

Hainan – the Island of South Sea A New Province in China

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The island of Hainan, the largest island of China, second only to Taiwan is called “Chu-Yi” or “shore of pearls” by ancient Chinese for it produces true pearls along the north shore. For Western visitors it is called “Isles of palms” for it possesses lush vegetation, especially palm trees. The present name Hainan means “Island of South Sea”, representing a frontier area for Chinese culture and the farthest penetration of China’s major territory into the tropics.

The latitude of Hainan, between 18°–20° N, makes its position comparable to that of Puerto Rico, Cuba, or Hawaii. Its pendent location to China reminds one of Ceylon to India or Tasmania to Australia.

Shaped somewhat like a pear, Hainan is about 210 km wide from W to E and about 165 km long from N to S. Its total area is about 33,920 km² which is only half the size of Ceylon, slightly smaller than Taiwan, but nearly twice the size of the state of New Jersey. Long administered as part of Quangdong, the island became an independent province of the People’s Republic of China in 1989 (Fig 1).

Historically, Hainan has been a backward place of the Chinese empire. When the officials in the court offended the Emperor, they were sent as exiles to Hainan. Mr. Li Deyu, a prime minister of the Tang Dynasty (c. 600–800 AD), and Su Shi, a high official and great poet of the Sung Dynasty (1127–1276), were good examples.

Because of its close proximity to Vietnam, its military importance has increased with the rise of border conflicts between Vietnam and China. Consequently, the W coast of Hainan island is dotted with naval bases, aircraft and missile bases, and army bases.

Hainan is separated from China’s mainland by Hainan strait which is only 24 km, much shorter than Tai-

wan strait separating Taiwan from China, which is 144 km. Hainan has not received as much Chinese migration as Taiwan, nor does it have the same degree of Japanese exploitation.

The forms of its mountains play a key role in shaping the physical geography of Hainan. The mountains stretch generally from NE to SW with a length of 288 km, forming a kind of back-bone. However, the high mountain core concentrate in the SW part of the island where the fivefinger mountains rise to 1867 m. The mountain’s name refers to the five great peaks spreading out like the fingers of a hand. There are 81 peaks along the range with a elevation above 900 m and 6 above 1350 m. The major plains appear around the coast especially in the NE where the plains extend between 1–9 km in width. As for land form classification in Hainan, mountains occupy 25.4%, hills 13.3%, terraces 32.6%, and plains 28.7% (Fig 2).

The SW portion of the mountain core is the result of the intrusion of granite which form a dome structure. With the long period of erosion and faulting, the surface is dissected into high peaks and deep valleys. It is these valleys which became the traveling routes.

High in the SW part, the land declines gradually toward the surrounding lowlands, forming a ring shaped landform, consisting of hills and coastal plains.

There are 154 rivers which start in the Five-finger mountains and radiate outward to the ocean in Hainan. Most of them are short and swift. There are 38 rivers with a drainage area of 100 km², 25 with 100 to 500 km² and 13 with more than 500 km², with a drainage area more than 3000 sqkl are only three rivers, namely Nantu, Wanquan and Changhua rivers. The rivers are not navigable, but provide the potential energy for water power. In the higher regions, the rivers cut the moun-

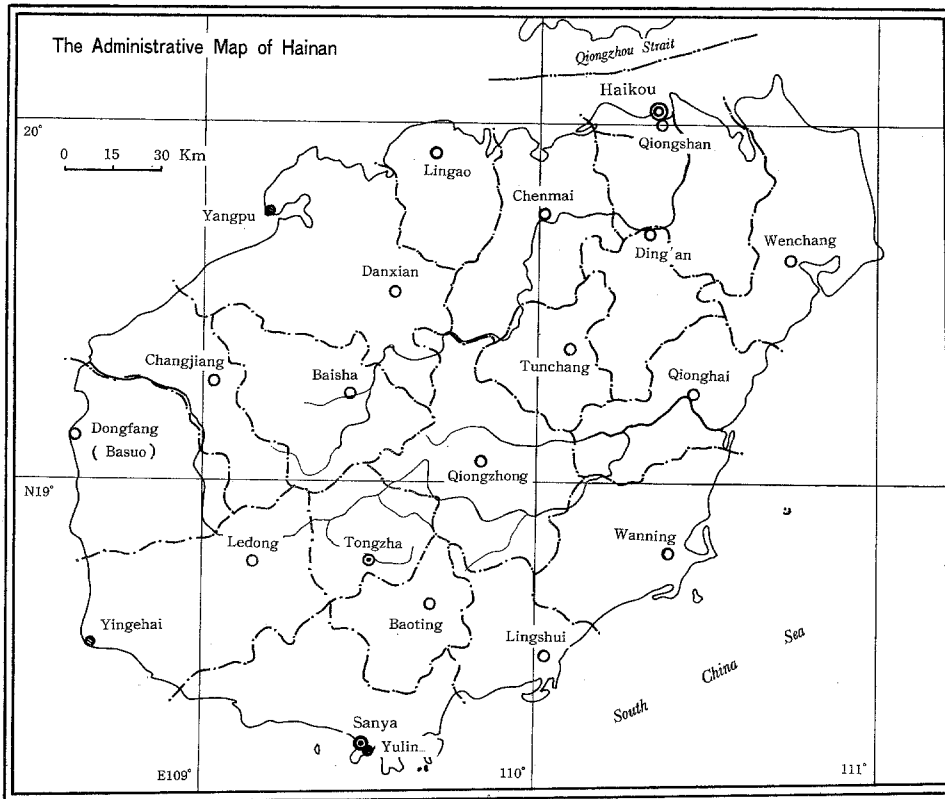


Fig 1
The administrative division map of Hainan

tains into gorges and form rapids; once descending into the lower lands, terraces are developed (Fig 3).

With 1528 km of coastline, Hainan reveals the tropical coast in characters. The coast of Hainan can be divided into three parts: in the N, are mainly volcanic basalt terraces resulting from sea wave erosion; the SE con-

tains the drowned-valley(ria)-type of coast; and in the SE has mainly beaches and sand bars, the depositional type of coast.

Though landform of Hainan is not necessarily an ideal place for cultivation, the island certainly has the advantage of a tropical climate that favors the growth of rice, sugar, rubber, coconuts, pineapple and coffee.

Located in low latitude, Hainan receives rich sunshine. For the most part, the average annual sunshine is about 2,000 hours, with the highest in summer and lowest in winter. In the W part of the island, sunshine can total 2700 hours; while in the central mountain regions, about 1700 hours.

In Hainan, the average temperature ranges from 22° to 26° C, decreasing from the surrounding low land to the central high mountains. Summers are long, lasting for a few weeks, with average temperatures between 28° to 29° C. Winters are short and warm with a temperature between 18° to 20° C. The peaks of the high mountains may be snow-capped in winter, but frost is rare on the plain. The N is often warm enough to raise two crops of rice, sugar cane, sweet potatoes, corn, peanuts, bananas, pineapple and even rubber.

Since Hainan is an island it receives maritime influences from all directions. The summer monsoon brings heavy rainfall, especially against the mountains on the S half of the area. Besides a year round growing season, all of Hainan except a very narrow strip along the W coast, receives an average of 1639 mm rainfall annually.

Fig 2 The relief map of Hainan

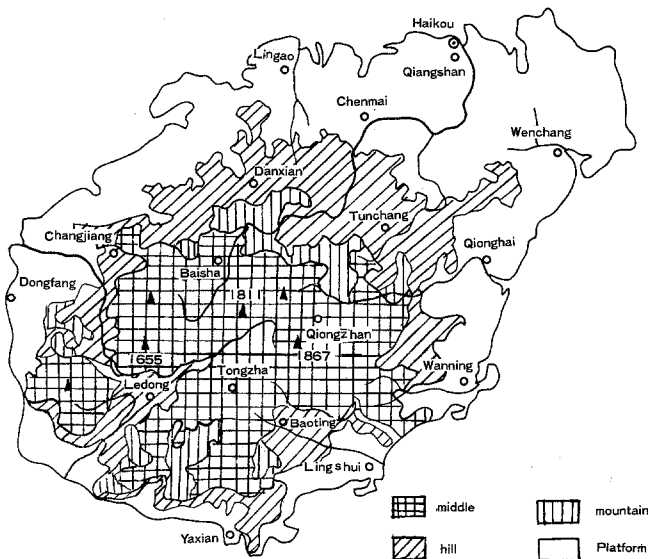
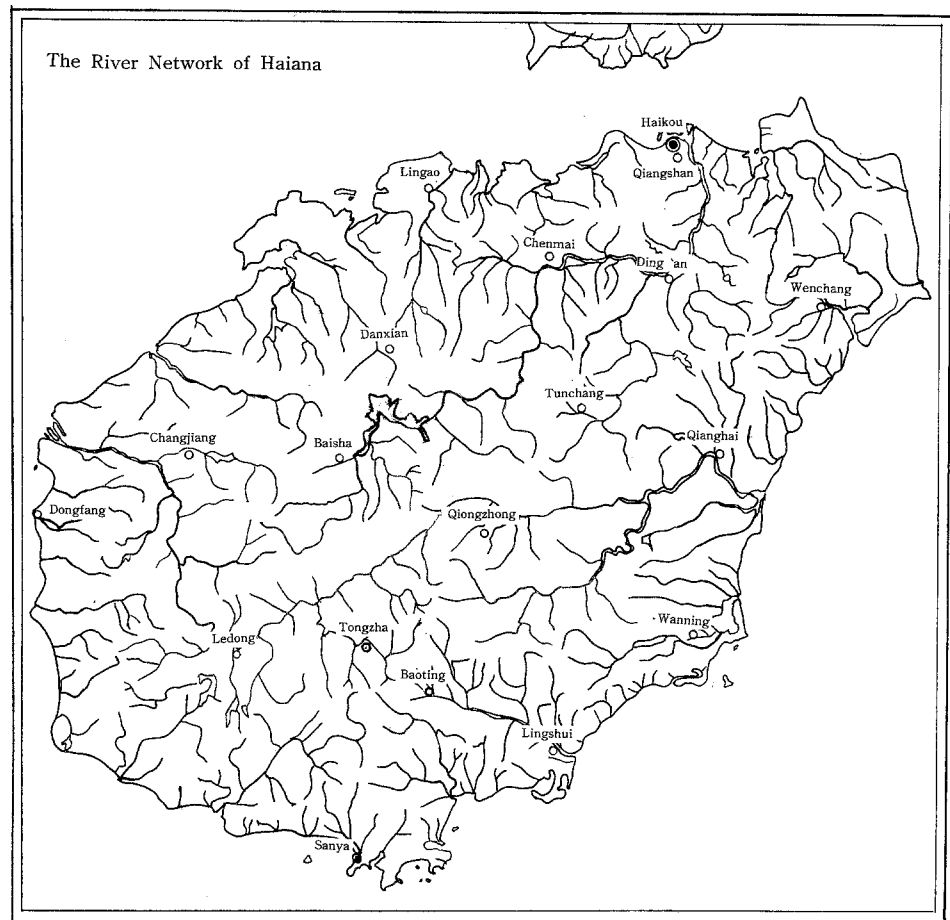


Fig 3
The river network of Hainan



The rainfall varies with different regions. The rainy E and dry W are distinctive. In the E the rainfall is between 2000 to 2400 mm, while in the W, it is reduced to 1000 to 1200 mm.

In addition, the seasonal distribution of rainfall is by no means even. The rainy season lasts from May to Sept. and accumulates 80% of the annual rainfall. The dry season extends from November to April and sees only 20% of the whole year's rainfall. The spring dry is especially conspicuous and can last more than 40 days, thus affecting the cultivation of rice and rubber. For rice cultivation to be successful, irrigation is necessary in order to reserve some water.

At any time between June and October the island may expect to be visited by two to six typhoons. They are most likely to come in August and September.

Typhoons bring strong winds, torrential downpours, and high tides which cause disastrous damages to crops and properties. Hainan has strong winds, reaching 2 to 3 m/s, especially in the W with 3.8 to 4.7 m/s. Local inhabitants utilize the strong wind to assist evaporation and make sunshine salt. However the rubber trees cannot endure strong winds with a velocity of over 2 m/s. Windbreaks are needed for protection of trees and shrubs.

Climatically located in the Tropics, Hainan is endowed with enough light and heat energy, high temperatures, and abundant rainfall to favor the growth of a variety of tropical crops and vegetation. However, it suffers from typhoons, strong winds and spring drought.

A further difficulty for agriculture is the poor quality of the soils which have been leached of plant nutrients through centuries of irrigation and heavy year round cropping.

With warmth and high humidity throughout the year, plus heavy rainfall, Hainan originally had a luxurious cover of tropical vegetation. Much of this remains in the inaccessible interior. Mahogany, rosewood, cedar and many other trees offer future lumbering possibilities. This lush vegetation has led foreign residents to call Hainan the "Isles of Palms".

Forests cover one-fourth of the total land of Hainan. Most of them belong to tropical rainforests. Five-finger mountain has the richest forest resources belonging to the native tropical rainforest.

The food crops of Hainan mainly are rice, sweet potatoes and others including corn, millet, kaolian and beans. While rice is cultivated chiefly in the NE part of the island, sweet potatoes are grown in the SW. In 1986, the cultivation of rice area occupied 78% of all cultivated

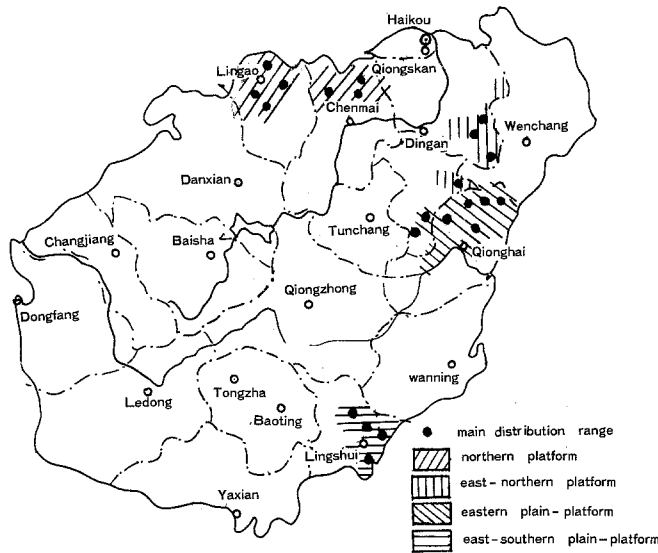


Fig 4 A Sketch map showing the grain bases distribution

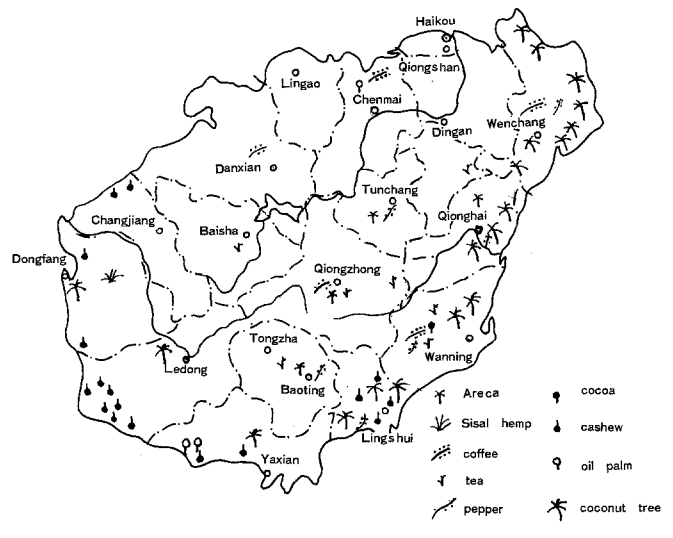


Fig 5 The distribution map of Hainan tropical crops

area and 88.5% of the production. Sweet potatoes occupied 19% of the cultivated area and 10.5% of production and other crops were 3% of cultivated area and 1% of the production. Generally, two rice crops are harvested from a plot each year; the first in the middle of May, the second in late November. Three crops of rice are also possible, but limited to a few favorable locations. The rice area in Hainan can be divided into paddy fields and dry farms. In 1956, the paddy fields occupied 40%, and 40% were dry farms. At present, the paddy fields far exceed that of dry farming.

Sweet potatoes are second in importance only to rice. In 1951, the rice consumption was 61.5%, while sweet potatoes was 38.5%. In the mountain area however, the inhabitants' consumption of rice was only 32.2% and sweet potatoes, 67.8%. But now the situation has been improved tremendously. The sweet potatoes are distributed widely but are grown mainly in the SW part of Hainan island. Most potatoes are eaten or used for fodder and alcohol (Fig 4, Tab 1).

Sugar cane, tea and fruits are the three major cash crops in Hainan. Sugar cane has high economic value and big demand. In 1987, the sugar cane planted area was

83,000 ha with a production of 2,614,000 tons. Tea is mainly planted in the hilly land of Five Finger mountain. In 1987 the tea planted area was 7160 ha with a production of 5807 tons. Hainan has a reputation of being called the "Garden of hundred species of fruits" for it produces varieties of fruits including lichee, lungyee, bananas, pineapples, oranges, and water melons, etc. In 1986 the total fruit cultivated area amounted to 43,000 ha with a production of 147,000 tons.

The production of rubber, sugar, coconuts, areca and coffee in Hainan reflects the humid tropical environment. Hainan is the only part of China warm enough for the growth of rubber trees (*Hevea braziliensis*) (Fig 5).

The rubber plants in Hainan form a ring-shaped belt which conforms to the circular landform (Fig 6) of Hainan with the high mountains in the central and SW part which is surrounded by hills and plains along the coast.

In order to avoid the cold temperature in the central mountain region, and the strong wind belt along the surrounding coastal plain, the best location for rubber plants would be in the intermediate belt of hilly land. The coastal plains not only have strong winds, but a dry climate and sandy soil. Most importantly, the trees

Tab 1 The food production in Hainan, (1952–1987); unit: (10,000 tons)

	1952	1957	1962	1965	1970	1975	1978	1980	1985	1986	1987
Rice	46.63	62.73	51.53	80.05	78.08	131.40	95.25	99.96	107.10	122.14	114.95
Sweet potatoes	8.88	16.56	8.91	9.88	17.40	19.03	17.11	13.20	12.90	14.47	16.73
Others	1.41	2.59	3.09	1.41	2.92	1.58	1.93	2.73	1.70	1.47	1.82
Total	56.92	81.88	63.53	91.34	98.40	152.01	114.29	115.89	121.70	138.08	133.50

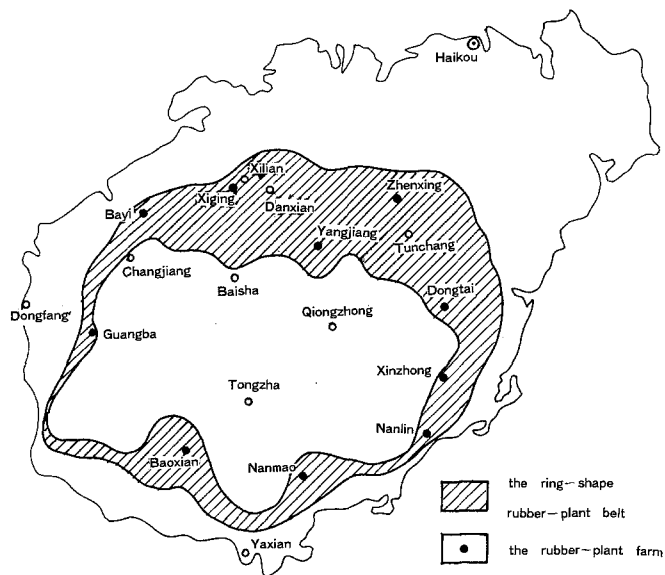


Fig 6 A sketch map showing the ring-shape rubber-plant belt of Hainan

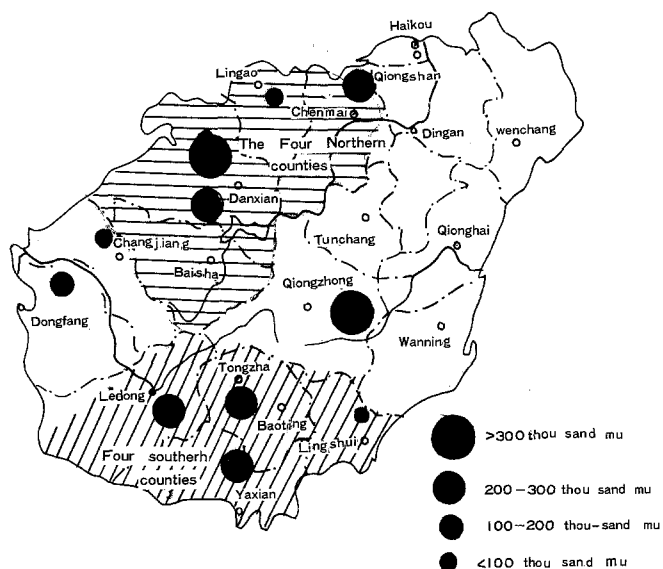


Fig 7 A sketch map showing the rubber bases distribution of Hainan

would be subject to typhoons, the most hostile force for rubber plant growth. In 1987, the total cultivated area of rubber amounted to 347,300 ha with a production of 158,200 tons, both occupy more than 70% of China's rubber cultivated area and production (Fig 7).

Hainan is the best place for producing coconuts. They are concentrated in the E coastal regions. Coconuts are not only good for drinking, but the shells can be used for ornaments. In 1987, the cultivated area of coconuts in Hainan amounted to 19,600 ha with a production of 65,450,000. The main area of areca cultivation is along the coast and the low and wet part of the central mountain region. In 1987, the cultivated area reached more than 8600 ha with a production of 2376 tons. With less labor and high yield, areca will bring the inhabitants economic benefits. Coffee cultivation in Hainan began in 1898, brought by the overseas Chinese. The favorable climate of coffee cultivation is a yearly temperature of 23° to 25° C and annual rainfall of more than 1,000 mm. In 1987, the cultivated area of coffee in Hainan amounted to 140,000 ha with a production of 430,000 tons.

Palm oil is the king of oil. In Hainan, it only has three years of manufacturing history, but it has expanded tremendously. At present it has 1750 ha, almost three times that of 1965. (Tab 2).

The outlook for minerals is less promising. Hainan has a fairly good supply of iron ore, coal, tin, copper, bauxite, titanium, cobalt, and quartz-sand.

The chief mineral resource developed thus far is high-grade iron ore. Before the Second World War, annual shipments to Japan were several hundred thousand tons. The ore averages 66% iron and the proved reserves of one deposit amount to two billion tons. Shilu Iron Mine is China's largest and richest iron mine with its grade up to 51% by average. At present Hainan produces iron ore of 7,652,000 tons annually, supplying for 70 steel mills for the whole country. The mines are in the NW and a railroad leads to an excellent harbor at Yulin in the S. Tin and coal are also present. The reserves of titanium in Hainan are 67% of those in the whole of China. Dozens of titanium mines are concentrated mainly along the E coastal areas. The reserve of natural gas near the reserves of zircon are more than half of

Tab 2 The tropical production in Hainan, (1952-1987); unit: (10,000 tons)

	1952	1957	1962	1965	1970	1975	1978	1980	1985	1986	1987
Rubber	426	750	5016	13696	38037	44989	67719	70326	126266	138262	158200
Coconut	1312	1649	2296	2497	3117	1770	2065	2523	4571	5405	6545
Areca	1185	905	2423	1501	787	587	422	579	2150	1880	2376
Coffee	9	45	82	63	6	13	32	56	180	350	430
Palm oil	-	-	116	906	1701	1527	968	548	1205	1254	-

those of the whole of China. The reserve of natural gas near Qiangshan also has a great potential. The prospect of petroleum extracting is also promising. The island's greatest potential source of power lies in the numerous swift-flowing streams fed by abundant mountain rain. At present there are 803 small scale hydro-electric power stations, with a capacity of 73,400 kW. Water power will help the development of fertilizer, sugar making, cement, agricultural machinery and other industries. At the moment there are more than 7000 electric lines throughout the island.

Surrounded by the ocean, Hainan is abundant in fishing and salt. The good fishing ports are all around the island. The long sunshine hours, high temperatures, great wind velocity, and quick evaporation all favor the development of tropical salt fields. The yearly salt production at present reaches 255,000 tons. The highest year produces more than 400,000 tons. Salt fields are located in the SW part. Yinkohai salt field is China's major modernized salt field, with a salt area of 3793.6 ha and a highest production of 270,000 tons, which is 62.6% of the total salt field area of Hainan.

The major industry of Hainan includes the sugar manufacturing, cane food, iron ore mining, lumbering, salt making and rubber tire manufacturing. These industries are distributed in special locations. For example, Haikou mainly developed the rubber manufacturing, food industry and electric industry. In 1988 the total industrial product valued to 398,000,000 dollars. Changjiang's industry concentrated on the iron ore mining and its related industries and in 1986 total industrial production reached 175,000,000 dollars.

Sugar manufacturing in Hainan has its long history. In 1987 there are 39 sugar factories with a total production of more than 2,000,000 tons. The product not only supplies the local needs but exports to Shanghai, Qingdao, Tianjin, Zhejiang and Jiangsu.

With the growth of industry transportation facilities have been pushed to their limits. In 1923, Hainan began to build highways. Before the Second World War, it reached 3,218 km with a highway around the island of 1308 km. Recently, the most important highway from Haikou port in the N to Yulin harbor in the S (699 km) was opened passing through the central mountain. The total highway network of Hainan amounts to 12,000 km with an average density of about 37 km per 100 km².

Hainan has a railroad from Yulin to Changiang, used principally for developing mineral resources, especially iron ore. The total length of railway amounts to 276.2 km.

Despite of all the problems, the picture would seem to be reasonably bright were it not for the fact that manpower in Hainan is adequate. At present Hainan's population is about 6 million (1987) with a density of 179 persons per square kilometers which is less than one-third that of Taiwan. However, the distribution of population is by no means even, with higher proportions in the NE where the density reaches 800. While in the

central-south mountain area, it is only 200 persons per square kilometer.

When Hainan was first incorporated into Chinese territory in the Han dynasty, 110 BC the population of Hainan was reported to have 23,000 families. If every family has 5 persons the total population would have been 115,000. With the development of the island, the population increased gradually. In 1774, the population of Hainan increased to 1,180,000 and in 1835 to 1,250,900.

In recent years, there have been three census' of Hainan which indicated the rapid increase of its population. In the first census conducted in 1953, Hainan had 661,000 families and a total population of 2,536,000. In the second census of 1964, Hainan increased its families to 823,700, and its population to 3,470,400. In the third census of 1982, the families of the island increased to 1,118,100 and the population to 5,667,700. At the end of 1987, the population of the island was reported to have 6,150,700 with a family number of 1,324,300.

Assuming the population figure of the island in 1950 was 100, then, in 1953, it increased to 111.19; in 1964, it increased to 152.13; in 1982, it increased to 248.14; and in 1987 it increased to 269.62. The average yearly increase rate is thus 2.7%.

The following factors contribute the rapid increase of population in Hainan: First, since 1949 after the establishment of the People's Republic, there are large numbers of immigrants from other areas into Hainan. Secondly, the rural population holds a large share in the population of Hainan. The rural inhabitants prefer to have a large size family. Thirdly, after 1949, the political situation is stable and economic development and medical care and nutrition improved, all combined to make the increasing birth rate and decreasing death rate. As a result of increased natural increased rate and the extend the life expectancy, the population of Hainan exploded. According to the third census of 1982, the immigrants occupied 15% of the whole population of Hainan, with the average yearly addition of 26,000 persons.

The population density of Hainan is rather high. According to 1987 data, the average population density of Hainan is 181 persons per square kilometer which is higher than the average figure of the whole country (112) about 1.6 times. Haikou city has the highest density, reaching 1521. It is lower than cities of Shanghai and Guangzhou, but higher than Beijing and Tianjing.

Before 1949, the population of Hainan island concentrated in the NE, N and the coastal areas. The SW, central and S part had few inhabitants. But the area abounds in mineral and forest resources and needs manpower. After the liberation, more people have moved into these regions and the uneven distribution has improved. For the population distribution of the island also see Fig 8.

The age composition of the Hainan island is rather young. According to the 1982 census, the population

who was born after 1949 amounted to 3,925,700, representing 69% of the whole island population. Among them 2,206,300 persons were under 15 years old (38.9% of the total). While the people, who reached the age of over 65, was only 316,800 persons occupying 6% of the total. Young population indicates the high potentiality of labor force. In the meantime however, it needs to pay attention to education, employment, and related problems.

The labor force in Hainan is enormous. In 1986 the total labor force was 2,796,100 which occupied about half of the total population. The labor force can be divided into three categories the first is agriculture, forest, fishing, and husbandry. In Hainan they included 2,023,400 persons which occupied 73.25% of the whole labor force. The second is the manufacturing personnel (industry, mining, etc.). In Hainan, they have 260,010 persons occupying 9.49% of the whole labor force. The third is the service employment of 468,880 persons or 17.26% of the whole labor force.

From the above figures, we notice that at present Hainan is primarily an agricultural economy with a low living standard. There are farmers 1,692,700 on Hainan. Since the cultivated land of Hainan is only 414,200 ha, the average is 0.25 ha per farmer which is lower than the average figure for the whole country. Therefore, Hainan has the problem of a surplus in farm labour. About 30 to 40% of the rural labor force needs to look for an alternative.

While the majority of Hainan inhabitants are Han Chinese who migrated from China to the island as early as the Han dynasty (c. 200 BC–220 AD), the real native inhabitants are the Li, Miao and Hui tribes. Their total numbers are 980,500 which is 15.9% of the total population of the island. Like Taiwan, the coastal plains are settled by the Chinese while the aborigines were pushed to the interior mountains. In 1987 the total Li people amounts to 908,400 persons. The Miao tribes are non-Chinese with a population of 45,600, and Hui 5,400 persons.

Hainan is the renowned home of a number of overseas Chinese. Two million overseas Chinese are living abroad, most of them (700,000), in Thailand, Malaysia and Singapore has a number of 300,000 respectively. The number of foreign tourists to Hainan have amounted to 170,000.

On the whole, there are four kinds of resources of the island which deserve full attention to development.

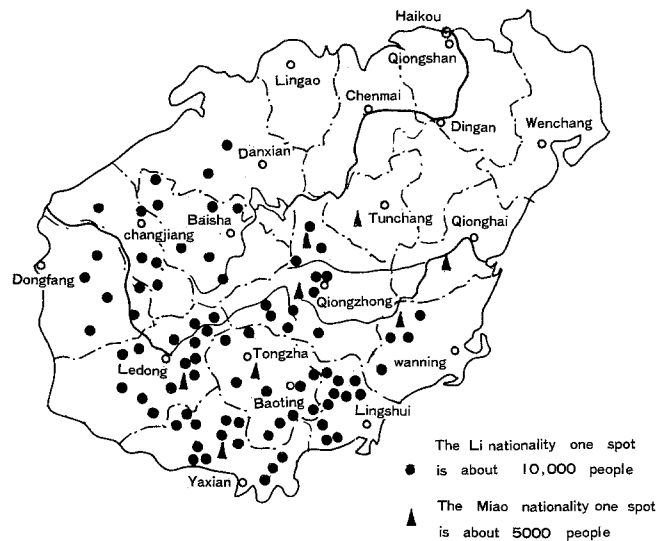


Fig 8 The population distribution map of the Li and the Miao nationality in Hainan

First is the tropical biological resources such as rubber trees, tropical fruits and rare lumber. The second is the marine resources, such as the fisheries and salt fields. The third is the underground mineral resources which include thirty kinds of minerals worthy of exploitation. The notable ones include iron ore, Tai, natural gas and petroleum. The last one is the tourist resources. The beautiful scenery, sunshine climate, long and sandy beaches of the island may have the potential to become the “Oriental Hawaii”.

Geographically, Hainan has the following advantages. First it is near Hong Kong and not too far from Taiwan and is located in the mid-way between Singapore and Japan. It faces south eastern Asia. Hainan is a pearl in the Pacific rim. Secondly, Hainan has 68 harbors which favours its oceanic transportation of which Haikou, Basuo, Yangpu and Sanya have the potential to be built into deepwater ports. Thirdly, Hainan is separated from mainland China as an island, and may easily become an opened special economic district. Fourth Hainan has about two million overseas Chinese scattered all over the whole world. Among them are business men, industrial managers, engineers, and specialists. With their capabilities and patriotic spirit, they could contribute much to their homeland.