

THE COMPILING CHARACTERISTICS AND THE BENEFITS OF “THE ATLAS OF AGRICULTURE OF FUJIAN PROVINCE”

Guo Debing (Fujian Agricultural Division Institute)
Chen Guangyong (Fujian Educational College)

An upsurge of revolution in the agricultural science and technology is in the making on the land of China. Deng Xiaoping, the general designer of the modernization, pointed out: “ Science and technology are the primary productive forces”. When we are building the socialism with the features of China today, we should always keep it in mind that agriculture is the foundation of the national economy. The agriculture today is developing in the direction of comprehensively and reasonably using and protecting various kinds of agricultural resources and making full use of the comprehensive potentials. The agriculture no longer relies on the weather. A surge of scientific farming is on the rise in the whole province and new technologies have emerged one after another. The Atlas of Agriculture of Fujian has come into being as the time demands.

Maps, as a special carrier of information, being visualized, picturesque, comprehensive, overall and practical, have many advances in the expression of various subjects.

Fujian is located at the southeastern coast of china, a place that links China to many parts of the world. It is one of the provinces that took the lead in carrying out special policies. It has rolling hills, long indented seacoast and vast waters. It has warm and moist subtropical climate and long growing period. With rich mountain and sea resources, the agricultural production is characterized with distinct diversity, complexity and regular regional distribution. It is suitable for the development of various farming, forestry, fishing, husbandry and township industry and tourism according to different local situation.

Since the launch of open door and reform, the province has organized large numbers of agricultural technical personnel to conduct investigation on the agricultural resources and division, surveys on soils, forest, soil erosion and shallow water sea coast. The findings of these surveys have been used in planning and implementing agricultural development projects for the whole province and greatly pushed forward the agricultural production. They contributed to the good start of sustainable development of agriculture in Fujian. However, the findings of these single surveys are rather dispersed. For many years, we have been exploring ways to make full use of the

integrated benefits of these scientific results.

Through years of practice in maps compiling and drawing, we deeply realize that agriculture is the garden that gives birth to and fosters cartography. Due to the distribution features of agricultural production and its close relationship with natural and economic environment, maps are especially needed in the demonstration and study of agriculture, and are used to reveal their regularity. Through visual creation and by means of various symbols, colours, quantity and locations, we make the newest agricultural investigation data and the large quantity of statistics gathered from various units shown visually on the atlas. The atlas will provide people with a handy means to carry out all-round integrated researches, involving multi-disciplines at multi-levels. It will also promote and improve all agricultural departments in making agricultural developing plan and implementing measures. The atlas received favourable remarks on an evaluating meeting held by the Science Committee of Fujian in July 1994. The assessing panel, formed by famous experts in geology, cartography and agriculture from Fujian and other provinces, unanimously agreed that “the Atlas, being the first large scale and comprehensive agricultural atlas at the provincial level in China, is systematic, advanced and practical, and has the striking features of the time. It occupies the leading position in China and is up to the international standard”.

I. Major Characteristics of the Atlas

1. A Large Comprehensive Atlas of Agricultural Science

The atlas is composed of 4 parts of maps: prefatorial group, the natural and ecological environment of agriculture, the economic environment of agriculture, the agricultural structure and distribution, 152 maps in total on various subjects. There are colour wash topographic maps, remote sensing images and large quantity of statistic charts, enlarged maps and typical maps that reflect the development and changes of agriculture in Fujian. It contains rich contents and information and gives a systematic and overall presentation of the natural and ecological environments of the macro-agriculture in Fujian, the features of economic development, regional distribution law and the achievement gained since the open-door and reform drive.

Fujian is called a kingdom of mountains in the southeast. It has very complex structure of earth surface. Hills alternating with river valleys and basins shape like strings of bead. As a result, a great number of spots representing agricultural resources are very tiny and scattered even in 1:1 million scales. They will just disappear if the scale of 1:2 million is used, consequently a large number of agricultural data will be lost. And considering that vegetation maps, soil maps and forest resources maps are very important basic maps in an agricultural atlas and the atlas should serve as a scientific ground for leaders and departments concerned at various levels in decision making, so the spots should be as

detail as possible. Besides, the scale of 1:1 million is in agreement with the scale of the series of special maps compiled by the state, and will be beneficial to resources sharing. So after repeated tests of drawing, we chose 1:1 million as the basic scale. The size of a fully open map is 507 X 683 mm, just fitting in the size of quarto folio. For the comparatively simple charts such as the economic statistics chart, weather chart and etc., scales of 1:2 million, 1:2.5 million, 1:3 million and 1:4 million are used respectively. Then they are classified and made up to form a provincial comprehensive agricultural atlas.

1. Topics are selected with macro-agriculture as the centre and fully reflect the characteristics of Fujian agriculture.

Agricultural production, particularly macro-agriculture, is one of the most wide spread economic activities on earth. It is an industry that involves many sectors at different levels. The process of agricultural production is a complicated and comprehensive production course in which natural reproduction alternates with economic reproduction. As it has direct and indirect links with natural and ecological environments of agriculture, social economic environment, human activities, resources and markets, it is huge system engineering, containing large quantity of information. The material involved is enormous in size and diverse in fields. How to have a systematic and orderly presentation of them in the form of atlas is always an important problem for us to study. First, in views that Fujian is featured in mountains, coast, subtropical climate, special zone, a great number of overseas Chinese and neighbouring Hong Kong, Macao and southeast Asia, all of which have great influences on the development of Fujian agriculture, we made them the focal points at the prefatorial maps. By using the maps of administrative areas, topography and transportation, an overall situation of the mountains and sea area and regional characteristics of Fujian are demonstrated. In addition to the maps of population density of the whole province, urban population, urban development and layout, "Distribution of Key Counties (regions) of Overseas Chinese" is also included in the population map. Maps of tourism resources and local markets, agricultural structure and foreign-oriented agriculture are selected to show the rich tourism resources in Fujian and the changes taken place in the agricultural structure, produce markets and foreign-oriented agriculture since the reform. "Map of comprehensive agricultural division of Fujian" is selected to show the agriculture in line with local conditions and the findings of latest surveys on agricultural division. In order to highlight this valuable tropical land in south Asia, "Division and distribution for the plantation of tropical plants" is especially included. The whole group of the maps covers the main regional characteristics of the whole province and serves as an introduction to the atlas.

Second, in the light of the law of agricultural production, the other maps are divided into three groups: the natural and ecological environment of agriculture, the agricultural economic environment and the structure and distribution of agriculture. In the group of the natural and ecological environment, following maps are included: climate, water, soil, vegetation, forest resources, nature reserves as well as rare animals and plants, water and soil conservation, land utilization, utilization and development of rural energy and geothermal resources. Maps in this group reflect features of the southern and central subtropical oceanic monsoon climate and the disastrous weathers that are closely linked to the agricultural production in Fujian, and the types, distribution and reform of earth, rich forest resources and ever-increasing forest cover rate, soil erosion and achievements of control, the nature reserves and the distribution of rare animals and plants, features of utilization of land and cultivated land, the average amount of land and cultivated land in each county (city or region), rural resources of energy with an emphasis on small hydropower stations, and the development and utilization of geothermal energy and hot springs, which are distinguished features of Fujian. These maps provide information that is crucial to the reproduction of agriculture.

The group of agricultural economic environment includes maps of the productivity of the land and cultivated land in Fujian, the average income and the consumption structure of peasants, the level of agricultural mechanization, major irrigation works, power net works, agricultural research institutes, universities and polytechnic schools, and the projects of comprehensive agricultural development which have been listed in national plans.

The group of agricultural structure and distribution includes charts of the grain structure, major cereals, economic crops, fruits, herbs, forest industry, fishery, husbandry and township enterprise. This group shows the structure of each sector in the macro-agriculture and per capita resources of each county (city or district), per capita output and graded production levels, displaying the status, achievement and regional difference of the agriculture in Fujian. For example, it reflects the structure of cereals with the rice as the main body, industrial crops like peanut, tea, flue-cured tobacco, edible fungi, asparagus, the seven major subtropical fruits like longyan, olive, loquat, banana and pineapple, outputs of forestry and timber, quantity of grown-up *mao* bamboo and the yield and distribution of pine resin and bamboo shoots and variety of herbs, long coast line and rich aquatic resources, and the development of the township and rural enterprises in Fujian. This group covers the general outlook and highlights the features of the agriculture of Fujian.

The last part of the atlas demonstrates the blue print of the magnificent plan of building

five large scale disaster preventing and fighting systems in Fujian. The project, as a infrastructure engineering of Fujian in the end of the century, will greatly enhance the disaster preventing and fighting ability of Fujian, and will improve the agricultural ecological and investing environment and ensure a sustainable development.

All maps are systematically sort out and induced according to related topics of macro-agriculture in the above four groups of maps. They compose a comprehensive atlas of agricultural science, which has distinguished features of the time, large quantity of information and an internal links to each other.

2. The Data in the Atlas is full, accurate, reliable and practical.

Data are the essence of an atlas. The accuracy of data determines how scientific and practical the atlas is. In the whole course of compilation, we always stressed that the data collected should be full, reliable and practical and should include the most up-to-date findings and results of scientific researches. The latest findings of surveys are used in most of the maps of the natural and ecological environment of agriculture. For example, in compiling the map of forest resources, TM satellite image and data were used, which was the first trial in Fujian. In the map of the development and utilization of geothermal resources, which is a feature of Fujian, the information of the distribution of hot springs is so detailed that it covers the data of villages. And the latest result of hot spring research in Fujian – a chart of the value of underground thermal currents in Fujian, was also included. In the parts of agricultural economics and agricultural structure and distribution, statistics of 1993 were used without exception. The statistics of the last year of every “five years plan” and the data in the year of 1978 were mostly used in statistical diagrams of the developing trends of agricultural economy. So, the whole atlas looks unified and coordinating.

A small number of charts that lack new data, but they are definitely needed in the atlas. When compiling these maps, we deal with them according to the practical situation. For example, we use charts of economic statistics and charts of typical natural resource distribution for the map of the land utilization in Fujian, including a chart of land utilization, a chart of farm land utilization and four TM satellite picture decoded charts of typical land utilization. They both show the features of the land and cultivated land in Fujian and various ways of land utilization.

For the convenience of foreign exchanges and the need of reform, both Chinese and English are used for the contents and titles and captions in the atlas. Phonetic annotations of Chinese characters are also used for the names of major geographic names in the administrative maps. The atlas is published in the forms of bound volume and loose leaf in case, convenient for the use of professionals in various fields and or

the replacement of some maps to keep the atlas up to date.

3. The Atlas takes an overall consideration of population, resources and environment. Through the four groups of maps the atlas gives an overall and systematic presentation of the distribution law of agricultural resources and environmental characteristics of the whole province, paying particular attention to their close relations with population. Standardized and stable indexes, such as per capita productivity and per capital consumption etc. are selected and widely used in various maps about agricultural resources. The map of population shows the population statistics of 1062 towns and the land area, depicts boundaries of towns, displays the population density and the distribution of the urban population, and the plan of development of towns, gross population and natural growth rate and other multiple information. So information about the population, resources and environments are clear at a glance in the atlas.

In the compiling of the atlas, we used multidiscipline in connection with cartography. We used the techniques of remote sensing and computer wherever possible. For example, in compiling the atlas, we used computers to calculate, analyze, process the large amount of statistics to speed up compilation and ensure the quality of the atlas.

II. Benefits of the Atlas

The atlas was highly praised by experts on 1993 the first China National Map Exhibition. It has been used by relevant government agencies and universities. For example, when Fujian applied for a loan (USD\$60 million) to Asia Development Bank, the atlas was used as one of the bases of feasibility in the subproject of water and soil conservation and rural development in Fujian. The experts from the technical support team of the investment centre of the grain and agriculture organization held that the atlas was exquisitely made and it accurately and visually showed the geographic distribution of the subprojects, and they asked for a donation. The natural resource centre of the geography department of the Normal University used parts of maps and charts in the atlas to establish a provincial natural resource information system. When the atlas was formally published in 1995, its application was increased constantly. For example, the Provincial Science Committee used the atlas for reference when they compiled the Plan of Science & Technology Development in the Ninth Five-year Plan and 2001. The atlas gives various departments information about resources distribution and provides guidance and foundation for agricultural production and scientific decision making. Fujian Water Conservancy Department used the atlas to analyze and study the comprehensive development of water resources in Fujian when compiling the Development Plan for the Ninth Five-year and 2001. The Fishery Department used the data of shallow water beach and fish resources and distribution provided in the atlas when compiling the Development Plan for the Ninth Five-year and 2001 of Fujian and

used the data to analyze the production scale and market demands in the next 5 – 10 years and put forward a development objective, priority and measures. The tumor prevention and treatment office of Fujian used the maps of soil, organic substance, climate, water and other natural and ecological environment that are related to the pathogen of tumors to provide useful clues to the treatment of tumors.

The atlas will also serve as a reliable guide for domestic and foreign people to know Fujian and invest in Fujian. It can also be used as a valuable text in the education of local geography and patriotism.

The atlas was awarded a publication fund for excellent publications by the Science Committee of Fujian in 1994. It has been purchased by relevant organizations since it came out and has achieved certain economic benefits. With the increase of distribution and application of the atlas, greater social and economic benefits will be achieved.

Conclusion:

In this age when new science and technology are developing rapidly, under the guidance of the theory of agricultural system engineering and supported by the new technology of remote sensing and computer, the Atlas of the Agriculture of Fujian Province will inevitably build up an agricultural geographical information system, agricultural database or agricultural electronic map. They will provide better and faster key data for the relevant leaders and departments in their decision making, and play a full role in consultation and decision making for the agriculture planning for the whole province.