

A BRIEF REPORT ON “GUANGXI KARST REGION COMPREHENSIVE ADMINISTRATION AND DEVELOPMENT STRATEGY RESEARCH”

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Guangxi karst region measures 89.5 thousand square kilometers which covers 37.8% of Guangxi's whole area, and 82 thousand square kilometers is naked karst hills. It mainly located in the western and northern of Guangxi. Investigation groups regard county prefecture, in which karst area takes over 30% of the whole county or exposed karst area surpasses 1 million mu (one mu equals 1/1500 square kilometres) of the whole county, as the standard to select the investigated area (according to data before the year 1985). According to this standard Xingcheng, Duan, Jingxi etc. twenty-seven counties are selected as the karst model to be investigated. The whole area of these twenty-seven counties is 76 thousand square kilometres which covers 32% of the whole area of Guangxi. Among which the exposed karst area is 53.1 thousand square kilometres, making up 66.5% of the whole.

Bordering with Yungui Plateau, Guangxi karst region forms plateau slopes and take the forms of peak-cluster depression and peak-forest valley with an elevation of about hundreds of metres and even above thousand metres.

Located in the Tropic of Cancer, Guangxi karst region belongs to typical subtropic monsoon climate, its annual average temperature is between 18—20°C and rainfalls is between 1350—1750 mm. Owing to the various landforms of karst region and the markable latitudinal and vertical change of the climate, Guangxi karst region get its variety in climate.

The variety of climate provides a good condition for the multiplying of various kinds of living things. From the investigation we know that there are many species resources of living things in Guangxi karst region, and there are more than three thousand plants, among which there is no lack of valuable subtropic fruits, for instance, litchi, longan, loquat, plum, big hawthorn and thorn pear etc.. And there are more than five hundred kinds of terrestrial vertedrate animals, about three thousand kinds of insects and more than eighty kinds of large economic fungus. Of all these living things, more than two thousand kinds can be used as medicine, and those with potential development value takes at least one third

of the whole.

The rivers flow through Guangxi karst region are Redwater River, Liujiang River, Zuojiang River and Youjiang River with rich water power resources. Red-water River, for example, its yearly water current is 130 billion cubic metres, generator capacity is 11 million kilo-watt, which can generate more than 50 billion kwh yearly, and it is reputed as one of the large scale hydropower bases of China.

Guangxi karst region is also rich in mineral resources. Until 1986 we had found seventy-three kinds of various ores. 53 kinds of available minerals have been found in 150 places, in which there are over 80 large and med-scale deposits. The ores are: manganese, iron, tin, bauxite, gold, silver, rare-earth ore, limestone, barite, bentonite, coal, petroleum etc., which have great developing value.

The anti-interfere ability of Guangxi karst region's ecosystem is very weak. Because of the unusual growth of karst landforms, everywhere you can see cave, gully, crack and karst funnel, furthermore, because of the rapid decreasing of forest and plants, this region's soil erosion becomes more serious than ever before. with poor soil, lower fertility, serious drought, the eco-environment in this region is becoming more and more vicious.

There are about 20 million people living in Guangxi karst region in which, the population of those twenty-seven counties is 9.7 million (at the end of 1985), the agricultural population is 8.9 million, taking 92% of the total, the population of minorities is 7.8 million, taking 80% of the whole. Zhuang, Yao, Miao, Mulao, Maonan, etc. are the major minorities. we can say in another word that Guangxi karst region is a place inhabited by many nationalities who takes up traditional Chinese agriculture as their major industry.

However, at the end of 1985, the cultivated area of Guangxi karst region is just about 11 million mu (one mu equals 1/15 hectare), in which paddy field is just about 5.2 million mu. The average per-person cultivated area is only 1.15 mu with very poor soil and very low yield of crops. In 1985, the average per-hectare yield of crops in karst region is 2265 kilograms.

Having been closed for long with poor transport and ill information, Guangxi karst region is not developed in commerce. In 1985, the gross output value of industry and agriculture for the twentyseven counties is 3 billion yuan RMB (the same below), the average per-capital is 310 yuan RMB, taking 26% of average value of the whole country, which matches the average per-person output value, 308 yuan RMB, of industry and agri-

culture in 1965.

The life of the people living in Gaungxi karst region is very poor. In 1985, the grain for average per-person is 250 kilograms and for peasant's is 198 kilograms. The peasant's average per-capital income is 57 yuan RMB. Only among 1400 thousand peasant households, are there 720 thousand's which do not have enough food to eat, coat to keep the cold out and have good house to keep away from wind and rain. Among 8950 thousand peasants those who lack of drinking water are 3080 thousand, taking 34.4%.

Gaungxi karst region is backward in production, lower efficiency in economy. The mean economy-intensive revenue of the twenty-seven counties is 2580 yuan RMB per square kilometer, which is 14.7% of the whole country average value. So every year it needs a lot of financial load subsidized by the higher financial organ. In 1985 the financial revenue of the twenty-seven counties is 196 million yuan RMB, but the expenditure is 412 million yuan RMB. The load subsidized by higher financial group and the financial deficits is 217 million yuan RMB.

Gaungxi karst region is fairly backward in culture, education, science and technology. Among the population above twelve years, the illiteracy and semilliteracy rate is fairly high, such as Longlin county, the rate reaches 65.5%. Bama, Linyun and Napo counties are all higher than 50% which doubles the rate of Gaungxi illiteracy and semilliteracy. The number of personnel going in for natural and social science is also very small. The ratio is 49 to 10,000, which matches 64% of the whole country's level. Moreover, the science and technology level is rather lower than that of the country.

Now we can conclude the basic concept of Guangxi karst region. That is, Guangxi karst region is a contradiction entity of rich resources in species of living things, water power and minerals, but of deteriorated eco-environment and fairly poor people's life. This is a rather close artificial dynamic system.

Guangxi karst region faces the depression of increasingly deteriorated in eco-environment, rapid increasing in population, decreasing in paddy field and bad harvest of crops, the influence of developing rural and township-run enterprises on the agriculture basis, the shortage in fund and insufficiency of talents and the backward basic education. The vicious circle of eco-environment, economy and social status will make the development of economy and society land in a predicament situation if we let these slide. In that case, the great difference between this area and advanced

area will become more and more distinct.

In order to help the people living in the karst region get rid of poverty, exploiting the various local specialities, waterpower and mineral resources to support Guangxi in developing exposed-oriented economy, taking concerted action in developing southwest China, and resuming Guangxi eco-shield, improving Guangxi eco-environment and taking comprehensive administration and development to Guangxi karst region are becoming a task which brooks no delay.

From investigation, we conclude that the outlook of Guangxi karst region must be changed, the vicious circle of eco-environment can be turned into good one. We have both determination and ability to solve the drinking-water problem in the mountain region and supply the people with sufficient food and adequate clothing for the future. The pessimistic view is utterly groundless. The people in karst region have been living and working there for thousands of years. This is the fact which was truly proved by history.

Where is the fundamental way out for Guangxi karst region economic and social development? The study shows that in order to change the poverty, vicious eco-environment, it is essential to carry out a comprehensive administration of the karst regions ecosystem, economy, society, education, science and technology, put natural resources into rational development and comprehensive use. We should follow the way of administration while developing, and promoting the development with administration. The guiding ideology of Guangxi karst region comprehensive administration and development strategy can be summarized as follow: improving eco-environment, pouring into times consciousness, devoting much attention to garden economy, developing commercial production, dredging channel for circulation, so as to achieve together rich.

Guangxi karst region economic development strategy can be divided into three stages. The first to be done is to solve the people's drinking, eating and dressing problem. Presently we should carry out the method of "getting rid of poverty". At medium period, we try to find out the way of "richen peasants". The long-term plan is to promote economy. Only by relying on resolving people's eating and dressing problem and furthermore changing the backward outlook of karst region can the people in this area follow the way of promoting economy.

On the choice of strategy target, we should seek truth from the facts, leave rooms, take difficulties and unforeseen circulation into consideration, pay much attention to coordination. The major target of Guangxi

karst region's national economy is about twenty years lagged behind that of the whole country. The goal that we map out is: In a not too long period, try to control the 20-year disparity between the karst region and the whole country, and try our best to maintain it, which means: By the end of the tenth five-year plan (in 2005), the average per-person national economic goal must achieve the average level of the whole country in 1985, continue to resolve the problem of eating and dressing, change the backward outlook preliminarily, and then, strive gradually to the well-to-do objective.

Vicious nature condition, inconvenient traffic, shortage of infrastructure and backward production technology, all these factors decide the crux of economic development in this region. That is: Strengthening its internal economic vigour, continuously raising the ability of self-developing. But on present preliminary stage, it needs a lot of necessary investment granted by external world (which means Guangxi Autonomous Region, state, financial groups and foundations of friendly states and regions). The power of external world can start the economic developing in this region and can give a hand in living up its internal vigour, so as to surmount the slowly developing inertia. However external support can just play a supplementary role, the decision factor for promoting the economic development in this region is still its internal running mechanism.

Because of the varied landforms and broken topography, which can not be carried out stretch-to-stretch development. Thus its developing model should be multi-level and pluralism. We should decide the developing model and scale according to the actual situation. But as for carrying out the large-scale regional development, we still put forward a infiltration model which develops coordinately from point to line for reference. That is to say the breakthrough should start from that area along rivers, main road and railway whose traffic is relatively developed, economic basis is better and resources is amassed and easy for developing, and then economic developing spreads and infiltrate to the adjacent area along the main traffic road.

Guangxi karst region is an impoverished area whose starting point for development is very low. The strategical focal points for administration and development are: Altering focal point according to each developing periods and paying different attention to different-level investment. In the starting phase, the first thing we should do is to resolve the eating, dressing and environment administration problem. So its focal point for economic and social development should be laid on exploiting superior re-

sources, follow the resources-transferred-oriented way, change of the resources-intensive and labour-intensive industry. In order to extricate the vicious circles of eco-environment, economy and society, we must select a breach. In these three circles, the crux is to break through economic vicious circle. We hold that the economic breach for the karst region is to develop garden economy relying on science and technology, bring the superiority of local products into full play. This will contain the benefit of economy, ecology and society. It is really a "starting industry" with lower investment, but with rapid effect and better benefit. The development of garden economy can strengthen the peasants' assimilation of science and technology, stimulate their commercial consciousness, improve the small-regional eco-environment. Thus local products can also enter markets which are becoming more and more lacking in the supply of some products, and moderate contradiction of supply and demand. The second-phase breach is to make good use of the opportunity of external world investing in local important resources, devote major effort to develop rural and township-run enterprises, provide various kind of much-needed products for state's key projects, such as building materials, agriculture and non-staple food etc.. We should develop relevant service trades, organize labour "export" program. This can not only accumulate fund for karst region economic developing but also improve the people's life. Meanwhile, it can lighten the long-time overload cultivation to land and let the eco-environment resume and readjust. The third-phase breach is that the state decides the basic construction of energy and traffic etc., and gradually form several medium and small-size karst cities, and then transfer to the adjacent countryside.

Guangxi karst region economic and social developing should undergo several levels of investment. That is the investment of foreign company and the state, locality, collective as well as individual business person. On the level of foreign company and state, the most important thing is infrastructure, for instance, energy, traffic, key water-control project, large-scale mine exploitation and strengthening basic education etc.. On the level of locality, the stress should be laid on exploiting local superior resources, developing vanguard projects so as to promote the development of other industry, strengthening professional training, harnessing small valley etc.. On the level of collective and individual business person, we should promote the division of cultivation and breeding, aim at developing garden economy, build up small commodities producing basis, play the commodity and trade role of local products, impel the transformation of agriculture

and slide-side products from “natural-oriented” to “commodity-oriented”.

As for the transformation of traditional agricultural technology, we must have sufficient power in technology, improved variety and fertilizer etc. to support the crop production. The department of finance in various levels should allocate to support the basic construction of water conservancy works, enlarge the investment in agriculture, so as to raise the self-sufficient rate of crops.

Besides, comparatively perfect economy-technology service network should be built to supply high-quality service for anteproduction, med-production and post-production of various industries, promoting development of production.

It will have very important significance for the karst region to divide the economic district rationally in accordance with the characteristic of nature, economy and society in this region. We divide Guangxi karst region into four economy areas with its own features respectively according to the nature condition and resources, based on present industry and agriculture, energy and traffic condition, taking regional division, professional coordination and selling market into consideration. 1) Zuojiang River valley economic area taking light and foodstuff industry as its leading one. This area follow the way of sub-tropical agriculture—agricultural and slide-side products processing, meanwhile supplying it with building materials and excavate industry. 2) Youjiang River economic area taking industry and mining along Youjiang River valley as its backing. Its economic developing tendency is to develop comprehensive industrial structure which combines light and heavy industry, integrating excavation, metallurgy, building materials and mechanics industry as well as light textile, food-stuff, dailyconsuming industry simultaneously. Agriculture should take the way of local products-commodity. 3) Red-water River valley economic area. Its characteristic is to take the cascade powerstation development as its turning point, integrating hydraulic electrogenerating and shipping into one unite, serialized with thermal accessories, to impel the overall economic development along the valley. 4) The economic area along Qiangui railway and Liujiang River. Its industrial development follows the way of heavy-duty structure. The stress should be setted on developing excavation, smelting, mechanics, building materials industry etc..

We should bring Guangxi karst region economic development into the economic developing orbit of Guangxi, south-western China and even the whole country. That conforms to the developing tendency of the world

and chinese economy. In that case the following methods should be adopted:

1. Open the door to external world, turn the close system into open one. We should formulate preferential policy and abstract the talents, fund, technology and information at home and abroad to develop this region's economy.

2. Readjust industrial structure, pay great effort to develop the second and the third industry, especially increase the proportion of the second one, exploit the superior resources. As for regenerated resources, we should exploit them as quickly as possible, and as for those unregenerated ones we should also exploit them rationally.

3. Develop basic education, strengthen professional training, so that they can support the development of garden economy and agriculture in technology.

4. Do a good job in family planning, advocate healthier birth and high-quality breeding, try to limit excessive rise of the population.

For the comprehensive administration and development of karst region, each research group puts forward many original views.

1. Guangxi helping the poor should follow the way of enterprise, the major resources developing model in minor nationality area adopt united stocks, the industrial economic communities should be built to promote regional prosperity, and labour export can less the pressure on land as well as promote information exchange.

2. Based on managing fundamental problems, agriculture should take the way of eco-agriculture. While raising the self-sufficient rate of crops, karst region will bring the superior local resources into full use, make good use of the opportunity that coastal areas develop external-oriented economy to develop labour-intensive resources agriculture and resources-transferred-oriented economy, try hard to get rid of poverty and become rich as quickly as possible.

3. As for the abundant valuable species resources of living things in Guangxi karst region, the developing countermeasure is: Based on the administrating and improving present eco-environment, we should make good use of the sub-tropical superior local resources of water, heat, niche and regional climate to carry out planting and breeding according to the situation, promote breeding of good strains, spread advanced technology, and with this to promote the exploitation of living things to transfer from poor-quality management to compound management and comprehensive use.

4. Among the four environment factors of ecology, soil, water and resources in Guangxi karst region, ecology is the most important one. Resuming and rebuilding regional eco-environment is becoming extremely urgent. We should do our best to make the average percentage of forest cover rate reach 35-40% which can lay a foundation for the construction of eco-agriculture and protect the resources of water and living things from exhausting and also can resolve the drinking water problem for people and cattle.

5. The climate-ecology-agriculture system in Guangxi karst region can be divided into three zones according to the elevation for development. The first zone is mountain valley and depression which relying mainly on developing crops and economic plants to meet the requirement of the people. The second zone is mountainslope whose relative altitude is lower than 300 meters, which mainly develop forestry, fruit tree planting and animal husbandry. This cannot only yield notable economic benefit but also can provide shield for mountain valley and depression to protect from various meteorological calamities. The third zone is mountainous area whose relative altitude is higher than 300 metres, which can act as the forest zone to protect headwaters. Its major function is to conserve water, provide the drinking water for the people and the cattle and water for agriculture production in the arid season. If this thought can come true, Guangxi karst regional climate-ecology-agriculture system will become better day by day.

6. Mineral resources developing is Adjust industry structure in accordance with the local condition, transfer single economy(planting)to comprehensive industry structure based on large-scale agriculture (including farming, forestry, animal husbandry, slide-side occupation and fishery), in which various industries are combined each other and develop in harmony. In order to make the increase of the investment, employment and income achieve a rather higher rate, it is necessary to take the local resources exploitation as one of the major development program, change the superiority of resources into superiority of economy.

7. Livelihood-fuel shortage of the karst region's people, which leads to an denudation of forest, can be resolved by model of "eco-energy". That is: closing off afforested mountains for protection. We should enthusiastically plant fuel forest, pay major effort to spread the saving fuel stove, make good use of methane, coal and small hydroelectric stations, transform the livelihood-fuel structure from just burning wood to using many kinds of fuels, so as to mitigate the contradiction of supply and

requirement of the current rural life energy, let karst region's forest, vegetation, water and soil have a rather long period for recuperate and multiply, make the good circle of eco-environment resume.

8. Guangxi karst region strategy research has obtained satisfactory results through quantitative dynamic simulation forecast with mathematical model and computer.

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