

RESEARCH, HARNESS AND DEVELOPMENT OF KARST REGION

The Speech on Receiving the Deputies to the Twenty- First International Hydrogeologist Society Congress

Senior Engineer Li Zhenqian

Ladies and Gentlemen,

First of all, on behalf of chairman of The People's Government of Guangxi Zhuang Autonomous Region, Wei Chunshu, Please allow me to welcome all of you. Experts, professors and scholars. you have made a long arduous journey, making nothing of hardship to come to Guilin. It may be rated as the grand occasion of a lifetime that so many well-known personages at home and abroad gather in beautiful Guilin. We extremely treasure it and are greatly honoured by your present.

We wish wholeheartedly that the Twenty-First International Hydrogeologist Society Congress will be crowned with success. We firmly believe that this gathering is not only for the sake of academic exchanges on karst hydrogeology and karst environment protection but also for the sake of benefiting human beings and making our descendants have a better life. Such a grand gathering will be of a great benefit to Guangxi as well.

The Working Meeting of Karst Area will be held also in Guilin by People's Government of Guangxi Zhuang Autonomous Region tomorrow. Both these two meetings have the same important academic contents and purpose of benefiting human beings. I feel very honoured to take this opportunity to introduce you to the basic condition of Guangxi karst region and our research work on comprehensive harnessing and exploiting karst region.

Located in the south of China, Guangxi is a border and coastal minority nationalities autonomous region. It has about 1400 kilometers coastline and 1020 kilometers borderline. Its total area is 236.6 thousand square kilometers with the Tropic of Cancer spanning in the middle.

Guangxi is a region whose karst grows in an extraordinary way. Karst area is 89.5 thousand square kilometers, taking 37.8% of the whole

Guangxi. It is widely distributed in the northwest of Guangxi, in which Duan, Xincheng and Mashan etc., 27 counties or cities are the areas which are mainly distributed with karst landforms. There are various nationalities, including Zhuang, Yao, Miao, Dong, Mulao, Hui, Maonan, Jing, Yi, Shui, Gelao and Han etc., inhabiting here. Their population is about 10 million, taking one-fourth of the whole Guangxi population. Among them, the population of minority nationalities takes 83.82%. Agricultural population takes 92.08%. The population density is average 130 persons per square kilometer.

Friends, nature has abounded us with well-known beautiful scenery in Guilin. Every year it attracts hundreds of thousands of tourists visiting here. Poets rate it as fairyland. But perhaps most people have not known that Guangxi karst region is one of the utterly destitute mountainous region in our country. The economic here relies mainly on agriculture, but it lacks of cultivated farmland. On the average, per-person area is less than 1/15 hectare and the soil is very barren, per-person grain is 240 kilograms, per-capital income is 300 yuan RMB and per-peasant income is 200 yuan RMB. There are still 5 million people living in destitute and more than 3 million people and 2 million cattle are lack of drinking water.

The destitute reasons for Guangxi karst region,

First, the natural condition is seriously deteriorated. Bordering with Yunnan and Guizhou plateau, Guangxi karst region forms plateau slopes with an elevation of about hundreds of metres and even above thousand metres. Lime stone construction is thicker than one thousand metres. In addition, because of the influence of subtropical monsoon climate and the effect of active hydrological factor, Guangxi karst grows in an extraordinary way and takes the forms of positive and negative landforms with obvious disparity of peak cluster and peak forest. Karst gully, cave, funnel and crack result in serious soil erosion. It will be very difficult for the soil and vegetation to resume once rock is exposed and stripping is faster than weathering. The basic characteristics of geographical factor here can be summarized as follows, complicated and distinctive terrain, criss-cross cave and crack underground, changeable dynamic hydrology, frequent drought and flood disasters, poor soil-forming ability and weak eco-environment. Moreover, originally there are few forests here, recently because of excessive lumbering of trees, the percentage of forest cover is less than 15%. In Xincheng percentage of forest cover is only 2.9%. Eco-environment suffers

from great damage.

The second, the social development level is very low. Scattered land and broken terrain make the people live scatteredly. Generally there is only one family living in a piece of depression or a mountain valley with several thatched cottages on a slope. From generation to generation they live there with less contact each other, so the social entirety function is very poor. The scattered land prevents the peasants from adopting advanced cultivating technology. Up to now some of the peasants there still employ primitive cultivation way such as moving cultivation, cultivating in turn, slash-and-burn cultivation etc. This results in serious erosion.

The third, social basic public welfare facilities are also backward. It has poor transport facilities which results in ill-informed. Until now there is still no road leading to some villages and towns, which have no electric power, no telephone, no broadcast and TV. Education, science and technology is fairly backward. In many counties, more than half population are illiterate or semilliterate among those who are above twelve years old. Scientific and technical personnel is seriously insufficient.

However the people here do not yield to the difficulties. From year to year they struggled to change the deteriorative environment. Especially these forty years since the foundation of the People's Republic of China, Guangxi Government has done a lot of work, invested large quantity of fund in developing this region and got some achievements. But the most important thing is that we have accumulated some experience and get further recognition on this region. That is,

1. Contrary to the utterly destitute state, this region abounds with species of living things, water and mineral resources. According to scientific investigation, this area belongs to the rare subtropical crop cultivated area in our country with mild climate and appropriate rainfall. Various climates provide a good condition for the multiplying of various kind of living things. According to incomplete counting, there are 4000 kinds of plants, 500 kinds of terrestrial vertebrate animals, nearly 3000 kinds of insects and more than 80 kinds of cash fungus. Of all these living things, those with potential development value takes at least one-third of the whole, and about hundreds of them can be exploited and used in a short time. Precipitous terrain makes the rivers here have great drop height, rapid flow and rich waterpower resources. For instance, the Red Water River, its yearly water current is 130 billion cubicme-

tres, installed capacity is 11 million kilowatt and can generate more than 50 billion KWH yearly. It is of great exploiting and utility value. Karst region is also rich in mineral resources. We have found 65 kinds of ores. 53 kinds of verified minerals have been found in 150 places, in which there are more than 80 large or medium-scale deposits. The major ores are: manganese, bauxite, tin, gold, rare-earth and bentonite etc., with great development value.

2. Undergoing many years' construction, we have laid a foundation for further harness and development, such as: building water conservancy projects, developing agriculture, constructing road, initiating education and helping karst regional people develop industry etc., and a few results have been achieved. Especially recent years, in spite of the economic difficulties, the central government still invests large quantity of funds in constructing a number of large-scale major projects for the sake of harnessing and developing this region and changing its backward situation thoroughly. For example: ten cascade hydro-electric stations along Red Water River, Tin industrial base of Nandan, Dachang—Lai-bin and bauxite industrial base in Pinguo etc.. Once these projects are put into production, the economy in this region will reach a new level.

3. In order to speed up the harness and development of this region in recent two years, Guangxi local government organized nearly one hundred experts and scholars which are from 10 research units, to study the harness and development strategy for this region. In every corner of karst region there are footprints left by our researchers. Through investigation, detailed analysis and strong argument, they put forward practical short-term plan and the concrete performing plan for developing projects. They prepare to carry out systematic action to promote the development of economy and society in this region.

The basic thought of this research is:

1) Starting with summing up the past experience and lessons of history, the researchers stick on the principle of comprehensive harness combining with development, following the way of existence while harnessing and development while exploiting. The focal point for Guangxi Karst region eco-environment harness is vegetation, water and soil. What should we do is that carry out the bio-engineering measures of closing off afforested mountains for protection, afforestation, canceling, cultivation to resume forest and doing a good job in managing forest etc., to enlarge the forestry area, resume eco-environment, that build water conservancy projects, resolve the drinking-water problem for people and cattle,

build up wall to protect the soil, improve agricultural production condition, so as to harness the eco-environment of karst region permanently. Meanwhile, we should work out an appropriate law to protect karst environment and prevent action of destroying, set up natural protecting area to preserve the species of animals and living things resources which are in imminent danger.

2) Keeping the need of market as guidance, we will reform the agricultural structure of single cultivation, exploit the abundant local species of living things resources, break the pattern of closed natural economy, develop small farm-yard economy relying on science and technology, set up eco-agriculture, expand the production of local products, widen the exchange with external world.

3) Industrial structure should be regulated to speed up development of industry. We should make good use of the rich natural resources in karst region to develop processing industry, liberate the local agricultural manpower from the limited cultivated land by manpower export, construction of mining industry enterprises, especially rural and township-run enterprises. This can not only develop economy but also mitigate the contradiction of man and environment, and can speed up the resuming of karst eco-environment.

4) Great effort should be devoted to develop education, science and technology, popularize nine years' compulsory education so as to decrease the illiterated rate. Especially we should strengthen the professional training of applied technology, improve manpower quality. Meanwhile we should advocate healthier birth, high-quality breeding and family planning.

5) The construction of basic facilities should be strengthened. Taking major country-developing area as core, we should enhance the construction of traffic, post and telecommunications, carry out open, flexible and preferential policy, improve investment environment to attract the funds and technology at home and abroad to harness and develop Guangxi karst region, and then speed up the development of this area.

6) The tactics should be adopted, which subdivides the region according to the economic functions, rationally arranges construction projects, pays more attention to key area, extends along traffic lines. The breakthrough of harness and development should be started from Red Water River, Zuojiang River, Youjiang River and Liujiang River etc. main channels and then spread to both sides along the main lines of communication. According to the principle of resources realignment optimization, we plan

to develop Red Water River valley into a developing area of power industry and building material industry, construct Youjiang River valley into a comprehensive-developing mining corridor of bauxite—coal —petroleum—engineering industry, construct Liujiang River valley into nonferrous industry base, construct Zuojiang River valley into an economic area which take sugar refining as its major industry, assisting it with developing of rare-earth. bentonite etc. nonmetal industry.

Ladies and Gentlemen:

The people's Government of Guangxi Zhuang Autonomous Region have a deep feeling of great responsibility for making the backward karst region and 10 million people properous in economy and well-off in life. Though we have a plan and begin to perform, it is a long-term and difficult task to carry out comprehensive harness and development of karst region, that there are still a lot of difficulties in fund, experience, person of talent, science and technology, material resources. Therefore, we also need different support at home and abroad. We welcome all present experts and friends all over the world to cooperate broadly with us in exploiting karst region. Especially, we hope that we can win the aid on karst region eco-environment, stone hill afforestation, the drinking water for people and cattle, traffic development, mineral exploitation, eco-energy construction, education and health development etc..

Ladies and Gentlemen,

Now you are in the typical karst city —Guilin. This is one of the most flourishing cities in Guangxi. After meeting, you will go to some karst regions to investigate and travel. We hope that Guangxi karst region will give you an overall and deep impression. For the sake of human being's friendship and happiness and on the base of understanding each other, let's make a joint effort.

Thank you all.

(王晓丽 译)