The Geographic Information Platform of New Socialist Countryside Comprehensive Services

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Abstract

According to domestic and foreign rural geographic information system construction, this article points out the problems of domestic new socialist countryside construction. Combined with the reality of Xinjiang new socialist countryside construction, it has constructed the geographic information platform of new socialist countryside comprehensive services, which is easier to realize farmland protection, cadastre management, central village plan and many other basic services in rural areas, and provided reliable and real-time information technology services for Xinjiang new socialist countryside construction.

Keywords: New socialist countryside; Comprehensive services; geographic information; Information services; Farmland protection

1. Preface

The 16th National Congress of the Communist Party of China and the Third Plenary Session and the Forth Plenary Session of the Sixteenth Central Committee of the Communist Party of China made the task of building a socialist harmonious society, and then, building a new socialist countryside is a major historic task set at the Fifth Plenary Session of the Sixteenth Central Committee of the Party. Among them, great emphasis is put on new socialist countryside reconstruction 20-character principle policies with “production development, lives wealth, local custom civilization, clean and tidy village, democratic management”, which is a major strategic layout for promote countryside economic development, and a necessarily request that build a moderately prosperous and socialist harmonious society, and comprehensive measures in solving problems about rural issues[1]. New socialist countryside construction plan is the objective requirement of co-ordinate urban and rural economic and social development, and a realistic choice of protecting and saving lands and promoting sustainable development in rural, is a major
decision of more improving the living conditions of farmers, and their life quality and civilize quality as well.

Xinjiang is humongous and has a very unique natural environment. It is advantaged to develop the advantageous industries. According to geographic information systems, remote sensing, global positioning system and computer network technologies, the author combines with the reality of new village construction of Xinjiang and constructs the geographic information platform of new socialist countryside comprehensive services, which store and manage region resources data, environmental data, and socio-economic data, and make these data as the information basis for decision-making, and provide the core functions as spatial data processing and analyzing, model simulation and analyzing and evaluating special topics, which provide reference for decision-making on sustainable development for the region.

2. Research on Geographic Information System for Rural Comprehensive Service Home and Abroad

The United States has built the world's largest agricultural computer network which connects 46 states in the 90s of 20th century, and has established a functional organization of agricultural information system, which perfects policies and regulations of agricultural information system improving; Japan has always attached great importance to agricultural and rural information technology work, and regarded it as an extremely important resource to promote rural development. Since 1994, they have build a network of agricultural throughout urban and rural areas, established a sound system of agricultural market information service, which played an important role in supplying market information, and attached importance to the popularity of computers and applications in rural areas; France formed diversified, comprehensive information service pattern, and a wide range of the main of information services, which included national agricultural sector, various types of agricultural research, teaching units and various agricultural industry groups and professional associations and a variety of agricultural production cooperatives, and unions, etc. The EU official bodies is the main part of agricultural information service. "Agriculture Association, the futures market and insurance agencies also take a big part of the information services, which play an important role of the European Union to prevent the risk of agriculture." in addition to the official information service[2].

Research on geographic information system of comprehensive services in rural China is focused on the local construction of agricultural information service system. The current agriculture-related database construction begin to take shape in some individual districts. Rural information construction network platform is establishing gradually, for example, three levels of agricultural information network of Hexi area in Gansu Province, an information service system of agriculture in Ningxia, a agricultural information service system of Cangnan County in Zhejiang Province, a geographic information public service platform for new rural construction of Jindong District, Jinhua City, Zhejiang Province[3]. In order to imply the major policy decision of building a new socialist countryside which is made by the central, and guide the work of surveying and mapping support new rural construction, the State Bureau of Surveying and Mapping launched a new socialist countryside construction security services demonstration projects. Surveying and mapping departments in various provinces and cities cooperate with relevant departments, make full use of high-tech mapping and GIS data resources, carry out topographic mapping and imagery, draw up thematic maps of rural practical, build geographic information platform construction of agriculture comprehensive information services and supply security services for new socialist countryside construction etc.
3. Problems

At present, the construction of geographic information system of new socialist countryside comprehensive services in China exists many problems, such as weak infrastructure, capital shortage and the lack of specialized technology, the narrow agricultural information gathering scope, impairment of transmission channels, the narrow of services scope; lack of information management from government and service capacities; the patent applying is relatively lag; quantity and quality of information resources for agriculture is not good, so the benefit farmers can get is rather limited.

4. The Geographic Information Platform of New Socialist Countryside Comprehensive Services

To deal with all the above issues, the author looks up for lots of literatures and research results of others and hold the point that the government should play the leading role in geographic information system construction of new socialist countryside comprehensive services, and develop comprehensive services principals diversity, co-ordination and integrate information resources energetically, in order to promote the establishment and improvement of geographic information system construction of new socialist countryside comprehensive services, build the geographic information platform of new socialist countryside comprehensive services, and develop new socialist countryside comprehensive services diversity, raise agriculture awareness and quality of farmers. Take specific needs of rural information services of one region in Xinjiang for example, the author build a new socialist countryside comprehensive services system, which is shown in Figure 1.

4.1 Services Objects

Every part in this system, such as all organizations or individuals benefitted from the geographic information platform of new socialist countryside comprehensive services, are the concrete services objects, which are agribusiness, industry associations, cooperative organizations and relevant institutions and research institutions, industry brokers, planters, breeders, farmers and so on.

4.2 Services Demands

According to the concrete services objects, we clarify the concrete services demands. First, direct demands, it refers to a series of basic services which meet information needs and technical needs and production and living needs of each services principal in systematic process of new socialist countryside comprehensive services. For example, by looking into the supply and demand hotline in the system, farmers could get the latest supply and demand information of vegetables and livestock, then they could readjust the direction of vegetable cultivation and livestock breeding; another example, by looking into the red land-lines in the farmland management system to identify which lands be used as farmland protection, it is easier to farm management. Secondly, indirect demands, the new socialist countryside comprehensive services should offer true and reliable information for the agriculture-related macro-control policies by national governments at all levels, and for enterprises that engaged in agriculture-related science and technology research. It is beneficial to constantly advance information and systematic in rural area, for example, by inquiring the system, the planning department could investigate population flow information in the area. From this they could master a specific trend of migrant workers and farmers in the area at a period of time, it is easier to manage population. The ultimate goal of building a geographic information platform of new socialist countryside comprehensive services is to full realize national rural informatization, and provide comprehensive information services protection for agricultural modernization and internationalization of our country.
4.3 Services

Based on the services objects, the author established a new socialist countryside cadastral management database to achieve many targets such as statistics of cadastral data, land registration and parcel of land registration; and the author established field and water conservancy resources database to achieve field survey and query and statistics of water conservancy in rural; the author established industrial and enterprises resources database to achieve query and statistics of industrial and enterprises; the author established the databases of aquaculture and agricultural products and greenhouse materials to achieve the mastery of production and living information of farmers by services objects. According to inquiry and integrate, use and develop many resources such as agriculture-related resources from departments such as agriculture, forestry, water conservancy, mapping and surveying, meteorology, territory and so on, the author established multi-media management database to meet the maximum demands.

4.4 Services Principals

The new socialist countryside comprehensive services principals are made up of organizations and staffs at all levels and from every field, who engaged in new socialist countryside comprehensive information services. The organizations include governments from all levels, departments, authorities, agribusiness, industry associations, co-organizations and relevant institutions and research institutions, etc. The staffs include agriculture-information workers, trade brokers, planters, breeders, farmers, etc. Because the information services principals are widely distributed, and they belong to different organizations systems, so it is difficult to integrate and coordinate a wide range of the services principals. It should give full scope to the leading role played by government departments in construction of the new socialist countryside comprehensive information services system, and it should organize and coordinate the wide range services principals. Information and resources should be integrated and shared by the township government, which is regarded as the services principal part. The relationship of the new socialist countryside comprehensive services principals is shown in Figure 2.
4.5 Integration Platform of New Socialist Countryside Comprehensive Services

On the basis of centre on services targets, confirm services objects and services principals, integrate services, the author obtains accurate information resources from services principals to reasonable integrate and effective manage, and with preliminary data analysis and data mining depth to build a geographic information platform of countryside comprehensive services for township government with the functions such as data integration, service integration, resource sharing and information sharing. It is both an integration platform and a service platform. The relationship among the geographic information platform of new socialist countryside comprehensive services and services principals and services objects is shown in Figure 3:

![Figure 3](image1)

Figure 3. The relationship among the geographic information platform of new socialist countryside comprehensive services and services principals and services objects

4.6 Design of Geographic Information Platform of New Socialist Countryside Comprehensive Services

1) Design of system target:

The geographic information platform of new socialist countryside comprehensive services construction is targeted as sustainable development in rural areas, and it effective integrate spatial data, attribute data, remote sensing image data in rural areas, and it is also a long-term and stable management platform of rural infrastructure data to timely and correctly supply policy, technology, price, production, life and other aspects of comprehensive information consulting services for the farmers and herdsmen, it help farmers and herdsmen adjust and arrange production and business in order to better meet market demand, change the status quo of population flow. Meet the demands of operation and management, infrastructure construction and maintenance, marketing and promotion specialty products, industry development for township leaders, it provide support services for new socialist countryside construction plan, rural infrastructure construction, major agriculture-related engineering and scientific decision-making.

2) Design of system framework:

With the support of spatial data, attribute data, remote sensing data and other resources of the town, the system provide the functions of basic data management and application services according to data management subsystem and information services subsystem. Overall structure of the system is shown in Figure 4:

![Figure 4](image2)

Figure 4. Overall structure of the system

3) Function design of data management subsystem:
Database management subsystem is based on C/S two-tier structure of server, and it is split into client side and server side. Server is implemented with Windows 2000 Server as its platform, and MS SQL Server 2000 as its database server. Based on the standard data query language and data self-organizing technology, the spatial data maintenance tool which responsible for spatial data management and maintenance will enable functions of storage, editing, management of the mass vector, raster, image and other spatial data based on large-scale relational database, which is shown in Figure 5:

![Spatial database maintenance tools](image_url)

Figure 5. Spatial database maintenance tools

Spatial data storage including vector data, raster data, and images data, which organized as a shape of a pyramid, it could improve the efficiency of analysis and display; spatial data editing will enable the function of the online editing of vector data layers, entities and entity attributes, which including point editing, line editing, surface editing, annotation editing, complex entity editing, and edge matching, metadata update, etc. Spatial attributes data management be used to manage the attribute information of spatial data, it includes basic attributes, such as length and area, etc, and it also includes attribute information of users, such as roads coding, etc.

4) Function design of information services subsystem:

Information service subsystem is based on B/S structure of browser. The subsystem is releasing for the public. Structure of platform is shown in Figure 6:

![Structure of the platform](image_url)

Figure 6. Structure of the platform

The functions of geographic information platform of new socialist countryside comprehensive services including introduction of the town, government information, breeding, central village planning, agricultural products, business and units, garden, greenhouse, investment, infrastructure, special joy,
supply and demand hotline, irrigation, cadastre management, etc. It provides the detailed basic information and data support for new socialist countryside comprehensive services.

Among them, the field information management system which developed from comprehensive information services platform that based on spatial data use a town as a pilot. It achieves canonical management, scientific management and effective use of the town farm. The function structure of agricultural information management system is divided into farmland inquiry subsystem and farmland registration subsystem. The functions of geographic information platform of new socialist countryside comprehensive services is shown in Figure 7.

4.7 Services Model

According to integrate computer networks, telecommunication networks, broadcast and television networks and other communication channels[4], it form one multi-network model of modern countryside information services, resort to computers, set-top boxes, fixed phones, mobile phones and other Internet terminals, it gives full play to the advantages of the different communication channels, through appropriate access mode, make the geographic information platform of new socialist countryside comprehensive services is used for the majority of farmers, so as to overcome the problems such as spread routes simplex, low efficiency, few users and many others problems of traditional countryside comprehensive information services, it is used for the benefit of a majority of farmers, and it lays a solid foundation for the new socialist countryside construction.

![Figure 7. The functions of geographic information platform of new socialist countryside comprehensive services](image)

5. Summary

Building a new socialist countryside is a major historic task in current time, is the scientific understanding for the economic and social development, especially for the rural economic development, of the Party. The geographic information platform of new socialist countryside comprehensive services consists of rural political, economic, cultural and other aspects of the basic content, in line with scientific development concept and the objective requirements of building a harmonious society; the establishment of geographic information platform of new socialist countryside comprehensive services is an important stage to achieve a great strategy of building a new socialist countryside, is the mapping departments in an important manifestation of service capabilities in building a new socialist countryside. The geographic information platform of new socialist countryside comprehensive services will provide real-time, basic and
detailed countryside comprehensive information services for a majority of farmers, in order to add the power for building a socialist harmonious society.

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