

Evolving Cartography: A Tool of Land Governmentality in China

Jiaqi Han

HIS 4374 Infrastructure, Cities, Politics

May 6th, 2021

Evolving Cartography: A Tool of Land Governmentality in China

In the experience of land governance in China, the central-local relationship is a very important dimension to understand the process of urbanization. From the research perspective of cartography, we can observe and grasp the overall change of governance form represented in China.

Keywords: cartography, technology, politics

1. The introduction of the concept of governance into China.

In Western countries, Michel Foucault elaborated a series of reflections on state and governance in 1978. He argues that Machiavelli's "The Prince" marked the height of the sovereign theory based on rights and justice, but after this, a new technology based on "governing" reshaped the relationship between the state and the individual. Governmentality, as a management form, is supported by technology simultaneously. Statistics was the earliest useful subject, which gradually developed in the 16th century and was widely applied to all aspects of national governance in the 17th century. Therefore, statistics is essentially the science of the state. With "sovereign power" shifted from sovereignty to governance, there was another important shift: the object of state governance. The object of statistical study is no longer the individual or the family, but the population as a whole. Any population statistics cannot be separated from the existence of a specific space. When the population is taken as the object of governance which can be analyzed and calculated, the territory naturally becomes the object of analysis and calculation at the same time.

"Inscription," developed by Latour (1986)¹, is an important concept for cartography, which is the scaling and preservation of reality across geographic spaces, and for a more general sense, for representing reality in visual documents. In the history of China, people first drew graphics to record the geographical environment, which also proved the nature of the inscription. China made the transition from recording to planning as early as the Zhou Dynasty. In the context of modern China, the construction and promotion of geographic information system is directly related to the strengthening of central government's monitoring over local governments. The digital geographic information platform of different themes is an important institutional tool for the central government to strengthen local supervision and control in recent years, and the construction of geographic informatization is one of the most important manifestations of such control at the technical level. However, the overall promotion of geographic informatization is based on the claimed objectivity of the technology, and the autocratic significance and transparency of the technology are worth discussing.

2. Ancient governmentality thoughts based on geography.

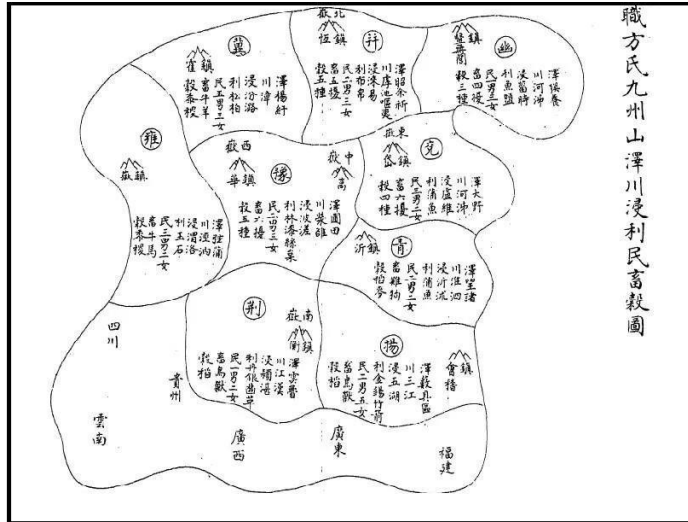
China's governance in early years was similar to the meaning of "obey the nature to take its course" in the liberal ideology, so it was highly related to geography. For example, the governance of the river emphasized the channeling of the river, and the governance of the country emphasized the obedience to the will of the people (or "the way of heaven"). The concept of governmentality is often used in the context of urban governance or regional governance in geography.

2.1 Zhou Dynasty (1046 B.C. - 256 B.C.):

China used cartography for records and city planning as early as the Zhou Dynasty. According

¹ Valérie November, Eduardo Camacho-Hübner, Bruno Latour, "Entering a Risky Territory: Space in the Age of Digital Navigation," *Environment and Planning D: Society and Space*, Vol. 28, 2010, p. 581-599.

to the spatial scope of mapping, the maps seen in *Rites of Zhou*² can be divided into country map, regional map, urban map and so on. According to different contents and uses, the maps in *Rites of Zhou* can be divided into a variety of thematic maps: 1. Administrative zoning plan. 2. Topographic map of mountains and rivers 3. Population census chart. 4. Agriculture map. 5. City planning map. 6. Geological prospecting map. 7. Map of Military Fortress. 8. Land boundary map. 9. Water conservancy plan. 10. Graveyard plan.



(figure1. Administrative province map in *Rites of Zhou*, drawn by geographical official served in the Zhou royal family)

2.2 Ming Dynasty (1368 A.D. - 1644 A.D.):

As a tool of official land administration, land atlas developed from the Han Dynasty (202B.C.-220 A.D.) and reached its peak in the Ming Dynasty. The "fish scale map registers"(yulin tuce 魚鱗圖冊) was a land registration book compiled for the purpose of levying taxes and protecting the feudal ownership of land. The fields, mountains and ponds were arranged one by one like scale and were noted with the owner's name for taxation consideration. The ancient "fish scale map" was widely used in the 14th year of Hongwu of the Ming Dynasty (1381 A.D.), because Emperor Zhu Yuanzhang found that land hiding caused serious losses to national tax revenue. In order to solve the above problem, he organized special personnel to make a complete and tight fish scale map album. The system of " fish scale map registers" has made clear land rights and cleared up hidden land to a considerable extent, which is a great progress in the history of land administration. It can be seen that, in a sense, "Fish Scale Map" is the earliest "GIS" in the world, and it is a tool created by ancient Chinese people to effectively manage land information. It is the basis for determining land ownership and levying taxes.

2 The Rites of Zhou (Chinese: 周禮; pinyin: Zhōu lǐ), originally known as "Officers of Zhou" (周官; Zhouguan) is a work on bureaucracy and organizational theory. It was renamed by Liu Xin to differentiate it from a chapter in the Book of History by the same name.



(figure2. Fish Scale Map in Ming Dynasty)

3. Major reform of the household registration system before 1990s.

During early northeast liberation (1948-1953), in some cities which were first liberated from the governance of Chinese Nationalist Party, the communists took over the business and management in the process of the city urbanization. Based on Soviet Union pattern, they gradually summarized a set of taking-over and management of the city and enterprise model, formed the original "Danwei (unit) system". The Danwei system is a basic tool for the country to achieve the goal of communism and national modernization through the management and control of human and material resources in the period of planned economy under the special historical background and social economic conditions.

The spatial genealogy of the Danwei is connected to "power, knowledge, discipline, government and subject formation in Urban China"³ with a new social purpose. The archetypal Danwei is organized in a spatial compound girdled by high walls under the surveillance of "cadre", who had to be both "red and expert," both politically loyal and skilled at mobilization, production, and leadership. And Danwei space is designed to bolster the socialist order yet it also mimics the family compound.



³ David Bray. *Social Space and Governance in Urban China: The Danwei System from Origins to Urban Reform*. Stanford: Stanford University Press, 2005.

(figure3. Supplementary road network pattern of Nanchang Danwei community and main road)

The household registration system in Chinese history was a population management mode based on family and clan, which was directly related to land. The function and influence of the household registration system in China are not immutable. It is a process of constant evolution, and its evolution has roughly experienced three stages: The first stage focuses on the function of household registration management. At this time, the main purpose of household registration management policy is to register the birth and living location and basic information of the population, which does not involve the mobility of citizens and the distribution of interest rights and other issues. The second stage focuses on the function of household registration in limiting the mobility of population, the most important of which is to strictly restrict and regulate the rural-urban movement of population. The third stage focuses on the distribution of relevant benefits, the most prominent manifestation of which is to connect the welfare rights and interests of citizens, such as employment, education, housing, medical care, social security and so on, with the household registration.

4. Governance challenges in the new era.

4.1 Population mobility and the rise of immigrant culture.

Since the reform and opening up, a large number of domestic immigrants have gathered in the Yangtze River Delta and the Pearl River Delta. The increasing population is constantly migrating to higher level cities and economic factors are the main driving force for them to choose and change cities. During the period of the 18th National Congress of the Chinese Communist Party, the Central Committee put forward the concept of new urbanization, emphasizing "the urbanization of people". In the National New Urbanization (2014-2020), it was clearly proposed to *"comprehensively liberalize the restrictions on the settlement in towns and small cities, and orderly liberalize the restrictions on the settlement in cities with an urban population of 500,000 to 1 million. We will appropriately relax restrictions on urban residency in large cities with an urban population of 1 million to 3 million, set appropriate conditions for urban residency in large cities with an urban population of 3 million to 5 million, and strictly control the size of the population in megacities with an urban population of more than 5 million."* This policy undoubtedly points out the direction for solving the future development problems of China's urbanization from the macro direction, and further indicates that the floating population, which is closely related to the urban settlement policy, will play a more important role in the period of China's new urbanization.

4.2 Establishment of land title confirmation system.

China is a country with a large population and uneven regional development. Agricultural land bears a large agricultural burden. China's cadastral management system before and after liberation has a fundamental difference. In China's socialism society, land is owned by the working massive throughout the country. The establishment of cadastral management system is not only to better protect the property of the labor, but also to better plan the land resources of the whole country. How to use land resources reasonably and effectively is the urgent concern of the land department. In the practice of urbanization in China, the protection of cultivated land has increasingly become the focus of the central government, so the delineation of basic farmland has become the top priority of land data construction in recent years, while illegal occupation of farmland and cultivated land is the focus to monitor and crack down on using satellite images. At the moment, prime farmland is

being or has been zoned and entered into the database over the past year. But the maps produced by the central and local governments are equally indifferent to the most specific facts: the actual population of each household and the actual ownership of the homestead.

4.3 multi-layer mapping for multi-identity citizen

In modern society, a person has multiple social identities, and it is difficult for the traditional household registration system to express the person with multiple social meanings in the limited and static geographic information. Therefore, the thematic map with hierarchical information expression is needed for information integration. Thematic maps, also known as special maps, are maps that highlight and perfect one or several thematic elements on the geographic base map in accordance with the requirements of the map theme, making the map thematic in content, diverse in expression and specialized in use.

4.4 Interaction between administrative power and spatial structure

For the central government, through nearly 20 years of cartographic practice, they have gradually established a land information system covering the whole country, and increasingly relies on these visual technical knowledges to monitor local governments. Image - based monitoring has shown great effectiveness in terms of cultivated land quantity and land type. However, cartography also inevitably brings new challenges to the governance of the central government: when relying on cartography for governance, the central government has a specific perception of space due to its position on the top of distant data. On the one hand, the central government believes in the objectivity and transparency of GIS, so it focuses on the information presented and relies on the information to supervise and correct the behaviors of lower-level (local) governments. Therefore, to some extent, it may ignore the complex practices that cannot be informationalized in reality. On the other hand, the possibility of new governance brought by cartography to local governments has gradually gone beyond the scope of governance achieved by the central government through administrative orders. A simple "yes" or "no" does not capture or limit the complex operations of a cartographic process⁴.

5. Practices of GIS-based governance system after 2000.

The experimental and applied research of remote sensing technology in China has been carried out rapidly in the whole country from the late 1970s to the middle 1980s. In the late 1980s, remote sensing mapping developed from color synthesis and visual interpretation to computer image digital processing and automatic classification mapping. After 2000, with the introduction of GIS technology from western countries, BIM+GIS model has been further developed in China, providing technical support for national governance at all levels.

5.1 Local governance system after digital reform

The urban and rural household registration electronic map management system is for the township police station to prepare an urban and rural household registration electronic tool for annotation, to help the village, household to create the detailed annotation of the household name, family members, residential address and other household query.

⁴ Du Yue. Cartography: A New Framework of National Governance, Journal of Sociological Research[J], No. 5, 2017

Given Zhejiang province as an example, *Seven Stars Pavilion* platform integrates party leading, security, local governance, intelligence governance into the five major modules. At the same time, the "three-dimensional geographic information system" and "social governance cloud platform" are used to integrate water, electricity, gas, public security, and domestic immigrants management into a multi-dimensional and visual social governance large database to form a three-dimensional real scene map and realize all-dimensional intellectual governance. On the one hand, the platform provides whole-process data support for social governance, people's livelihood services, emergency command and leadership decision-making. On the other hand, the "Four Platforms of Local Governance" are used to promote data feeding the grassroots to help the towns (streets) that are the subject of local governance to better prevent risks, deal with problems. In the work of serving the masses, the platform integrates the "digital home" smart community system to create various scenarios for the government, property management and the citizens respectively, carry out online interview and remote assistance, and form a new pattern of community integration and co-governance.



(figure4. Local governance system *Seven Stars Pavilion* platform in Nanhu, Zhejiang province)

5.2 Electronic map of industrial and commercial economic residence

With the diversification of social and economic life, the business of industrial and commercial administration has become more and more complex and changeable, and the corresponding information of industrial and commercial administration has also been generated, accumulated and changed through various technical means and information systems. Industrial and commercial administration management of enterprise information includes the identity of the enterprise registration information, trademark, advertising, contracts and other business information such as search information performed by the industrial and commercial departments at the local level supervision and enterprise annual inspection information, all of these industrial and commercial administration management and the enterprise basic information is contained behind a geographical space and related data. Combining these geographic and spatial information with business data can construct a visual business management information system, so as to conduct intuitive and

comprehensive industrial and commercial supervision and decision support.

Suzhou industrial and commercial economic account electronic map management system is the economic account business software and electronic map and other modern network technology organic combination developed by Jiangsu Province Industry and Commerce Bureau. With the help of the industry and commerce system internal private network, they create a multi-functional dashboard and information platform. Its purpose is to use the electronic map information means to better play the economic account management information system function, effectively solve some problems encountered in the daily supervision of the local branch to further improve the scientific management of the economic account, to achieve the scientific supervision of the economic household. As a complete electronic map application system, in addition to the above-described functions to meet the business needs, it also has the basic and general map functions.



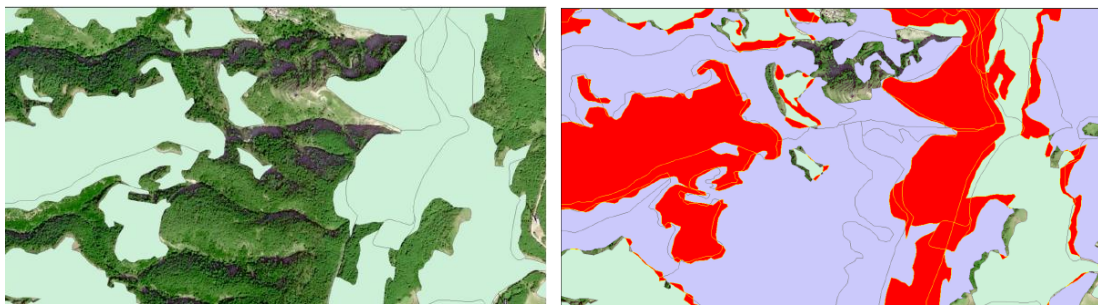
(figure5. An example of industrial and commercial economic account electronic map management system)

5.3 Application of GIS in natural resource asset audit

The land parcel in the spatial database has spatial and non-spatial attribute information, such as the total number of populations, the name of the land parcel, the name of the holder, land use type and so on. The basic information of natural resource assets mainly includes the boundary range, gross area, attribute and distribution of natural resources. The audit of these contents cannot be realized by the naked eye of the auditor. There are problems such as high cost, difficulty, and lack of precision in the method of physical assets exploration and field investigation. Obviously, the written records obtained from the auditors cannot be verified, which requires the help of geographic survey data. The supporting technology is usually in the form of remote sensing image map and GIS, which is the necessary condition for storing, reading, and analyzing such data. In order to develop the local economy, local governments often seize natural resource assets and grant construction land in violation of regulations. The other misuse of power and privilege is the occupation of relevant

special funds, such as repeated remediation of land consolidation projects, false development for forest planting projects. Therefore, the compliance of relevant construction projects needs to be verified by authenticity and efficiency. To verify whether the construction project conflicts with the relevant farmland, forest, grassland, and greening land, it is necessary to compare the construction land planning and utilization map with the land planning of other natural resources and a remote sensing image map of the country. Such difficulties need to be overcome by GIS.

For example, the land identified as cultivated land by the natural resource planning department and the land identified as forestry department overlap partly, that is to say, the land types in this part are different from those identified by the two departments. To highlight the overlap, the disputed land is marked red, as shown on the right ⁵.



(figure6. Land Identified by Natural Resources Planning Department as cultivated land)

First of all, GIS provides the required information for auditors across departments, regions and time, and solves many measurement and comparison problems that cannot be realized manually. By using GIS, the longitude and latitude of the investigated plot can be accurately located, and the field investigation has a definite objective, which improves the audit efficiency. Secondly, GIS integrates the data of different departments to analyze and process on a unified platform, which breaks the information asymmetry between departments. Finally, GIS is used to audit natural resource assets, which ensures the audit results efficiently and accurately. Since the audit process is open and transparent, with the participation of the staff from the audit department, the recognition of the audit results is improved, and the accuracy of the results is guaranteed.

6. State governmentality and intervention

In the process of using maps to carry out land governmentality, local governments firstly abstract the actual geographic space through a simplified process to present favorable information and hide the social contradictions caused by the practice of expanding and merging projects. Secondly, the government took the initiative to make maps and other documents to increase the legitimacy and used the selection and overlay of layers to reshape and present the space through spatial reorganization. These operations enable local governments to satisfy "map justice" and show compliance with superior orders on the one hand, and on the other hand expand the autonomy of action beyond the aspect of image display. In a word, the focus of cartographic research is not to analyze technological change, but to reflect the change of the overall form of governance.

⁵ Kunpeng Liu. Research on GIS Application in Audit of Natural Resources Assets——Case from Audit of Land Resources Assets. Yunnan University of Finance and Economics, 2020

At present, there are several obstacles and challenges for cartography as a way of governance:

1. The problem of "digital gap" caused by the different level of regional development also attracted the attention of experts. The uneven development of digital platform geographically may lead to a widening gap in the application of digital information technology among different regions, leading to a vicious circle.
2. The so-called principle of transparency cannot be substantiated. The absolute control attribute of the government in spatial governance basically eliminates the process of the supervision and participation of the masses, and the masses are always in the state of "being governed". Therefore, improving the fairness and objectivity of cartography and related technology is the challenge of the next stage.

Reference:

- [1] Valérie November, Eduardo Camacho-Hübner, Bruno Latour, "Entering a Risky Territory: Space in the Age of Digital Navigation," *Environment and Planning D: Society and Space*, Vol. 28, 2010, p. 581-599.
- [2] David Bray. *Social Space and Governance in Urban China: The Danwei System from Origins to Urban Reform*. Stanford: Stanford University Press, 2005.
- [3] Wang Meiyuan, Cai Fang. The Course and Prospect of Household Registration System Reform [J], *Guangdong Social Sciences*, 2008,6
- [4] Guo Xue. *The Design and Implementation of the Rural Land Ownership System based on GIS*, Hebei University of Science and Technology, 2016,12
- [5] Kunpeng Liu. *Research on GIS Application in Audit of Natural Resources Assets——Case from Audit of Land Resources Assets*. Yunnan University of Finance and Economics, 2020
- [6] Du Yue. Cartography: A New Framework of National Governance, *Journal of Sociological Research*[J], No. 5, 2017