Assessing the effectiveness of marine environmental regimes in East Asia*

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〈Abstract〉

To protect marine eco-system, regional environmental regimes have been established in East Asia. Despite talks and promises, the effectiveness of the regimes is in question. This study aims to provide a theoretical framework to define and examine the concept of regime effectiveness and its driving forces. Our case studies of three marine environmental regimes (PEMSEA, YSLME, and NOWPAP) reveal that marine regimes with financial resources, information sharing, and non-government actors participation are more likely to obtain output and outcome dimension of regime effectiveness.

Key Words: regime effectiveness, marin environmental regime, East Asia, PEMSEA, YSLME, NOWPAP
I. Introduction

The seas of East Asia have a coastline of 234,000 km and include six large marine ecosystems of 7 million km². The East Asian seas include the Sea of Okhotsk, the East Sea, the East China Sea, the Yellow Sea, the South China Sea, the Arafura Sea, the Banda Sea, and the Andaman Sea. The marine ecosystems in these areas support almost 30 percent of the world’s coral reefs, one-third of the world’s mangroves, 41 percent of the world’s fishing and 80 percent of the world’s aquaculture goods. The region retains diverse wetlands, estuaries, lagoons, bays and gulfs. Nearly 72 percent of approximately 2 billion people in the areas bordering the Seas of East Asia live within 100 km of the coastline. However, recent rapid economic development and explosive population growth have resulted in environmental degradation in marine and coastal management areas in this region (Liu et al., 2012).

Since the 1990s, the marine environmental programs have implemented in East Asia. This led to the establishment of diverse regional and subregional marine environmental regime. However, many scholars point out that in spite of talks and promises, efforts to form an effective, comprehensive marine regime that serves to facilitate cooperation in dealing with marine environmental problems in the region vary.

The researchers mainly focused on the features of current East Asian marine environmental regimes and their constraints. By looking at YSLME and NOWPAP, Chung suggests a new structure
for marine cooperation from a fusion of two bodies based on an integrated approach to generate a synergy effect (Chung, 2010). Hass addresses the prospects of effective marine environmental regimes in the East Asia are not promising because of weak institutions, the absence of strong transnational network, weak commitment from states, and inactive knowledge sharing (Hass, 2000). As lack of these factors such as marine environmental awareness, project ownership, and good governance are the reason for ineffectiveness in East Asian marine environmental regimes, capacity building and existing regimes’ collaboration are needed (Shin, 2000). Comparative cases analysis on NOWPAP and MAP based on multi-level governance presents NOWPAP reveals centralized authority, closed boundary, and independent linkage while MAP shows vigorous interactions among actors with distributed authority, open boundary and interconnected linkage (ChaㆍSuh, 2010). Existing literature has much interests in introducing marine environmental regimes and examining their problems. Therefore, this study tries to analyze the effectiveness of three marine environmental regimes in East Asia based on financial, intellectual, and membership assets to bridge the research gap.

How can we assess the effectiveness of the marine environmental regime in East Asia? This paper seeks to answer above research question by looking at drivers of marine regime effectiveness. The paper provides a theoretical framework to define and examine the concept of regime effectiveness and its driving forces. We hypothesize that marine regimes with financial
resources, information sharing, and non-government actors participation are more likely to obtain output and outcome dimension of regime. To test our hypotheses, we assess the existing regional marine environmental regimes including PEMSEA (Partnerships in Environmental Management for the Seas of East Asia), NOWPAP (Northwest Pacific Action Plan) and YSLME (Yellow Sea Large Marine Ecosystem Project) in East Asia. Based on our empirical research, we suggest that more efforts should be made to secure funding, encourage participation of NGOs in the regimes and share information among members for facilitating regime effectiveness.

II. Theories of Regime Effectiveness

Krasner defines the term “regime” as “implicit or explicit principles, norms, rules and decision-making procedures around which actors’ expectations converge in a given area of international relations” (Haggard·Simmons, 1987). Generally speaking, actors in regime involve state and civil society at the local, national, regional, and global levels. It also includes political organizations and sets of rules, including decision-making procedures. Historically, such regime has played an important role in global security, economic development, and currently environmental issues (Adeel, 2003).

Thinking of regime in the context of the marine environment, we need to identify key principles that have underlying value for design, implementation, and implementation of regime. These
principles, developed over years and currently being refined in the UN Secretary-General’s development of the post-2015 development framework. Hildebrand, Liu and Chuang pointed out these principles included the pursuit of environmental sustainability in marine systems, accountable marine-oriented institutions, and empowerment for marine stakeholders outside of government (Hildebrand et al., 2013). Post-2015 development framework defines a new generation of sustainable development goals based on the Millennium Development Goals and outlines a road map for the world as a shared framework for global action and cooperation beyond 2015. Without environmental sustainability, poverty and loss of biodiversity cannot be ended, and stable climate and resilience to natural hazards cannot be achieved. The post-2015 development agenda emphasizes on ocean and seas in this context, integrating ocean issues into the agenda to encourage an institutional framework for the protection of ocean with environmental sustainability (The Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda, 2013).

1. Regime effectiveness

The question of regime effectiveness is closely related to whether and to which extent regimes matter (Helm-Sprinz, 2000). Scholars have asked a question, why are some environmental regimes more effective than others? (Hisschemolle-Gupta, 1999). Regime effectiveness refers to the degree of relative improvement in situation or outcomes resulting from the existence and activities of
regimes (Frantzi et al., 2009). The concept of effectiveness is closely related to goal attainment. In the comparative studies, for instance, Jacobson and Weiss argue that the Montreal Protocol and the London Dumping Convention is more effective than the Conventions on Species (CITES) and forest (TTA) because those regimes achieved the goals by accomplishing intended outputs and outcomes (Jacobson·Weiss, 1995). In addition, questions, what consists of regime effectiveness and how we can measure it?, are critical to understand the efficacy and role of regime.

Based on the literature review, we identify the three dimensions of the environmental regime effectiveness: (1) the output, the regime’s actual activity; (2) the outcome, the change in the behavior of societal actors; and (3) the impact, the changes in policy targets, such as quantifiable and tangible improvements in the natural environment (Skjarseth·Wettestad, 2002). The output is specific policy enacted by an organization to promote its vision and influence national policy of member countries. In order to address environmental issues, organizations first need to implement relevant policy measures among members and then induce outcome as a necessary condition for regime effectiveness.

What matters is the change of member countries’ behavior in adopting environmental policy induced by an organization. (Skjarseth ·Wettestad, 2002, Biermann·Bauer, 2004). While output indicators are comparatively easy to collect, their empirical significance remains limited. Impact indicators data, on the other hand, is highly difficult to determine, particularly in the environmental field. In other words, because of ecological complexity, linking observable environmental
improvements to the specific influence of a regime in a meaningful way is virtually impossible (Biermann-Bauer, 2004).

In order to measure regime effectiveness, we use two dimensions, output and outcome since these data are observable and available from existing literature and organization report. As Biermann and Bauer pointed out, the regime’s impact on marine environment is very difficult to measure, and therefore, this paper leaves out the impact indicator, and uses activity of an organization as output and member countries’ policy change and policy decision as outcome for regime effectiveness (Biermann-Bauer, 2004).

2. Drivers for Regime effectiveness

To understand the drivers of regime effectiveness, we have to pay greater attention to the organizations’ resources, information sharing scheme, and governance structure. These resources and institutional factors are the organization’s different sources of leverage that organizations rely on to transmit information and to influence decision-makers, describing as (1) financial, (2) intellectual, and (3) membership base. These three assets are related to actors’ rational considerations of costs and benefit that determine outcome (Botetzagias et al., 2010). Stakeholders are more likely to actively participate in the regime and share the burdens of the regime’s management if regimes offer financial, intellectual, and membership to participants, which lead to achievement of a high level of regime effectiveness.

We propose three hypotheses that link different resources to
regime effectiveness. First, marine regimes vary significantly in their access to financing. One of the key factors for regime effectiveness assumes the availability of stable financial resources for operation. More plentiful financing allows for a high degree of flexibility in implementing the activities of regimes and inducing stakeholders’ commitment to regimes. Securing financial resource is critical for marine regimes to conduct investigation, planning and implementation.

*Hypothesis 1 : Marine regimes with financial resources are more likely to obtain regime effectiveness.*

Second, as intellectual asset, sharing information among members such as specialized knowledge, expertise and advice to marine environmental regimes is important for participants since their participation is perceived beneficial to themselves. Therefore, whether and to what extent marine regime has and utilize information sharing scheme is a key to achieve targeted goal and change the behavior of participating government.

*Hypothesis 2 : Marine regimes with information sharing are more likely to obtain regime effectiveness.*

Third, though states still remain key players to resolve marine environmental issues, the problems like coastal pollution, marine habitat destruction, and marine debris cannot be addressed solely by states. States have shared the burden and managed resources to
solve the marine problems with non-government organizations in marine regimes. As non-state actors become an important partner to states in marine environmental regimes, membership is translated into non-government actors’ involvement in this study. Their participation in marine regimes helps to generate cooperation, dialogue, and vision across sectors to address issues and enhance the dynamics of the regimes. In the past, non-state actors were regarded as playing a relatively peripheral role in global environmental politics, however, this perspective has changed. Non-state actors have become active in agenda setting, a critical connection between local communities and international organizations, and bringing a good deal of expertise that bear on environmental marine problems and their consequences (O’Neill, 2009).

**Hypothesis 3:** Marine regimes with non-governmental actors are more likely to obtain regime effectiveness.

### III. Case Analysis

#### 1. Comparative studies

To compare three Asian Ocean regime, we utilize most similar systems design (MSSD) in comparative case studies (Przeworski and Teune, 1970). The MSSD is useful to compare and explain different outcomes (the dependent variable) in similar settings.
Despite the limitation in controlling all different and similar drivers, the MSSD compare similar subjects (in this case, ocean environmental regimes) with key driving factors begetting different outcomes.

Environmental regimes and institutions in East Asia have developed since the UN Conference on Environment and Development was held in Rio and presented Agenda 21. Agenda 21 recommended a number of approaches for establishing regulatory and institutional frameworks to achieve sustainable development (Adeel, 2003). These were recognized by the governments in the East Asian region and a variety of marine environmental regional regime has promoted since the 1990s such as the Northwest Pacific Action Plan (NOWPAP), the Yellow Sea Large Marine Ecosystem Project (YSLME), the Intergovernmental Oceanographic Commission Sub-Commission for the Western Pacific (IOC/WESTPAC), the Tumen River Area Development Program (TRADP) and Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) (Chung, 2010). Among these, three regimes, PEMSEA, NOWPAP, and YSLME are analyzed with three factors (financial resource, information sharing scheme, and participatory governance) to examine regime effectiveness. These regimes are chosen for comparative case studies because they are not only representative East Asian marine environmental cooperation regimes, but also illustrate varying characteristics of regime effectiveness and its drivers.
1) PEMSEA

PEMSEA is a regional partnership program implemented by the United Nations Development Programme (UNDP) and executed by the United Nations Office for Project Services (UNOPS) to prevent natural and man-made hazard, to protect habitat protection and to restore deteriorating coastal conditions. It serves as a regional coordinating mechanism for the implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS–SEA).

(1) Financial resources

The Regional Partnership Fund receives voluntary contributions from nations, international agencies, individuals and other entities for the implementation of the SDS–SEA. PEMSEA operated on core funding of US$8 million for the first phase (1994–1999), and US$16.2 million for the second phase (1999–2006), which is equivalent to an average of US$2 million a year. This is a relatively modest but necessary amount considering what has been achieved regionwide (PEMSEA Terminal Evaluation Report, 2006).

(2) Information sharing

PEMSEA built Regional Centers of Excellence for SDS–SEA implementation and Integrated Coastal Management (ICM) Learning Centers for capacity-building activities. In order to scale up capacity-building, PEMSEA established the Regional and National Task Forces, which are teams of specialists and experts that serve as the region’s knowledge sharing agents. PEMSEA also
disseminated information by various publications such as Guidebook on the State of the Coasts Reporting as PEMSEA–certified documents, Information–Education–Communication (IEC) materials (PEMSEA Accomplishment Report 2011–2013, 2013).

(3) Non–government actors participation

PEMSEA consists of 12 country partners and 19 non–country partners with a collective commitment to improving sustainable development of coastal areas. Non–state actors are various such as Coastal Management Center (CMC), International Environmental Management of Enclosed Coastal Seas (EMECS), Conservation International (CI) Philippines, Oil Spill Response Limited (OSRL), UNDP/GEF Small Grants Programme, and UNEP Global Programme of Action for the Protection of the Marine Environment from Land based activities (UNEP/GPA) and so on (Sustainable Development Strategy for the Seas of East Asia (SDS–SEAS) Implementation Plan 2012–2016, 2012).

(4) Regime effectiveness

① Output

PEMSEA’s triennial East Asian Seas Congress plays a key role in gathering high–level government officials and other stakeholders to discuss and find solutions to address coastal and ocean concerns within the SDS–SEA framework. One of the primary features of the EAS Congress is the Youth Forum that aims to strengthen the role of young people in conserving the East Asian ocean. When
PEMSEA’s first phase was launched 20 years ago, ICM pilot sites were set up in Xiamen, China, and Batangas Bay, Philippines, covering about 286 km of coastline. Currently, PEMSEA’s ICM initiatives cover about 12% of the 234,000 km coastline of the region, benefiting over 146 million people. In hosting annual Congress and Youth Forum, modest but stable financial resources of the PEMSEA is crucial to achieve stated goals.

Having information sharing scheme such as Integrated Information Management System (IIMS) also propel the regime effectiveness. PEMSEA also generated various tools, codes, guidelines and good practices to support sustainable ocean and coastal development efforts in order to provide quality services including the Port Safety, Health and Environment Management (PSHEM) Code and Implementation Guidelines, the ICM Code with over 300 publications of technical reports, case studies, training manuals and so on (PEMSEA Accomplishment Report 2011-2013, 2013).

② Outcome

The adoption of the SDS–SEA in 2003 was acclaimed as the first concrete approach for coastal nations in a shared sea area to provide a clear framework enough to address emerging challenges of sustainable development in the East Asian Seas. Embodying a shared vision, strategies and action plans over the years, the SDS–SEA implementation has made a significant progress. At the governance level, approximately 80 legislations were introduced in support of the implementation of the SDS–SEA. Indonesia, Japan and South Korea enacted laws regarding the implementation of the
ICM and coastal and ocean governance. After the Five-Year Regional SDS-SEA Implementation Plan was completed and submitted to the Ministerial Forum in 2012, it was adopted with the signing of the *Changwon Declaration* by the ministers and senior government officials from 10 countries. The table below summarizes the current status in the development of these plans (PEMSEA Accomplishment Report 2011–2013, 2013). In the reports, the PEMSEA identified, “As PEMSEA moves into a phase of scaling up the implementation of SDS–SEA...Country and Non–country Partners,...university and non–government entities are the principal actors that need to be engaged in the process (p. 38).” In the PEMSEA workshops, local NGO representatives participate to the process of international water strategies and develop and implement community project.

| Country      | Status                                                                 |
|--------------|----------------------------------------------------------------------|
| Cambodia     | Finalized                                                            |
| PR China     | Finalized and adopted (2012)                                        |
| DPR Korea    | Draft Five-Year SDS–SEA Implementation Plan (2013–2017) under development |
| Indonesia    | For submission to the Ministry of Environment (MOE) for adoption     |
| Lao PDR      | National Water Resources Strategy (2020) and Action Plan (2015) submitted to the Government for consideration |
| Philippines  | National ICM Program (2012–2016) for adoption by the DENR (Department of Environment and Natural Resources) National ICM Program mainstreamed into the Philippine Development Plan |
| Country     | Status                                                                 |
|------------|------------------------------------------------------------------------|
| Thailand   | Draft prepared and for integration into the Department of Marine and Coastal Resources (DMCR) Strategy for Marine and Coastal Resources Management |
| Timor-Leste| Draft prepared                                                          |
| Vietnam    | Revised; under review and finalization                                  |

*Source: PEMSEA Accomplishment Report 2011–2013, 2013.

2) NOWPAP

NOWPAP with the participation of China, Japan, Russia and Korea was launched in 1994 after 3 years of negotiations under the auspices of the United Nations Environmental Program (UNEP) and the Intergovernmental Maritime Organization (IMO) (Hass, 2000). It covers most of the Northeast Asian Seas and aims to become a comprehensive and cooperative framework for marine environmental issues in the region by establishing the permanent secretariat, the Regional Coordinating Unit (RCU) (Chung, 2010).

(1) Financial resources

Trust fund raised by four countries is the NOWPAP’s main financial source with a yearly budget of US$ 500,000. Regarding financial contributions from all member states, they showed a different position of practical possibilities to increase the contributions and reiterated the RCU’s efforts on approaching potential donors to seek external funding sources. According to the 18th intergovernmental meeting, four countries agreed to encourage all NOWPAP member states to make their utmost efforts to increase
their annual contributions to meet the target amount of US$ 500,000 after deciding the scale of contribution for 2014 as US$ 100,000 for China, US$ 125,000 for Japan, US$ 125,000 for Korea, and US$ 125,000 for Russia, respectively, US$ 475,000 in total (Report of the Eighteenth Intergovernmental Meeting on the NOWPAP, 2013).

(2) Information sharing

The Data and Information Network Regional Activity Center (DINRAC), located in Beijing, China, was set up to promote a regionwide data and information exchange with a goal of creating a NOWPAP Clearinghouse. However, these efforts to build a regional information sharing system have not been effective because some of the available data sets such as regional data on the legal measures in the database have provided scant and non-specific information, generating difficulties in the development of a Clearinghouse among member countries (Chung, 2010).

(3) Non-government actors participation

Four participating governments, Korea, Japan, China and Russia in the Intergovernmental Meeting of NOWPAP, the supreme decision making body discuss and determine agendas, activity implementation and review, budget and other operation issues (Chung, 2010). There is little room for non-governmental actors participation in the regime.
(4) Regime effectiveness

① Output

NOWPAP is a Regional Activity Centers (RACs) – based organization that mainly implement all NOWPAP activities. Four RACs comprises POMRAC (Pollution Monitoring RAC) in Vladivostok, Russia, MERRAC (Marine Environmental Emergency Preparedness and Response RAC) in Daejeon, Korea, DINRAC (Data and Information Network RAC) in Beijing, China, CEARAC (Special Monitoring and Coastal Environmental Assessment RAC) in Toyama, Japan.

It became clear that the system of RACs have not only advantages, but also disadvantages. With limited human resources and budget, as well as without adequate technical capacity and expertise of RACs, it is hard to address new and emerging issues such as biodiversity conservation, climate change impacts, and invasive species. Some projects needed additional human resources and special expertise not available at RACs. An example was the issue of persistent toxic substances (PTS) where existing RACs did not have required expertise (NOWPAP Medium-term Strategy, 2012–2017, 2011).

According to the report of 2013 Intergovernmental meeting, a NOWPAP Coordinator pointed out that only 52% of all projects included in 2012–2013 Programme of Work (PoW) were executed on time and highlighted delays of many technical projects, suggesting appropriate actions taken by RACs including introduction of milestones in their work plans (Report of the
Eighteenth Intergovernmental Meeting on the NOWPAP, 2013). Despite the importance of research and activities in NOWPAP’s regional offices, lack of financial resources impeded to attain goals.

2. Outcome

Whereas NOWPAP operated a regional Oil Spill Contingency Plan since 1997, its effect was limited and ultimately may not have been helpful to address the Hebei Spirit oil spill incident along the Korean coast in December 2007. The Korean government received some assistance from NOWPAP member countries through its regional contingency plan, however, according to the UN assessment report, the restoration of the damaged area in a short time was possible not by the Oil Spill Contingency Plan but by collective activities from both the Korean government and the public (Chung, 2010). Another unsatisfactory outcome is Marine Litter Activity (MALITA) initiative to resolve the marine litter issues in the region. In 2006–2007, NOWPAP Marine Litter Activity (MALITA) was conducted using different implementation mechanism. Even though all NOWPAP RACs and RCU were involved in the implementation, each member state designated Marine Litter Focal Points who were responsible for coordination of MALITA implementation within their country (NOWPAP Medium-term Strategy, 2012–2017, 2011). The MALITA involves raising public awareness and planning a long-term monitoring program. However, these efforts have not been effectively translated into member countries’ regulatory measures and remained non-legally binding, failing to prevent marine litter
build-up (Chung, 2010). Little room of nongovernmental entities in the regime could be an obstacle to enhance public awareness and participation to attain intended goals.

3) YSLME

Launched in 2005, the Yellow Sea Large Marine Ecosystem Project (YSLME) developed a cooperative mechanism between Korea and China to keep ecosystem-based and environmentally sustainable management in the Yellow Sea. YSLME’s five Working Groups of Fisheries, Pollution, Ecosystem, Biodiversity and Investment consist of experts in the relevant fields, allowing YSLME to build up technical expertise. The effective implementation of YSLME activities has strengthened by the support of the Korean and Chinese governments (Chung, 2010).

(1) Financial resource

YSLME is self-sustained thanks to approximately US$ 14 million of financial support from the Global Environmental Facility (GEF) for the first Phase of YSLME Project (Chung, 2010). The recent GEF Council Meeting approved the second Phase of YSLME Project, securing US$ 8.2 million.

(2) Information sharing

A joint Korea–China cruise collected data from the Yellow Sea for the first time in 2008 and this activity was considered as being meaningful since this had been almost impossible for political
reason. Every working groups in YSLME have compiled a wide range of data on fisheries, pollution, diversity, ecosystem and social institutions and possessed an extensive data collection on marine environment in the region for years. These credible and comprehensive marine environmental data encourage relevant stake-holders and policy-makers to take appropriate measures and to maintain effective activities to reduce pollution, and to rebuild degraded marine resources in the East Asian Seas (Chung, 2010).

(3) Non-government actors participation

The Project includes various non-governmental actors at the international, regional, national, and local levels. The participants are scientific institutions, universities, and nongovernmental organizations and so on. A wide range of stakeholders have been actively involved in Project activities, which helped to address the issues of real concern to them. This includes the improvement of marine and coastal conditions such as the quality of recreational waters, eutrophication, waste at beaches, habitat destruction and biodiversity. According to the final evaluation report, various non-government actors involvements in the Project are taken as very satisfactory and of high value by the evaluation team (UNDP/GEF Final Evaluation Report, 2011).

(4) Regime effectiveness

① Output

The TDA(Transboundary Diagnostic Analysis) is one of the
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major outputs and consists of a scientific and technical assessment of the international waters area, identifying and quantifying the environmental issues and problems. Thus, the TDA looks for the immediate, intermediate and fundamental causes, and finds possible solutions through a logical sequential evaluation. The Project provides a vehicle for this through the SAP (Strategic Action Plans). The SAP aims at addressing the issues found in the TDA by applying the ecosystem carrying capacity (ECC) approach. One of the most important outputs of the project’s role in strengthening regional cooperation was the operation of joint winter and summer research cruises in 2008. The data and selected samples from the joint cruises were fully shared between Korea and China. In addition to this, as another joint activity, joint regional biodiversity and fish stock assessments were conducted by the project, resulting in common methodologies that provide the foundation for cooperation. (UNDP/GEF Final Evaluation Report, 2011). These research activities funded by the GEF help the regime to attain the goals for analyses of Yellow sea status and cooperation strategies.

2 Outcome

The SAP recommends a road map for improving the ECC of YSLME by 2020 through environmental legislation and enforcement. This includes regional coordination between governments at national level, elimination of environmentally damaging subsidies, enhanced public awareness, and use of regional monitoring networks. The SAP was formally signed by two countries in 2009. The policy adjustments are also seen in the endorsement by the
governments of the SAP together with the soft-law voluntary approach to the YSLME Commission as a bridging period. Both governments have already allocated national financial support for this. Another important outcome of the Project is the endorsement of the root causes from lack of adequate legal instruments. This has already had policy-shaping effect on the development of the National Maritime Protection Plan in Korea and the elements of the next 5-year plan of China. There are significant indications of perception changes in marine environmental protection and sustainable use of marine and coastal resources, gradually resulting in a joint monitoring network with reference stations. The two governments see a model for such a network in the The Baltic Marine Environment Protection Commission (HELCOM) and Oslo and Paris Commission (OSPARCOM) networks in the Baltic and North Seas areas.

The public awareness efforts have significantly enhanced understanding for the actions. The proposed introduction of education about the sea in primary and secondary schools in coastal cities in China, entitled “Know Ocean, Love Ocean” is one example and fits excellently with the aims of the ongoing UN Decade of Education for Sustainable Development (2005-2014) (UNDP/GEF Final Evaluation Report, 2011). In the report, NGOs in China and Korea joined the regime as a joint education and public awareness program. It also identifies that "The emphasis should be switch from natural science to social science, with policy makers, local officials and parliamentarians, NGOs and other stakeholders become more involved (p. 25).” NGOs and civil society actors get involved
in YSLME public awareness program to facilitate ocean environmental campaigns.

IV. Discussion and Conclusion

All key country members joined the Ocean environmental regimes of PEMSEA, NOWPAP and YSLME. Furthermore, all three regimes work on defined boundaries of jurisdiction, which may reduce ambiguity in management. However, the output and outcomes of the regime activities vary.

Table 2 presents the overview of financial, intellectual, membership assets, and regime effectiveness of PEMSEA, NOWPAP and YSLME. Sustainable financing of PEMSEA has strengthened investments in ICM scaling up and commitments to the SDS–SEA. PEMSEA was able to leverage resources for technical and financial support of ICM sites expansion. At the national level, PEMSEA also has embarked on prioritizing the implementation of the SDS–SEA. PEMSEA has continued to share information to advocate ICM initiatives and to meet the SDS–SEA scaling up objectives by setting up ICM Learning Centers for capacity-building activities, mobilizing Regional Centers of Excellence for the SDS–SEA implementation, and conducting various regional and international events. PEMSEA has had collaborative arrangements with non-government actors that provide expertise, skills and additional resources for the SDS–SEA and ICM including co-execution of projects, training workshops of
national and local governments, and information system development. PEMSEA has been able to offer benefits to more than 100 million people from ICM implementation and the Five-year national SDS–SEA implementation plans are being implemented at the national level.

In NOWPAP, different budget requirements and lack of financial resources have lowered the overall effective output of RAC, causing the delay of Program of Work. Insufficient budget allowed the limited operation of regional Oil Spill Contingency Plan and MALITA initiative. Joint response activities such as regular oil spill exercises and training, marine litter reporting system were not yet carried out. Lack of information sharing has hindered DINRAC from becoming a repository of all marine environment relevant data and member states from developing early warning system for oil spill detection using remote sensing techniques. Additionally, lack of information sharing on marine litter delayed the development of technical guidelines, regular marine litter workshops and setting reduction target among member states, which became the reasons for low priority on taking measures at the national level. Because NOWPAP cannot mobilize various resources from non-government actors, the result of projects has depended on RCU and RACs. When RCU and RACs began facing limited human resources and budget problems, their performance has been disappointing. When planning and implementing a regional Oil Spill Contingency Plan, non-government actors were not involved, bringing less collaborative mechanism at regional and local level.

NOWPAP has some success with establishment of permanent
secretariat instead of the UNEP temporary secretariat and trust fund out of entire financial dependence on UNEP (Cha Suh, 2010). Furthermore, NOWPAP of intergovernmental regime has contributed to trust building and environmental cooperation in the region through joint marine protection projects and high-level meetings (Hong, 2012). Despite these contribution of NOWPAP, overall evaluation on the regime is not favorable. NOWPAP as formal institutional arrangement has been lying dormant because of lack of high-level commitment to cooperation by the governments of the region, and financial difficulty, and participation issue of North Korea (Hass, 2000). NOWPAP demonstrates overlapping or competing marine agendas with other regional cooperation works, and significant influence of political consideration on the internal process and budget issue, leading to difficulty in providing substantive marine cooperation policy (Hong, 2012). Chung argued NOWPAP has some limited success with addressing marine problems, but it fails to serve as a framework mechanism for marine environmental protection in the region (Chung, 2010).

YSLME, benefiting from GEF funding, has been able to develop TDA to find out the cause and effect of marine environmental problems. Securing financial resources helped to carry out joint cruise research on marine ecosystem in the Yellow Sea. The data and selected samples from the joint cruises were fully shared between Korea and China, and analytical measurements from TDA were carried out. Working groups and cooperative cruises in YSLME have compiled marine environmental data sets to share and exchange among two nations. The SAP developed by the financial
support and credible information sharing have contributed to legal, policy and institutional reforms and investments to address the priority transboundary issues identified in TDA, including the development of the National Maritime Protection Plan in Korea and next 5-year plan in China as part of the regional strategy of SAP and TDA. Scientists and other experts from a number of universities and technical institutes in both China and Korea participated in the implementation of TDA and SAP of Project. A variety of local NGOs were involved as well. These non-government actors have showed strong support for providing a number of key management tools and increased mutual understanding and trust between countries for the success of TDA and SAP. Furthermore, participation of NGOs in the regime policy making can enhance public awareness and public participation in the activities of regimes, which increases regime effectiveness.

In summary, first, while PEMSEA and YSLME secure modest or more than modest amount of funding for financial asset, NOWPAP’s projects are hindered by lack of resources. Second, PEMSEA and YSLME show various kinds of information-sharing activities, however, NOWPAP provides scant and general information from Data and Information Network Regional Activity Center. Third, non-state actors are not allowed to participate in NOWPAP because four governments from Korea, Japan, China and Russia are the only members, but, PEMSEA and YSLME are open to non-state actors.

When we investigate the achievements of three regimes for regime effectiveness, the differences are obvious. The activities of
PEMSEA and YSLME as output include a wide range of performances, however, NOWPAP generates the disappointing rate of project implementation because of insufficient financial and human resources. As for outcome of three regimes by looking at member countries’ policy decision, NOWPAP does not have a significant influence on participating countries’ marine policy-making process. PEMSEA and YSLME affect the enactment of participating countries and adjustment of relevant policies.

This paper examines the effects of financial, intellectual, and membership assets on regime effectiveness. In three East Asian marine regimes, financial, intellectual, and membership bases are key factors to generate output and outcome. Our findings suggest policy to enhance the efficacy of regional marine regimes. The case study reveals that funding, knowledge sharing, and non-government actor participation strengthen the regional marine environmental regime effectiveness in East Asia.

This research leaves several limitations for future research. The number of cases examined is limited as three East Asian marine regimes are analyzed. Furthermore, the impacts of regime on environmental improvement using quantitative measurement of regime effectiveness have not been tested in this paper. Thus, future research benefits comparable case studies of marine environmental regimes in East Asia and other regions by using quantitative method.
<Table 2> Regime effectiveness and its drivers of PEMSEA, NOWPAP and YSLME

| Regime effectiveness drivers | PEMSEA | NOWPAP | YSLME |
|------------------------------|--------|--------|-------|
| Financial asset (Funding)    | Modest amount US$8 million for the first phase (1994-1999), and US$16.2 million for the second phase (1999-2006) | Lack of financial resource target amount of US$ 0.5 million from annual contribution of 4 member states | Self-sustained US$ 14 million of financial backing from the Global Environmental Facility |
| Intellectual asset (Information sharing) | Training workshops, publication of various technical documents, Regional Centers of Excellence for SDS–SEA implementation, Integrated Coastal Management Learning Centers | The Data and Information Network Regional Activity Center (DINRAC) in Beijing Scant and non-specific information | Synthesized environmental data sets on fisheries, pollution, diversity, ecosystem from joint research cruises Interdisciplinary conferences and cross-sectoral, country-driven dialogues |
| Membership asset (Non-governement actors) | Civil society, private sector, research and education institutions, communities, etc. | 4 participating governments not open to non-government actors | Universities, nongovernmental organizations etc. |
| Regime effectiveness drivers | YSLME | NOWPAP |
|-----------------------------|-------|--------|
| Output | EAS Congresses, the EAS Youth Forum, ICM initiatives included in 2012-2013, projects covering about 12 percent of the 23,000km coastline, benefiting over 146 million people, addressing biodiversity conservation, climate change impacts, and various tools and guidelines for good practices and publications. | The SAP (Strategic Action Plan) was formally signed by China and Korea in 2009, policy-shaping the National Policy of the National Maritime Protection Plan of Korea and the 5-year plan of China. The policy adjustments are also seen in the endorsement and acceptance of the SAP by the governments of the region. |
| | Only 52% of all projects were executed on time. | No implementation of the Malita SAP. |
| | Issues related to transboundary and coastal multimedia were not addressed by RACs due to lack of funding and human resources and expertise. | The SAP's Oil Spill Contingency Plan was ineffective. |

| Outcome | More than 80 legislation were enacted in support of the SDS-SEA Action Plan, and Indonesia, Japan, and Korea enacted laws supporting the implementation of ICM and coastal and ocean governance. The Five-Year Regional SDS-SEA Implementation Plan is being finalized and adopted among country partners. | The outcomes of the SAP were not as expected. |
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<Table 1> Overview of PEMSEA, NOWPAP and YSLME

|                             | PEMSEA                                                                 | NOWPAP                                                                 | YSLME                                                                 |
|-----------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| Brief description           | A partnership arrangement involving various stakeholders of the Seas of East Asia and the regional coordinating mechanism for the implementation of the Sustainable Development Strategy for the Seas of East Asia implemented by the UNDP and executed by the UNOPS | A cooperative framework where countries co-sharing Northwest Pacific are grouped for region-suited solutions to deteriorating coastal and marine environment, in the context of UNEP's global initiative, the Regional Seas Programme. | The project has been established through the GEF and partner countries - China and Korea, to support environmentally sustainable management for the Yellow Sea and its watershed. |
| Geographic scope            | Seas of South-East Asia and North-East Asia including five large marine ecosystems | Northwest Pacific                                                      | Yellow sea                                                             |
| Members                     | 12 countries including Korea, China, and Japan, 19 partner organizations | China, Japan, Korea and Russia                                        | various agencies and institutions of China and Korea                   |
| Organizational structure    | East Asian Seas (EAS) Partnership Council and EAS Congress held every three years | Annual intergovernmental meeting as high-level governing & decision-making body, 4 Regional Activity Centers, Regional Coordinating Unit | Annual network meetings National focal points Project Steering Committee (PSC), Regional Scientific and Technical Panel (RSTP), and Regional Working Groups (RWGs) |
|              | PEMSEA                                      | NOWPAP                                      | YSLME                                         |
|--------------|---------------------------------------------|---------------------------------------------|------------------------------------------------|
| Secretariat  | PEMSEA Resource Facility (PRF) located in Quezon City, Philippines | Toyarra in Japan and Busan in Korea | Project Management Office (PMO) in Korea Ocean Research and Development Institute located in Gyeonggido Korea |
| Fund         | Regional Partnership Fund, established by the EAS Partnership Council | Financed mainly by contributions from the member States to Trust Fund | GEF project grant & contributions from member countries |
| The year of establishment | 1994                                      | 1994                                       | 2005                                           |