

An Introduction to Miyi County

Physical Features

Location. Miyi County is located on the south-eastern border of the Qinghai-Tibetan Plateau and in the eastern section of the Central Hengduan Mountain Range. It lies between $26^{\circ} 42'N - 27^{\circ} 10' N$ latitude and $101^{\circ} 44'E - 102^{\circ} 15'E$ longitude (See Map). The longest distance from south to north is 73 km, and from west to east 52 km. The total area is $2,081 \text{ km}^2$ and it is shaped like a rhombus.

Landform. The overall relief consists of alternate gorges and ridges. The area is drained from north to south by the Yalongjing and Anning rivers (both tributaries of the Jinshajing River) which form a confluence on reaching the southern border of the County. The Yalongjing River hinterland is characterised by deep gorges and steep valley slopes with hardly any flat or alluvial land. On the other hand, the Anning River drains many large and small areas of alluvial flatland and terraces and this area is characterised by wide valleys. From valley bottoms to mountain ridges, the height varies from 980 to 3,447m. The principal geomorphological characteristics include:

- o small plains distributed throughout the Anning River Valley at elevations below 1,150m; accounting for 5 per cent of the total area and consisting of Quarternary alluvials;
- o terraces at elevations between 1,150m and 1,300m in the Anning River Valley; accounting for 3 per cent of the total area and consisting of fairly smooth terrain;
- o middle hill areas between 1,300m and 2,500m on both sides of the Yalongjing and Anning rivers; consisting of 82 per cent of the total county area; and
- o a middle mountain range between elevations of 2,500m and 3,477m; being the highest area in the County and accounting for 10 per cent of the total area.

Climate. The principal climatic features can be summarized as follows:

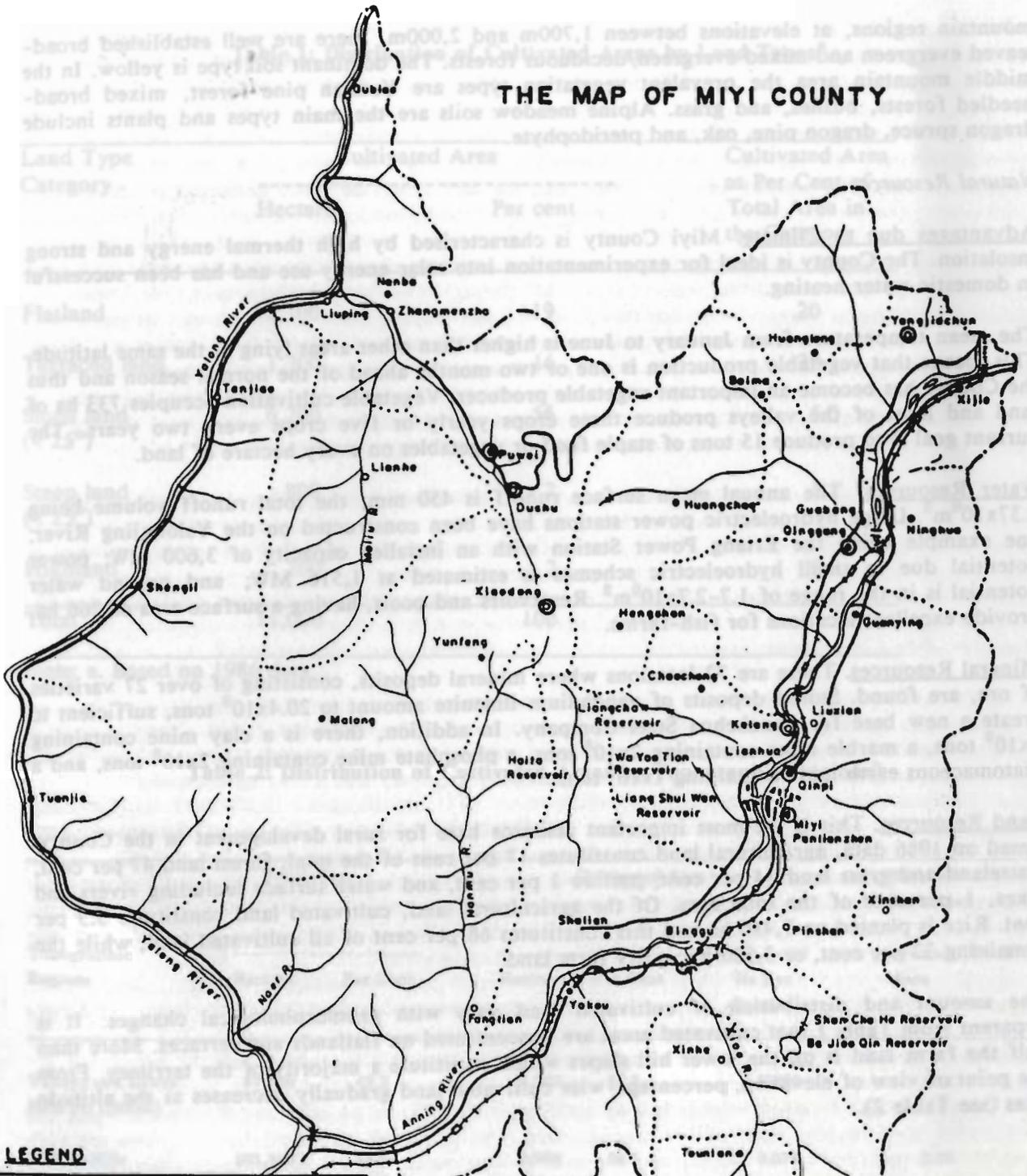
- o Vertical temperature variations resulting in thermal belt characteristics. The mean annual temperature is 19°C. In January, the mean monthly temperature ranges from 13°C to 15°C. The annual mean frost-free period is 315 days in the valley belt.
- o The annual mean insolation period ranges from 2,213 hrs to 2,413 hrs in the valleys and there are only about 7 days of fog. Thus, insolation is strong and the area has one of the longest illumination periods in Sichuan Province.
- o Seasons are alternately wet and dry. The mean annual precipitation is high and ranges from 900 mm to 1,300 mm. The potential evapotranspiration, representing the water vapour flux under ideal conditions, is greater than precipitation; the average annual evapotranspiration rising to 2,385 mm. Precipitation distribution is uneven. during the dry season (November to April), which is also the season in which temperatures are highest, the precipitation accounts for only four per cent of the yearly average. Seventy-seven per cent of the annual precipitation occurs from June to September. Seasonal evapotranspiration is marked. In spring, when precipitation is the lowest, evapotranspiration is at its maximum constituting 59 per cent of the yearly average. This renders the valleys hot and dry.
- o The vertical climatic variations range from subtropical to temperate. The changes correspond to the topographical sequence from south to north and from valley - lower hills - lower/mountains - middle mountains.

Rivers. The Yalongjing and the Anning are the two main rivers in the County. Both are subject to appreciable fluctuations in discharge. The water head of the Yalongjing varies by 130m within the County and the Anning is subject to abrupt fluctuations that fall off rapidly and dry up; the minimum flow is 5.2m³/s in the dry season and this rises to a maximum of 3,410m³/s in the rainy season. The annual mean flood flow rises to 1,640 m³/s.

Vegetation. Vegetative cover and soil groups are clearly demarcated and vary according to topography. In the valleys, the soil is suitable for rice cultivation. These valleys are characterised by grasslands mixed with shrubs and trees. The soil is often red in colour and mangoes, bananas, lemon grass, Chinese flowering quince, and kapok grow. In the hills and on the valley slopes the soil varies in colour from reddish brown to red. It supports sparse trees, shrubs, and steppe land. Shillac and mulberry plants grow in this region.

In the lower mountain areas, at elevations between 1,500m and 1,700m, the vegetation shifts from Savannah woodland, bush-wood, and Steppe to broad-leaved evergreen forests. The soil is yellow and oranges and apples are examples of the types of crops that grow in this region. In the lower

THE MAP OF MIYI COUNTY



LEGEND

- STUDY TOWN & VILLAGE -- (circle with dot), (circle with dot)
- TOWN, VILLAGE -- (circle with dot), (circle with dot)
- COUNTY BOUNDARY -- dash-dot line
- TOWNSHIP BOUNDARY -- dotted line
- RAILWAY -- line with cross-ticks
- ROAD -- dashed line
- RIVER, RESERVOIR -- wavy line



mountain regions, at elevations between 1,700m and 2,000m, there are well established broad-leaved evergreen and mixed evergreen/deciduous forests. The dominant soil type is yellow. In the middle mountain area the prevalent vegetation types are Yunnan pine forest, mixed broad-needled forests, bushes, and grass. Alpine meadow soils are the main types and plants include dragon spruce, dragon pine, oak, and pteridophyte.

Natural Resources

Advantages due to Climate. Miyi County is characterised by high thermal energy and strong insolation. The County is ideal for experimentation into solar energy use and has been successful in domestic water heating.

The mean temperature from January to June is higher than other areas lying at the same latitude. This means that vegetable production is one or two months ahead of the normal season and thus the County has become an important vegetable producer. Vegetable cultivation occupies 733 ha of land and most of the valleys produce three crops yearly or five crops every two years. The current goal is to produce 15 tons of staple food or vegetables on every hectare of land.

Water Resources. The annual mean surface runoff is 450 mm; the total runoff volume being $9.37 \times 10^6 \text{ m}^3$. Large hydroelectric power stations have been constructed on the Yalongjing River; one example being the Ertang Power Station with an installed capacity of 3,600 MW; power potential due to small hydroelectric schemes is estimated at 1,516 MW; and ground water potential is in the range of $1.7-2.7 \times 10^9 \text{ m}^3$. Reservoirs and pools, having a surface area of 266 ha, provide excellent locations for fish-farms.

Mineral Resources. There are 72 locations where mineral deposits, consisting of over 27 varieties of ore, are found. Stored deposits of vanadium ilmenite amount to 20.4×10^9 tons, sufficient to create a new base for Panzhehua Steel Company. In addition, there is a clay mine containing 1×10^9 tons, a marble mine containing 2×10^8 tons, a phosphate mine containing 2×10^8 tons, and a diatomaceous earth mine containing 1×10^8 tons.

Land Resources. This is the most important resource base for rural development in the County. Based on 1986 data, agricultural land constitutes 17 per cent of the total, forest land 47 per cent, wasteland and grass land 34 per cent, pasture 1 per cent, and water surface including rivers and lakes, 1 per cent of the total area. Of the agricultural land, cultivated land constitutes 5.3 per cent. Rice is planted on 7,480 ha and this constitutes 68 per cent of all cultivated land, while the remaining 32 per cent, or 3,580 ha, is dry farm land.

The amount and distribution of cultivated land vary with geomorphological changes. It is apparent from Table 1 that cultivated areas are concentrated on flatlands and terraces. More than half the farm land is on the lower hill slopes which constitute a majority of the territory. From the point of view of elevation, percentage-wise cultivated land gradually decreases as the altitude rises (see Table 2).

Table 1: Distribution of Cultivated Areas by Land Types^a

Land Type Category	Cultivated Area		Cultivated Area as Per Cent of Total Area in the Category
	Hectare	Per cent	
Flatland	2,100	19	20
Terraced land	1,700	16	28
Slope land (< 25°)	6,200	56	5.5
Steep land (< 25°)	800	7	1.2
Highland	200	2	0.9
Total	11,000	100	5.3

Note: a. Based on 1986 data

Table 2: Distribution of Cultivated Areas by Topographic Regions^a

Topographic Regions	Total Area		Cultivated Area			Ratio of Cultivated Area and Total Area
	Hectare	Per Cent	Hectare	Per Cent	Ha Per Capita	
Valleys and Lower Hills (< 1,500m)	87,800	42.2	6,960	63.1	0.066	1:12
Middle Hills (1,500m - 2,500m)	101,200	48.6	3,980	36.1	0.076	1:25
Middle Mountains	19,100	9.2	90	0.8	0.015	1:212
Total	208,100	100.0	11,030	100.0	0.067	1:19

Note: a. Based on 1986 data

As far as the land use structure is concerned, the proportion of cultivated land to the total territory gradually decreases as the land rises from the valley to the mountain areas. Conversely, the proportion of forests to total land area increases. In terms of agricultural production, the higher the altitude the greater the income from forest products and livestock whereas income from agriculture diminishes. The proportion of food crops to cash crops increases with the elevation. The total output in food crops and the per unit rice yield decreases with altitude. Conversely, the proportion of corn and wheat in total food production increases with altitude.

Potentials of Vertical Agriculture System. Miyi is the centre of tropical and subtropical cash crop production in the middle latitude regions of China. The main valley crops are mangoes, pineapples, bananas, litchis, Chinese flowering quince, kapok, sisal hemp, olives, oil palm, and sugar cane. In the lower hills, the crops are pineapples (annual output 1,000,000 tons), pears, peaches, pomegranates, mulberries, and oranges. The main crops in the middle mountain areas are Chinese prickly ash, mushrooms, Chinese medicinal plants, sweetgrass, and flowers (suitable for the perfume industry). The County has 458 species of wild animals, is an important exporter of cattle, and an ideal area for livestock development (oxen, sheep, and goats).

The variations in environment and natural resources at different elevations provide a comparative advantage in mountain areas such as Miyi County. The spatial management of such resources along different vertical zonations is the basis for further development of vertical agriculture in the County. Villages in the area have the potentials therefore of drawing up plans and projects to improve on resource utilization, industrial distribution, and overall organisation and management.

Social and Economic Background

Miyi County's headquarters are based at Panzhihua Town. It is located at the edge of Sichuan Province and is an impoverished mountain area in need of development. It has a long history of agricultural development with pronounced local economic characteristics. Today it lies at the transitional stage between a self-sufficient subsistence economy and a trading economy.

Population. The total population of Miyi is 175,085 (1986 data) and this is small compared to the other counties of Sichuan Province. The average density is 84 persons per km² and this, too, is lower than the average of other counties in the province. The distribution is uneven. For example, the valley constitutes 42 per cent of the total area and contains 74 per cent of the population. The average population density in the valley is 200 persons per km² and this decreases to less than 50 persons per km² in the mountain areas.

Apart from the *Han*, there are several minority ethnic groups in Miyi. The *Han* comprises 89 per cent of the population, the *Yi* 9 per cent, the *Lisu* 0.9 per cent, and the *Hui* 0.7 per cent; in addition, there are small groups of Mongolians, *Bias*, Tibetans, *Shuis*, and *Mans*.

The total number of people engaged in agriculture is 147,000 or 84 per cent. This means that the cultivated land absorbs most of the labour force. The illiteracy and semi-literacy rates are high and only 46 per cent of the population are over twelve years of age. In the areas where minority ethnic groups reside, such as Malong, Baima, Huanglong, and Xinshang, the illiteracy and semi-literacy rates are 63 per cent, 73 per cent, and 66 per cent respectively. In Baima, Huanglong, and Xinshang, the female illiteracy rate is 94 per cent, 93 per cent, and 97 per cent respectively.

Economic Structure. An analysis of the economic production shows Miyi as a predominantly agricultural county, both previously and currently. Dependence on local agricultural production plays a vital role in both agricultural and industrial productivity. Agricultural production accounted for 95 per cent of the gross production in 1949 and 45 per cent in 1986. In addition,

85 per cent of the labour force is engaged in agriculture, over 90 per cent of the population live in villages, and the level of town and city development is low: for example, no town has over 10,000 people and the County town has a population of only 8,214.

Industry is not well developed. The total output amounts to \$ 12.95 million. The main industries are sugar refining, food processing, mining, construction materials, and printing. Cottage and village industries are developing slowly and accounted for \$ 3.2 million in 1986.

Regional Differences. There are distinctive regional differences in economic development. Generally speaking, the valleys are developing rapidly in both industry and agriculture. Most of the towns are concentrated in the valleys because of the convenient communications' network. The average income ranges from US\$ 160 to 270 per year and a few people earn more than US\$ 2,702.7 a year. The lower hill zone comes second with average income ranging from US\$ 110 to US\$ 160 per year and the middle mountain area, where the minority ethnic groups live, lags behind. In an average year, food production (52,630 tons) just meets the demand (per capita availability = 300 kg). In the years when natural calamities take place, government relief has to be given. The average income at such times decreases to below \$ 54 per year.