

A Comparative Study on Marine Spatial Management between China and South Korea

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SUMMARY

In spite of the significant need for a marine cadastre because of its geographical situation on the Korean peninsula, South Korea has not yet established a specialized and proper Marine Cadastral System. In order full consider the issues and opportunities for a marine cadastral system in South Korea, we can look to other advanced countries as comparison targets.

Recently, China associated with the maritime boundary right protection and management has been carried out with appropriate law successfully.

In this study, the brief comparison focuses on the following three aspects: firstly, comparative registration methods and laws in each country , secondly how the organizational operation of the marine cadastre systems and lastly, the key motivations or advantages identified by the China and South Korea.

Therefore, this study performed benchmarking through the "Chinese Marine Cadastral System" and proposed methodologies and 'General rules of Marine Cadastral survey' would help to establish an effective marine cadastral system in South Korea.

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1. INTRODUCTION

In 1609, a book named 'Mare Liberum' by Hugo Grotius declared international freedom of the seas. Grotius formulated the new principle that the sea was international territory and all nations were free to use it for seafaring trade (Strain et al. 2006). After the industrial revolution and world wars, the technology for mapping the ocean and seabed was much improved, and led naturally to a greater recognition of the economic potential provided by the marine environment.

South Korea is a deeply maritime nation; it has over 3000 islands with 443,000 km² of marine area, which is 4.5 times greater than the land area, and 11,542 km of political borders dominated by maritime boundaries(Lee, 2010). South Korea is located in Northeast Asia. Due to the only land border for South Korea is North Korea, almost all imports and exports are transported through ships. Marine activity has increased exponentially over the past few decades, includes aquaculture, tourism and mineral and energy extraction and recreation, shipping and fishing. Due to the increasing use of maritime area, the marine territory is more highly valued than in the past.

Because of the diversity of activities in South Korea's maritime areas, the current legal policy and institutional situation is very complex and overlapping. Further, the marine environment is inherently three dimensional and increasingly needs to be viewed as four dimensional because attributes and conditions need to be related to particular times (Lee, 2009).

One solution for this situation is to create an integrated system for the classification and the visualization of mapping. Generally this integrated system is called a Marine Cadastre System. It would integrate current overlapping management organizations and assist in representing and managing the competing rights, restrictions and responsibilities of all possible stakeholders (Binns et al. 2003)

Despite the public's need for integrated system, it was not adopted in South Korea yet. Due to the concept of marine cadastre system is relatively new and the complex three dimensional environment and numerous organizations and stakeholders. The absence of law can explain about some important issues of jurisdiction over the marine and coastal boundaries. As a result, the conflict over maritime border has significantly increased and depending on the current Local Autonomy Law, local governments operate an address Reconciliation Commission. However, few cases are resolved because of the complicated overlapping jurisdictions

Several legal and institutional issues with building marine cadastre system in South Korea will be mentioned and there was a unique situation with Tsunami in Japan's Northeast coastline. This extreme disaster made a huge sensation and can occur a lot of re-considering on the marine area.

To summarize the main problems within developing marine cadaster system in South Korea, firstly the unclear law of the marine boundaries to the overlapping jurisdiction which conflict between international and local government, secondly, the balance between development and the exploitation of marine resource with environmental protection and social needs.

2. CURRENT ISSUES OF MARINE AREA IN SOUTH KOREA

2.1 Context of Marine Spatial management

Due to the absence of law about certain marine boundaries for local governments, conflict related to maritime borders has increased dramatically. The land reclamation is one of the examples. A committee of local government reconciliation with local autonomy is meant to have authority to resolve the disputes but most of local governments did not accept the decisions of this committee due to the complicated overlapping jurisdictional problems. The many cases went to the Supreme Court, generally means there are long delays before there is resolution.

There are marine related maps called, 'Nautical Chart' and 'Nautical Publication' produced by South Korean Government. The nautical chart not only provide the depths of water and heights of land and natural features of the seabed but also tides and currents and manmade structures such as harbours, buildings and bridges. Nautical charts are mainly used for marine navigation and made by paper and computerised. Due to the shortage of marine surveyors, the marine survey data are scattered and remained imperfection. However, RTK-GPS and Echo-sounder new technologies can be a part of the solution to the problems. Integrated marine environment information system can provide high efficiency data management and remote sensing detection methods can reduce the amount of expense for marine survey (Lee, 2010).

2.2 Objectives of marine spatial management in South Korea

South Korean government officially announced an intergrated ocean policy, named Ocean Korea 21, This policy proposed a plan for marine development with three objectives as follow, the first, the creation of living ocean, the second, establishment of knowledge-based marine industries, the third is sustainable development of marine resources.

Furthermore, the Ocean Korea 21 has seven specific goals, as below,

1. Undertaking a paradigm shift from localised resource extraction to the sustainable management of ocean economic space with an awareness of the global significance of the region

2. Preservation of a clean and safe ocean environment
3. Promotion of knowledge-based ocean industries
4. Enhancement of international competitiveness in ocean service industries and infrastructure
5. Remodelling fishing structures and communities
6. Efficient utilization of marine resources
7. Strengthening international cooperation and South-North Korea collaboration

2.2.1 Marine parks and reserves in South Korea

After Natural Park Act (1967), four marine-coastal national parks have been established (Table 1) there are two objectives. The first objective is to conserve ecosystems, and conduct survey research on natural and historical scenery and the second is to promote the sustainable use of South Korea's national parks. National Parks have several problems including, the restoration of damaged marine environment, protection of shoreline and ecosystem, the conflict of fishing rights and environmental groups' rights, and also as mentioned before, the problems of management by too many organization with limited available budgets (Lee, 2009).

These marine parks are listed below in Table 1.

| Name of park | Established | Park Area (Km ²) | Marine area (Km ²) |
|--------------------|----------------------------|------------------------------|--------------------------------|
| Hal yeo Marine | 31 th Dec, 1968 | 545.627 | 395.479 (72.5%) |
| Taeon Coast | 20 th Oct, 1978 | 326.574 | 289.543 (88.5%) |
| Dadohae Marine | 23 th Dec, 1981 | 2,321.512 | 1,986.684 (85.6%) |
| Byeonsan Peninsula | 11 th Jun, 1988 | 154.715 | 9.196 (6%) |
| Total | | 3,348.428 | 2,680.902 |

<Table 1> Marine parks in South Korea (Kim, 2006)

2.2.2 Marine environment and Coastline management in South Korea

Ministry of Land, Transport and Maritime Affairs established an 'Integrated Marine Environment Information System' with several organizations, including the National Fishery Research & Development Institute, National Oceanographic Institute, Korea Coast Guard, Korea Ocean Research & Development Institute, Ministry of Environment of Korea, Korea Meteorological Administration (MLTM, 2008).

- Web based National Marine Environment Survey plan

One of the main projects of MLTM is to establish a National Marine Environment Survey Web with three development states planned between 1996 to 2015. This survey plan have improved with permanent establishment of coastal area contamination condition survey and establishment of water quality investigation

network and investigation of sea survey, harbour environment condition survey, estuary survey, monitoring of rivers, survey of sea deposits and so on(MLTM, 2008)

Since the South Korean coastline has become increasingly important in terms of land use increase and natural environment conservation, it is currently difficult to resolve land ownership disputes with insufficient title registration along the coasts (Choi et al. 2006). An integrated marine cadastral system must support management of the marine/land interface and so incomplete data in the land cadastre along the coast will also impact on the effectiveness of the marine cadastre.

3. CURRENT ISSUES OF MARINE SPATIAL MANAGEMENT OF SOUTH KOREA

Marine spatial planning caused the most difficulties related to too many organizations and the related regulations. Integration of each organization and the law, is the real purpose to build a marine cadastre system. South Korea also has the same problem, we have the marine related organizations such as 'Ministry of Education, Science and Technology', 'Ministry of National Defense', 'Ministry of Public Administration and Security, 'Ministry of Culture, Sports and Tourism', 'Ministry for Food, Agriculture, Forestry and Fisheries', 'Ministry of Knowledge Economy' 'Ministry of Welfare and Family Affairs', 'Ministry of Environment, 'Ministry of Land, Transport and Maritime Affairs', 'Statistics Korea', 'Korea Meteorological Administration, 'Korea Coast Guard', and many local governments.

Furthermore the marine spatial related regulations in including 'Coastal Act' and 'Shared Marine area management and Landfill Act', 'Harbor Act', 'Fishing and fisheries Act', 'Domestic Water Act', Fishing boat Act' etc. They have detail provisions on the marine spatial usage.

In this study, we look close to the two main law of marine spatial management. They would be 'Shared Marine area Management' and 'Fishing and fisheries Act' which include the right of fishing and marine area use such as mining and landfill activities.

| | | | | | |
|------|-----|-------------------------------|----------|-----------------------|--|
| 권리번호 | | 권리상장식 제00001호 | | 50000㎡ | |
| A | 연락처 | 2000년 5월 24일 | 이접인 (위지) | 전라남도 신안군 일제면 북동리 북동지선 | |
| | 이접인 | 전라남도 신안군 일제면 북동리 북동지선 | 이접인 | 전라남도 신안군 일제면 북동리 북동지선 | |
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| | 이접인 | 전라남도 신안군 일제면 북동리 북동지선 | 이접인 | 전라남도 신안군 일제면 북동리 북동지선 | |
| | 이접인 | 전라남도 신안군 일제면 북동리 북동지선 | 이접인 | 전라남도 신안군 일제면 북동리 북동지선 | |
| B | 이접인 | 2000년 5월 24일부터 2030년 5월 24일까지 | | | |
| | 이접인 | 2000년 5월 24일부터 2030년 5월 24일까지 | | | |
| | 이접인 | 2000년 5월 24일부터 2030년 5월 24일까지 | | | |
| | 이접인 | 2000년 5월 24일부터 2030년 5월 24일까지 | | | |
| C | 이접인 | 2000년 5월 24일 | | | |
| | 이접인 | 2000년 5월 24일 | | | |
| D | 이접인 | 2000년 5월 24일 | | | |
| | 이접인 | 2000년 5월 24일 | | | |



<Figure 1> Registration of fishery rights <Figure 2> Sample map of registered fishery

- The fishery rights; the fishing permits should be registered in the fishery registration book
- Registration for this permit has the same power as the inland right; consequently the fishery rights can be exchange as land title. However it is prohibited to be divided or changed (restricted by law).

The fishing title has description of the fishing license number, the limitation of fishing license including cancellation, expiration date, divided and other changes. The first part called Gap-gu (A) set in a fishing rights, the destruction, recovery of previous ownership details and Ul-gu (B) is relating to the mortgage, byunggu (C) is relating to the entrustment of registration, the last junggu (D) report closed and reopened records.

In the figure 2, the fishery area has recorded by the lot number of land which is located in front of the fishery area. However the location of fishery rights has ambiguity and impossible to know the exact location, it would be misleading the dispute between the owners of fishery area.

3.1 Several issues with marine management in South Korea

According to Kim (2006), the duplication of marine related law and the contradictions between legislation can be a huge issue. There is a certain overlapping regulation in areas in Fisheries legislation and the Fishing Ground management rules. The marine hierarchical legislation caused by complex international and national laws about marine areas. For instance, UNCLOS and local government’s laws are discordant in terms of the definition of the ‘outer edge of continental margin’.

Lee(2009) argued that Australia has over 600 legislative elements affecting in marine areas

and currently South Korea has much the same situation. Many problems caused by confusion and misapplication of the law because of excessive laws of marine management in both countries. There are many kind of rights related to maritime area for example, fishery, approach, development, operation, sea navigation, mining, use of seabed, disposal, manmade structure at harbour.

The institutional problem is due to lack of a properly organized policy structure between the central and local government, and also by a lower capacity in terms marine specialists compared to other advanced countries.



<Figure 3, 4, Computerized coastal management in South Korea>

4. MARINE CADASTRE SYSTEM IN CHINA

4.1 Legal aspect of China marine cadastre system

Korea legislation institution has been studied the Marine related law in China (Moon, 2003), according to him, the laws can be divided into marine boundary and marine area use. The first marine boundary law group includes ‘Law of Contiguous Zone and Territorial waters in China’ and ‘Continental Shelf and the Exclusive Economic Zone Act in China’, the second group has shown as below;

<Table 1> Marine area usage related Regulations in China

| |
|--|
| (1) Desert island protection and use management regulations |
| (2) Approval the marine area use and the State Council report |
| (3) Standard fee of demonstration marine area using |
| (4) Registration right of marine use |
| (5) Marine use survey management |
| (6) Offshore oil platforms and installation management |
| (7) Marine area use license certificate management |
| (8) Marine area using related argument quality management regulations |
| (9) Offshore oil development process, environmental impact assessment management |
| (10) Marine License and related conflict adjustment management |

In the study of 'China Marine related Laws' (2003), Moon assessed that China has built a proper legislation of marine area for rational development of marine resources and sustainable marine environment. One of the laws, the 'Marine Management Act' has been released since January of 2002 and has objectives which include, disciplining marine use and order, to protect the marine resources and right of users. They have a strong penalty to the water use illegally; the user must restoration the marine resources as the same as before, and force to the confiscation of illegal income. Furthermore the offender must pay a fine for the 5-15 times of the normal fee of marine use (when there are illegal landfills activities, the fine will be 20 times of the normal fee)

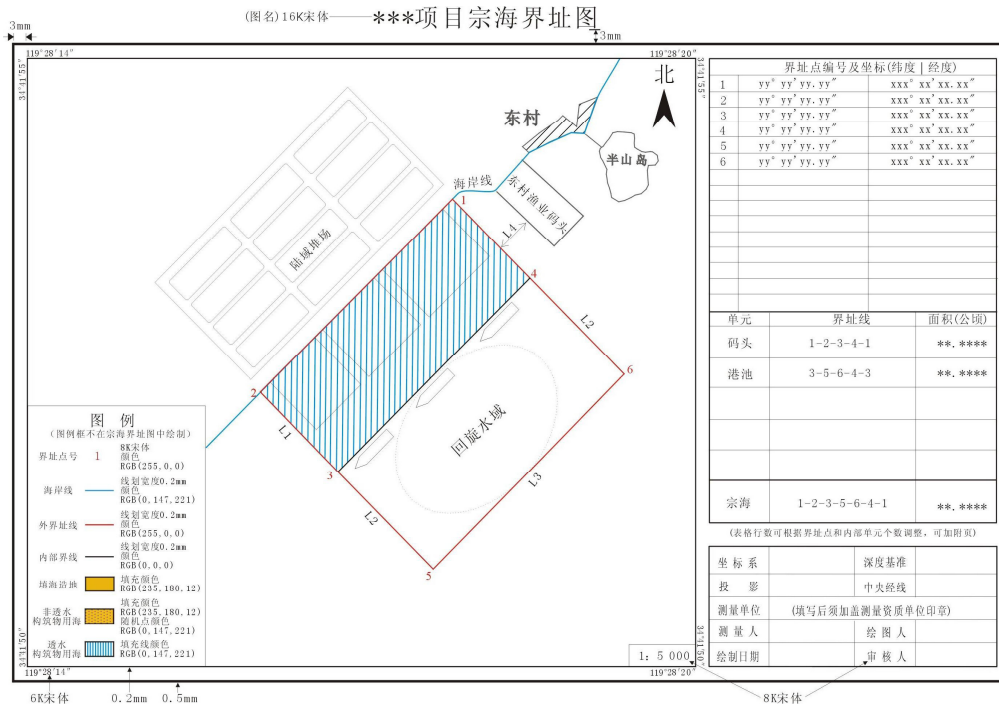
4.2 Chinese marine management organization system

'The State Oceanic Administration' is belong to the 'State Land and Resources', which has a character of protecting a Marine environment and manage the marine usage. It is an administrative unit of marine scientific research and including a hundred marine specialists.

The State Oceanic Administration has significant roles as below;

- Produce regulations, policies, and marine related laws
- Directing of marine area usage and license of fishing permit
- Marine environmental protection planning
- Emission standards and limitation of total amount of sea water use
- Directing through the China sea monitoring about illegal activities
- A comprehensive survey conducted maritime
- Monitoring of marine related disasters such as Tsunami
- The polar and ocean exploration

China has a Marine Cadastre system which is used to survey of marine usage and cadastral survey on marine area, monitoring of marine activities. Currently, many coastal countries need to introduce the same system but in my point of view, only China has a practical operation on marine cadastral survey and marine rights registration and other relevant mapping. Moreover, China's experience can help when South Korean government attempt to build a marine cadastre system.



<Figure 5, Sample of the Chinese marine cadaster map>

China has been used a 'Guideline for marine boundary survey using high-level technology' and 'Maritime surveying form'. However South Korea has been used 'Guideline for hydrographic survey' by the law (released at 15, May, 2010) but the law does not have any survey form or detailed regulations.

Moreover South Korean law regulated an accuracy tolerance of $\pm 2m$ on marine survey without considering of the distance from inland, Chinese law have divided the same regulation into three categories, if the distance is less than 20km, the accuracy will be less than $\pm 1m$, 20km ~ 50km, within the $\pm 3m$, when it is over 50km, the accuracy will be $\pm 15m$. To improve Korean marine system, not only introduce of the new accuracy tolerance and maritime boundary survey form but also considering of 'Guideline for marine boundary survey' would be appropriate for current situation.

Chinese government has been established the marine cadastre system for 10 years and to avoid dispute between the local government, set several principles on marine administration delimitation as below;

1. Considering of the social stability and unity of coastal areas
2. Considering of National Security and Defense
3. Considering of Sustainable development of the maritime boundary
4. Considering of administrative aspects

Chinese Government has a 'National Marine Function Demarcation Experts Committee' and America has a 'Marine Boundary Working Group' as a decision making professional group.

These professionals are relatively free to join the Committee or Working group and improving their countries' institutions and organizations efficiently. At this point is good enough reason to introduce a professional group in South Korea.

In addition, since the Chinese marine registration system has been relatively successful, South Korean government need to improve the current marine management system. In order to realize it, implementation of a clear definition of three dimensional characteristics of the marine area and proper management through marine cadastre system will be essential. For this goal, we need an organization which has a manner of good understanding on the specificity of marine and maritime survey and marine related policies.

5. CONCLUSION

The marine area needs a lot of human resources and finance funds to build a new system. Therefore, it is necessary to benchmark other advanced marine cadastre system to get efficiency and take advantages. In this regard, several maritime strategies were derived for the introduction of marine cadastre system as follows;

First, an integrated organization is required to make a reasonable choice for marine spatial management properly. The integrated organization (or committee) may include 'Korea Cadastral Survey Corporation' for coastal area survey and building a cadastre system, 'Marine Research Associations' to execute marine survey, 'Korea maritime Institute' and the 'National Oceanographic Research Institute' for marine policy, lastly the relevant departments of the 'Ministry of Land, Transport, Maritime affairs' to be a headquarters.

The committee has a role of 1) Improve and clarify the marine laws as establish a governance, 2) Integrated marine spatial data infrastructure, 3) Effective networking and enhance accessibility for stakeholders and involved parties.

Second, the cutting-edge measurement technology on the marine survey is needed to develop a sound marine cadaster system. Therefore, as I mentioned before the correction of accuracy and official marine survey form are essential. Some of government agency is considering the Network RTK survey on marine survey.

Third, capacity building is essential for a marine cadastre field. We need to actively respond to the varied marine environment with global warming, in order to respond appropriately, improve the current marine survey technology and related qualification system is needed.



If these proposed several maritime strategies provide an active practice of the committee with advanced marine survey technology and capacity building on marine experts, introducing marine cadaster system to South Korea is a lot easier than we expected. Furthermore it has a lot of advantages such as solution for the maritime boundary dispute and its prevention and efficient use of marine space. In addition, marine cadastre system can be used as basic information for a comprehensive marine spatial planning in the future.

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BIOGRAPHICAL NOTES

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