies for Labour Transformation and OFE Development**

### *Standards for Evaluating "Success" or "Failure" in Off-farm Employment.*

Before talking about options and strategies, we should set some standards to evaluate "success" or "failure". Based on experiences and lessons from the past, we propose the following.

- (1) Economic Development. Labour force transfer, in addition to solving the employment problem, should accelerate economic development.



- (2) Increasing the Income of Local Inhabitants. Off-farm employment should guarantee that local people derive more benefits and income from it than traditional agricultural activities.
- (3) Increasing Productive Efficiency and Benefits. The transferral of the labour force from agriculture to off-farm activities must enhance both the labour force utilization rate and production efficiency. We should avoid the possible conflict between efficiency and employment. In the past, the tactics of providing employment opportunities to a large number of people at any cost resulted in decreasing efficiency and benefits. In future, the transformation of the agricultural labour force must avoid repeating the same mistake.
- (4) No Damage to the Ecological System and the Environment. Transfer of the rural labour force is usually accompanied by the expansion of production scale; increase in professional activities; widening of resource utilization; and so on, all of which result in more pressure on the environment. In the Hengduan Mountains, the forest cover has decreased and the environmental quality has deteriorated because of irrational use of some resources, for example, in mineral exploitation, logging, grazing, and in exploitation of wild plants. In order to protect the environment, we should implement serious policies to control and manage it.

#### *Main Features of Proposed Strategies*

The transfer from traditional agricultural activities to off-farm activities must be gradual. It is necessary to wage a protracted and lasting struggle to solve the problems of the surplus rural labour force.

- (1) Transference within Local Areas. Some important features are described below. We should remember that it would be very difficult for other areas to absorb a large labour force from the Hengduan Mountains. Surplus labour force may be a feature of areas and countryside for a long time to come in China. The labour force from the Hengduan Mountains is less skilled than from other places. They cannot compete in the labour market especially when opportunities are increasingly more difficult to come by. It is advisable therefore to adopt an employment strategy that takes into account the opportunities presented by the Hengduan Mountains themselves. The sparsely distributed population must be oriented to off-farm activities within their own counties.
- (2) The Transformation of Labour Skills Depends Mainly upon Agricultural Development. In the Hengduan Mountains, deep-rooted traditional agricultural practices and the fragile resource base imply that strengthening agriculture is still the most important task. Transformation of skills should be targetted first within agriculture. At present, it may focus on broadening the agricultural base, from traditional agriculture, for example, to developing forests, sideline production, animal husbandry, fisheries, and then gradually to the processing of agricultural products. At the same time, farmers can be encouraged to become involved on a part time basis in agricultural processing, road construction, raw material processing and hydropower generation.
- (3) Small Towns Must be Promoted to Develop the Bases for Off-farm Activities. At present, the town population accounts for only 13 per cent (1985). Some counties have no towns



at all even now. Each town has no more than ten thousand people. Some have no water supplies, no buses, and very poor communication. We should therefore develop medium or small towns with the goal of making them industrial or off-farm employment centres.

- (4) Developing Township Enterprises as the Centre of Labour Force Absorption in the Hengduan Mountains. We cannot expect to start big projects, modern enterprises, or large factories in the next few years. Rural enterprises, mostly small and labour-intensive ones, can, however, be created at lower cost and lower technical levels. These would be suitable for the Hengduan Mountains and can be established now.
- (5) Off-farm Activities Should Focus on Local Resources' Utilisation. Shortage of techniques, highly educated people, funds, and communication system are the constraints to development of high level industries in the Hengduan Mountains. The region, however, abounds in natural resources which can be exploited such as minerals, forests, grassland, fruits, and wild plants. Off-farm activities must be concentrated on sectors such as mining, timber, and food processing. In order to create better conditions for development, the hydro-electric power supply and transportation must also be improved.

### *Institutions and Management*

The role of institutions and management in off-farm employment has been neglected in China. Upgrading and improving institutions and management are necessary to boost off-farm activities.

- (1) The local government and its departments must emphasise the following. (1) Although there are departments of labour and personnel and a bureau of enterprise administration they are not responsive to the demands of new developments in off-farm employment. It is urgent to have an integrated and coordinated institutional arrangement that addresses the problems related to the surplus rural labour supply. (2) Off-farm employment projects and plans should be a part of the whole social and economic strategy of the Government. (3) Providing market information and giving instructions to jobless farmers according to the demands of the labour market must be performed by local authorities. (4) The local government should set up rural marketing cooperatives and offer farmers more scientific, and technological services to increase the farmer's ability to absorb new techniques. The local government should also provide technical training to the jobless so that they will be able to take advantage of existing opportunities. (5) The provincial labour authorities should be in contact with enterprises outside the province or outside the Hengduan Mountains. Local governments could then coordinate the supply of rural labourers to areas that are in need. (6) The government policy of developing tertiary industries and promoting collectively-and privately-owned enterprises as well as Sino-foreign joint ventures should be introduced here and implemented rigorously.
- (2) Some other policies are also urgent. They are outlined below.
  - (1) Food Supply for Off-farm Employees. It is necessary to provide non-agricultural I.Ds to enable them to get grain, edible oil, electricity, and housing at State prices.



- (2) Land Deeds for Off-farm People. Off-farm employees should be able to keep their land rights according to the Household Contract Responsibility System as these existed prior to their finding off-farm jobs.
- (3) Registered Permanent Residence for Off-farm Employees. Employees should have the right to choose their place of residential registration.
- (4) The economic interests of cities and rural areas should be readjusted. We should make more effort to transfer surplus rural labour to the city and service trades. The rural-urban flow of population cannot be stopped, but China must try to prevent the unfavourable social problems that some places have experienced because of urban migration.
- (5) A certain proportion of income from rural enterprises should be invested back in agriculture to raise the living standards of farmers. Rural enterprises should also give priority to processing farm products, side-line production, and utilisation of local resources.
- (6) The pricing policy for farm products should be reformed, with the objective of establishing the rural markets and forming a healthy environment for the sustained and stable development of off-farm activities as well as of the rural economy.

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ICIMOD is the first international centre in the field of mountain development. Founded out of widespread recognition of environmental degradation of mountain habitats and the increasing poverty of mountain communities, ICIMOD is concerned with the search for more effective development responses to promote the sustained well being of mountain people.

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