Marine policy in the Republic of Korea

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Introduction

Marine policy can be defined as the framework of decisions that plan or implement an integrated management of marine resources and ocean space with a view to avoiding or minimizing conflicts among competing uses of the ocean, and protecting the long-term values and benefits presented by the extension of marine areas under national jurisdiction.

The marine policy of the Republic of Korea (hereinafter Korea) is not just a domestic policy oriented towards achieving national goals. It also includes the broader issue of Korea's rights and obligations as a coastal state under the new international legal order governing ocean space.

Koreans have always had close economic ties with their three neighbouring seas, using them throughout history for fishing and national security, as well as for trading and the associated exchange of cultures.

From sometime around 3000 BC, there is evidence of Neolithic man throughout the Korean Peninsula, along the coast and the banks of rivers. Most of the food of these Neolithic people was largely supplied by the marine life in the sea beside which they lived. From the middle of the tenth century, Korea traded not only with neighbouring countries (China and Japan), but also with Arab merchants. Arab ships that so busily plied their trade with Song China (960–1279 AD) entered Yesong harbor, the port for Kaesong, the Capital City of the Koryo dynasty. Yesong harbor (near the port of Inchon, located on the west coast of the Korean Peninsula) came to flourish at that time as an international commercial port.

In the late 16th century, Admiral Yi Sun-Shin built his famed Kobukson (turtleships) with a protective covering to ward off enemy arrows and shells, numerous spikes implanted in the covering to prevent the enemy from boarding, and emplacement cannon around the entire circumference of the ships. Interest in the development of agricultural technology and scientific surveys was paramount in the seventeenth and eighteenth centuries, and the 'Register of Huksan Fish' (Chasan Obo) by Chong Yak-Chore, written in 1815, is a remarkable feat of marine biology.

The first modernistic oceanographic soundings in Korean waters were conducted not by Koreans, but by a French scientist, La Perous, in...
Since then, many sounding activities have subsequently been undertaken by the British, American and Russian navies for navigation. Japanese forces later took over the soundings for fisheries and other ocean-related activities.

After World War II (1945), Korea gained independence from Japan and began to build her own nation. Before a National Economic Development Policy started in the 1960s, there were few marine activities due to the hardships of the Korean War (1950–1953) and social unrest.

As a country embarks on its road to development, it is faced with both constraints and opportunities, depending on certain features of its environment, such as geographic site, geopolitical location, natural resources, national ethos and the economic development strategy of the government.

Three major factors shaped Korea's marine policy. First, the rationale for marine policy took into account the geopolitical situation of Korea. Bounded on the north by North Korea, on the south by the Korea Strait, on the west by the Yellow Sea and on the east by the East Sea, Korea is in effect a geopolitical island and a land bridge connecting the Pacific Ocean and mainland of Asia.

Second, the lack of land area and natural resources spurred Korea to put more emphasis on marine policy. In 1991, a population of 43.27 million occupied the southern 45% of the Korean Peninsula, an area of 99,299 km². The maritime area falling under Korean national jurisdiction on the basis of delimitation by the median-line-equidistance formula is, however, about 447,000 km². Since only about 26% of the total land area consists of lowlands and plains, this maritime space is about 17 times larger than the arable land area. With high population density (436/km²), lack of natural land resources and pressures for economic development, effective management of living resources and efficient exploitation of non-living resources from its own maritime jurisdictional areas are of critical importance.

Third, Korea's marine policy has kept its prominent place on the socioeconomic agenda since the middle of 1960s. In the three decades from 1962–1992, Korea's GNP increased from U$ 2.3 billion to U$ 294.5 billion, with per capita GNP soaring from U$ 87 to U$ 6749. Fisheries, shipping and shipbuilding, offshore structure construction and coastal construction are some of the primary policy imperatives facing Korea. In 1990, the Korean ocean sector contributed about 7% of the total gross national product, or U$ 14.7 billion. Table I shows some marine indicators of macroeconomic projections for 1991–2001.

Following the above succinct historical account of Korea's marine policy, this paper focuses on the growth and potentiality of ocean economic sectors; fisheries, shipping and shipbuilding, coastal zone utilization, offshore oil and gas, and some emerging challenges such as deep seabed mining, the conservation of the marine environment and marine technology development. This paper also presents an overview of the various initiatives and governances dealing with marine policy.

Main issues of Korean marine policy

The physical characteristics of Korea have had a profound effect on the uses of the seas, and these uses have in turn been determined by and have reinforced the nation's economic development strategy. Four
turning points in the Korea's economic growth can be identified: the import substitution phase (1945–1961); labour-intensive and light industry export-led phase (1962–1971); heavy and chemical industry export-led phase (1972–1981); and the technology-intensive industrialization phase (1982–present).9

Economically, Korea depends heavily upon ocean shipping for its rapidly growing trade, and fisheries are one of the main sources of nutrients for the Korean people. Thus, Korea’s marine interest is mostly in fishing, shipping and other related uses and development of the seas. General growth of marine activities has played an important role in the process of economic development, and with several environmental changes over the last two decades or so (such as technological progress and the emergence of the new international marine order), Korea's marine interest has been expanded to include the exploration of deep seabed minerals and marine pollution control.

This examination of Korea’s marine issues has seven main concerns: fisheries; shipping, shipbuilding and port development; space creation by reclamation; oil and gas exploitation; deep seabed mining ventures; coastal environmental preservation; and marine scientific research.

Fisheries

Although the fishing industry accounts for only about 1.1% of GNP, Korea's fisheries have made a significant contribution both to the diet of the Korean people (48% of protein source) and to the nation's export earnings (US 1.6 billion in 1991).10

The production of marine fisheries in Korea amounted to 2953 thousand tonnes in 1991, of which 874 thousand tonnes were produced in distant waters, 1304 thousand tons in coastal waters and 775 thousand tons in fishing farms.11

Although Korean fishery policies in the adjacent waters have been managed under a rigid institutional management regime over the past three decades, some failure of the legal arrangements has led to: a decline of coastal and offshore fisheries resources (in particular, a drastic decline of the stocks of high-value species); prevailing illegal fishing activities; the existence of overcapacities in some fisheries; the environmental degradation of fishing grounds, mainly caused by toxic

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11Ibid.
pollutants and tide-land reclamation; and international overexploitation on the high seas surrounding neighbouring countries.

Several important targets for fishery policies in adjacent waters can be highlighted as follows: (i) a commitment to rational management of scarce fishery resources; (ii) the betterment of the income and employment of fishing households; and (iii) restructuring of national fisheries toward the 21st century to bring the capacity in line with sustainable development.\textsuperscript{12}

Since the mid-1970s, Korean overseas fisheries have shown a rapid expansion in production, and fishing fleets have played an increasingly important role in Korean fishery economy. This is due to several reasons, including: (i) fishery promotion and export-drive policies; (ii) the demonstrated viability of distant water operations; (iii) the existence of unexploited resources on some high seas; and (iv) buoyant domestic and international demand for fish and fish products.

The distant water fishery of Korea, one of the largest in the world, has suffered from several external factors, including the declaration of Exclusive Economic Zones (EEZ) by coastal States such as the USA and the USSR (CIS) since 1977, the fluctuation of oil prices and a fall in fish prices.

Moreover, due to the recent comprehensive fisheries agreement between the United States and Russia, Korean overseas trawlers are expected to face an additional hardship in the ‘Doughnut Hole’ (the area in the Bering Sea in international high seas between the EEZ of the United States and the Russia). The United States escalated its diplomatic pressure on the Japanese, Taiwanese and Korean governments to withdraw from the North Pacific fishery. Korea faces similar arguments from Canada, that Korean trawlers overfish particular stocks in the NAFO (Northwest Atlantic Fisheries Organization) regulatory area beyond the Exclusive Fishery Zone of Canada.

There is also a growing politically active ‘Green Movement’ in fisheries utilization, which is concerned about by-catch (turtles and marine mammals), habitat and ecological damage, as well as total harvest levels. The UN moratorium on all large-scale pelagic drifting fishing on the high seas requires the cessation of all such drifting fishing until there is a statistically sound analysis upon which to base an effective conservation and management regime.\textsuperscript{13} It aims to press for the withdrawal of Japan, Korea and Taiwan from the North Pacific high seas drifting fishery. As a consequence, the pattern of diplomacy evidenced in the North Pacific and the NAFO controversies threatens to affect other areas of international concern, including the US/Korea and Canada/Korea positions on the General Agreements on Tariffs and Trade (GATT) and other international trade arrangements.

To cope with changing domestic and foreign environments, the Korean government initiated by the Fisheries Administration is cautiously examining fishery policies as follows:

- enhancing fishery stocks through such measures as the construction and operation of fish hatcheries, artificial reefs, mari-culture, etc.;
- reducing fishing efforts in the adjacent seas to recover overexploited marine species;
- halting the degradation (by reclamation and marine pollution) of coastal environments used as fishing habitats and nursery areas;
- strengthening fishery technology, marketing and processing to improve the value-added of fish and fish products;


• improving fishery diplomacy efforts to develop international cooperative arrangements for access to fishing grounds and for management of international fisheries.

Shipping, shipbuilding and port development

The long coastline of Korea has favoured the development of marine transportation. There are, in general, seldom natural navigational hazards, except for the extremely high tides along the west coast of the Korean Peninsula. Maritime transportation and ports have always played a strategic role in the country’s export-led trade, economy and naval defence. Owing to technological innovations, quality improvements and market development, Korea’s shipbuilding industry has become one of the largest in the world, second only to that of Japan. In the course of its growth, this industry has contributed to the growth of the domestic shipping industry.

Import/export cargo volumes have grown at an average annual rate of 12.5% between 1970 and 1991, rising from 22.3 million tons to 263 million tons. Korean shipping policy has emphasized the expansion of national shipping capacity to complement rapidly growing foreign trade. The Korean government encouraged shipping companies to expand the national flag tonnage, resulting in a sustained growth from 22.3% in 1970 to 34.2% in 1991. Building up a national fleet has been one of the inevitable key policies for securing the necessary stability of the national economy. The Korean registered fleet has had a substantial growth from 798 thousand G/T in 1970 to 7821 G/T in 1991, 14th in the world in terms of tonnage.

The shipping policies in Korea can be divided into four stages in chronological order. In the first stage in the 1960s, the policy was mainly to promote a shipping industry use tax credits, financial subsidies for ship maintenance and scrapping second hand vessels, etc. In the 1970s, the emphasis was on fleet expansion and cargo reservation, resulting in a very rapid growth rate (18.4% annual growth rate) in the fleet. However, the second oil shock and the overcapacity of world shipping tonnage forced the Korean government to restructure the shipping industry, reducing the number of shipping companies through mergers and a reduction of various subsidies in the 1980s. The 1990s will witness liberalization policies, reflecting the world trend of deregulation, because of which the formulation and implementation of policies with as little governmental influence as possible is under way.

Most of Korea’s seaborne cargo is carried from the ports of Pusan, Pohang and Kwangyang on the south coast, and Inchon on the west coast. These four ports represent about 70% of Korea’s total capacity of cargo handling by tonnage.

Three trends reaching well into the next century will influence port decision-making substantially:

1. Shifts in maritime trade and transportation due to economies of scale and deregulation within a highly competitive environment.
2. The scarcity and higher cost of capital with which to build new facilities.
3. Increased pressure from local environmental organizations and public agencies seeking more benefits and better accountability from public ports.

Logistics costs play an important role in international trade. Logistics

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15 Ibid.
costs today approach 16.8% of the value of international trade, but are often twice as large in trades with developing countries. Intermodal transport has offered major advantages to good transportation by greatly reducing logistics time and costs of origin to destination transport, particularly of break bulk or package cargo which could be containerized for efficient handling by the different sequential transportation modes.

As a case in point, if Korea utilizes the Trans China Railway (TCR) for an intermodal transport system, it can reduce the transportation distance from Pusan to Rotterdam by about 2147 km compared to the Trans Siberia Railway (TSR), with a resultant cut of about 20% in transportation costs. Furthermore, transportation by TCR will be about 9152 km shorter than by maritime shipping. Thus, international cooperation among contiguous nations is advantageous for intermodal transport because of reduced logistics costs.

To meet these changes and the future growing demand for shipping and port facilities, the Korean government intend to:

- expand and improve harbor landing capacities in Pusan, Inchon, Kwangyang, Mokpo and Kunsan;
- assess the causes and effects of restructuring in international shipping, including multimodal transport service arrangements;
- develop an appreciation of the effects of protectionist policies and international conventions on the conduct of seatrade;
- minimize and mitigate impacts of harbor development and operations on marine ecological resources;
- keep up with advances in seatrade-related transport technologies and their effect on cargo management.

Space creation by reclamation

Food self-sufficiency has become an elusive goal since the early 1960s, when Korea first became a food deficit country. Therefore, the increase of agricultural productivity, which is constrained by a limited area of arable land, has long been one of the top priority issues on the national agenda.

Since the early 1970s, the Korean government has allocated about 18% of its investment funds to agriculture, mainly on large-scale projects of tidal land reclamation and improvement of irrigation systems. A number of large-scale reclamation projects, mainly on the west coast, have been undertaken to exploit their great potential, and are being revitalized by the West Coast Development Policy.

Reclamation of tidal land and public waters generally is conducted according to the Reclamation Act of Public Waters of 1962 (Law No. 986, approved on January 30, 1962), and its amendment of 1986 and 1990 (amended by Law No. 4252, approved on August 1, 1990) and is subject to special procedures to ensure proper control and management. The reclaimed area is now about 1515 km². This represents about 25% of the total potential area, which is estimated to be 6096 km². Strong supporters for reclamation stress that the reclamation of the total potential area would create new arable land corresponding to about 23% of the total existing arable land area.

The purpose of reclamation has so far been mostly for agricultural use

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(about 92% of the total reclaimed land), and the areas zoned for industrial and residential purposes are only 7% and 1% of the total, respectively. In the next decade, however, the area for industrial and residential purposes is expected to increase (about 30% of total area to be reclaimed) to meet the growing demand. The coastal areas to be reclaimed are particularly subject to multiple uses, resulting in various demand by the different interest groups and user agencies. Basic conflicts arise between traditional fishermen and reclaimers. It has not been easy to resolve these conflicts, though efforts to develop compromise schemes are continuing.

**Oil and gas exploitation**

As Korea’s economy has grown toward energy-intensive industry, domestic energy consumption has been heavily dependent on foreign supplies due to the lack of domestic production of oil and anthracite. Total imports of crude oil were about US$1.5 billion in 1976, and rose to about US$8.1 billion in 1991, at an average growth rate of over 12% per year since the mid-1970s.\(^2^2\)

It was not until the late 1960s when a series of geophysical surveys indicated the likelihood of oil under the seabed of Korea’s adjacent seas that the oil-hungry government began to show increased interest in seabed oil development. The UN Economic Commission for Asia and the Far East report (ECAFE, renamed in 1974 ESCAP–Economic and Social Commission for Asia and the Pacific) publicized an optimistic judgment that the sediments beneath the continental shelf and in the Yellow Sea were believed to have great potential as oil and gas reservoirs.\(^2^3\)

The progress of Korean plans for offshore exploration was closely watched by western oil interests. Since 1970, oil-development contracts have been signed for seven seabed oil development zones, between the Korean government and Western oil companies, including an agreement between the Republic of Korea and Japan concerning joint development of the southern part of the continental shelf, designated as Block VII by Korea.

In 1970, with the promulgation of the Submarine Mineral Resources Development Law (Presidential Decree No.5020, May 30, 1970), Korea’s oil exploration was mainly carried out by some concession contracts with western oil companies. Since 1979, however, the government has initiated efforts toward an independent drilling capability through the inauguration of the Korea Petroleum Development Corporation (PEDCO), the government-sponsored corporation intended to manage both downstream and upstream processes of oil development. Results in offshore oil exploration off Korea since 1969 have not yet been appreciable, but are not discouraging.

Up to now, 26 holes have been drilled by PEDCo and foreign concessions, and geophysical surveys have reached 91,170 L-km.\(^2^4\) Although offshore drilling has found no commercial deposits of oil or gas, there remains the possibility of 149 reservoir beds in the continental shelf.

Despite increased attention by the government, Korea’s offshore oil exploration has been hampered by considerable problems, such as a lack of both technical experience and capital availability, and serious international conflicts concerning the extension of jurisdiction surrounding seabed oil development zones.\(^2^5\)
To gain mutual benefits from developing petroleum resources in the continental shelves in the Yellow and East China Seas, Korea should take into account some considerations:

- joint scientific research and information exchange to determine the general petroleum potential and its distribution;
- joint development as the only alternative to no action (and thus no hydrocarbon development);
- development of technology for manufacturing and designing offshore platforms.

**Deep seabed mining venture**

Due to the poor endowment of mineral resources on land, the dependence on the mineral supply from overseas sources has intensified the vulnerability of the Korean economy to sporadic external shocks. The Korean government has therefore been evaluating a deep seabed mining venture as a possible option for stable long-term procurement of strategic metals essential for its sustained economic growth. Although Korea has not sought exclusive entitlement to any specific area for deep seabed mining ventures, it accelerated a national deep seabed exploration effort as one of the most important marine policies in 1982.

The apparent 'hurry and spend to catch up' policy that the Korean government has shown in deep seabed mining venture has been motivated by legal requirements to qualify as a developing country pioneer investor under the terms of Resolution II and the New York Understanding. The Marine Development Basic Act (Law No.3982, approved on 4 December 1987) also triggered national efforts to carry out large-scale projects in the deep seabed area beyond the limits of national jurisdiction.

Although this sort of policy leaves room for criticism solely on the basis of commercial feasibility and economic adequacy, it is unclear whether another more appropriate policy could be adopted by the resource-poor but industry-oriented Korea at this uncertain time.

The Korea Ocean Research and Development Institute (hereinafter KORDI), sponsored by the Ministry of Science and Technology (MOST) and the Ministry of Trade, Industry and Energy (MOTIE), has conducted deep seabed mineral resource exploration since 1983. KORDI had a joint exploration program with USGS from 1989 to 1991, aiming to evaluate the potentiality of manganese nodules in the Clarion–Clipperton (C–C) zone, as well as that of manganese crusts in the western Pacific. From around 1992, the Korean government accelerated its programme by the reconfirmation through the economic ministers' conference and the commission of a new research vessel, Onnuri-Ho. The Onnuri-Ho is about 1400 G/T, facilitated with various advanced instruments including GPS, multi-beam echosounder (Sea-beam 2000), a multi-channel seismic system and a MDM system.

The Korean deep seabed mining program aims at concentrating on exploration activities for manganese nodules in the C–C zones of the Pacific Ocean, spending about US$ 40 million up to 1994. During this period, the exploration target area each year is approximately 500,000 km², and four or five cruises are being carried out during 120–150 working days each year.

Having prepared the prerequisite legal requirements to be a pioneer investor, Korea will disclose its desire to be a pioneer investor before the Law of the Sea Convention enters into force.
The cost for minesite application fees and annual rentals are relatively small costs to pay for keeping Korea’s deep seabed mining option open. These should be compared with the alternatives of increased import dependence on foreign sources of strategic metal supplies (i.e. the risk of embargo) as the Korean economy expands, the costs associated with establishing and maintaining a strategic stockpile, or the potential costs of reduced economic growth.

Korean participation in deep seabed mining ventures offer both opportunities and risks. Effective investment decisions, especially with significant government involvement, require inter-disciplinary considerations. The most important benefits of the many opportunities would be in maintaining stable long-term procurement of strategic metals, and in enhancing marine science and technology capability. If deep seabed nodule mining proves commercially viable, then Korean as a pioneer investor will have made headway along the various ‘learning curves’ of technical and scientific knowledge.

Marine science, technology and education
In the geological sense, the Korean seas are unique. The Yellow Sea is a shallow, post-glacially submerged epicontinental sea bounded on the east by a long stretch of ria-type coast. The East Sea is characterized by a narrow shelf with a straight coastline. The Yellow Sea floor is rather flat and deepens progressively towards the southeast to form the Okinawa Trough in the northern East China Sea. The East Sea deepens abruptly, forming a number of deep basins between ridges and surrounding margins that are probably related to the rifting of a back-arc basin associated with the subduction of the Pacific Plate. The South Sea is also shallow and flat, similar to the Yellow Sea, but characterized mostly by rocky embayments.

However, these interesting and unique features of the Korean Seas have not received full scientific investigation even today.

Since 1960, carrying out oceanographic surveys has become a routine function of the Korea Fisheries Research and Development Institute (FRDI) and the Hydrographic Affairs Office of the Ministry of Transportation. In 1966, the Oceanographic Society of Korea was organized, and since then it has published annually the Journal of the Oceanological Society of Korea, with currently more than 300 registered members. In 1968, education of oceanography was initiated by Seoul National University, and now more than 10 universities offer undergraduate and graduate programs. KORDI was established in 1973 to lead a national effort in scientific ocean research. Scientific research in Antarctic waters has recently been added to KORDI’s activities. KORDI also has published an annual scientific journal called Ocean Research. Korea has only 12 research vessels (above the size of 50 tons) of various types and missions, with a total capacity of 4696 tons. These vessels are managed by governmental agencies and academic and educational institutions. Through these activities, physical, chemical, biological and geophysical aspects of the ocean have been actively investigated. Research areas of the Korean oceanographers are now expanding from territorial waters to international programs such as deep seabed minerals exploration, the Tropical Ocean and the Global Atmosphere (TOGA), the World Ocean Circulation Experiment (WOCE) and the Joint Global Ocean Flux Study (JGOFS).
World trends in marine sciences are shifting from observation and description to process-oriented research, and from intra- to interdisciplinary studies. Inter-disciplinary programmes are now studying physical oceanographic effects on marine plankton and fish (GLOBEC), atmosphere/ocean interactions (TOGA and WOCE), chemical/biological interactions (JGOFS) and geosphere/ocean interactions (RIDGE). Recent cooperation between KORDI and USGS in survey cruises assessing deep seabed minerals spurred Korean oceanographers to start international cooperative survey programmes.

Internationally, Korea has also participated in the Intergovernmental Oceanographic Commission (IOC) of UNESCO since 1960, and in the Co-operative Study of Kuroshio (CSK; 1965–1972) programme. In terms of non-governmental cooperation, Korea formed the National Scientific Committee on Oceanic Research (SCOR) and joined SCOR to the International Council of Scientific Unions (ICSU) in 1990.

If the current trend of disintegration of the cold war continues, then a full understanding of the Korean seas is imminent. The last decade of the twentieth century will be a milestone for Korean oceanography, becoming a part of the world community, and having a proper infrastructure of research, institutions, education and organization.

Coastal environment preservation

A number of oil spill incidents, including the Exxon Valdez disaster in 1989, have awakened global concern over marine environment preservation. Although such a serious oil spill catastrophe caused by a large tanker has not yet occurred along the Korean coast, the problem of marine pollution has emerged as an important social issue because of several sporadic oil spills, inflows of urban and industrial waste water and land reclamation.

First, the growing tanker traffic accompanying Korea's increased consumption of imported oil poses a constant threat of oil spills. Crude oil is the largest single import item – more than 97 million tons (US $8.1 billion), or one-third of Korea's total imports in 1991. Oil spills in some locations have recently become frequent due to the increase of shipping and frequent shipwrecks. The Ministry of Environment reported that the number of marine oil spill incidents between 1979 and 1991 stood at 2470, with compensation for damage to fishery and mariculture reaching over 25.48 billion won. Along with a recovery cost of 17.37 billion won, the total expenses add up to over 42.85 billion won (US $56.4 million) (see Table 2).

Korea is also concerned over the reality that the semi-enclosed Yellow Sea is always in peril of oil spill catastrophe, as China exports oil by large tankers annually about 8 million M/T to Japan.

Second, inflows of urban and industrial waste water are damaging the coastal ocean environment. In 1990, an average 10,217 thousand tons of
sewage water and 7280 thousand tons of industrial waste water were discharged each day into rivers and coastal waters. This waste effluent is eventually discharged into the sea. The current capacities for treating industrial effluents and municipal sewage are 34% and 33%, respectively. As a result, growing coastal industrialization as well as coastal urbanization has created serious marine pollution problems.

Most of the rivers in Korea flow into the Yellow Sea, a semi-enclosed body of water. The coastal seas near major harbors and estuaries on the western coast of Korea are therefore seriously polluted compared with other seas. The pollution status of the coastal seas of Banwol, Kunsan and Mokpo on the west coast exceed COD 2.0 mg/l, the quality level for second-class sea water according to the marine environmental standard.

Sea water on the southern coast maintains first-class sea water quality, below the level of COD 1.0 mg/l. However, the Masan and Chinhae bays, the semi-enclosed area of water near the heavily populated and industrialized cities of Masan, Changwon and Chinhae, are severely polluted, with a COD level of more than 4.0 mg/l. Red tides have occurred in the eutrophicated waters of these bays, and chronic red tides at Chinhae and Masan bays impose great damage to many sea farms almost every year. To remedy this, the Ministry of Environment in 1982 designed 934 km² of vulnerable coastal waters connecting Ulsan, Pusan, Chinhae and Kwangyang Bay, as Special Sites of Coastal Pollution. In these special sites, some industrial development activities causing marine contamination are limited.

Korea’s east coastal sea is, in general, not polluted. But the harbor areas of ports like Sokcho, which is an enclosed sea, have experienced some pollution problems.

Finally, large-scale coastal reclamation along the west and south coasts have caused great environmental changes. The various benefits provided by coastal wetlands, which are being lost to reclamation activities, were not adequately appraised when the feasibility of the reclamation development was assessed. The government has failed to take into account the fact that wetlands reclamation causes reduction in environmental quality, and that there are also damaging externalities in terms of foregone benefits associated with storm protection, waste assimilation and wildlife habitat that are related directly to the amount of wetlands loss.

Coastal reclamation since the 1970s, authorized by the Reclamation Act of Public Waters and supervised by a very development-minded Ministry of Construction, has damaged fishing grounds and sea farms. This has strongly provoked local fishermen, so that these areas of wetlands reclamation have become battlegrounds for compensation issues between traditional and new industrial users.

In July 1991, the Central Environmental Disputes Coordination Commission was newly established to handle environmental pollution damage claims through mediations. This is in keeping with Korea’s cultural tradition that mediation and reconciliation are advocated for dispute settlement.

The only mechanism for environmental control in Korea is the Environmental Impact Statement (EIS) process required by the Basic Environment Policy Act of 1990. However, the EIS is to be prepared by the developer himself and, moreover, procedural apparatus such as public hearings have not yet been established in Korea. In most cases,
the EIS becomes thus merely justification papers for development, and the process is not effective in protecting the marine and coastal environment. Though nearly 300 environmental impact statements have been prepared in recent years, not one project has been cancelled or delayed on account of disclosure of environmental problems through the EIS process.\textsuperscript{37}

In 1972, the Korean government enacted two important statutory laws managing the coastal and marine environment, the Environment Preservation Act and the Marine Pollution Preservation Act (MPPA). Both laws seek to balance domestic needs and international responsibilities.

Recognizing the new international legal order, the Korean government from the 1990s accommodated the sectoral legal regime instead of the integrated legal regime concerning the marine environment. Accordingly, the Environment Preservation Act of 1977 was differentiated into seven laws including the Basic Environment Policy Act (Law No. 4257, approved on August 1, 1990 and amended on December 31, 1991), the Water Environmental Preservation Act (Law No. 4260, approved on August 1, 1990 and amended December 8, 1992) and the Natural Environment Preservation Act (Law No. 4492, Approved on December 31, 1991).

Also, the MPPA was amended in 1986, and again in 1991. The 1986 amendment was made after for the Korea’s accession to the MARPOL 73/78, and the 1991 amendment was made to meet the standards of the Annex V of the MARPOL 73/78. The MPPA focuses on pollution prevention and control from vessels, offshore structures and ocean dumping. It also deals with pollution from seabed drilling, but does not cover pollution from radioactive materials and from naval vessels which is covered by separate laws. It is notable that the 1991 amendment added the establishment of the Marine Pollution Control Commission, as the operating arm for taking the necessary measures against oil spill incidents, under the Minister of Home Affairs.\textsuperscript{38}

One of the most difficult problems arising within the sectoral system of marine environment law is the fragmentation of administrative authorities into several separate agencies which cooperate, as of yet, only in a limited fashion.

Though such fragmentation of authorities in marine pollution control is inevitable, the coordination of such separate policy making is absolutely necessary to remedy the inefficiencies rendered by institutional fragmentation.

As a first step for integrating marine environment policy, the Korean government in 1992 empowered the Maritime and Port Administration to handle oil spills and clean-up operations. To be truly effective, however, national strategy for marine environment policy must focus not just on responding to oil spills and clean-up operations, but also on preventing marine pollution. This means developing a national marine environment policy to harmonize the myriad managerial, scientific and technical activities underpinning the marine environmental industries.

Recently the Korean government established a comprehensive marine environmental preservation programme to carry out efficiently coastal and marine environment protection policies under the sustainable development concept. The main elements of the action program are as follows:

- to establish sea water quality monitoring system;

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- to strengthen countermeasuring capability to marine pollution accidents;
- to expand basic environmental facilities;
- to apply environmental impact assessment system broadly to coastal activities;
- to designate and manage special conservation sea areas;
- to conduct contingency plans to respond effectively to oil spill incidents. 39

39UNEP Environmental Problems of the Marine and Coastal Area of Korea, UNEP/ NOWP, WG.2/Inf.5, Beijing, 1992.

Governance for marine policy

In today’s world, marine policy needs the flexibility to respond to complicated and rapidly changing conditions in three directions: (i) from single or few use-based to multiple use-based patterns (growing complexity); (ii) from the shoreline sea areas to further offshore (extending management space); (iii) from internal waters and the territorial sea to the Exclusive Economic Zone (EEZ), the high seas and the deep seabed area beyond the limits of national jurisdiction (jurisdictional and legal complexity). 40

Recently, the Prime Minister’s Office of Korea set up a nationwide marine policy toward the 21st Century, through the Working Group for the Integrated Marine Policy (WGIMP). Organizationally, the WGIMP, its membership representing every sector of government concerned with marine policy, is an approximate replica of the Marine Development Committee (MDC) chaired by the Prime Minister. Taking into consideration several key elements (the identification of criteria to define the problem, the specification of relevant environmental parameters, and the identification of the time frame and other constraints that help to bound the problem) the WGIMP aims to reinforce the national sea power. 41

Mahan sought to explain why some nations are more effective than others in making use of the sea, and concluded that the conditions affecting sea power are: geographical position; physical conformation, including natural production and climate; extent of territory; size of population; character of the people; and character of government, including national institutions. 42 Mahan’s principles of sea power, when applied to recent social, political and technological conditions, still have much to tell us about the present and also the future.

If Mahan were writing today, rather than in 1890, he would be obliged to expand his technological and economic considerations beyond the dependence of nations upon seaborne trade – wealth crossing the sea – to include the wealth of new ocean industries (offshore oil and gas, global fisheries, hard minerals, bridging the oceans via fibre optics and satellites, etc.) from the sea. 43

To achieve its target, the WGIMP (1993) identified eight agendas: 44

1. Reinforcing ocean technology, oceanographic surveys and national ocean services.
2. Enhancing the international competitiveness of the shipping industry through the self-controlled open-door policy and the efficiency of the port system.
3. Maintaining fishery stocks at a maximum sustainable yield in the adjacent seas and securing distant-water fishing grounds by intensifying bilateral and multilateral cooperation.
4. Establishing a new direction of exploiting oil and gas in the continen-
Until the 1950s, only a few government agencies, such as the Ministries of Agriculture and Fisheries, Home Affairs, and National Defense, were associated with marine policy issues. Since the 1960s, several new government agencies were added to deal with new issues. The Ministry of Construction was established in 1962, the Ministry of Science and Technology in 1967, the Maritime and Port Administration in 1976, the Ministry of Energy and Resources in 1978, and the Environment Administration in 1980. In 1990, Environment Administration was upgraded to the Ministry of Environment.

Complexity in the national governance of Korean marine policy has been introduced by the sectoral, functional and hierarchical differentiation that accompanies national social development and modernization. From an institutional perspective, marine policy was a simple issue area with few functional linkages in Korea before the 1960s. Since the 1960s, however, some major social-environmental changes—such as rapid industrialization, increased space needs for agriculture and industrialization, growing population density, increased foreign trade, technological advances and an increased recognition of environmental values—have challenged the traditional hierarchy of national interests and multiple sea management. An increased number of important marine policy issues were reflected in the creation of new governmental structures and new laws that dealt with marine resources and environment. The Korean government thus has created 11 ministries with subordinate agencies specifically to address major marine policies.

Table 3 shows the ministries that govern the Korean marine policies and their functions, which governmental organizations tended to set their own policies and priorities neither conforming to nor being responsible for creating or enforcing a national master plan for marine policy. The Korean governance for marine policy is thus somewhat decentralized, although the Economic Planning Board (EPB) is responsible for producing economic development plans, as well as for presenting the yearly overall resource budgets. The influential ministries, in charge of Agriculture and Fisheries, Transportation, Foreign Affairs, Home Affairs, Commerce and Resources, Construction and Science and Technology, were allowed a great deal of discretion in the application of rules and regulations.

As a result, these organizations have had to make hard choices about priorities and performance to adjust to the difficulties of implementation. The viewpoints of EPB economists and other related ministry officials have often diverged and, as in most bureaucracies, there has
been competition over administrative responsibility. Some decisions have been made for purely political reasons but most have reflected economic judgement.

Since the early 1950s, the Korean National Assembly has enacted 66 laws relating to marine affairs. The mechanisms for resolving interministerial conflicts over the management of marine resources and environments vary widely from law to law. Further, the government operates 17 committees or commissions under various ministries for the purpose of resolving interministerial conflicts or improving efficiency or marine policies.

The enactment of the Marine Development Basic Act (MDBA: Law No. 3983, December 4, 1987) was thus a welcome response to the urgent need for a more visionary approach to providing direction to the government's basic policy necessary for marine development and even further to coordinating interministerial conflicts rationally through the deliberation of the Marine Development Committee (MDC) chaired by the Prime Minister. Article 11 of the MDBA stresses that the government shall, taking into consideration the importance of sustainable development, adopt necessary measures and arrangements for rational coordination between marine environment preservation and marine development.

Although the MDBA was similar to the Marine Resources and Engineering Development Act of 1966 in the USA, the Korean government failed to achieve its goal due to the lack of enthusiastic leadership and responsible institutions.

If public policies are to be carried into effect, responsibility for their implementation must be assigned either to an existing agency or to a new agency established for this purpose. Governmental institutions are the instrument with which to accomplish public policy. Because public policy consists essentially in the establishment of priorities, its implementation presupposes the availability of the resources needed to carry out these priorities.

Underdal explores the concept of an 'integrated marine policy'—its content, rationale and instruments. He explores how creating a new institution can respond to a political diagnosis:

This could be done by merging two or more existing institutions, creating a new agency to promote certain values and policy perspectives through bargaining with other agencies, or by establishing a new 'superagency' to coordinate work done by other specialized agencies.

Gamble looks at the rationale for advocating a separate identity for marine policy, such as a Ministry of the Ocean. He argues that since marine characteristics are contained in many different aspects of public policy, political energies would be better directed at identifying policy linkages rather than advocating separate treatment.

Miles argues that reorganization is not the obvious solution because structural rearrangement within government is significant only if it changes actual patterns of behavior, allocation of budgetary resources and therefore, organizational autonomy, security and prestige. He also explores how developing countries, suffering from extreme bureaucratic fragmentation, lack of technical skills, lack of information, lack of funds and inadequate planning and decision processes, can focus on developing the capability to formulate and implement integrated national ocean policy and can increasingly concert their efforts to this end.
The governance for Korean marine policy has addressed itself to three persistent challenges. An initial attempt to draw together the fragmented marine programs was the formation of a Ministry of Maritime Affairs, but this was replaced by the Maritime Affairs Agency (1955–1961) under the Ministry of Commerce and Industry. Although not a cabinet-level institution, the Maritime Affairs Agency’s mission covered a very wide range, including fishery, port construction and management, maritime surveillance and shipbuilding. However, it was abolished after the military coup of 1961. Since then, marine institutions have been segmented sectorally or functionally into the Ministries of Transportation, Agriculture and Fishery, Home Affairs and other marine-related agencies.

The second phase emphasized the need for high-level coordination to harmonize disparate goals and programmes of existing agencies, but also for more power to raise marine priorities. Through the 1987 MDBA, the Minister of Science and Technology was given that responsibility, backed up by the Marine Development Committee. The MDC failed, as mentioned above, and it would appear that policy coordinations and recommendations made by presidential or prime ministerial commissions in Korea often do not have much immediate impact on policy making.

The third phase for a still more influential and permanent organizational device (such as a Ministry of Ocean Industry or a Ministry of Ocean) look at centralization rather than coordination. The new President, Kim Young-Sam (1993–1998), the first civilian president elected through a popular vote after 32 years of military junta, vowed to construct what he termed as a ‘New Korea’ with strong leadership based on the legitimacy he gained through a fair election. During his campaign, Kim pledged to set up a tentatively named ‘Ministry of Ocean Industry’, integrating sectoral marine administrations into one institution. Since the 1950s, marine consolidation has had the strength of logic supported by marine constituencies but no political propulsion.

The motivation for reorganization in Korea comes from a change of administrative environment, ambiguities of contemporary policy and the initiative of a key player, the President. For much of the past half-century, the President has had statutory authority to proposed reorganization plans creating, renaming, consolidating and transferring whole agencies and any of their component units.

It is difficult at this moment to predict what decisions President Kim will make for the governance of marine policy. The basic framework of a Ministry of Ocean Industry would incorporate the Maritime and Port Administration, the Fisheries Administration, and some other marine-related agencies. Anyone could make up a checklist of criteria that should determine the choice of organizational structure. A good example of such a checklist is as follows:52

- public acceptance;
- adaptability to changes in technology, international trends, and economic conditions;
- consistency of decisions;
- professional competence;
- participation, representation and diversity;
- effective data base;
- cost and speed in making decisions;
- promotion of private efficiency;

Table 4. Pros and cons of establishing a single agency responsible for marine policy in France.

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
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<tbody>
<tr>
<td>attractive, simple, imaginative solution for increasing importance of the sea, increased responsibilities</td>
<td>difficult separation between wet and dry activities</td>
</tr>
<tr>
<td>policy coherence and consistency</td>
<td>political difficulty to achieve</td>
</tr>
<tr>
<td>avoidance of duplicated effort</td>
<td>ambiguity of ocean constituency</td>
</tr>
<tr>
<td>consolidation of information</td>
<td>cost of integrating efforts</td>
</tr>
<tr>
<td>clarity of command</td>
<td></td>
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Source: Aquarone (1988).

- accountability to the President;
- accountability to the National Assembly; and
- compatibility with the government’s regulations.

The French, Canadian, and Indian experiments to establish a single agency responsible for marine policy might be object lessons for Korea (Table 4). Although there are some arguments for and against the plan for establishing a Ministry of Ocean Industry, an evaluation of the checklist mentioned above remains relevant.

Conclusion

Marine policy is partly a process of reflecting interest and related plans about marine resources and of incorporating them into the national economy. It requires, first, the commitment of the Government to enter this field, and second, the employment of the proper institutional arrangements, whether they be existing or newly created, to carry it out.

To Korea, marine policy is an emerging public policy area. The Korean marine policy has been traditionally concentrated on two major issues, coastal fisheries and defence. However, since the mid-1960s, several major environmental changes – such as rapid industrialization, increased needs for space, growing population density, increased foreign trade, technological advances, increased recognition of environmental values, and the changing international maritime order – challenged this traditional hierarchy of national marine interests and multiplies marine policy areas. As a result, distant-water fisheries, shipping, shipbuilding and port development, wetland reclamation, oil and gas exploitation, deep seabed mining ventures, coastal environment preservation and marine science and technology development were added to Korea’s major marine issues during the past three decades.

In readiness for the 21st Century, the so-called Ocean Century, Korea is now preparing an integrated marine policy including eight agendas, to strengthen the national sea power. Three changing directions such as growing complexity, extending management space and jurisdictional and legal complexity are being considered. The governance for marine policy is a catalyst to achieve the planned target. Establishing a Ministry of Ocean Industry in Korea is under examination by President Kim Young-Sam. Although it is difficult to figure out what decisions President Kim will make for the governmental institution for marine policy, an evaluation of the checklist related to reorganization rates high with the ocean constituencies in Korea. If it should happen, it will be a happy coincidence that a civilian President should establish a new integrated ministry, 32 years after the military junta abolished such an agency in 1961.