



2016 State of the Coasts of Ansan City

*A dream city beyond your imagination,
Ansan is the human-centered city.*

2016 State of the Coasts of Ansan City



387, Hwarang-ro, Danwon-gu, Ansan-City, Gyeonggi-do, Korea, 15335

비매품



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August 2016

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ANSAN



**Ansan “The Green and Eco City”
Greetings from Ansan City, RO Korea!**

Message

I am pleased to present the State of the Coasts (SOC) report of Ansan City which is a collective production of the City government. You will find useful and interesting information about our City's efforts toward the sustainable development. As you may see in the report, I am also pleased to see the result of the assessment is quite positive. Since the baseline year of 2010, Ansan City has made significant progress over the last five years. However, as there are some areas that need to be improved, we will endeavor to make progress in those areas. Through the 35 core indicators of SOC, this report will be a basis for the assessment of progress on sustainable development of our City.

I consider the publication of this report timely as the global community is putting significant efforts toward the Sustainable Global Goals or SDGs of 2015. In time of SDGs, Ansan City became a member of the PEMSEA Network of Local Governments for Sustainable Development or PNLG in 2015 during the EAS Congress 2015, Danang, Vietnam and is hosting the 2016 PNLG Annual Forum. During the Forum, you may also witness the efforts of Ansan City in sustainable development through ICM implementation.

As our city celebrates its sixth government elected by popular vote, Ansan is planning to turn itself into a human-oriented city, where people and life come first, as well as an environmentally friendly eco-city where environment, culture and art exist in harmony. I ask Ansan citizens and netizens to show love and interest to their ever-developing city. Through the implementation of the ICM program in collaboration with PEMSEA, I see the bright future of Ansan City growing and prospering sustainably.

I would like to thank PEMSEA for the technical support and collaboration for this publication. I also commend our team to successfully develop this report in timely manner.

Thank you very much.

Dr. Jong-Geel Je, Mayor of Ansan



PEMSEA

**Partnerships in Environmental Management
for the Seas of East Asia**

Message



I would like to congratulate the City Government of Ansan and its SOC Task Team, partners and other stakeholders for all the effort exerted in preparing the State of the Coasts of Ansan City. I appreciate your enthusiasm and attention and as one of the youngest members of the PEMSEA Network of Local Governments (PNLG), the City has shown its strong commitment to meeting the targets that have been agreed upon by the Network. Being this year's host for the PNLG Forum, the publication of the Ansan City SOC report is both timely and significant.

This SOC report provides a comprehensive assessment of the socioeconomic and environmental status of Ansan City, including the management programs and implementing arrangements for the sustainable development of Ansan City. The report presents positive achievements of Ansan City over the past 5 years (2010-2015) in various aspects of governance and management programs, as well as areas that need further attention (e.g., water quality). It is also worth noting from the report the conscious effort of the City to involve its citizens in various aspects of its management programs, which translates one of the principles of ICM, i.e., stakeholder participation.

The strategies and management actions of the City towards its vision of a 'Green and Eco City by 2030' are highly encouraging and an example for other PNLG members. The SOC reporting system allows subnational/local governments to track their progress towards achieving sustainable development targets. To fully realize the objectives and benefits of the ICM program of Ansan City, PEMSEA encourages the City Government of Ansan to incorporate the SOC reporting system in its regular monitoring and reporting process. This will serve as basis for the continual evaluation and refinement of the ICM program and, ultimately, facilitate the achievement of Ansan's Vision as Green and Eco City.

Of course, the enabling national policies, legislation and supporting mechanisms, including RO Korea's Coastal Management Act with its corresponding national and provincial level inter-agency mechanisms, capacity building and financing programs, provide the City the full advantage in pursuing its ICM program and sustainable development initiatives. The SOC report of Ansan City is a significant resource document, for use by policy and decision makers, environmental planners and managers, and the general public, all of whom have a stake in achieving the City's vision. PEMSEA and the PNLG will be closely watching your progress.

Again, in behalf of all of us at PEMSEA, please accept our warm congratulations.

Stephen Adrian Ross
Executive Director
PEMSEA



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Technical support from PEMSEA is hereby also acknowledged. Review and comments from Ms. Daisy Padayao, Technical Officer for SOC, Dr. Won-Tae Shin, Consultant and Mr. Stephen Adrian Ross, Executive Director and Chief Technical Officer of PEMSEA contributed to making this report more complete.



Executive Summary

The State of the Coasts Report of Ansan City is a record of Ansan City's efforts on sustainable development and attainment of the City's vision: Green and Eco City. This report presents a comprehensive data, information and analysis on PEMSEA's SOC core indicators from various sources since 2010 as the baseline year. Major findings of the report are summarized below.

Governance of Marine and Coastal Resources

Policies, Strategies and Plans

Ansan City developed the 2nd Ansan City Integrated Coastal Management Plan (2015-2021) in accordance with the national law, the Coastal Management Act (1999). The ICM plan is the main policy guidance for the City's ICM program as well as the City's development plans including Ansan City Development Master Plan and 2nd Ansan City Comprehensive Environmental Protection Plan. There are numerous plans supporting the ICM implementation in Ansan City.

Daebudo Treasure Island Project 2030 is the most significant development project in Ansan City relating to the sustainable development. The City is putting considerable efforts to develop the Daebu Island as a model site for ICM and sustainable development. The Daebu Island was designated as PEMSEA's ICM site in 2015. Various assessments at coasts including coastal profile and environmental risk assessment have been conducted through national and local programs. These assessments at the coastal areas provide valuable data and information in developing and updating the City's development plans including ICM plan.

Institutional Arrangements

Various coordinating mechanisms are available at Ansan City to discuss and resolve conflicts in City's policy implementation. The most relevant committees for ICM are the National ICM Committee and Gyeonggi ICM Committee which are directly affecting Ansan City's ICM program. Aside from these committees, Ansan City is preparing the establishment of the Ansan City Coastal Management Council in accordance with the 2nd Ansan City ICM Plan. This will enhance stakeholder's participation to ICM program more viable.

Citizens and stakeholders are encouraged to involve in the Ansan City's policy implementation. The City is operating various committees composed of civil society and citizen groups including "Citizen Council for Policy Consultation", "Citizen Comptroller Group", and "Citizen Involvement Committee" etc. The Mayor of Ansan is organizing an annual open forum for residents to meet and discuss the City's policies and receive feedbacks from the residents. Shihwa Lake's rehabilitation is considered as a success story for stakeholders' involvement in policy shaping and implementation.

Legislation and Enforcement of Laws

The legal basis of the ICM program of Ansan City stems from the Coastal Management Act of RO Korea. The Act provides various policy tools for the sustainable development at the coastal areas such as sea use zoning scheme. In accordance with the Act, Ansan City developed the sea use zoning scheme through the 2nd Ansan City ICM Plan implementation. The sea use zoning scheme provide valuable policy foundation for conflict resolution and holistic development of the coastal areas of Ansan City.

Ansan City is also putting significant efforts on enforcement of the environmental laws and regulation. Violators are charged with fines and in some cases subpoenaed for criminal cases. The City involves civil groups for monitoring and surveillance of environment. Fisheries activities are also monitored using the two surveillance boats.

Information and public awareness

Ansan City actively promotes information sharing and public outreach of its policy implementations. The City is putting various efforts on public communication and awareness activities through several communication channels including on-air channel, on-line channel and off-line channel. Publication of City magazine and broadcasting high quality media clips enhances public awareness on city's policy implementation. Also Ansan City's internet webpage (<http://www.iansan.net>) and its information sharing system is instrumental for providing information to the citizens.

Involvement of civil society enhances the awareness of safety policy implementation. Citizen-led patrol groups and volunteers are very helpful in maintaining safety and cleanliness of the City. Through the "Building Good Neighborhood Project", residents are actively participating in revamping their own villages and communities. This participatory process is effective due to enhanced sense of ownership.

Capacity Development

Ansan City put efforts in developing the capacity of city officers. Using the study groups of the officers, the new policy suggestions were submitted for adoption and execution. The City is offering various opportunities for learning and education to the City officers. Overseas study visits are also a regular program for capacity building. The City operates the Life-time Learning Center which acts as a learning hub for the citizens. Under the Center, there are five libraries and one special center operating. These libraries are instrumental for Ansan Citizen's life-long learning and education.

Ansan City's ICM program is at its beginning state. There are urgent needs to educate the officers involved in ICM program and build capacity of the managers as well as stakeholders. As limited numbers of officers are involved in the ICM program, the City will need to enhance capacity of those officers. PEMSEA's training program can be a good source of capacity building facility for Ansan City.

Financing Mechanisms

Ansan City has enough financial resources for ICM implementation. The total budget for ICM related activities was around US\$ 901M in 2015. This budget is already 82% increase compared to 2010 budget. The budget is expected to grow in the future. In addition, there are some funds available for potential use for ICM program. For

sustainable financing of the ICM program, Ansan City already identified the sources of funding, namely national and local sources. Also, existing funds can be also utilized if necessary.

Sustainable Development Aspects of Marine and Coastal Management

Natural and Man-made Hazard Prevention and Management

Disaster preparedness and response is one of the most important agenda of RO Korea in recent years. This is due to series of tragic accidents happened recently in RO Korea. In response, RO Korea's disaster preparedness and response system was entirely revamped by creating the Ministry of Public Safety and Security (MPSS) in 2014. Under the guidance of MPSS, Ansan City established the Disaster and Safety Response Center to coordinate actions in time of emergencies. Various hazards maps are available for preemptive safety measures and policy implementation. In time of emergencies, response measures are actively being mobilized.

Ansan City is considered as relatively safe from natural disasters except for typhoons. Most of the casualties are reported from man-made hazards including traffic accidents and fire. Ansan City will need to put more efforts on these areas in the future.

Habitat Protection, Restoration and Management

Ansan City sets the Vision of the City as "Green and Eco City" as spearheaded by the Mayor, Dr. Je Jong-Geel. With this Vision, the City is aggressive in greening the City through creating more green spaces and build green landscape throughout the City. The 2020 City Urban Greening Master Plan (2013) and 2020 Ansan City Development Master Plan (2015) provide strong policy environment for the attainment of the City's Vision.

Ansan City is planning to establish two Wetland Protected Areas along the coasts of the Daebu Island. This is to protect the remaining mud flat of the Island and to support the sustainable and eco-friendly development of the Island. The areas of habitat of Ansan City remain the same since 1994 when the Shihwa Lake was created. There are lots of development activities on-going inside the Shihwa Lake which were approved by more than 10 years ago. Ansan City is restraining the additional reclamation of mudflat, unless reclamation in a small scale is absolutely necessary such as development for the Marina and fisheries ports, in order to protect the ecosystem around the City.

Water Use and Supply Management

Ansan City is providing safe drinking water to its residents in an affordable price. City's water supply is secured through the implementation of the Ansan City Comprehensive Environmental Protection Plan (2011-2020). The production and distribution of drinking water is operated by City's water concessionaire, the Water and Wastewater Treatment Agency. The Agency is producing safe drinking water through stringent quality and safety checks.

Ansan City has achieved 99.8% of safe drinking water supply to its residents in 2014. The price of drinking water is one of the lowest in the country with KRW 458.9/ton. The treatment facilities' capacity is more than enough to cover the water demand of City residents. There were few water-related infectious diseases outbreaks reported but no loss of human lives reported.

Food Security and Livelihood Management

Fisheries management is coordinated by the national government, Ministry of Oceans and Fisheries. The national plan and its implementation plan are the basic framework for the management of Ansan City's fisheries. The fisheries catch shows increasing trend while the number of fisher is decreasing. Various supports for fishers are implemented by Ansan City government including fish fingerling release, environmental friendly aquaculture development etc.

Malnutrition and poverty incidents are rare in Ansan City. The government of RO Korea is implementing social welfare policies which support disabled and marginalized group of residents. The City is implementing government's social welfare policies to ensure the minimum livelihood and meet the basic needs of the socially vulnerable people. Various livelihood support programs are also available to those who need support. These support programs are very helpful especially to young generation to start their own livelihood projects.

Pollution Reduction and Waste Management

Ansan City is implementing the Ansan City Comprehensive Environmental Protection Plan which is the backbone of the water quality protection of the City. The budget relating to the water quality management is about KRW 12,470M in 2016. Many activities are on-going for protection of the water environment. Still, it was found that the water quality of the streams of Ansan City is degrading trend. This is one area that Ansan City should put more efforts in the future.

Air quality and wastewater effluent quality are in good condition. Municipal solid waste generation is steadily increasing but the City is effectively collecting and treating using several treatment facilities. The City shows a 53% of recycling rate of municipal solid wastes. Industrial waste generation shows steady trend. Ansan City will need to enforce more stringent measures for the industrial waste reduction.



Ansan city

Overview

Ansan City is located at the South West of Seoul (within 30 radius away) and is open to West Sea of the Republic of Korea. The City is adjacent to Gunpo City (East), Yellow Sea, Hwaseong City and Uiwang City (South) and Siheung City (North). Ansan City was first developed in accordance with the Industry and Population Decentralization Policy of Seoul city. Ansan city is artificially developed with strict planning scheme to be an environment and residents oriented city. Ansan city has relatively smooth geographical feature in the inland along with low hill areas in Northern (Mt. Gwangdeok / Mt. Ma) and Southern areas (Mt. Nabong / Mt. Chilbo). Numerous streams such as Banwol Stream, Ansan Stream and Hwajeong Stream are passing through downtown areas with wide alluviums in vicinity. Most of them are cultivated and used as rice fields.





Jurisdictional boundary of Ansan City. White background is land areas including islands. Solid blue line is territorial boundary and dotted blue line is coastal water boundary.

Territorial wise, Ansan City possesses large part of Shihwa Lake and more than 2/3 of its dike including tidal power plant as well as Daebu Island.

Key Facts (As of 2015)

Land area (km ²)	Total land area: 149.50km ² Districts: Sangnok-gu: 57.99km ² / Danwon-gu: 91.51km ²
Coastal length (km)	84.5km
Population	Number of population: 763,716 Sangnok-gu: 390,876 / Danwon-gu: 372,840
Administrative District	Administrative district: 2 gus 25 dongs 1,228 tongs 6,002 bans Sangnok-gu: 13 dongs 624 tongs 3,109 bans / Danwon-gu: 12 dongs 604 tongs 2,893 bans
Fiscal Scale	Fiscal scale: 1,277.5 billion won (Revised supplementary budget in 2014) General account: 957.5 billion won / Special account: 320 billion won
school	Number of schools: 211 Kindergarten (96), elementary school (54), middle school (29), high school (24), college (3), university (2), graduate school (1) other (2)
Business (As of Jun. 30, 2014)	Number of businesses: 10,364 Banwol Industrial Complex (7,111), Shihwa Industrial Complex (2,818), Banwol Plating Industrial Complex (106), other (329)

City Symbols



City Emblem

The slanted oblique yin and yang symbol stands for the hopeful waves of the West Coast and contains an image of the number 2 of the 21st century. The logo means that Ansan will be the center of the west coast era. The gradual enlargement of the circles means expansion to the world and the three circles stand for state-of-the-art city, maritime city and culture and arts city.



City Mascot - Techmi

Stands for advancing as futuristic industrial city of the 21st century while being in harmony with nature.



City tree - Gingko

The ginkgo is unchanging. It has a long life, beautiful leaves and bears nuts. The majesty of it stands prosperity and harmony.



City flower - Rose

A rose withstands pollution and takes pride of its beauty. variety of breeds stands for unlimited wisdom: the subtle scent for elegance, and the thorns for courage to fight for justice.



City bird - Swinhoe's Egret (*Egretta eulophotes*)

Swinhoe's Egret represents the city's leap toward the future while respecting the tradition of cherishing the noble spirits of scholars. It is white and inhabits natural, clean areas, representative the city's cleanliness and integrity. A natural monument considered globally rare, the bird represents the citizens' commitment to taking the lead in preserving the environment.

City Population

Population by District, Ethnicity and Sex (December 2014)

Item	Total			Korean				Foreigners		
	Population			Household	Population			Population		
	Total	Male	Female	Total	Total	Male	Female	Total	Male	Female
Total	761,631	393,436	368,195	283,527	707,876	362,826	345,050	53,755	30,610	23,145
Sangnok-gu	390,693	198,980	191,713	152,242	381,508	194,419	187,089	9,185	4,561	4,624
Danwon-gu	370,938	194,456	176,482	131,285	326,368	168,407	157,961	44,570	26,049	18,521

Population by year (as of Dec 2014)

Item / Year	Number of Households	Population		
		Total	Male	Female
2014	283,820	764,831	395,026	369,805
2013	283,650	762,915	393,949	369,966
2012	282,006	758,573	391,349	367,224
2011	281,655	759,902	392,463	367,439
2010	280,919	753,862	389,878	363,984
2009	273,075	739,493	380,939	358,554
2008	273,025	741,073	382,024	359,049
2007	269,534	734,713	379,312	355,401
2006	264,603	723,075	373,513	349,562
2005	253,174	697,239	359,764	337,475
2004	244,608	686,873	355,002	331,871
2003	236,313	671,687	347,861	323,826
2002	223,529	637,660	328,950	308,710
2001	205,712	598,560	310,026	288,534
2000	195,972	575,574	299,064	276,510



Industry by Sector

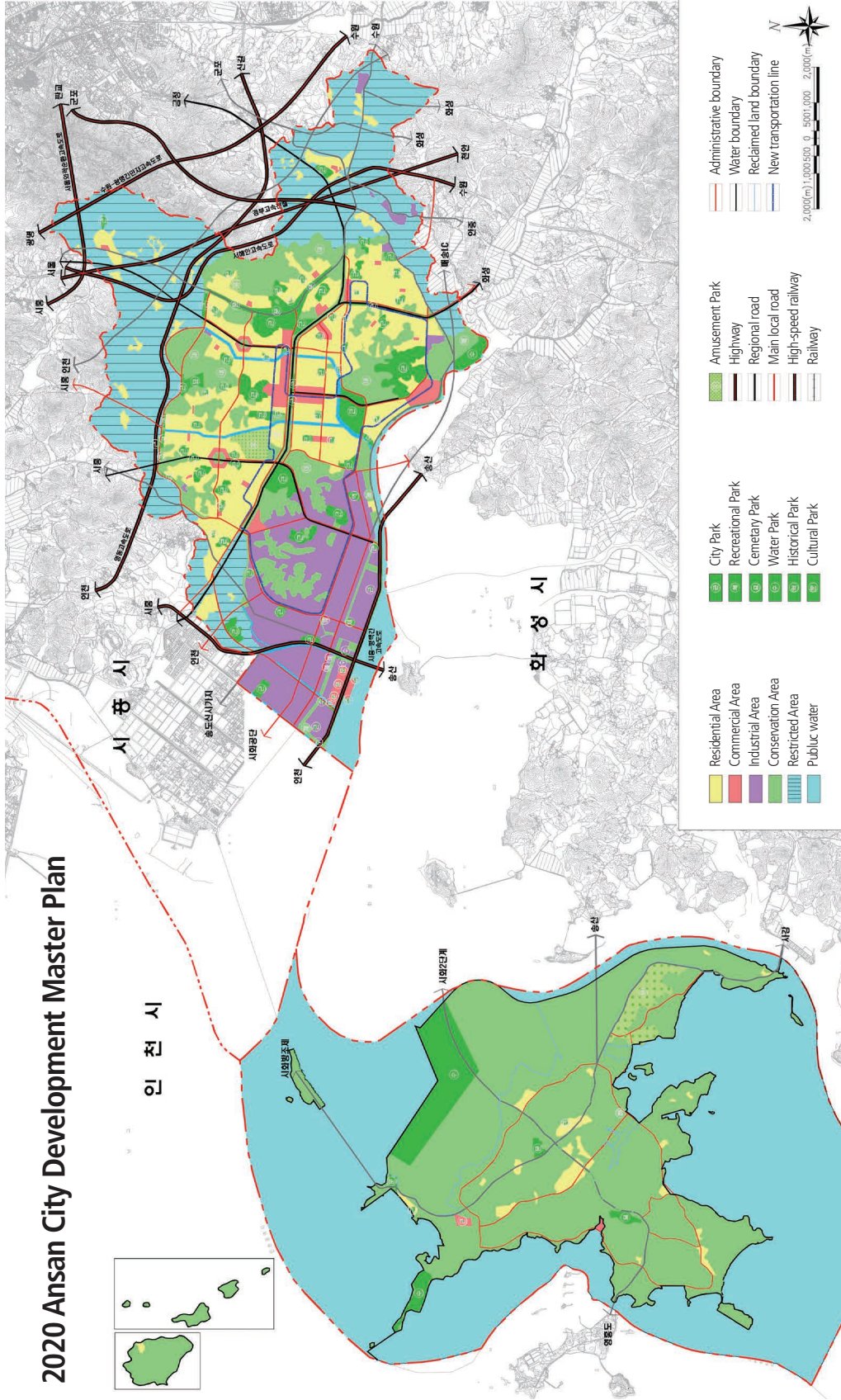
Sector	Number of enterprises	Employees
Agricultural	3	41
Sewerage waste management	119	1,360
Mining	2	36
Manufacturing	7,788	125,772
Utility (Electricity, gas, water)	15	686
Construction	1,537	9,731
Wholesaler/retailer	11,214	34,754
Accommodation/restaurants	8,459	24,085
Transportation	5,886	11,670
Information and communication	188	1,510
Financial/Insurance	451	6,634
Real-estate/Rental Service	1,906	5,570
Public Affair/Social Security/Administration	87	4,897
Education	2,083	17,832
Medical and Social Welfare	1,691	17,542
Entertainment/Culture/Sports	1,669	5,098
Other public, repair, private services	6,664	37,073
Total	48,054	278,863



City government organization

























2020 Ansan City Development Master Plan




2020 Ansan City Development Master Plan. In 2015, Ansan City adopted a Master Plan for the development of the City till 2020. Incorporating future development plan in zoning schemes, the Master Plan will guide the future work of the City in a sustainable and systematic way. (Source: 2020 City Master Plan)


Core Indicators For Soc Reporting For Ansan City


Category	SOC Code	Indicator	Trend (2010-2105)
Governance			
Policy, strategies and plans	001	Coastal profile and environmental risk assessment	
	002	Coastal strategy and action plans	
	003	Local government development plan, including coastal and marine areas	
Institutional arrangements	004	Coordinating mechanism	
	005	Participation of stakeholders in the coordinating mechanism	
Legislation	006	ICM enabling legislation	
	007	Administration and monitoring of compliance to legislation	
	008	Environmental cases filed/resolved	
Information and public awareness	009	Public education and awareness	
	010	Stakeholder participation and mobilization	
Capacity development	011	Availability/accessibility	
	012	Human resource capacity	
Financing mechanisms	013	Budget for ICM	
	014	Sustainable financing mechanism	
Sustainable Development Aspects			
Natural and man-made hazard prevention and management	015	Level of preparedness for disasters	
	016	Degree of vulnerability to disasters	
	017	Social and economic losses due to disasters	

Habitat protection, restoration and management	018	Habitat management plan and implementation	
	019	Areal extent of habitats	
	020	Protected areas for coastal habitats and heritage	
	021	Reclamation and conversion	
Water use, supply management	022	Water conservation and management	
	023	Access to improved water source	
	024	Incidences/deaths due to waterborne diseases	
Food security and livelihood management	025	Fishery management plan and implementation	
	026	Fisheries production	
	027	Malnutrition rate	
	028	Poverty, education and employment	
	029	Livelihood programs	
Pollution and waste management	030	Management plans	
	031	Water quality	
	032	Air quality	
	033	Sanitation and domestic sewerage	
	034	Municipal solid waste	
	035	Industrial, agricultural and hazardous wastes	

Trend

 Good (Improving)

 Bad (Deteriorating)

 Baseline data only or data not conclusive

___ No data

Indicators

What are indicators?

Indicators are quantitative/qualitative statements or measured/observed parameters that can be used to describe existing situations and to measure changes or trends over time (Duda, 2002). Indicators are developed as tools to make monitoring and evaluation processes operational. To become powerful ICM management tools, indicators must demonstrate the measure of effectiveness of a project, program or policy. They become effective tools when they are used to reflect changes in the state of coastal and marine environments, trends in socioeconomic pressures and conditions in coastal areas, and corresponding links among anthropogenic activities and ecological health. Finally, when used to evaluate ICM program performance, indicators offer feedback on action plans and provide parameters for subsequent actions that may prove useful in justifying further investments in ICM (Chua, 2006).

What are the indicators for the State of the Coasts?

Indicators for the State of the Coasts were determined based on PEMSEA's Framework for Sustainable Development of Coastal Areas thru ICM (Annex 1) to indicate current status, management responses, targets and impacts of management actions in each of the governance elements (policy, strategies and plans; institutional arrangements; legislation; information and public awareness; capacity development; and financing mechanisms) and the five sustainable development aspects (natural and man-made hazard prevention and management; habitat protection, restoration and management; water use and supply management; food security and livelihood management; and pollution reduction and waste management). The indicators were chosen based on the following criteria: (a) simple and meaningful; (b) easy applicability in the region; and (c) complementary to the indicators identified in relevant international instruments, including the World Summit on Sustainable Development (WSSD), Agenda 21, the Millennium Development Goals (MDGs) (Annex 2), the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), and the Bali Plan of Action.



What are the core indicators for SOC included in this report?

From a total of 160 indicators based on the Framework for Sustainable Development of Coastal Areas through ICM, a set of 35 core indicators were identified for the development of the initial SOC report. These 35 core indicators are considered to be a basic set of indicators for evaluating changes that have occurred in the Province over time as a consequence of ICM implementation. As the SOC becomes operational, more indicators will be considered in the succeeding SOC reports (PEMSEA, 2011).

How are the indicators presented in this report?

Each of the indicators is presented in the following format:

- a. Category, which identifies the particular governance element or sustainable development aspect in the Framework for Sustainable Development of Coastal Areas
- b. Name of the indicator
- c. Description of the indicator
- d. Rationale for using the indicator in the SOC
- e. Data requirements
- f. Results which describe the current status, management actions and impacts of management interventions in the area relating to the particular indicator
- g. Implications of results and recommendations to respond to changing conditions



Governance

Policy, strategies and plans

001 Coastal profile and environmental risk assessment

Description

This indicator measures the percentage of coastline that has undergone environmental risk assessment, coastal profiling or similar science-based evaluation in order to identify priority issues/threats to sustainable development of coastal and marine resources.

Rationale

Effective coastal management relies on planning that takes into account strategic and scientific assessment of the area, including social, cultural, political, economic, environmental and policy issues, and the identification of priority concerns for coastal managers and policymakers. This strategic assessment should be the basis for developing strategies and action plans for coastal management.

Data requirements

- Total length of coastline
- Coastal environmental profile/environmental risk assessment/other similar assessments
- Length of coastline covered by environmental assessment

Results

The total length of coastline of Ansan City is 94.69 km. The area of coastal waters within the City's jurisdiction is about 241.49 km² among which tidal flat covers about 54.75 km². Ansan City's coastal area encompasses more than two thirds of the dike of Shihwa Lake and Daebu Island and its adjacent small islands.

The coastal profile and environmental risk assessment of Ansan City have been conducted through the regular National Coastal Survey which is being conducted every 5 year for the entire coasts of RO Korea in accordance with Article 5 of Coastal Management Act. The National Coastal Survey includes assessment of environmental profile, socio-economic and use status of the coasts. Table 1 summarizes the National Coastal Survey. The Survey has been the foundation for the development of the National Integrated Coastal Management Plan of RO Korea.

Table 1. Brief description of the national coastal survey

(source: www.coast.kr)

Survey	1 st Coastal Survey	2 nd Coastal Survey	3 rd Coastal Survey
Survey Period	2002-2004	2009	2014
Contents	Natural environment, socio-economic condition, resources utilization, pollution etc.	Coastal socio-economic, utilization, natural environment, pollution, natural disaster, policy development	State of the coasts, utilization, hazards, coastal environment, natural environment, socio-economic condition



The National Coastal Survey provides comprehensive information regarding coastal profile and use information including vulnerability and hazards at the coastal areas. Based on the survey results, the 10-year National Integrated Coastal Management Plan has been established in accordance with the Coastal Management Act (CMA). The law also requires the development of local integrated coastal management plan by all local governments. In line with the CMA, Ansan City developed the 1st Ansan City Integrated Coastal Management Plan (2009-2014) and the 2nd Ansan City Integrated Coastal Management Plan (2015-2021).

Through the studies and research for developing various development plans such as 2020 Ansan City Development Master Plan, 2020 Ansan City Urban Development Plan, 2020 Ansan City Greening Master Plan, Daebu Island Development Master Plan, among other, the City developed comprehensive environmental profile and disaster risk map. Ansan City is continuously updating the state of environment and vulnerability of the city in order to systematically address the potential problems.

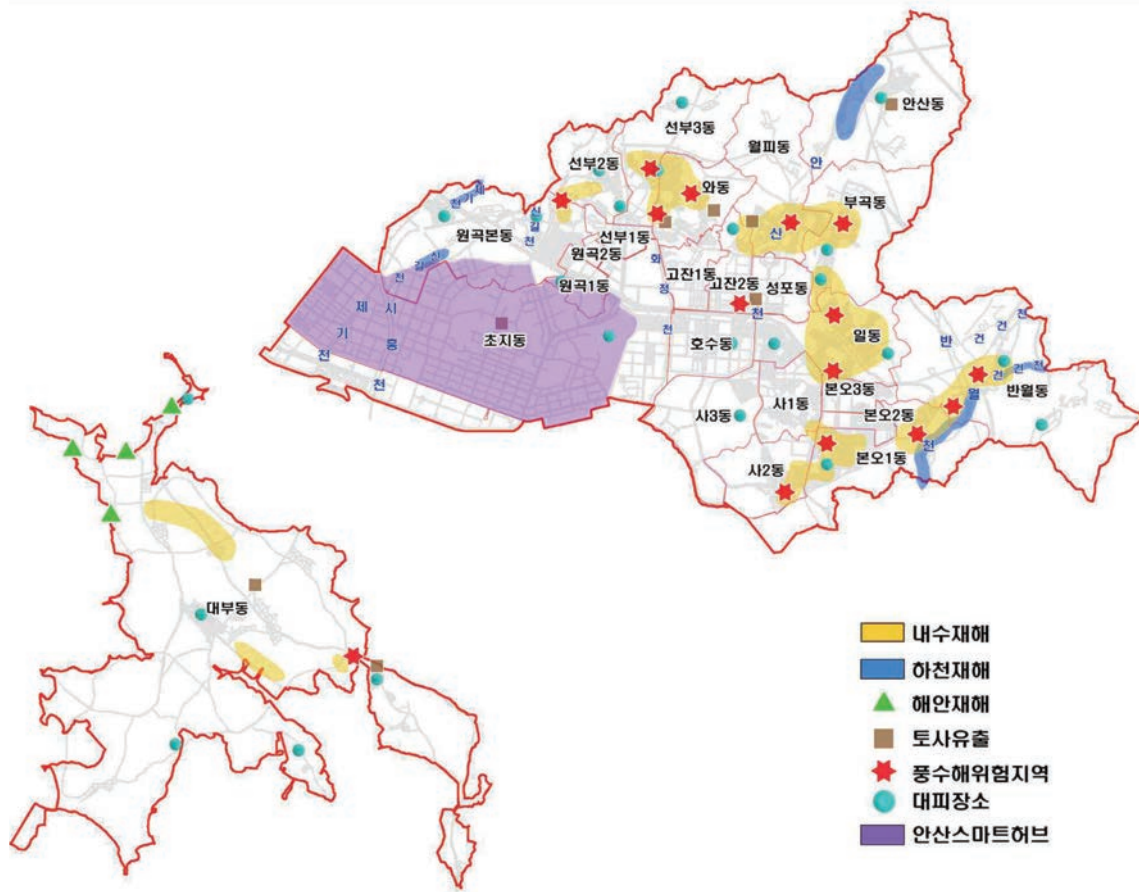


Figure 1. Storm and flood hazard map of Ansan City (source: 2020 Ansan City Development Master Plan)



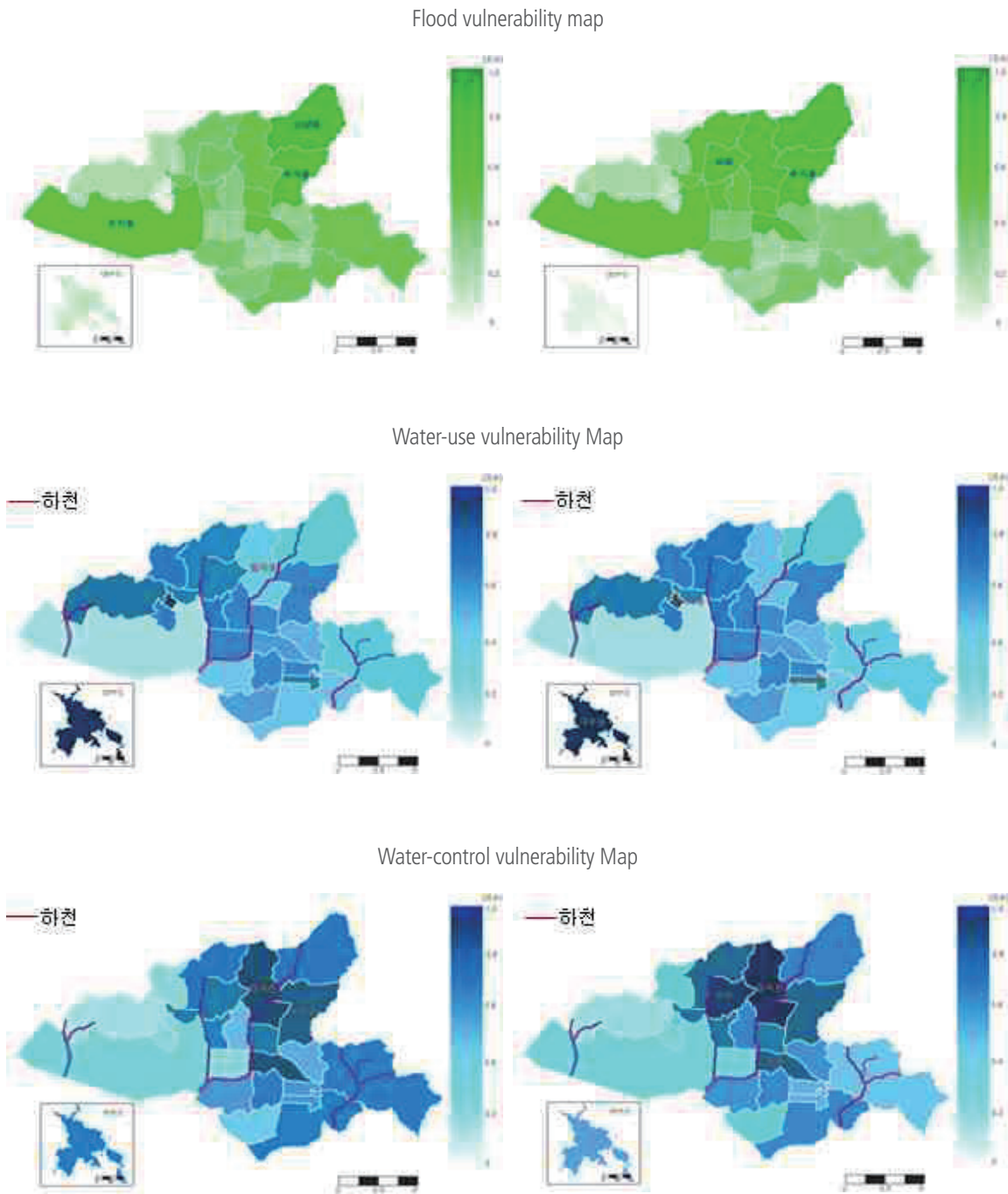


Figure 2. Ansan City water vulnerability maps (Upper: flooding; Middle: water use; Bottom: water control)
(source: 2020 Ansan City Urban Development Plan, 2013)

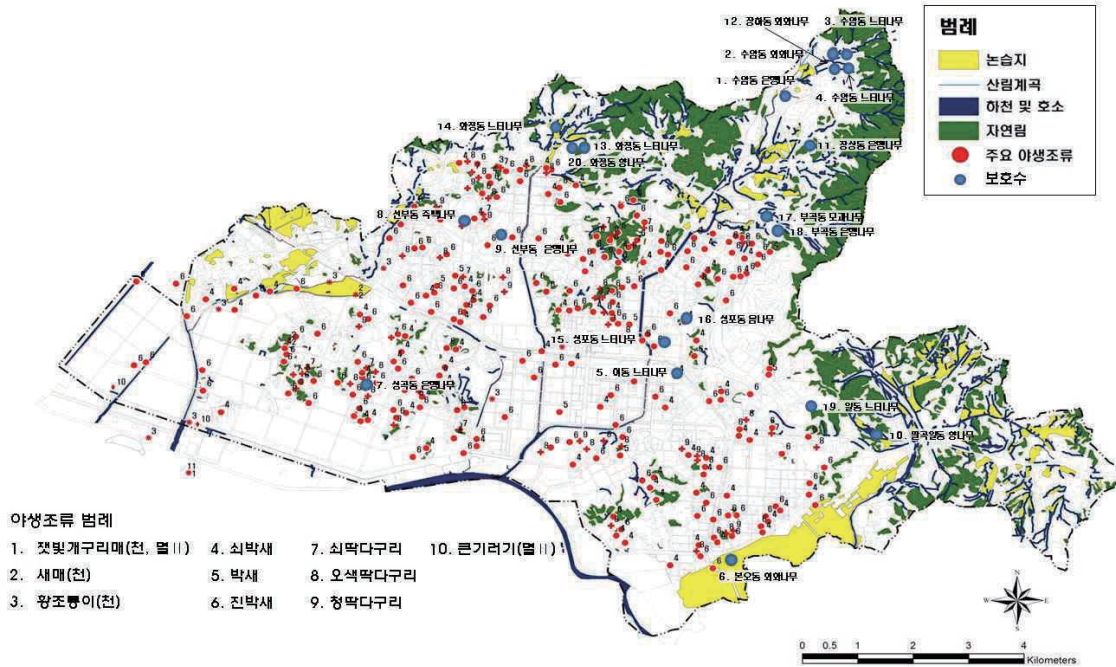


Figure 3. Ansan City urban forest resource map
(source: 2020 Ansan City Urban Greening Master Plan, 2011)

Implications and Recommendations

The assessment of coastal areas through the regular National Coastal Survey in accordance with the Coastal Management Act provides comprehensive and scientific information for coastal policy development. In addition, Ansan City also conducts various assessments of City’s environment and vulnerability in a regular basis (every 5 year). The results of the assessments become sound foundation of the many development plans of the City. Ansan City is recommended to continue monitoring the environment and vulnerability along the coastal areas considering the changing environment and climate.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City
 2nd Ansan City ICM Plan, 2015, Ansan City
 Coastal Information Portal, www.coast.kr, Ministry of Oceans and Fisheries
 2020 Ansan City Development Master Plan, 2015, Ansan City
 2020 Ansan City Urban Development Plan, 2013, Ansan City
 2020 Ansan City Urban Greening Master Plan, 2011, Ansan City



Policy, strategies and plans

002 Coastal strategy and action plans

Description

This indicator measures the scope, coverage and objectives of coastal management, as delineated in coastal strategies and action plans. The indicator further looks into the specific roles and responsibilities for different stakeholders, proposed interventions to address existing or potential threats to sustainable development, including economic, biophysical and social aspects with specified targets and timeframes. Finally, the indicator determines the government's commitment to implement the coastal strategy or action plan through its adoption at the provincial/city/municipal level.

Rationale

A coastal strategy is a critical component of ICM, providing a framework for integrated planning and management. It not only serves as a platform for policy reform that promotes good governance, but facilitates interagency consultation, multisector cooperation and stakeholder participation. A coastal strategy identifies conflicts arising from multiple use of limited marine and coastal resources, establishes approaches and actions for protecting or enhancing environmental quality and biodiversity, while facilitating environment-friendly economic development and environmental investment opportunities. The strategy will not be useful if it is not adopted and translated into on-the-ground actions. Action plans define: a) the steps that are required in order to execute the strategies; b) the milestones or indicators that can be used to measure progress and changes; c) the timeframe for the actions; d) the roles of the various stakeholders; and e) the measures for monitoring the implementation of the strategy.

Data requirements

- Coastal strategy and action plans
- Management boundary (geographic) of the Plan
- Operational management plans
- Multisectoral participation mechanisms
- Local government commitments to implementation
- Monitoring and evaluation program

Results

RO Korea's modern, holistic and systematic management of coastal area has begun in 1999 through the enactment of the Coastal Management Act (CMA). The CMA provides the framework for designating coastal use zones and coordinating multiple uses of coastal resources in the context of sustainable development. It stipulates the regular survey of coastal areas of RO Korea, the establishment of long-term ICM plan and its implementation plan at the local level, designation of coastal use zoning, establishment of coordinating mechanism at national



and local level, implementation of coastal management activities, and enforcement of coastal management-related laws, among others.

The Article 6 of the CMA stipulates the establishment of National Integrated Coastal Management Plan which acts as the coastal strategy of RO Korea. The National ICM Plan provides overarching framework for the sustainable development of the entire coastal areas of RO Korea. The Plan establishes vision and strategies for the sustainable development of the coastal areas for the next 10 years. In order to operationalize the National ICM Plan, the Article 9 of the CMA stipulates the establishment of the Local ICM Plan by all local governments. The Local ICM Plan serves as the implementation plan for the National ICM Plan.

In 1999, the MOF established the 1st National Integrated Coastal Management Plan for 2000-2010. During this period, around 70% of the local governments had developed their local ICM plans due to lack of capacity and funding in implementing the plan. In 2010, as the 1st plan expires, MOF developed the 2nd National ICM Plan for 2011-2021. During the 2nd plan phase, all the local governments developed their local ICM plan. Now, 100% of RO Korea's coastal areas are covered by ICM program.

The Local ICM Plan is developed following the process shown in Figure 4. As shown in the figure, Ansan City needs to develop a draft Ansan City ICM Plan through experts and stakeholders meetings. Then, the draft plan will go through the review and approval process of the local and national ICM coordinating committees. Finally, the Minister of the Ministry of Oceans and Fisheries approves the plan.



Figure 4. Establishment process of the Local ICM Plan

In the CMA, the coastal area is comprised of two areas: coastal land and coastal sea areas. Coastal land is defined as the land area from the coastal sea toward the land area. Figure 5 shows the administrative boundary of coastal and marine areas under the Ansan ICM Plan. In this figure, Ansan has more than 23,523 ha of coastal sea area which covers more than 78% of their coastal areas.



Figure 5. Administrative boundary of coastal and marine areas
(source: 2nd Ansan City ICM Plan)

Table 2. Coastal Areas of Ansan City

	Coastal land	Caostal sea	Total
Area (ha)	6,299	23,523	29,823
Coverage (%)	21.1	78.9	100

(source: 2nd Ansan City ICM Plan)

The 2nd Ansan City ICM Plan is a 6 year plan (2015-2021) which provides the vision of “ecosystem-based regeneration” and target of “harmonized coastal environment and balanced coastal utilization”. The plan includes 4 objectives and 10 strategies as shown in Table 3.

Table 3. Objectives and strategies of the 2nd Ansan City ICM Plan

Objective	Strategy
New paradigm for coastal area management	1. Setting natural disaster management target and operation considering coastal utilization and environment
	2. Establishing coastal use zoning in consideration of coastal use types and future needs
	3. Planned and coordinated use of coastal resources through suitability assessment of sea areas
Objective	Strategy
Enhancing coastal ecosystem health and coastal scenic beauty	1. Monitoring of water quality targets of Specially Managed Seas
	2. Reducing the adverse impacts of development projects on coastal scenic beauty
Strengthening climate change and disaster response	1. Protecting coastal defense facilities in response to sea-level rise and climate change
	2. Protecting natural coastlines from unplanned development
Establishing coastal governance	1. Building management capacity for coastal use conflict
	2. Establishing and operation of the Coastal Management Council
	3. Enhancing citizen groups for coastal protection

Implications and Recommendations

The 1st and 2nd ICM Plans of Ansan City have been the framework for the sustainable coastal management of Ansan City. The plan is being updated for every 6 years to respond to changing environment as part of adaptive management strategy. Ansan City is putting significant resources for the implementation of the ICM Plans. It is recommended that Ansan City continue to strengthen the implementation of the ICM program.

References

2nd Ansan Integrated Coastal Management Plan, 2015, Ansan City
Coastal Information Portal, www.coast.kr, Ministry of Oceans and Fisheries

Policy, strategies and plans

003 Local government development plan incorporating coastal and marine areas

Description

This indicator reviews the local government units that have integrated coastal management issues and sustainable development of coastal and marine resources into their multi-year development plans.

Rationale

To determine an understanding of their commitment to coastal management, the development plans of local government units can be evaluated to ascertain whether the sustainable use of coasts and near coastal areas and the associated resources have been recognized for their value and the role they play in the development process. The integration of ICM into the development plans of local government units reflects a local commitment to ensure the protection and development of coastal and marine areas in the broader context of the coastal development strategy/SEMP, through a more integrated economic, social and environmental policy and planning approach.

Data requirements

- Local development plans

Results

In accordance with national laws, Ansan City has formulated various development plans in order to design and shape the City in a systematic and coordinated manner. The development plans have to go through the City-wide coordination committees involving city officials, invited experts and citizen representatives. Once approved by the committee, the plans should be approved by the City Council for the budget approval and legal conflict and soundness check. The City Council is the final authority over the budget for the plans and their approval is the most important step to finalize the plans. The City Council is formed by the general election, and hence it represents the residents of the City.

Several development plans established by Ansan City are available. The following are few selected plans relevant to ICM, including:

- 2nd Ansan City Integrated Coastal Management Plan (2015-2021)
- 2020 Ansan City Development Master Plan (2015)
- 2020 Ansan City Urban Development Plan (2013)
- 2020 Ansan City Urban Greening Master Plan (2013)
- 2nd Ansan City Comprehensive Environmental Protection Plan (2012-2016)
- Daebudo Treasure Island Project 2030 (2015)
- Ansan City Climate Change Adaptation Implementation Plan (2013)



- Ansan City Landscape Management Plan (2011)

Also, the government of RO Korea established numerous plans for sustainable development of the country in accordance with the relevant laws. The ICM related national plans which cover Ansan City in the plan include:

- 2nd National Integrated Coastal Management Plan (2011-2021)
- 4th National Comprehensive Marine Environment Management Plan (2011-2020)
- 3rd Shihwa Lake Comprehensive Environmental Management Plan (2012-2016)
- 1st National Marine Ecosystem Conservation and Management Plan (2008-2017)
- 2nd National Fishing Ground Management Framework Plan (2012-2016)
- 4th National Comprehensive Land Management Plan (2007-2016)
- 3rd National Capital Area Development Plan (2006-2020)
- 2nd Fishing Village and Fisheries Port Development Framework Plan (2014-2018)
- 2nd National Coastal Maintenance Plan (2010-2019)
- 3rd Public Waters Reclamation Plan (2011-2021)
- 1st Unmanned Island Management Plan (2010-2019)
- 3rd National Port Development Framework Plan (2011-2020)
- 1st National Marina Development Plan (2010-2019)
- West Sea Area Tourism Development Plan (2008-2017)

The government of RO Korea led by the Ministry of Oceans and Fisheries and other ministries has been implementing those plans with the national and local budgets. As Ansan City is located in the national capital region, the City is receiving significant attention from the national government for its sustainable development.

Among those plans, the Daebudo Treasure Island Project 2030 is one of the top priority plans of the Mayor, Dr. Je Jong-Geel. The Mayor wishes to develop the Daebu Island as an eco-centered, sustainable development model case since the City considers the coastal and marine areas as one of the key future growth engines of the City. The total budget planned for the Project is KRW 686,310M (approx. US\$ 623M at the exchange rate of KRW 1,100/\$ 1). The details of the Project are introduced in following section. The Daebu Island has been designated as PEMSEA's ICM site of Ansan City in 2015.

Implications and Recommendations

Ansan City developed various development plans for the sustainable management of coastal and marine resources of the City. Also, most of the national plans cover Ansan City as one of the target local governments. Among them, the Daebudo Treasure Island Project 2030 is the key development plan which the City government is putting significant efforts. It is recommended that Ansan City collaborate with other Cities in the region for exchange of knowledge and success stories in developing their environment as sustainably and beautifully. PEMSEA's PNLG can be a good learning network for Ansan City.

References

- 2014-2015 Ansan City Whitebook, 2006, Ansan City
- 2020 Ansan City Development Master Plan, 2015, Ansan City
- Daebudo Treasure Island Project 2030, 2015, Ansan City





Overview of Daebudo (Daebu Island)

- Population
- Size
- Culture
- Tourism
- Production



Daebu Island Development Plan

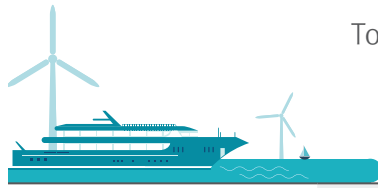
-  Confirmed and/or finished
-  Under planning



Daebudo Treasure Island Project 2030

4 Areas and 22 Projects

Total investment of **KRW 686,310M**
(all units in KRW)



Sea **427,530M**

Sea

Bangameoree Marina Port	99,700M
Marine Safety Experience Center	40,000M
Shihwa Lake Boatline	2,800M
Bangmeoree Coastal Improvement	17,940M
Biofloc aquaculture complex	10,000M
Gyeonggi Mudflat Research Center	32,300M
Carbon Zero City	37,590M
Aquarium	170,200M
Daebudo LNG Satellite Center	17,000M



Culture / Tourism **142,719M**

Culture/Tourism

Daebudo Sport Culture Center	22,500M
Museum Street	202M
Sedimentary Rock Natural Concert Hall	19,437M
Healing Complex	100,000M
MICE Tourism Center	580M



Ecology **2,964M**

Ecology

Eco-tourism Village	300M
Pungdo Wild flower field	164M
Daebu Halophyte field	500M
Marine Ecovillage	2,000M



Transport **113,097M**

Transport

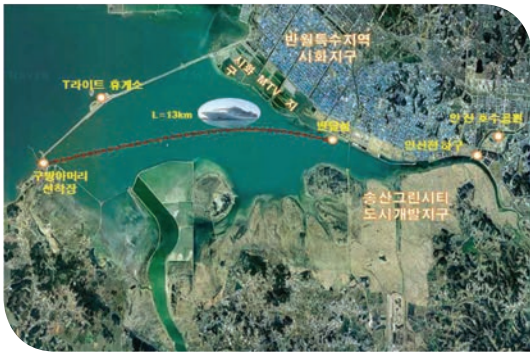
Coastal road	45,700M
Track and hiking road	18,700M
Daebudo Double-deck bus	2,700M
Daebudo Eco-train	45,997M



Bangameoree Marina Port



Marine Safety Experience Center



Shihwa Lake Boatline



Bangameoree Coastal Improvement



Biofloc Aquaculture Complex



Gyeonggi Mudflat Research Center



Carbon Zero City



Aquarium



Daebu LNG Satellite Center



Daebu Sport and Cultural Center



Museum Street



Sedimentary Rock Natural Concert Hall



Healing Complex



MICE Tourism



Eco-tourism Village



Pungdo Wild Flower field



Daebu Halophyte field



Marine Ecovillage



Coastal road



Track and hiking road



Institutional arrangements

004 Coordinating mechanism

Description

This indicator considers the presence of a functional interagency and multisectoral coordinating mechanism that oversees the development and implementation of the ICM program. The indicator further looks into the institutionalization of a local office with adequate administrative resources – staff, budget and equipment – to oversee, guide and coordinate the implementation of coastal strategies and action plans.

Rationale

A fully functional coordinating body consisting of the government agencies, nongovernment entities, the private sector, civil society and other stakeholders, as appropriate, is a key component of ICM programs. The purpose of the coordinating mechanism is to harmonize any overlapping responsibilities of line agencies and stakeholder interests, as well as to integrate policy and management interventions. Moreover, the availability and allocation of adequate administrative resources for ICM is an expression of the capacity of the ICM management team to administer, coordinate and implement activities over time. In the implementation of ICM, there is a need for a local office to serve as a clearing house, central coordinating agency and focal point for multisectoral activities.

Data requirements

- Coordinating mechanism established and legal basis
- Organizational structure of the coordinating mechanism
- Coordinating office established and legal basis
- Organizational structure of the coordinating office
- Staff and budget allocation of the coordinating office

Results

Coordinating mechanism is an important element of the ICM program. It brings the various stakeholders together for resolving the conflict and drawing consensus for sustainable development of the coastal areas. In RO Korea, the coordinating mechanism is stipulated in the Coastal Management Act (CMA). The CMA requires the establishment of the coordinating committee at the national and local levels. The summary of national and local ICM coordinating committees relating to Ansan City ICM program is shown in Table 4.



Table 4. National and local ICM committees

Committee	National ICM Committee	Gyeonggi ICM Committee
Chair	Vice Minister Ministry of Oceans and Fisheries	Director General Agricultural and Oceans Bureau Gyeonggi Province
Members	20 Mandatory members: 7 senior officials from Ministry of Finance, Ministry of Defense, Ministry of the Interior, Ministry of Industry, Trade and Natural Resources, Ministry of Environment, Ministry of Land and Transport Invited experts: recommended by Minister of Ministry of Oceans and Fisheries	15 Mandatory members: 2 officials (1 from Gyeonggi Province Council and 1 from Gyeonggi Province) Invited experts: Should be more than 1/2 of the members
Legal basis	Article 30, Coastal Management Law	Article 31, Coastal Management Law
Terms of Reference	Ministerial Decree No. 296 (2006)	Gyeonggi Provincial Ordinance No. 4651 (2004)
Secretariat	Coastal Planning Division Ministry of Oceans and Fisheries	Oceans and Fisheries Division Gyeonggi Province

As Ansan City is under the coordination of the Gyeonggi Province, the CMA does not require the establishment of a city level ICM coordinating committee. However, the 2nd Ansan City ICM Plan stipulated that the City will establish the "Ansan City Coastal Management Council" (tentative name) to coordinate City level ICM program implementation. The Council will be composed of local governments, experts, civil groups, academe, and private sector. Also, development programs relating to ICM are being coordinated by various committees such as the City Planning Committee and the City Landscape Development Committee.

Ansan City created the Daebu Marine Tourism Headquarters in 2015 in order to spearhead and coordinate the work of ICM and sustainable development of Daebu Island. Stationed in the Daebu Island, the Headquarters is taking the leadership role for the Daebudo Treasure Island Project 2030 which is the flagship program of the City. The Headquarters contains three divisions, namely: Daebu Development Division; Tourism Division; and Maritime Fisheries Division. The focal point of ICM implementation is the Marine Fisheries Division.



Opening of the Daebu Marine Tourism Headquarters in Daebu Island

As a coordinating mechanism within the City, Ansan City promotes inter-division dialogues. In 2015, the City organized 53 inter-division consultation meetings involving 30 lead divisions and 67 collaborating divisions to encourage inter-division coordination. For resolving conflicts between divisions, 2 collaborative meetings and 4 policy talks were organized. The City is encouraging all the divisions to engage in inter-division dialogues to establish conflict resolving mechanism and to reduce potential conflicts in policy implementation. To officially launch the ICM coordinating mechanism, Ansan City is planning to establish the Ansan City Coastal Management Council as stipulated in the 2nd Ansan City ICM Plan.

Implications and Recommendations

The local ICM coordinating committee relating to Ansan City ICM program is located in Gyeonggi Province. However, the City level coordinating mechanism within Ansan City is already in place and functioning for coordinating the ICM program implementation. The Daebu Tourism Headquarters is the responsibility center for the ICM program implementation in Ansan City. It is recommended that Ansan City to continue its efforts on coordination for ICM programs among stakeholders and within the City.

References

- Coastal Management Act (1999), Ministry of Oceans and Fisheries
- 2nd Ansan City Integrated Coastal Management Plan, 2015, Ansan City
- 2014-2015 Ansan City Whitebook, 2016, Ansan City



Institutional arrangements

005 Participation of stakeholders in the coordinating mechanism

Description

This indicator reports the pertinent sectors (government, non-government, private, civil society, academe) that are represented in the coordinating mechanism for the ICM program and are part of an integrated decision-making process. It further reflects the commitment of government agencies and other stakeholders to implement, comply with and enforce ICM plans and activities. It also suggests the reality of the execution and performance of ICM initiatives, as well as the degree of acceptance on the part of users subject to the plan.

Rationale

Stakeholder participation is the key to coastal management. The ICM coordinating mechanism provides stakeholders (government and nongovernment) with access to decision-making processes and activities. It provides concerned parties with the satisfaction that their views and concerns are taken into account in the planning and decision-making process. The concerned sectors include those that exploit and use the natural resources for profit, communities that traditionally use natural resources for their food and livelihood, and the public sectors (local and central) that govern and manage the resources.

Likewise, in order to achieve the targets of sustainable use and development of the oceans and coasts, the commitment of national agencies, local governments and concerned non-government stakeholders is essential. Thus, their respective programs, projects and activities should be aligned with the action plans, programs and policies identified in the coastal management plans.

Data requirements

- Representation of stakeholders in the coordinating mechanism
- Staff and budget allocation of agencies in the coordinating mechanism

Results

In accordance with the 2nd Ansan City ICM Plan, Ansan City will establish the Ansan City Coastal Management Council before the end of the planning period (2015-2021). The Council will be composed of civil society, academe, local governments and NGOs. It is expected that the stakeholder participation and coordination for ICM implementation will be significantly enhanced through the Council. To enable the establishment of the Council, Ansan City is also planning to enact the local ordinance for the Council.



Ansan City is encouraging the participation of the residents and citizen groups to City's decision making processes and activities. During 2014-2015 period, the Mayor of Ansan invited the citizens and civil groups to the City's decision making processes through organizing forums and public hearings. These include:

- Establishment and operation of the Citizen Council for Policy Consultation
- Establishment and operation of the Citizen Comptroller Group for securing transparent implementation of policies and projects
- Organization of yearly open forum with residents
- Organization of Citizen Involvement Committee for promoting policies to general public (6 times in 2015)
- Operation of the Citizen Evaluation Group for assessment of policy implementation efficiency



Inauguration of Citizen Council of Ansan City



Inauguration of the 1st Citizen Comptroller Group



Inauguration meeting of the 8th Citizen Evaluation Group

One significant achievement of civil society around Ansan City relating to the resolving conflict of interest among the government and local stakeholders is the Shihwa Lake rehabilitation. The story of citizen groups' efforts of Shihwa Lake rehabilitation is introduced in the following section. Ansan City is continuously putting efforts for sustainable development of the Lake Shihwa.



Implications and Recommendations

Ansan City is putting various efforts in involving residents to ICM and policy implementation. Various committees are available for decision making participation of residents. Now, residents and citizen groups are actively participating in the City's policy making processes. Also, efforts on strengthening the stakeholders' involvement in ICM coordinating mechanism through establishing the Ansan City Coastal Management Council are on-going. The Council is expected to invite NGOs and civil groups as well as experts groups. Through the Council, transparent and participatory process will be further enhanced.



References

- 2014-2015 Ansan City Whitebook, 2016, Ansan City
- 2nd Ansan City Integrated Coastal Management Plan, 2015, Ansan City

Rehabilitation of the Lake Shihwa - Efforts of civil groups

(Rearranged the publication "Shihwa Lake" by Ministry of Maritime Affairs and Fisheries" in 2010)

Lake Shihwa is an artificial lake surrounded by Ansan City, Hwaseong City and Shiheung City. In July 1986, the development plan to build a 12.6 km seawall was approved to create a 133.7km² of reclaimed land as well as 42.3 km² of a freshwater lake for rice paddy irrigation. The Korea Water Resources Cooperation constructed the dike from December 1986 to January 1994.

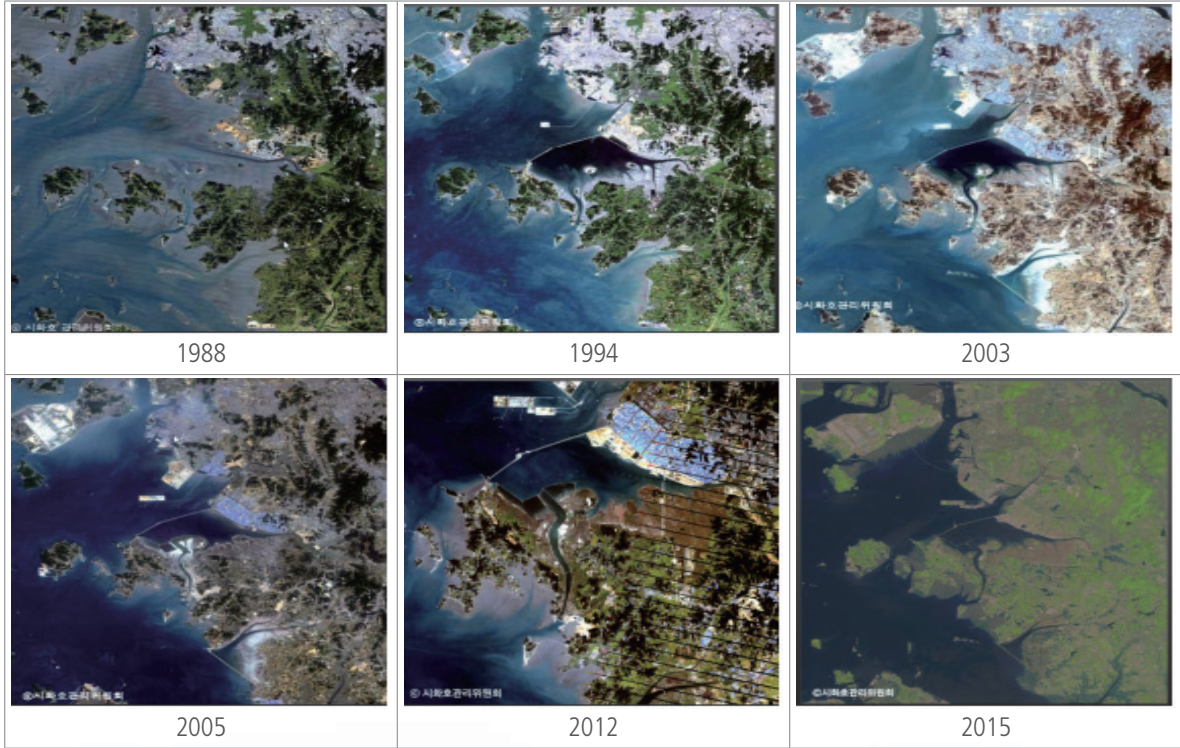
After the completion of the dike, the water quality had been rapidly degraded since 1994 due to increasing pollution loads from the watershed. The lake suffered from severe pollution, e.g., 17.4 mg/L of annual mean Chemical Oxygen Demand (COD) in 1997, so that even treated water from the lake could not be used for irrigation of agricultural lands. Water pollution of the lake brought up huge social and environmental concerns.



Location of Shihwa Lake

In 1997, the Ministry of Environment established water quality improvement plan to control land-based pollution sources with an investment of US\$377 million until the year 2006. The water quality of the freshwater reservoir could not be controlled through any countermeasures because nutrient overloading was unstoppable. It was finally decided that the Lake be designated as a Special Management Area and be managed as a seawater lake rather than fresh water lake in 2000.





Aerial view of the Lake Shihwa from 1998 to 2015

(source: The Lake Shihwa Management Committee, Ministry of Oceans and Fisheries, <http://shihwaho.kr>)



Following the decision to manage Lake Shihwa as a seawater body on 30 December 2000, a systematic and comprehensive management plan “The Shihwa Lake Comprehensive Management Plan” was established by the Ministry of Maritime Affairs and Fisheries (MOMAF) in 2001. Local forums composed of 24 local stakeholders were organized in the process of establishing the plan. The strategic goal of the plan was to establish a management system that enables coexistence of humanity and nature and encourages participation of local people in the management of the lake. Lake Shihwa was designated as a PEMSEA parallel site in 2000, followed by the signing of MOA among MOMAF, local governments and PEMSEA in 2001. The Lake Shihwa management committee was formed in 2002. Operation of Lake Shihwa Management Committee contributed to establish a unified decision-making system that ensures cooperation between various stakeholders such as the national government, the local governments, and the local residents. The Management Plan is a joint venture of all the stakeholders involved. For the 1st Plan (2001-2005), a total of US\$469 million was invested while the 2nd plan (2006-2010) and 3rd plan (2011-2016) invested higher budget.

COD of the Lake is maintained below 3mg/L average and the Shihwa tidal power plant is in operation to increase seawater circulation, which is the most efficient measure for improving water quality and restore its ecosystem. Also, a total pollutant daily loading system is being implemented. Public participation mechanism has been strengthened after ICM program implementation and local capacity building activities. Perception changes were detected among the stakeholders of the Lake Shihwa. Governments, NGOs, and private sectors are trying to work together to balance and harmonize various coastal uses. Lake Shihwa may be a good site for teaching historical lessons on inadequate reclamation planning and its failure as well as for demonstrating how successful the approaches are in achieving sustainable solutions for the future through intergovernmental, interagency and intersectoral partnerships.

*Ministry of Maritime Affairs and Fisheries (MOMAF) is now Ministry of Oceans and Fisheries (MOF) since 2013.



View of Shihwa Lake Tidal Power Plant in Daebu Island (Left), Ansan Reed Wetland Park (Right)

Legislation

006 ICM enabling legislation

Description

This indicator describes the existence and adequacy of legislation enabling the implementation of ICM interventions.

Rationale

The existence, adequacy and effectiveness of legislation are important in order to determine if the goals and objectives of coastal management are supported by a clear and enforceable legal basis. Legislation defines what is required, permitted and prohibited in the coastal and marine area. Awareness and understanding of coastal management legislation promotes compliance and therefore achievement of coastal management goals and objectives.

Data requirements

- Legislations/local ordinances regarding ICM institutional mechanism and management activities
- Coastal use zoning
- Fisheries, mining and other extraction activities
- Pollution-related activities
- Building structures in the coastal environment, including aquaculture structures
- Access to rules and regulations

Results

The Government of Korea enacted the Coastal Management Act (CMA) in 1999. The Act has been constantly updated to improve coastal management effectiveness and included various measures to assist the planning of coastal zone. The development of the sea use zoning scheme has been included in the Chapter 3 Sea Use Zoning Scheme Development and Management of the CMA in 2013. Now local governments can develop the sea use zoning scheme in order to prevent coastal use conflict and manage coastal sea areas more systematically and sustainably.

In the CMA, the Article 15 stipulates the designation of the 4 sea use zones in consideration of various status and needs of the sea area. Within the four zones, 19 specific functional zones can be designated. Table 5 shows the 4 sea use zones and the 19 functional zones.



Table 5. Sea use zoning scheme of RO Korea

Sea use zone (Article 15 of CMA) (4 sea use zones)	Functional zone (Article of 19 of CMA) (19 functional zones)
Multiple use zone	7 functional zones: Port zone, Navigational channel, Fisheries Port zone, Leisure and Tourism zone, Beach zone, Mining zone, Off-shore facility zone
Special use zone	6 functional zones: Water quality management zone, marine survey zone, Disaster management zone, Military facility zone, Industrial zone, Environmental restoration zone
Conservation zone	6 zones: Marine flora and fauna protected zone, Marine ecosystem protected zone, Scenery protected zone, Park zone, Fisheries zone, Cultural heritage protection zone
Managed zone	None of the 19 zones applicable or multiple functional zone

Through the 2nd Ansan City ICM Plan, Ansan City developed the coastal use zoning (CUZ) scheme. Figure 6 shows the four sections of coastal seas managed by Ansan City. In accordance with the research and consultation, the sea use zoning of Ansan City has been finalized as shown in Figure 7 to 10. The coverage of each zone is shown in Table 6. The conservation zone covers 7.48% suggesting more efforts should be exerted to conserve the sea area of Ansan City.



Figure 6. Four regions of Ansan City for Sea Use Zoning

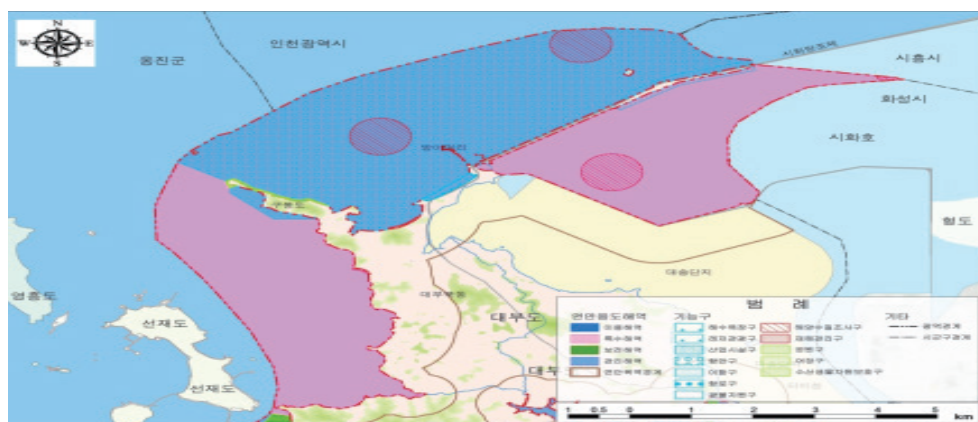


Figure 7. Sea use zoning of Ansan City (region 1)





Figure 8. Sea use zoning of Ansan City (region 2)



Figure 9. Sea use zoning of Ansan City (region 3)

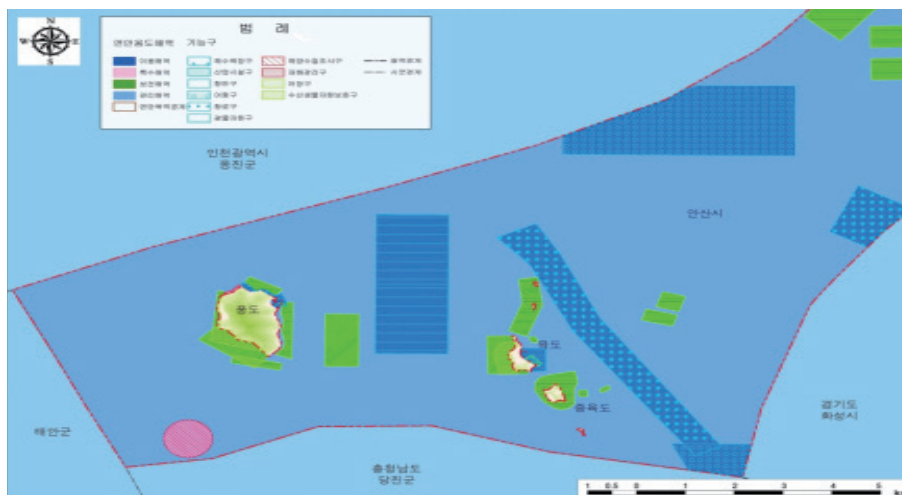


Figure 10. Sea use zoning of Ansan City (region 4)

Table 6. Sea area and coverage of each zone

Zone	Area (km ²)	Coverage (%)
Conservation Zone	17.61	7.48
Multiple use zone	21.56	9.17
Special zone	29.30	12.46
Managed zone	166.77	70.89
Total	235.24	100.00

As a part of the 2nd Ansan City ICM Plan implementation, Ansan City is planning to enact the local ordinance to support the ICM implementation including the Ansan City Coastal Management Council, Coastal Keepers, capacity building activities and others. The ordinance is expected to be enacted in 2017.

Implications and Recommendations

Strong legal basis for coastal management is an imperative for the success of the ICM program. Backed by the Coastal Management Act, Ansan City already developed the sea use zoning scheme as a part of the 2nd Ansan City ICM Plan implementation. Through the sea use zoning scheme, Ansan City is expected to reduce coastal use conflict and efficient resource use in the years to come.

To enable strong ICM implementation, Ansan City will need to establish local ordinance for the ICM implementation. As the implementation of the 2nd Ansan City ICM Plan is on the way, the City is recommended to expedite the process of formulating the local ordinance.



References

2nd Ansan City Integrated Coastal Management Plan, 2015, Ansan City
Coastal Management Act, 1999, Ministry of Oceans and Fisheries

Legislation

007 Administration and enforcement of legislation

Description

This indicator reports the various types and frequency of inspections conducted in the area to determine compliance with coastal policies and legislation. It further looks into the effectiveness of enforcement of legislation.

Rationale

The available capacity within government to enforce laws and ensure compliance with coastal policy and regulations is paramount to successful implementation of ICM programs. The effective management of illegal and uncontrolled activities taking place along the coast and in coastal waters is an important step in addressing and minimizing unsustainable practices.

Data requirements

- Types of environmental compliance monitoring/inspection (i.e., market inspections for fishery violations; aquaculture; manufacturing, coastal polluting and coastal tourism establishments, ports and water transportation)
- Frequency of environmental compliance monitoring/inspection including coastal patrols

Results

Ansan City is putting efforts on environmental compliance monitoring and surveillance throughout the City's establishments. There are several environmental compliance monitoring and surveillance on-going including air quality monitoring, waste water discharge monitoring, illegal fishing monitoring and others.

For the waste water discharge monitoring, Ansan City is mobilizing the Citizen Monitoring Patrol which conducts regular monitoring of river and streams discharge sites, industrial establishments, and requested sites. Table 7 shows the results of monitoring activities of the Citizen Monitoring Patrol.

Table 7. Monitoring results of waste water discharge sites by Citizen Monitoring Patrol

Year	Violation	Action			Clean up
		On-site correction	Administrative correction	Report to relevant offices	
2014	445	408	4	33	42
2015	452	444	1	7	24



There are more than 710 industrial establishments registered as the pollutant emitting facility. Ansan City is regularly monitoring the environmental compliance and, if found violating, legal actions were undertaken. Table 8 shows the environmental compliance monitoring and its results. Although the number of pollutant emitting industrial establishments is increasing over the recent years, the number of violation is decreasing. This is due to the heightened awareness of industrial establishment owners on environmental protection and effective monitoring and surveillance, as well as enforcement of relevant laws.

Table 8. Number of violations for environmental violations

Year	Number of pollutant emitting facilities	Number of establishment inspected	Violation	Administrative Correction		
				Warning	Order of correction	Temporary suspension
2010	292	168	2	1	-	1
2011	300	190	-	-	-	-
2012	341	175	4	2	1	-
2013	306	183	17	5	5	-
2014	710	179	2	1	-	-

In order to promote compliance in fisheries, Ansan City actively monitors the illegal fishing activities around the jurisdictional seas of Ansan City using the surveillance vessels. Ansan City owns two vessels: one vessel (Picture below; 67ton) and Vessel Gyeonggi 218 (2.38ton). In 2015, the results of illegal fishing activities were: 10 cases for apprehension and 4 cases for administrative correction. Also, use of illegal fishing gears had been eliminated in the Ansan coasts. Table 9 shows the results of illegal fishing gear removal.



Ansan City's multi-purpose fisheries surveillance vessel



Table 9. Illegal fishing gear removal activities

Year	Location	City Budget (K KWR)	Removed gear (ton)
2013	Daebu Island south	50,990	18.25
2014	Daebu Island north	18,500	2.38

Implications and Recommendations

Ansan City is implementing various efforts to enforce environmental regulations and apprehend violations with the support of citizen groups. The monitoring and surveillance of environmental compliance covers air, waste water, fisheries and solid wastes. Ansan City takes monitoring and surveillance as important activities in effectively enforcing laws and maintaining environmental compliance thus resulting to safe and clean environment. Ansan City will continue to strengthen the monitoring and surveillance of suspicious and illegal activities.

References

2015 Ansan City Statistical Yearbook, 2016, Ansan City
 2014-2015 Ansan City Whitebook, 2016, Ansan City



Legislation

008 Environmental cases filed and resolved

Description

This indicator reports the total number of cases filed and resolved, and the total value of fines issued for non-compliance of relevant coastal legislations.

Rationale

Effective enforcement of environmental legislation taking place in the marine and coastal areas can be reflected by the number of cases filed, resolved and fines collected resulting thereof. The strict enforcement of relevant legislation is an important step in addressing and minimizing unsustainable practices in the coastal areas.

Data requirements

- Total number of reported complaints
- Total number of violations where violators were arrested
- Total number of violations penalized
- Total value of fines collected for non-compliance with relevant legislations

Results

Ansan City is strictly enforcing the compliance of the laws and regulations including ICM related laws such as environmental and fisheries laws. Violators are charged with fines and in severe case, subpoenaed for criminal case. Table 10 shows the results of surveillance and monitoring of industrial waste generation and the resultant violators and fines. The number of violation and amount of fines are on the decreasing trend in recent years.

Table 10. Industrial waste generation violations and fines

Year	Inspected			Administrative Action			
	Total	Disposal facility	Generator	Total	Administrative correction	Fine	
						No.	Amount (K KRW)
2014	839	186	653	59	16	43	72,000
2015	725	115	610	17	1	16	5,850

Ansan City is implementing the pollution penalty system. This penalty is imposed when the polluters discharge pollution concentration over the allowed limit. Pollution penalty is imposed to both air and water polluters in accordance with the Air Environment Protection Act and Water Quality Conservation Act. Table 11 shows the trend of pollution penalty charge and collection of Ansan City.



Table 11. Pollution penalty charge and collection

(Unit: M KRW)

Year	Total Penalty	Total collection	Air		Water	
			Penalty	Collection	Penalty	Collection
2011	1,771	1,466	216	166	1,555	1,300
2012	1,616	1,159	190	179	1,426	960
2013	6,019	2,409	611	490	5,408	1,919
2014	2,303	1,706	340	302	1,963	1,404

Ansan City is strengthening the environmental enforcement and compliance through regular monitoring and surveillance of environmental quality of air and water. The administrative actions by Ansan City will help enhancing the environmental quality of the City.

Implications and Recommendations

Ansan City is strictly enforcing the environmental and fisheries laws. Through the enforcement, awareness of environmental laws is enhanced and illegal activities in the coastal areas are minimized. It is recommended that Ansan City continue to enhance monitoring and surveillance of environmental compliance in order to minimize the environmental pollution at the coastal areas.

References

- 2014-2015 Ansan City Whitebook, 2016, Ansan City
- 2015 Ansan City Statistical Yearbook, 2016, Ansan City



Information and Public Awareness

009 Public education and awareness

Description

This indicator reports on communication plans, staff and budget allocations, and public awareness programs initiated by various sectors, and the different communication channels used to promote public awareness.

Rationale

Easy access to information can promote awareness of stakeholders. Public education promotes increased awareness of the value of the coastal and marine resources, the issues affecting the environment, and the need for coastal management to protect and conserve these resources.

Data requirements

- Communication plan available
- Budget and staff allocation for implementation of communication plan
- Local governments have facilities for public access of information
- Local awareness programs
- Frequency of community participation activity
- Number of participants in community participation activity

Results

Ansan City recognizes the importance of public awareness and outreach activities to enhance the citizen's right to know regarding the City's policy implementation. The City conducts public communication and awareness activities through several communication channels including on-air, on-line and off-line channels. There are several media available at Ansan City including 4 news agencies, 2 national newspapers, 3 broadcasting company, 21 local daily newspapers, 9 local weekly newspapers, 2 regional weekly newspapers, and 4 internet news media. Using these media, Ansan City is actively broadcasting information regarding the City's environmental activities.

Ansan City has set its Vision as Green and Eco City and actively campaign the Vision. In particular, Daebu Island is the main development target for eco-tourism, zero-carbon, blue economy initiatives, and ecosystem conservation. Several TV advertisements on City's brand "Green and Eco City" were broadcasted through TV stations. Also, 2 TV programs on Daebu Island were created and regularly aired. Using the City's own capacity, HD news were created and distributed to media and TV stations for public exposure. In 2015, 137 news clips on Ansan City policy implementation were provided to TV broadcasting agencies.

Ansan City is publishing the City Magazine "Ansan Bravo" for increasing public awareness on City's policy implementation since 1995. The Magazine (16-page tabloid type) is being published on every 2nd and 4th



Wednesday for distribution (24,000 copies). Ansan City is also operating a City TV Broadcasting Station. The Station is to support the public awareness activities of the City through producing high quality contents for broadcasting by news agencies. The City also advertised their policy implementation at LED sign boards and screen doors at several locations within and outside of the City.

As part of the on-line awareness activities, social network services (SNS) such as Facebook, Twitter, Kakao talk, Blogs are actively utilized. The City is also organizing trainings on SNS utility for citizens and recruited 60 SNS citizen reporters to increase exposure of City policies and activities to citizens. Ansan City has received the highest honor award at the 7th and 8th Korea Social Media Award.

Information and Public Awareness
Public education and awareness
😊



Ansan City Magazine "Ansan Bravo"



Policy outreach through exhibition booths

Ansan City is operating information sharing system through its website – “iansan.net”. Most of the publications and policy records are available in PDF format at the “Open Information” section of the website. Table 12 shows the available information at iansan.net. Classified and unavailable data can be requested and the requests will be answered within 7 days in accordance with the City ordinance. In 2014, Ansan City enacted the ordinance “Ansan City Public Data Provision and Utilization Promotion” in accordance with the national Law “Public Data Provision and Utilization Promotion Act”.

Table 12. Information available at Ansan Information Sharing System: iansan.net

Unit	Total	Electronic Publication	Old Electronic publication	DB-stored Publication
Book	281,633	187,827	6,696	87,110
Item	13,196,924	12,116,973	248,023	831,928

(source: 2014-2015 Ansan City Whitebook, 2016, Ansan City)

Maintaining data and statistics is also an important area for City’s transparent operation and assessment of policy implementation. Ansan City annually publishes statistical yearbook, report of census on establishments and social survey report. These reports are useful in tracking the changes in socio-economic as well as environmental status of the City.



Statistics reports of Ansan City

Ansan City’s strong effort to enhance public education and awareness can be seen in the Mayor’s initiative on public awareness activities. The Ansan Mayor organized a road show to interact with citizens since 2014. From July 2014 to December 2015, he met with a group of citizens from different social classes to discuss about his policy implementation and receive feedbacks from them. Figure 11 shows the road show itinerary. During that time, he met more than 2,135 citizens with various social status. He is planning to keep this policy dialogue with citizens as a part of public awareness activities.





Figure 11. The Mayor's road show for policy dialogue with citizens (2015)



The Ansan Mayor regularly meets with the citizens during the policy dialogue road show

Implications and Recommendations

Public awareness is one of the key areas that the Ansan Mayor considers as priority. The City continues to provide information to general public and involve citizens to policy dialogues. Various media are employed to increase public exposure of city's policies. This area is much improved by the Mayor Je Jong-Geel as he stressed the importance of the public awareness and outreach. Ansan City is recommended to continue the public awareness activities and involving citizens to policy implementation.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City

Information and Public Awareness

010 Stakeholder participation and mobilization

Description

This indicator reports the number of nongovernmental organizations, civil society groups and other stakeholder organizations who are contributors to sustainable development of the coastal and marine areas.

Rationale

The active involvement of stakeholders reflects their understanding on the value of implementing coastal management and mobilizing activities related to it.

Data requirements

- Nongovernmental organizations, civil society groups and other stakeholder organizations with environment-related programs and activities
- Types of environment-related programs and activities
- Number of members

Results

Ansan City is providing support to the community-based projects for the villages. Under the name “Building Good Neighborhood Project”, villagers propose projects such as revamping village environment and roads, building gym facilities, solid waste management system, villager education program etc. The City selects good proposals and provide fund to execute the projects. This helps community to increase the capacity and ownership of their village through implementing their own projects. The City also implement the “Building the Village of Hope” to support the villages of victims of the tragic accident of Ferry Sewol. For this project, the government of RO Korea provided US\$1M for various projects.



Building Good Neighborhood Project Implementation

Public safety and security is a priority area of Ansan City. Together with the National Police, Ansan City supports various citizen groups such as Citizen-led Volunteer Patrol Team and Robocop Patrol Team, to name a few. The Volunteer Patrol Team conducts surveillance and crime prevention activities around the City especially at night and crime vulnerable areas. The Robocop Patrol Team patrols around the schools for securing safety of the school children. The City supports their equipment such as patrol vehicles (37 vehicles), blackbox, heater and air conditioner for the Outposts and winter cloths. These citizen patrol groups are helpful in maintaining city's safety and security.



Activities of Citizen-led Patrol Groups. (left: Volunteer Police Team; Right: Robocop Patrol Team)

Ansan City is providing supports to the community-based projects for the villages. Under the name "Building Good Neighborhood Project", villagers propose projects such as revamping village environment and roads, building gym facilities, solid waste management system, villager education programme etc. The City selects good proposals and provide fund to execute the projects. This helps community to increase the capacity and ownership of their village through implementing their own projects. The City also implement the "Building the Village of Hope" to support the villages of victims of the tragic accident of Ferry Sewol. For this project, the government of RO Korea provided US\$1M for various projects.

Table 13. Number of volunteer groups and number

Volunteer	2011	2012	2013	2014	2015
Number	102,140	114,809	134,470	144,973	173,914
Group	902	755	846	942	1,036
Site	557	584	643	680	745





Activities of Citizen-led Patrol Groups. (left: Volunteer Police Team; Right: Robocop Patrol Team)

Implications and Recommendations

Ansan City supports various citizen-led groups to encourage the activities self-improvement of their own villages and communities. The supports from the City government are instrumental in improving the environment and well-fare of the villages and communities with the increased ownership. The volunteer groups are also useful in providing citizen's services to areas where City government may not reach due to limited human resources.

Ansan City is recommended to continue its supports to citizen-led groups in order to increase their capacity and ownership of their communities and villages.



References

2014-2015 Ansan City Whitebook, 2016, Ansan City

Capacity Development

011 Availability / accessibility

Description

This indicator reports access to facilities and training programs, staff and budget allocation, and technical resources available for coastal management. It also measures the extent to which local personnel can impart their knowledge and experiences in coastal management as well as the presence of universities, research institutions and local experts in the area.

Rationale

Building local capacity to plan and manage their own resources is essential in ICM programs. Similarly, access to facilities and training programs, and budget allocation are essential in building local capacity. Local capacity is also enhanced by the availability of institutions such as universities, research institutions and local experts, which can be tapped in implementing coastal management activities and training and education programs. Local personnel with the appropriate skills must be able to impart their knowledge and experiences in coastal management to other coastal and natural resource managers.

Data requirements

- Access to facilities and training programs
- Staff and budget allocation for capacity development
- List of experts
- Universities and research institutions in the area with related courses/research activities
- Local capacity to conduct trainings

Results

ICM implementation will be enhanced if the capacity of the officers involved in ICM implementation is high. In this reason, Ansan City is encouraging its officers to develop their capacity through various activities. The City supports its officers' in-house Study Groups in order to facilitate the capacity building activities of the officers. The Study Groups select the subjects of their own interest and conduct research and related activities. In 2015, the subject of the Study Group is focused on the City's Vision: Green and Eco City Ansan. The resulting outputs can be reflected to city policies.

Table 14. Ansan City officers' study group operation

Item	2014	2015
Team	26	32
Budget (KRW)	42,000K	59,740K

Ansan City offers regular training opportunities to city officers. The training programs are intended to increase the knowledge of officers on various areas including language, social science, environmental issues, leadership and others. In 2014, a total of 2,340 officers were trained at 28 courses while 2,685 officers at 29 courses in 2015. The training programs include graduate school education for the officer. About 50 officers were trained at graduate school program.

Ansan City also encourages the learning of the officers through international experience and exposures. Various opportunities exist for the officers who exceptionally contribute to the City policy implementation. In 2015, 50 young officers and 26 senior officers (ready to retire) enjoyed a 10-day experience to foreign country. About 63 long-term serviced officers (more than 30 years) also received overseas training opportunity. The City is trying to increase the number of overseas training opportunities to its officers.

Ansan City offers education opportunities to citizens on IT area. In 2014, a total of 1,758 citizens has received training on IT while 2,620 citizens were trained in 2015. Ansan City is constantly increasing the citizens' education on IT areas in time of IT era.

Table 15. The number of persons for IT education

Year	Focused group IT	IT supporters	Disabled person
2014	95	920	743
2015	96	1,143	1,381

There are four universities in Ansan City: Hanyang University ERICA Campus, Ansan University, Shin Ansan University and Seoul Art University. Also, the City hosts the world class research institute "Korea Institute of Oceans Science and Technology (KIOST)" which is the national research institute specialized in coastal and marine sector. The Rural Research Institute, Korea Electric Research Institute Ansan Branch, Gyeonggi Technopark also can meet the research needs of Ansan City. These research institutes are acting as brain and training facility for Ansan City.

Ansan City operates the Life-time Learning Center under its organization in order to promote learning throughout the entire life of the citizens. Under the Center, there are five libraries and one special center operating, namely: Ansan Central Library (opened July 2016); Gamgol Library, Kwansan Library, Sunbu Library (opened January 2015), Daebu Library (opened November 2015) and Woman's Vision Center. These libraries and Woman's Vision Center are instrumental in providing learning opportunities to citizens, women and senior citizens of the City. Ansan City will continue to support the libraries and Woman's Vision Center as key operational arms of the Ansan City's learning mechanism.





Opening of Ansan Central Library (July 2016)

Implications and Recommendations

Ansan City is rich in resources for training and education for its officers. As the empowerment of citizen and officer is a top priority, the City is offering various opportunities for training and education. The only limiting factor for human resource development in Ansan is the will of officers to educate themselves rather than support and resources of the City. Ansan City is recommended to keep increasing the opportunities for human resource development for the officers as well as its citizens.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City
 2015 Statistical Yearbook, 2016, Ansan City



Capacity Development

012 Human resource capacity

Description

This indicator measures local capacity in implementing coastal management in terms of skilled human resources.

Rationale

The knowledge and skills of local personnel is essential for effective implementation of coastal management.

Data requirements

- Number of people trained in ICM
- Number of skilled personnel working in ICM programs
- Number of graduates in ICM-related courses
- Number of required ICM trained people

Results

ICM program in Ansan is at its early stage. Although the City has already implemented the 1st Ansan ICM Plan in 2009-2014, the implementing mechanism is not fully established and mature. The Mayor of Ansan City proclaimed the City's vision to be a Green and Eco City in 2015 aiming at developing the City in an eco-friendly and sustainable way. In follow up action, the Mayor designated the Daebu Island as an ICM site of PEMSEA and introduced the techniques and methods of ICM program implementation in collaboration with PEMSEA in 2015.

In line with the efforts of ICM in Ansan City, the Mayor decided to join the PEMSEA Network of Local Governments or PNLG in 2015 during the EAS Congress 2015 in Danang City, Vietnam. The Mayor also decided to host the PNLG Annual Forum in Ansan City in 2016. The publication of the State of the Coasts of Ansan City is part of the City's commitment to be PNLG Charter and SDS-SEA implementation.

Although the City is putting various efforts in educating the officers of Ansan City in ICM, there is limited capacity among officials in implementing the ICM program. The responsibility center of the ICM program implementation is the Oceans and Fisheries Division of the Daebu Tourism Headquarters. Only few officers are working for the ICM program within the Division. Limited understanding of the ICM process and mechanism is also an area to be improved.





Mayor's Vision to be a Green and Eco City. (left: Vision Manifestation; right: hosting the PNLG Annual Forum)

Implications and Recommendations

Human resources and capacity of Ansan City in ICM programme implementation is still limited. The programme is at its beginning and officers need to be trained. Coordinating mechanism should be also established through the implementation of the 2nd Ansan City ICM Plan.

Ansan City is recommended to establish the Ansan City Coastal Management Council and make it operationalize. At the same time, capacity building for the ICM personnel should be pursued in parallel with ICM programme implementation.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City



Financing Mechanisms

013 Budget for ICM

Description

This indicator reports the financial requirements for coastal management and the government allocation including investments for environmental infrastructures. It also looks into the financial sources for coastal management, such as loans, and grants from financing institutions and donors.

Rationale

The activities for coastal management have specific budgetary requirements and thus need financial allocation for their implementation.

Data requirements

- Total budget identified for coastal management
- Total budget allocated by LGU
- Total expenditure for coastal management
- Grants and loans from external sources
- Investments in environmental infrastructure

Results

Most of the coastal and ocean related works as well as ICM programs of Ansan City are carried out by the Daebu Marine Tourism Headquarters which was created in 2015 in order to systematically implement the sustainable development of the Daebu Island. The Daebu Island was designated as ICM site of PEMSEA in 2015.

The coordination for ICM work program and budget within the City is conducted by the City government, spearheaded by the Planning and Economy Bureau within the two divisions, namely: Planning and Legal Affairs Division and Budget Division. These divisions are directly involved in coordination of the ICM program and budget. Divisions involved in the implementation of the 2nd ICM Plan submit their work plan and budget for the following year's program for Mayor's approval.

In 2015, the total expense for the city was KRW 991,327M (approximately US\$ 901M at the exchange rate KRW 1,100/US\$ 1). From the budget, the total expenditures for ICM related program including marine, fisheries and agriculture (KRW 16,905M, 1.7%), culture and tourism (KRW 54,442M, 5.5%), environment (KRW 58,854M, 5.9%) were about KRW 130,201M which accounted for about 13.1% of the total expenditure of Ansan City. It is about 82% increase compared to 2010. In comparison to 2010 expenditure, Ansan City increased their investment in ICM related programs in recent years. In 2010, the total expenditures for ICM related programs were KRW 107,501M.



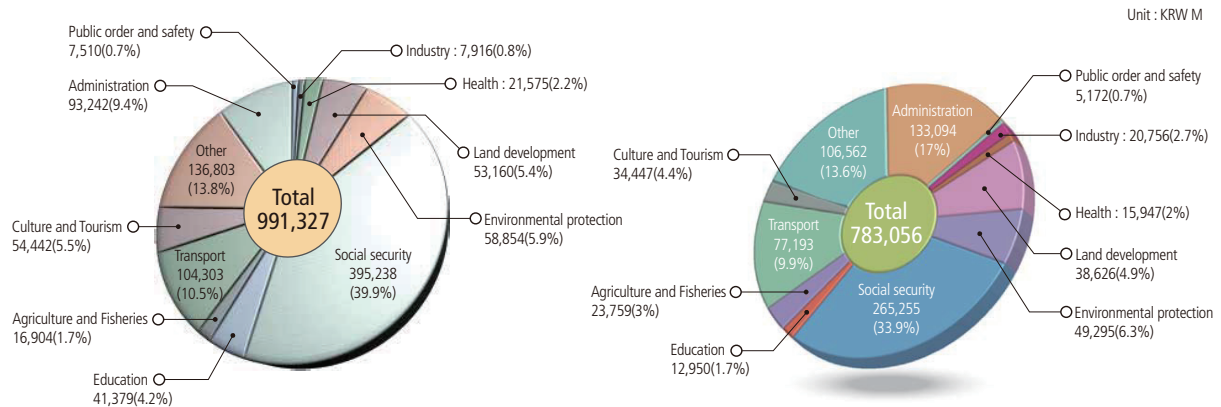


Figure 12. Total expenditure of Ansan City (left: 2015; right: 2010)

Also, Ansan City is operating several Funds for various purposes. The relevant funds for ICM implementation are shown in Table 16. Although the funds are allocated for specific purposes, emergency allocation for ICM might be possible under the permission of City management and the City Council.

Table 16. Fund available for ICM related activities

Name	Established	Total Size (M KRW)	2015 expenditure (M KRW)
Food Promotion Fund	2001	1,247	629
City Development Fund	2004	3,465	2,860
Disaster Relief Fund	1997	21,546	3,382
City Environment Improvement Fund	2005	27,719	467
Environment Conservation Fund	1999	23,341	191
Culture and Art Promotion Fund	2000	3,412	113

Implications and Recommendation

Ansan City has ample financial resources for ICM implementation. It is matter of how to implement the planned activities relating to ICM in coordination with relevant divisions, civil groups and experts. Ansan City is recommended to put efforts in securing enough budget for ICM in the coming years.

References

- 2015 Ansan City Statistical Yearbook, 2016, Ansan City
- 2010 Ansan City Statistical Yearbook, 2011, Ansan City
- 2014-2015 Ansan City Whitebook, 2016, Ansan City

Financing Mechanisms

014 Sustainable financing mechanisms

Description

This indicator takes account of the institutionalization of measures and means to support environmental conservation and environmental infrastructure improvements. Economic and market-based instruments, such as public-private partnerships, environmental user fees, user pay schemes, and corporate social responsibility (CSR) programs are among the tools being considered. The indicator also considers policies and programs put in place to enhance the climate for public and private sector financing of coastal management activities and for constructing and operating environmental infrastructure.

Rationale

Financial support for coastal management implementation may come from different sources. The sustainability of ICM programs is dependent on how revenue sources are developed and managed.

Transparency in all financial transactions is necessary to avoid suspicion from stakeholders. Apart from regular allocation from the government, various financing options must be explored to sustain financial inputs for coastal management activities and environmental infrastructure and service.

Data requirements

- Corporate social responsibility
- Private sector financing (e.g., PPP)
- Environment user fees
- Percentage of environment-user fees allocated to environment projects
- Private sector investment for environmental infrastructure
- Standard procurement process in place (e.g., defined ceilings for bidding, canvassing, and shopping)
- Provincial/city/municipality authorized to engage in public-private partnership

Results

The budget for ICM implementation of Ansan City has been already allocated. During the planning process, the budget request was submitted to national and local ICM coordinating committee for approval. The 2nd Ansan ICM Plan identified the financing plan for funding the ICM projects implementation. Funding sources for the planned activities are shown in Table 17.



Table 17. Funding source for the 2nd Ansan ICM Plan

Objective	Strategy	Funding Source
New paradigm for coastal area management	1. Setting natural disaster management target and operation considering coastal utilization and environment	National and local budget
	2. Establishing coastal use zoning in consideration of coastal use types and future needs	Local budget
	3. Planned and coordinated use of coastal resources through suitability assessment of sea areas	National and local budget
Enhancing coastal ecosystem health and coastal scenic beauty	1. Monitoring of water quality targets of Specially Managed Seas	National budget
	2. Reducing the adverse impacts of development projects on coastal scenic beauty	National and local budget
Strengthening climate change and disaster response	1. Protecting coastal defense facilities in response to sea-level rise and climate change	National and local budget
	2. Protecting natural coastlines from unplanned development	National and local budget
Establishing coastal governance	1. Building management capacity for coastal use conflict	Local budget
	2. Establishing and operation of the Coastal Management Council	Local budget
	3. Enhancing citizen groups for coastal protection	Local budget

For the sustainable financing for the ICM implementation, Ansan City will continuously seek the available funding from National and Provincial governments. Also, the City can apply for additional funding for ICM utilizing the existing funds as shown in Table 18.

Table 18. Fund available for 2nd Ansan ICM Plan implementation

Name	Established	Total Size (M KRW)	2015 expenditure (M KRW)
City Development Fund	2004	3,465	2,860
Disaster Relief Fund	1997	21,546	3,382
City Environment Improvement Fund	2005	27,719	467
Environment Conservation Fund	1999	23,341	191

Implications and Recommendations

Budget for the 2nd Ansan City ICM Plan has been already allocated for implementation in the next 5 years. The City will need to implement the planned activities in timely manner. Transparent implementation and stakeholder participation should be ensured. Also, the budget spending will need to be evaluated for efficiency and effectiveness as stipulated in the 2nd ICM plan.

References

2nd Ansan City Integrated Coastal Management Plan, 2015, Ansan City



Sustainable Development Aspects

Natural and man-made hazard prevention and management

015 Level of preparedness for disasters

Description

This indicator measures the availability of disaster preparedness and management plans, capable people, equipment, budget and preparations to anticipate, reduce, respond to, and recover from various hazards/disasters.

Rationale

Local communities and disaster management personnel must be prepared to respond to various hazards, if the number of deaths and property losses due to natural and man-made hazards are to be minimized. Moreover, proper preparation and mitigation measures can reduce the frequency of man-made hazards and severity of disasters.

Data requirements

- Availability of natural/man-made disaster/environmental emergency response plan
- Scope of natural/man-made disaster/environmental emergency response plan (e.g., floods, earthquakes, oil spill, etc.)
- Identification of mitigation strategies
- Institutional mechanism for the implementation of the emergency response plan
- Number of trained and non-trained personnel allocated
- Early warning system in place
- Availability of adequate equipment
- Budget allocation for natural/man-made disasters

Results

RO Korea's main framework for disaster preparedness and response is the Framework Law on Disaster and Safety Management (2004). Before 2014, the Law was managed by then Ministry of Administration and Safety. However, due to the tragic accident of Sewol in 2014, the government of RO Korea realized the need for an integrated and holistic control toward disaster preparedness and risk reduction system. As such, the Ministry of Public Safety and Security (MPSS) has been created and the public safety has become one of the top priorities of the Park Geun-hye Administration of RO Korea.

The Framework Law on Disaster and Safety Management requires creating the National Safety Management Committee (NSMC) chaired by the Prime Minister and the National Disaster Response Center (NDRC) headed by the Minister of MPSS at the central level. Locally, the Law requires creating the Local Safety Management Committee (LSMC) chaired by the local chief executive and the Local Disaster Response Center (LDRC) headed



by the local chief executive. Two levels of organization are required for the LMSMC and LDRC: Provincial level and City/municipality level. Also, the Law requires developing the National and Local Disaster Preparedness and Response Plans.

In accordance with the Framework Law, Ansan City developed the Ansan City Disaster Preparedness and Response Plan which was approved by the Ansan City LSMC and NSMC. The Plan is being implemented by the Safe Society Division of the Security and Administration Bureau. Under the plan, the City organized the Ansan City Disaster and Safety Response Center which is chaired by the Mayor. The City response organization is shown in Figure 13. Also, the City developed the disaster vulnerability map associated with climate change.

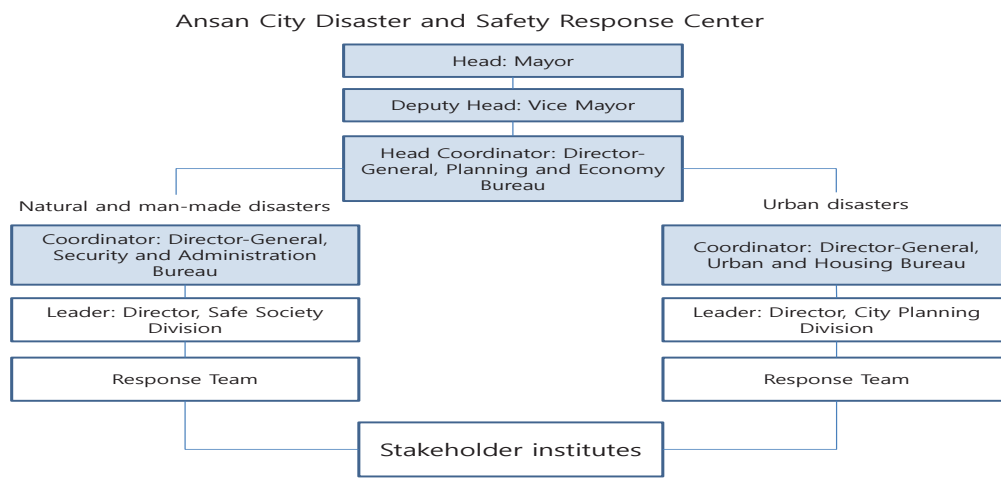


Figure 13. Ansan City Disaster and Safety Response Center Organigram

Natural and man-made hazard prevention and management

Level of preparedness for disasters



기후변화재해 취약등급도

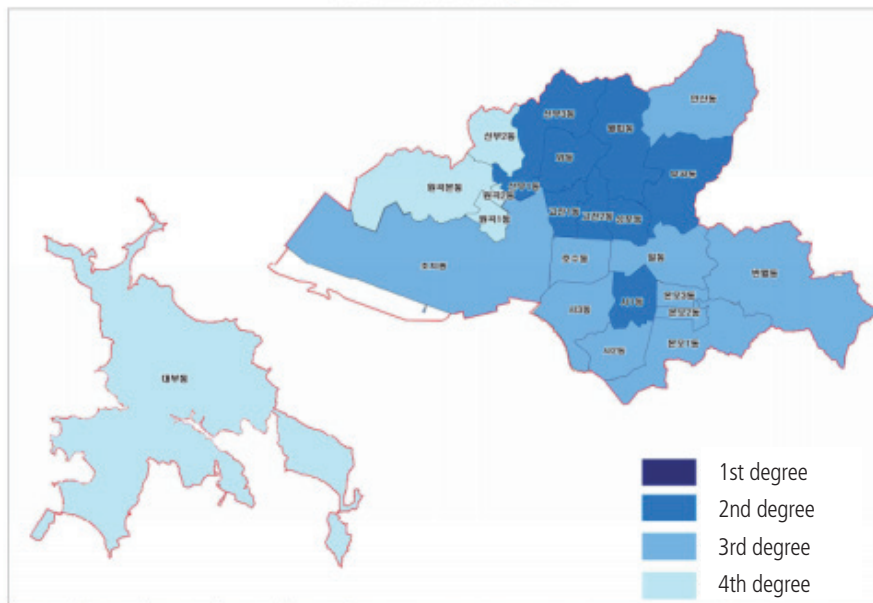


Figure 14. Disaster vulnerability map associated with climate change (source: 2020 Ansan City Development Master Plan, 2015)

Major programs for disaster preparedness and response of Ansan City are included in the Plan - natural and social disaster prevention and response measures, immediate response to disasters, support to citizen-operated disaster response prevention unit, operation of natural disaster insurance, public awareness on prevention of public safety, regular public safety check on City facilities and infrastructures, operation of disaster relief fund, and others.

In 2015, the budget for public safety and disaster response was KRW 6,143M (equivalent to US\$5.5M at the exchange rate KRW 1,100/\$). This is a 75% increase over the last 5 years from KRW 4,589M in 2010. Ansan City continues to increase their capacity in disaster response and management system.



Restoration activity from flooding (left) and public awareness campaign for disaster prevention (right)

Implications and Recommendations

The level of preparedness for disasters of Ansan City is considered as good. Disaster Preparedness and Response Plan has been set up and proper budget for implementation has been already allocated. Disaster and Safety Response Center is active in responding to emergencies. Ansan City is recommended to continue to implement the response plan in accordance with its schedule.

References

- 2014-2015 Ansan City Whitebook, 2016, Ansan City
- 2020 Ansan City Development Master Plan, 2015, Ansan City
- Ansan City Budget Information System, <http://fin.iansan.net>



Natural and man-made hazard prevention and management

016 Degree of vulnerability to disasters

Description

This indicator measures the degree to which populations are at risk of exposure to natural and man-made hazards, i.e., populations living within various multihazard zones.

Rationale

The greater the degree of potential exposure to natural and man-made hazards, the more that government and local communities should be prepared and must put in place mitigation measures for disasters. Identification of the levels of threat from various hazards can also help focus preparations on the most relevant types of threat.

Data requirements

- Availability of multihazard (landslides, storms, floods, etc.) map
- Number of people located in hazard-prone areas
- Number of people relocated or moved away from hazard-prone areas

Results

The government of RO Korea established the Ministry of Public Safety and Security (MPSS) in 2014 from its previous Agency-level organization. This is to strengthen the preparedness to natural and man-made disasters and effectively and efficiently coordinate response actions across the sectors and regions in a holistic manner to reduce or minimize the loss of properties and human lives in time of emergencies and disasters. The MPSS conducted comprehensive studies on disaster and hazard mapping across the country and presented the results in a map for the entire country. The multiple hazard maps are available through www.safemap.go.kr. As the figures below show, the webpage provides information regarding hazard maps and statistics of incidences include flood hazard, landslide hazard, wild fire, building collapse, earthquake, fire incidence (number, casualties and damage), etc.



Figure 15. Flood hazard map of Ansan (source: www.safemap.go.kr)



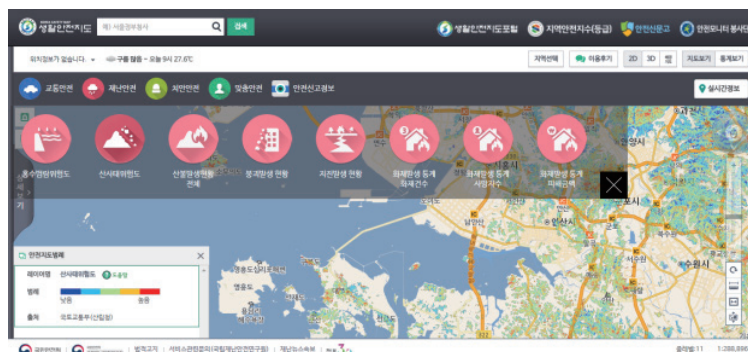


Figure 16. Landslide hazard map (www.safemap.go.kr)

The MPSS issued a Regional Safety Index incorporating various data from 7 categories, namely: natural disasters, fire incidences, traffic accidents, crime, safety incidences, suicide and, contagious diseases. As shown in Figure 17, Gyeonggi Province where Ansan City is located was rated as the safest local government unit in RO Korea. Among the 7 categories, Ansan City received 1st grade in two categories: fire and safety incidences.

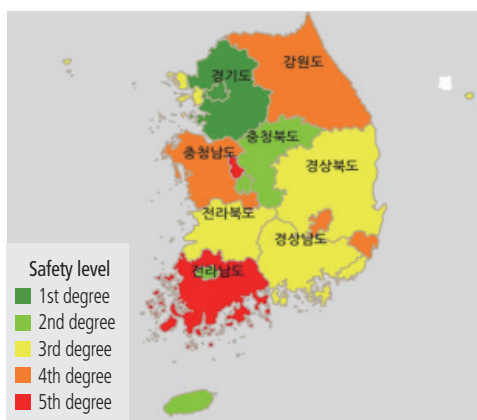


Figure 17. Degree of Safety Index of RO Korea in 2015 (source: MPSS)

Implications and Recommendations

Ansan City is located in a relatively safe area from landslide, storm surge and flood hazards as it is located inside the Shihwa Lake. Also, earthquake seldom occurs in RO Korea with low magnitude when it happens. Majority of residents feel that the City is safe from various natural hazards. It is recommended however that Ansan City continue to strengthen preparedness and readiness to respond in case of any hazard occurrence through strengthening of monitoring and surveillance.

References

Korea Safety Map, www.safemap.go.kr, Ministry of Public Safety and Security
 Regional Safety Index, Ministry of Public Safety and Security



Natural and man-made hazard prevention and management

017 Social and economic losses due to disasters

Description

This indicator measures the population affected, deaths and economic losses due to each type of disaster (including the severity of the cause of disaster). It is a measure that integrates: (a) the level and location of hazards vis-à-vis populations; and (b) the level of preparedness and response mechanisms that result in the frequency and severity of actual disasters.

Rationale

Disasters set back development and especially impacts those least developed. The number of deaths, people and property affected are what hazard prevention and management ultimately aims to reduce.

Data requirements

- Frequency of disaster incidents by type
- Number of people severely affected by natural/ man-made disaster incidents
- Number of people that have died due to natural/man-made disaster incidents
- Total amount of economic losses due to natural/man-made disaster incidents

Results

In disaster, there are two categories: natural and man-made disasters. Except for Typhoon, natural disasters like earthquake, tsunami, landslide, volcanic eruption etc. are rare in RO Korea. Typhoon causes floods and storm surges. Table 19 shows the damages caused by storms and floods in Ansan City during 2010 to 2014. The degree of damage shows a decreasing trend over time.

Table 19. Damages from Storms and Floods (Unit: M KRW)

Damage	Building	Vessel	Farm Land	Public Facilities	Others	Total
2010	88	36	-	484	1,186	1,759
2011	73	-	-	-	-	73
2012	123	-	-	834	122	1,079
2013	46	-	-	-	-	46
2014	12	-	-	-	-	12

(Source: 2015 Ansan Statistical Yearbook)



On the other hand, man-made disasters are occurring in a frequent manner. Most significant disasters are fire and vehicle accident. As shown in Table 20, more than 400 cases of fire and more than 2,000 vehicle accidents are reported every year. Most of the casualties are caused by vehicle accidents. It is encouraging to note that there were no disasters caused by marine accident such as vessel collision, oil and chemical spill from ships etc. and environmental pollution cases such as oil and chemical spill from factories, toxic waste discharge.

Table 20. Disasters by type

Year	2010		2011		2012		2013		2014	
	Case	Person	Case	Person	Case	Person	Case	Person	Case	Person
Fire	548	27	587	17	606	15	537	22	447	15
Forest fire	6	-	-	-	-	-	-	-	3	-
Marine accident	-	-	-	-	-	-	-	-	-	-
Collapse	-	-	-	-	-	-	2	2	4	7
Explosion	-	-	-	-	-	-	4	-	2	3
Vehicle accident	2,725	3,412	2,632	4,234	2,797	4,491	2,677	4,151	3,314	5,132
Environmental pollution	-	-	-	-	-	-	-	-	-	-
Total	3,279	3,439	3,238	4,270	3,403	4,506	3,256	4,175	3,770	5,157

(Source: 2015 Ansan Statistical Yearbook)

Table 21 shows the casualties and damages from disasters during 2010-2014. Deaths and injuries as well as loss to property remain mostly the same. Figure 18 shows the map showing areas where incidents relating to flooding during the typhoons occurred. As shown in the figure, there are several areas vulnerable to flooding.

Table 21. Casualties and Damages from Disasters

Year	Death	Injury	Property (M KRW)
2010	38	3,401	3,271
2011	48	4,170	2,733
2012	48	4,414	3,808
2013	45	4,192	3,324
2014	43	5,252	2,624

(Source: 2015 Ansan Statistical Yearbook)





Figure 18. Map showing the occurrence of flooding related incidents (2005-2010)
(source: 2020 Ansan City Development Master Plan)

Implications and Recommendations

Even though Ansan City has been implementing holistic measures and response systems for disasters, casualties and property damages show steady occurrence. The flooding hazard also confirmed that there are several areas that are vulnerable to flooding hazards. Also, one of the main sources of disasters is vehicle accident. Ansan City will need to put more efforts on traffic safety measures.

Overall, the occurrence of disasters is not an alarming level in the Ansan City. However, the City will need to continue its efforts to minimize the losses of lives and properties due to disasters.

References

2015 Ansan City Statistical Yearbook, 2016, Ansan City
2020 Ansan City Development Master Plan, 2015, Ansan City

Habitat protection, restoration and management

018 Habitat management plan and implementation

Description

This indicator measures the availability of plans, people, and budget to manage coastal habitats and heritage.

Rationale

Coastal habitats serve as critical life-support systems for a multitude of aquatic living resources. The quality of these habitats must be maintained and improved to sustain their benefits. Local governments need to identify specific strategies and action plans for habitats and the means to implement these action plans indicate the degree to which habitats will be effectively managed.

Data requirements

- Availability of habitat management plan
- Staff and budget allocation for habitat management

Results

Habitat management is one of the top priorities of Ansan City as the City set its Vision as the Green and Eco City. The main foundations for coastal habitat management of Ansan City are the 2nd Ansan City Integrated Coastal Management Plan (2015-2021) and the Ansan City Comprehensive Environmental Protection Plan (2011-2020). Also, in accordance with the Wetland Protection Law, the Ansan City is required to protect the wetlands belonging to Ansan City. Under the Ansan City Comprehensive Environmental Protection Plan, two projects for habitat protection were identified and budgeted. Two projects are: i) securing habitat along the streams; and ii) developing urban habitat. The total budget for the two projects in 2015 was around KRW 650M.

The Daebu Treasure Island Project 2030 stipulates the designation of the two sites in Daebu Island as the wetland protected areas. The two target sites are Sang-dong Wetland Protected Area (area: 1.2 km²) and Goretburi Wetland Protected Area (area: 3.3 km²) as shown in Figure 19. Ansan City is taking an aggressive stance in designating protected areas and habitat protection areas among the valuable mud flat of the City.

The Ansan Reed Wetland Park became a famous tourism site of Ansan City. Developed from 1997 to 2005 by Korea Water Resources Company, the Park became a home to numerous wild animals including endangered species such as migratory birds and mammals. Ansan City is endeavoring to protect the natural environment of the Park through conservation planning and public participation.



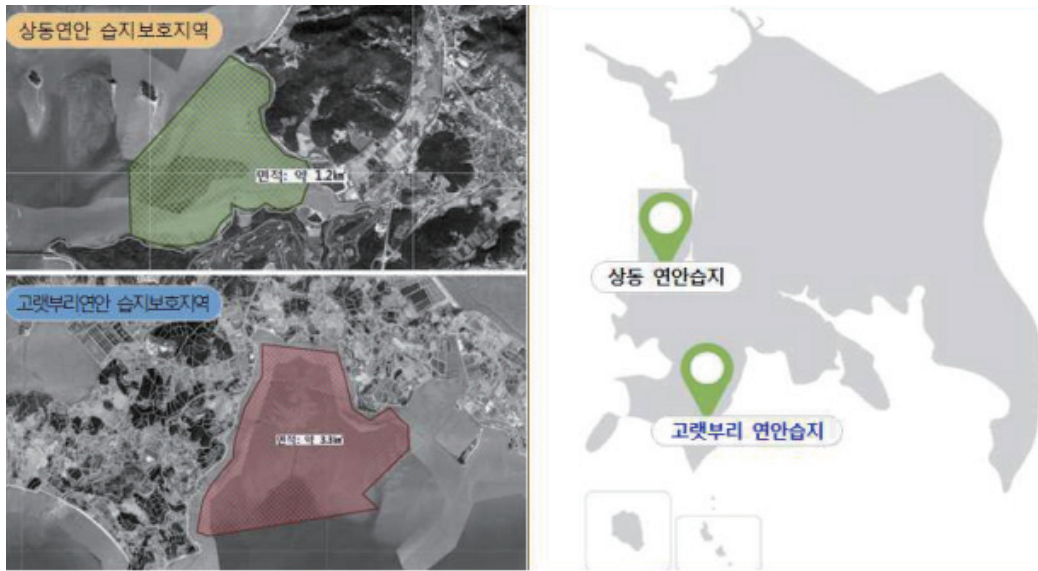
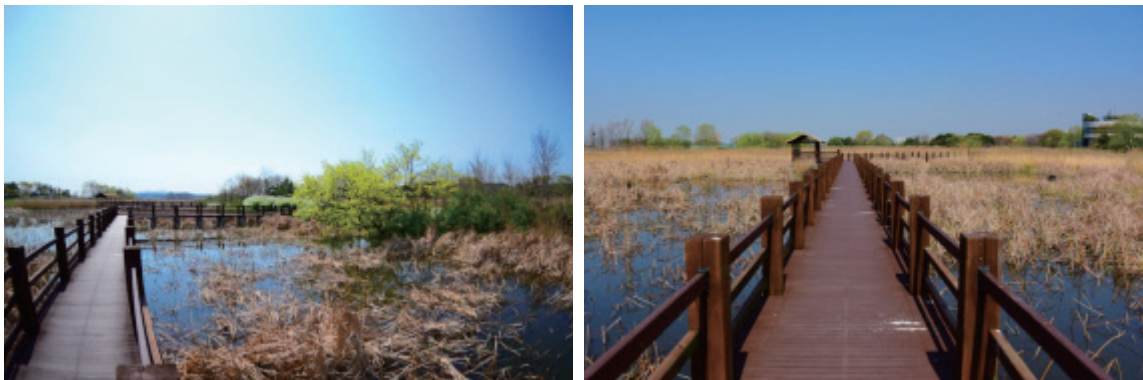


Figure 19. Target sites for the Wetland Protected Areas of Ansan City (source: Ansan City)



Ansan Reed Wetland Park (source: Ansan City)

Implications and Recommendations

Habitats and mud flats are protected by relevant plans with budget allocated by Ansan City. Although there is no nationally designated protected area yet, the City is planning to submit the proposal to national government for designation of protected areas in Daebu Island. Ansan City is recommended to continue providing its efforts in protecting habitats such as tidal flats and in-land wetlands. Daebu Island mud flat and the Ansan Reed Park can play significant roles in coastal habitats for migratory species visiting Ansan City.

References

- Ansan City Comprehensive Environmental Protection Plan, 2015, Ansan City
- 2nd Ansan City Integrated Coastal Management Plan, 2015, Ansan City

Habitat protection, restoration and management

019 Areal extent of habitats

Description

This indicator measures the area of various natural habitats (coral reefs, seagrass beds, mangrove forests, beaches, forests, urban green areas).

Rationale

Natural habitats and associated species help sustain products and services that support and benefit human activities. The extent and condition of various habitats also indicate the populations of associated species.

Data requirements

Total area (Km²) of coastal habitats (coral reef, seagrass, mangrove, natural beach, forest (excluding mangrove), and urban "green" area)

Results

As an urban city, Ansan City does not possess the coastal habitats such as coral reef, seagrass, mangrove area, natural beach etc. However, Ansan City is boasting its urban green areas. In 2014, the number of parks within the City was 190 with an area of 6.3 ha. Ansan City announced its vision to become a Green and Eco City 2030 in 2015. Urban green area per capita in 2014 was about 5.77 m². The City is planning to extend the urban green area per capita to 15 m² in 2030. For this, the City will invest KRW 110,800M (about US\$100M) until 2030 to create green city. The City already conducted feasibility study for the development of the urban green space. It was found that the return from the investment is more than the investment in terms of market value alone. If capital value increase will be added, the return would be much higher.



Ansan Mayor announces the Vision of Green and Eco City. An example of urban green area (right)





Figure 20. Ansan City urban green planning (source: 2020 Ansan City Development Master Plan)

Creating the urban green space is the key agenda of the Ansan City’s Vision: Green and Eco City. The 2020 Ansan City Development Master Plan (2015) and the 2020 City Urban Greening Master Plan (2013) provide comprehensive framework for urban greening. As these plans show, Ansan City is determined to create the City as green as possible through creating and securing green spaces within the City.

One interesting project is to create urban green spaces using unattended and no-commercial value patch of lands into parks with flower beds, shelters and chairs for residents’ use. The mini-park is called “Ssamji Park” in Ansan City. The City is planning to develop 500 mini-parks within 10 years (until 2024). This project is a win-win strategy because it creates additional resting places for the City residents as well as creates the green landscapes rather than unattended waste lands.

Table 22. Plan for developing mini-park (Ssamji Park)

Year	Total	2015	2016	2017	2018	2019-2024
Number	500	50	50	50	50	300

Implications and Recommendations

Ansan City is aggressive in greening the urban area. The vision of making the city “Green and Eco” supports the investment of US\$100M till 2030. Through the investment, Ansan City is planning to achieve higher urban green space coverage of 15 m² per capita than the WHO recommendation of 9 m². Ansan City is recommended to continue its plan of greening the urban area in order to provide clean and green environment to its residents.

References

2030 Ansan the Green and Eco City, 2015, Ansan City
 2020 Ansan City Development Master Plan, 2015, Ansan City
 2020 Ansan City Urban Greening Master Plan, 2011, Ansan City

Habitat protection, restoration and management

020 Protected areas for coastal habitats and heritage

Description

This indicator measures the area of coastal habitats and heritage effectively protected from degradation, as well as the extent of rehabilitation.

Rationale

The protection of coastal habitats and heritage reflects the commitment of local governments to prevent habitat loss and degradation. The protection of these habitats helps sustain the environmental, social and economic benefits derived from them.

Data requirements

- Number and area of terrestrial, marine and coastal heritage areas protected by law
- Management effectiveness rating of terrestrial, marine and coastal heritage protected areas
- Natural areas rehabilitated (km²)

Results

Ansan City is promoting cultural and heritage protection within the City. There are 14 City designated cultural heritage site and monuments. Also, there is one national treasure in Ansan City: National treasure No. 1673 Chungemmuljeon. The Chungemmuljeon is an essay written by a scholar and choreographer, Lee Hajin, in 17th century.

The Ansan City is planning to designate two wetland protected areas: the Sang-dong Wetland Protected Area and Goretburi Wetland Protected Area. The total area for the two sites would be 4.5 km². The plan will be submitted to the Ministry of Oceans and Fisheries for their approval in 2016.



Ansan City's cultural heritage site and artifact (left: Ojunggak; right: National treasure No. 1673)



Implications and Recommendations

Ansan City is putting various efforts in designating protected areas around the City. The 14 City designated cultural heritage sites are well protected and maintained. The Wetland Protected Area will be designated in 2016. Proper management plan and management effectiveness assessment should be followed.



References

2014-2015 Ansan City Statistical Yearbook, 2016, Ansan City
Ansan City homepage, <http://iansan.net>



Habitat protection, restoration and management

021 Conversion and reclamation

Description

This indicator measures the area of coastal habitat that has been converted for other uses (e.g., mangrove to fishpond). This also includes the extent of reclamation in the coastal areas.

Rationale

The costs (limited access for some sectors, stability and safety of those using structures built on reclaimed land, destruction of mangrove nursery grounds of marine life, loss of fisheries fry gathering grounds, erosion, etc.), benefits (ports that would benefit society, etc.) and the sectors that would be affected should be considered before reclamation or land conversion is authorized.

Data requirements

- Total length of coastline and area reclaimed
- Total coastal area converted to other uses (e.g. mangrove to fishpond)

Results

The length of coastline of Ansan City is 95 km with 76 km of coastal land and 19 km of Island. This number has been unchanged since the creation of the Shihwa Lake in 1994 through the construction of dike connecting Daebu Island and Shiheung City. Since the lake's creation, various development activities were carried out around the lake. Most of the reclaimed land created by the Shihwa Lake was devoted to the Shihwa Industrial Complex with which Ansan City is sharing with Shiheung City.

The total area of tidal flat of Ansan City is 56.6 km² (green color in Figure 21). The area of tidal flat of the City remained the same since 1994. Few very minor reclamation projects for developing fisheries ports and developing the Marina were conducted.



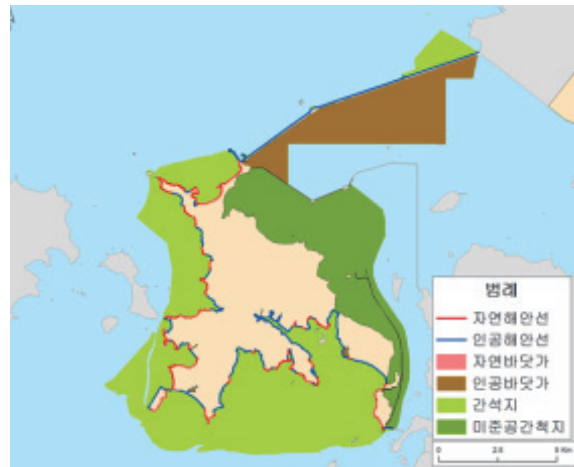


Figure 21. Area of tidal flats of Ansan (source: 2nd Ansan City Integrated Coastal Management Plan)

There are huge development activities on-going within the reclaimed areas of the Shihwa Lake. The development plans were approved in early 2000 when the stakeholders discuss about the sustainable utilization of the Lake. The approved projects are: the Multi-Techno-Valley (MTV) Project and the Daesong Agricultural Complex Project. There are few more development projects approved.

Ansan City is a part of the MTV development along the northern part of reclaimed land of Shihwa Lake. The MTV is being developed by the Korea Water Resources Company (K-Water) during 2002-2016 for a total area of 9.26 km². K-Water is putting a total of US\$ 239B for the development. The MTV is designed to host a complex of establishments such as high-tech venture industry, tourism and leisure, research and development, green space, and others.



Figure 22. Shihwa Multi-Techno Valley Development Plan
(source: 2nd Ansan City Integrated Coastal Management Plan, Aerial view of MTV by K-water)

Ansan City is also a part of the Daesong Agricultural Complex in the southern part of reclaimed land of the Shihwa Lake. The Complex is being developed by the Agricultural and Fisheries Company since 2001 to create agricultural land. The total area of Daesong Complex is 36.36 km². Ansan City has requested the development committee to create a wetland for the purpose of cleaning the pollutants that enter into the lake. In this effect, a 4.19 km² of wetland will be created.

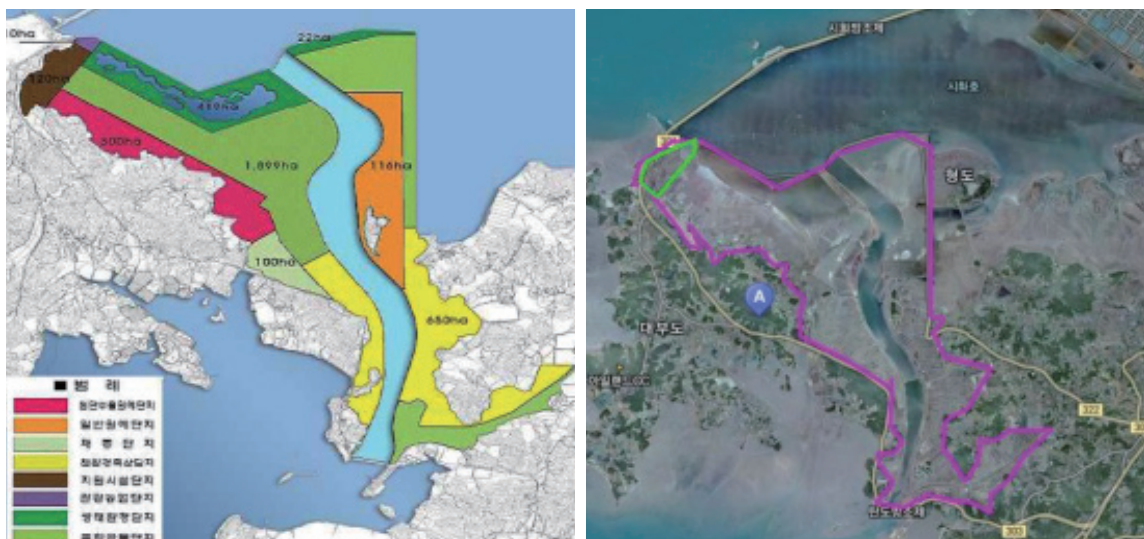


Figure 23. Daesong Agricultural Complex development plan
(source: 2nd Ansan City Integrated Coastal Management Plan)

Implications and Recommendations

The development projects currently on-going are largely within the reclaimed lands inside the Shihwa Lake. The development plans were approved by the RO Korean government in 2001. The tidal flat area of Ansan City is intact since 1994 except for few minor development activities along the coasts such as fisheries port and Marina developments.

Ansan City is recommended to protect the tidal flats of the City through designating as protected areas. Also, developing management plans for the tidal flat areas is necessary.

References

2nd Ansan City Integrated Coastal Management Plan, 2015, Ansan City



Water use, supply management

022 Water conservation and management

Description

This indicator measures the demand of the population for freshwater and accounts the intensity of freshwater management efforts through availability of water management and conservation plans, strategies adopted, and staff and budget allocated.

Rationale

Freshwater is essential for life and effective management for its sustainable use is of utmost importance for a healthy community.

Data requirements

- Availability of water management and conservation plan
- Mitigation and adaptation strategies identified
- Water use per capita
- Staff and budget for water management

Results

The Ansan City Comprehensive Environmental Protection Plan (2011-2020) provides framework of water conservation and management of the City. Among the 8 components of the Plan, the water conservation and management is included in the Component 2: Water Environment. The Water Environment in the Plan laid out 10 projects being implemented during the 10 year period. They are summarized in Table 23. For the management of water, a total of KRW 118,100M will be invested until 2020.



Table 23. Water Environment of the Ansan City Comprehensive Environmental Protection Plan

Project	Total budget (2011-2020, M KRW)
Developing system for Total Maximum Daily Pollutant Loading at Shihwa Lake	300
Expanding water quality monitoring stations and Tele-Monitoring System	23,000
Building international-level water management system through participating international water forums	100
Systematic management of point sources and optimization of the wastewater treatment plants	20,000
Developing management plan for non-point source and its implementation	10,000
Creating lively water ecosystem	1,000
Developing rainwater utilization system and expansion of the utilization facilities	42,000
Increasing the use of treated water	20,000
Increasing involvement of citizen groups in water management	700
Building participatory water demand management system	1,000
Total	118,100

Drinking water supply of Ansan City is managed by a concessionaire, the Water and Wastewater Treatment Agency which is in charge of safe drinking water production and sanitary treatment of wastewater. The Agency has four divisions as its organ: i) water administration; ii) water supply facility management; iii) drinking water treatment; and iv) wastewater treatment. For the safe drinking water production, the Agency operates 4 drinking water treatment facilities to provide safe drinking water to the City residents. The total drinking water supply to Ansan City is 456,200 m³/d.

Table 24. Drinking Water Treatment Facilities of Ansan City

Facility	Production Capacity (m ³ /d)		Supply to Ansan City (m ³ /d)	
	Municipal	Industrial	Municipal	Industrial
Banwol Plant	190,000	-	190,000	-
Shiheung Plan	101,000	166,000	5,200	40,000
Ansan Plant	83,000	60,000	83,000	60,000
Yeonseung Plant	260,000	123,000	178,000	123,000
Total	634,000	349,000	456,200	223,000



The produced drinking water is undergoing stringent tests for its quality and safety. The Agency conducts daily test for 6 parameters, weekly test for 22 parameters, and monthly test for 59 parameters. The production of drinking water is a good education opportunity to kids. The City operates a visiting program for the kids to water treatment facilities. In 2015, 1,965 students visited.



Drinking water test (left) and kids participating in water treatment plant visiting program (right)

Implications and Recommendations

Ansan City is providing sufficient amount of safe drinking water to its residents. Proper water management plan is in place and implemented by the water concessionaire. Ansan City is recommended to proceed in the implementation of its Comprehensive Environmental Protection Plan, and other programs for water conservation and management.

References

Ansan City Comprehensive Environmental Protection Plan, 2012, Ansan City
 2010 Ansan City Statistical Yearbook, 2011, Ansan City
 2015 Ansan City Statistical Yearbook, 2016, Ansan City



Water use, supply management

023 Access to improved water source

Description

This indicator estimates the households with access to an improved water source, the amount delivered and the price paid by households for water supply.

Rationale

Freshwater resources, whether scarce or abundant, may not necessarily be accessible or equitably accessible. Difficulty of access including high prices disproportionately burdens those with less resources, especially more vulnerable individuals and households within communities.

Data requirements

- Households with access to improved water sources
- Volume produced from piped water sources
- Water pricing per cubic meter

Results

The population of Ansan City in 2014 was 761,631 and the population served with safe drinking water was 759,803. Thus, the City achieved 99.8% drinking water supply rate. In 2010, the rate was 99.6%. The safe drinking water supply per capita per day was 347 L in 2010 and 367 L in 2015. The City is increasing its capacity to supply safe drinking water to its residents.

Ansan City provides safe drinking water to almost all the residents at the low cost. The table 25 shows the drinking water production and the price.

Table 25. Drinking water operation results (2014)

Production Result			Budget and Account		Water Price		
Supply rate	Supply efficiency	Production per day	Asset (M KRW)	Surplus (M KRW)	Production cost (KRW)	Sales price (KRW)	Sales/ production cost
99.8%	93.8%	436,000 ton	387,500	1,600	495.9/ton	458.9/ton	92.5%

(Source: 2015 Ansan City Whitebook, 2016, Ansan City)

As shown in the table, Ansan City ranked top class in supply efficiency of 93.8% among the entire country (national average is 85.7%). Supply efficiency is calculated by charged/supplied. Also, Ansan City marked the lowest production cost of KRW 458.9/ton in the country (national average is KRW 802.7/ton) and the highest rank of Sales/production cost of 92.5% (national average is 80.63%).

Implications and Recommendations

Safe drinking water production and supply of Ansan City is in good status. The City is recommended to continue its good work on safe drinking water production and supply to its residents.



References

- 2014-2015 Ansan City Whitebook, 2016, Ansan City
- 2015 Ansan Statistical Yearbook, 2016, Ansan City



Water use, supply management

024 Incidences/deaths due to waterborne diseases

Description

This indicator measures the number of reported cases and number of deaths due to diarrhea and other waterborne diseases.

Rationale

While other factors (such as food handling practices, etc.) may affect these figures, the prevalence of diarrhea and waterborne diseases also indicate the level of sanitation services and the cleanliness of freshwater supplies and of bodies of water for recreation.

Data requirements

- Number of incidences of illness/infections and deaths due to waterborne diseases (e.g., diarrhea; typhoid fever; cholera; amoebiasis; schistosomiasis; giardiasis; etc.)

Results

In RO Korea, infectious diseases are controlled and managed by the Infectious Disease Control and Prevention Act. In the Act, there are 5 groups of infectious disease. Waterborne diseases are included in Group 1 as they are serious infections potent enough to create social insecurity. Table 26 shows the infectious diseases which are managed by the Act of RO Korea.

Table 26. Infectious diseases grouping under the Korean law

Group	Disease
Group 1. infectious diseases spread via drinking water or food, with a high risk of mass outbreak, requiring the formulation of immediate control measures upon the outbreak or prevalence thereof	Cholera; Typhoid; Paratyphoid; Shigellosis, Bacillary dysentery; Colon bacillus infection with enterorrhagia; Viral hepatitis A
Group 2. infectious diseases which can be prevented and controlled by vaccinations, subject to national vaccination programs	Diphtheria; Pertussis; Tetanus; Measles; Mumps; Rubella; Poliomyelitis; Viral hepatitis B; Japanese encephalitis; Varicella; Haemophilus influenzae type B; Pneumococcus
Group 3. infectious diseases which require continuous surveillance and the formulation of control measures against the outbreak thereof as they may prevail intermittently	Malaria; Tuberculosis; Hansen's disease (Leprosy); Scarlet fever; Meningococcal meningitis; Legionellosis; Vibrio vulnificus sepsis; Epidemic typhus; Murine typhus; Scrub typhus; Leptospirosis; Brucellosis; Anthrax; Rabies; Hemorrhagic fever with renal syndrome; Influenza; Acquired immunodeficiency syndrome (AIDS); Syphilis; Creutzfeldt-Jakob disease (CJD) and variant Creutzfeldt-Jakob disease (vCJD)





Group	Disease
Group 4. infectious diseases which have newly broken out or are likely to break out in the Republic of Korea, or which prevail abroad with a risk to be transmitted into the Republic of Korea: Provided, That Group 4 infectious diseases include infectious diseases designated by the Ministry of Health and Welfare, as they are feared to be suddenly transmitted into or prevalent in the Republic of Korea and are necessary for urgent prevention and control	Pest; Yellow fever; Dengue fever; Viral hemorrhage fever (VHF); Smallpox; Botulism; Severe acute respiratory syndrome (ARS); Animal influenza infection in humans; Novel influenza (H1N1); Tularemia; Q fever; West Nile fever; Emerging infectious disease syndrome; Lyme disease (also known Lyme borreliosis); Tick-borne encephalitis; Melioidosis; Chikungunya fever; Severe fever with thrombocytopenia syndrome (SFTS); Middle East respiratory syndrome (MERS); Zika Virus
Group 5. infectious diseases spread by parasite infection, which are designated by Ordinance of the Ministry of Health and Welfare, as they require surveillance through regular investigations: Provided, That Group 5 infectious diseases include infectious diseases designated by the Ministry of Health and Welfare, as they are feared to be suddenly transmitted into or prevalent in the Republic of Korea and are necessary for urgent prevention and control	Ascariasis; trichuriasis; Enterobiasis; clonorchiasis; paragonimiasis; Fasciolopsis buskii

Table 27 show the occurrence of Group 1 diseases from 2010 to 2014. No death was reported due to the infectious diseases since 2010. Also, there is no occurrence of Cholera since 2012. The total occurrence is showing decreasing trend overall.

Table 27. Occurrence of infectious disease

Year	Cholera	Typhoid	Shigellosis	Viral hepatitis A	Total
2010		1	2		3
2011	1			193	198
2012		1		44	45
2013		3	2	19	25
2014		4	1	38	43

(source: 2014-2015 Ansan City Whitebook)

There are two City Health Centers in Ansan City. These Health Centers provide services to residents for treatment, vaccination and control of these infectious diseases. The two Health Centers are key institutes for securing residents' health in Ansan City.

Implications and Recommendations

Infectious outbreak is very rare in Ansan City. Viral hepatitis A is noticeable but the number is negligible considering the population size of the City. However, infectious diseases outbreak can happen any time. Therefore, Ansan City is recommended to put continuous efforts to provide safe drinking water to its residents.

References

- 2014-2015 Ansan City Whitebook, 2016, Ansan City, RO Korea
- Infectious Disease Control and Prevention Act, Ministry of Health and Welfare

Food security and livelihood management

025 Fishery management and implementation

Description

This indicator estimates the extent of fisheries management efforts through availability of fisheries management plans, staff and budget allocated.

Rationale

Fish is a direct product of the coastal zone, providing both food and livelihood to coastal dwellers, and to consumers far from the coast. Fisheries management is a challenging but necessary aspect of managing marine and coastal resources in order to ensure the sustainability of this valuable natural asset. A management strategy, supported by adequate resources and equipment, are markers of local government towards managing this resource.

Data requirements

- Fisheries Management Plan
- Staff and budget allocation for fishery management

Results

The backbone of the fisheries management in RO Korea is the Fisheries Resources Management Act. The Act stipulates the development of the Fisheries Management Framework Plan and its implementation plan. In accordance with the Act, the Ministry of Oceans and Fisheries (MOF) developed the 2nd Fisheries Resources Management Framework Plan (2016-2020) in 2016. At the same time, the Fisheries Resources Management Implementation Plan (2016-2020) has been subsequently developed.

Unlike other laws, the fisheries laws of the government are universally applied to all the local governments. This is to maintain the integrity and efficiency of managing migratory marine resources which do not honor political boundaries. Local governments simply implement the implementation plan. The financial resources are also supported by MOF. In the Fisheries Resources Management Implementation Plan, there is one important strategy for local fishers, which is the promotion of "autonomous community-based fisheries management". This is to promote the sustainable fisheries resource management by community fishers through strengthening the ownership of their fishery ground and the management capacity. Since 2002, Ansan City supported KRW 2,540M to the 25 fishing communities. In 2015, the City supported KRW 240M to 3 communities and, in 2014, 160M to 3 communities.

The fisheries management is administered by the Oceans and Fisheries Division under the Daebu Marine Tourism Headquarters. As part of the fisheries resource management, the Division is implementing the development



of eco-friendly shrimp aquaculture farm in Daebu Island, autonomous community-based fisheries resource management, release of fish fingerlings and others.



Fish fingerling release for increasing fisheries resources

Implications and Recommendations

Ansan City is actively implementing the Fisheries Resources Management Implementation Plan. Various management activities will enhance the resources around the Ansan City which will eventually benefit the local fisheries communities.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City
 Fisheries Resource Management Framework Plan (2016-2020), 2016, Ministry of Oceans and Fisheries



Food security and livelihood management

026 Fisheries production

Description

This indicator measures the trend in fisheries production and tries to estimate whether fisheries stocks are sustainable (using changes in catch composition and/or the frequencies of various sizes per species).

Rationale

The increasing fish catch would mean either greater dependence of the population to fisheries' resources or improved condition of resources.

Data requirements

- Municipal (small-scale), commercial (large-scale) and aquaculture fishery production
- Size and composition of fish catch

Results

Table 28 shows the trend of population of marine fishers over the past 4 years. The fishing population of Ansan City is continuously decreasing. This is due to the fast development of coastal areas of Ansan City to accommodate the development needs of the region.

Table 28. Marine fisher population of Ansan City

Year	Fisher population	Fisheries worker	Total
2011	4,418	2,372	6,790
2012	4,198	2,254	6,452
2013	3,987	2,128	6,115
2014	3,776	2,012	5,788

(source: 2015 Ansan City Statistical Yearbook)

However, the production of fisheries is increasing. In 2011, the total fisheries production reached 2,152 M/T whereas in 2015, it reached to 4,138 M/T (Figure 24). Over the past 4 years, the production has almost doubled. This is a significant increase in production. Part of the reason might be contributed to the efforts of resource increase measures such as fish fingerling release, autonomous community-based fisheries management, stringent enforcement etc. It is noted that the large portion of the production is covered by seaweed culture. Seaweed culture coverage increased from 34.5% in 2011 to 87.6% in 2015. On the other hand, fin fish production has been decreased from 110 M/T in 2011 to 33 M/T in 2015.



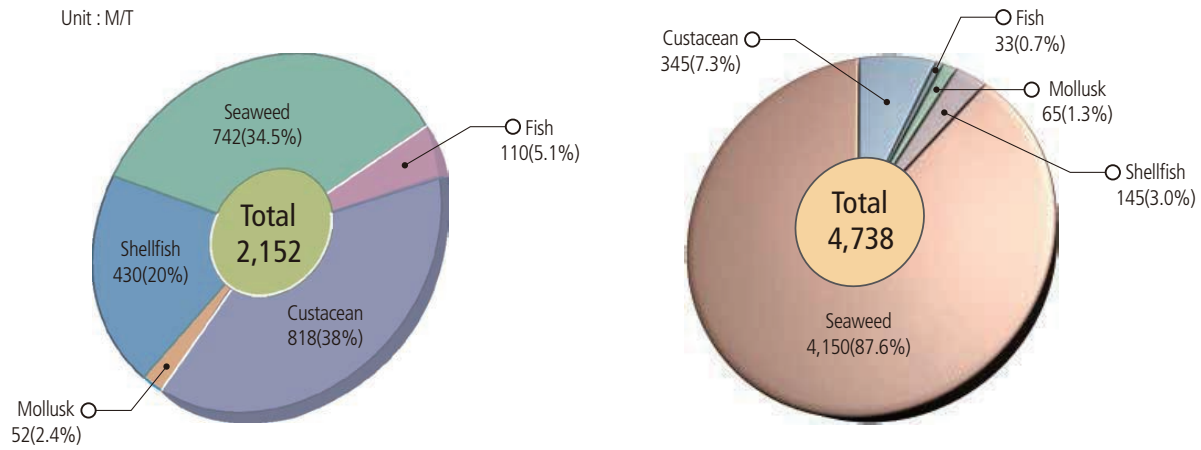


Figure 24. Composition of fisheries catch in Ansan City (left 2010; right 2015)

Implications and Recommendations

Ansan City’s fisheries production is solid and growing annually even though the fisher population is dwindling. This might be caused by the perception that fishing is difficult and dangerous. Ansan City will need to develop and nurture more reliable fisheries practice such as eco-friendly shrimp culture. In this sense, development of eco-friendly shrimp aquaculture is promising.

References

2010 Ansan Statistical Year Book (2011), Ansan City
 2015 Ansan Statistical Year Book (2016), Ansan City

Food security and livelihood management

027 Malnutrition rate

Description

This indicator measures the proportion of population with access to sufficient daily dietary requirements.

Rationale

Nutrition status is an indicator that integrates availability and equitability of access to food and livelihood. While other factors (such as agriculture and trade) may affect these figures, nutrition status is also affected by the availability of seafood.

Data requirements

- Number of undernourished males (all ages)
- Number of undernourished females (all ages)
- Number of undernourished males (less than 5 years old)
- Number of undernourished females (less than 5 years old)

Results

Malnutrition and undernourishment are more likely happening to poor and marginalized group of people. These social groups include low-income single parent family, sole-living senior citizens, disabled persons, single-mom family, child-headed family, orphans and others. For the welfare of these marginalized groups, the Government of RO Korea implements social security programs which are readily available to them through counselling at the local welfare and social security office. In Ansan City, the social welfare is administered by the Welfare and Culture Bureau. Under the Bureau, four divisions are directly in charge: Welfare Policy Division, Social Welfare Division, Women and Family Division, and Nurture Policy Division.

In line with the government laws and policies on social welfare, Ansan City is implementing several support programs for the disabled and marginalized groups. For example, Ansan City is operating 32 facilities of children's welfare centers and 36 facilities of disabled person's welfare centers. The number of child-headed family is showing decreasing trend. In 2010, there were 29 child-headed families but in 2014 the number decreased to only 5. For the poor families, the government supports the minimal living expenses of about \$600 per month so that they can maintain their livelihood. Also, through discounted rice program, the poor families can purchase cheap rice to meet their daily needs.



In 2014, registered sole-living senior citizen was 14,619 whereas the number was 14,071 in 2013. As RO Korea is becoming a highly aged population country, the government is expecting that the number of sole-living senior citizen will increase significantly in the next few years. In this response, Ansan City is increasing its capacity to support the sole-living senior citizens through senior citizen's welfare center and free medical services to senior citizens. The government also issues senior citizen pension to all the senior citizens to support their livelihood.

No case of malnutrition is reported in Ansan City. This might be due to the effective social welfare system of RO Korea where marginalized group and person can receive some sort of supports for their immediate needs and livelihood.



Child nurture program (left); Senior Citizen welfare center (right)

Implications and recommendations

Ansan City is implementing various social security measures for the disabled and marginalized group of people as they are susceptible to various socio-economic hazards. Ansan City does not have any reported case of malnutrition and undernourishment. This might be due to well-designed social security programs and effective implementation at Ansan City. It is recommended that Ansan City continue its support to disabled and marginalized groups of people so that their welfare will be secured.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City



Food security and livelihood management

028 Poverty incidence, employment and education

Description

This indicator estimates the degree of poverty, employment and the potential for employment.

Rationale

The degree of poverty reflects an area's degree of social development. Productive employment is a foundational element needed to provide households with goods and services in their struggle against poverty, while education is a key to productive employment.

Data requirements

- Poverty threshold
- Poverty incidence
- Income per capita (male/female)
- Total employment (male/female)
- Education; proportion of population (male/female; primary/secondary/tertiary)
- Budget allocation for livelihood programs

Results

Ansan City's Gross Regional Domestic Product (GRDP) is steadily increasing over the past year. In table 29, it is shown that the per capita GRDP is steadily increasing to reach KRW 22,172K in 2010. As Ansan City was developed as an industrial complex, there are various opportunity to employment. Ansan City shows unemployment rate of around 3% similar to the national average. In 2015, a 2.7% of employment rate increase compared to the previous year was observed.

Table 29. Gross Regional Domestic Product of Ansan City

Indicator	2007	2008	2009	2010
Population	704,050	709,720	705,340	714,890
GRDP (B KRW at 2005 constant prices)	14,952	15,460	14,173	15,743
Economic growth rate (% at 2005 constant prices)	19.96	2.95	-6.70	9.20
Per capita GRDP (K KRW)	20,893	20,855	19,659	22,172

(source: 2015 Ansan City Statistical Yearbook)

In accordance with the Korean Law, people below the social security basic standard are entitled to receive the government support through "Basic Livelihood Security Program." There are two types of recipients: people below the basic standard and senior citizen. The amount received is different case by case but it is about KRW 600,000/month. Table 30 shows the population who received the government support through the two social security programs.

Table 30. Recipients of government's social security support program

Program	Basic Livelihood Security Program	Basic Senior Pension Program
2012	14,855	49,523
2013	14,496	51,663
2014	14,267	53,780

(source: 2015 Ansan City Statistical Yearbook)

As shown in Table 30, basic livelihood security program recipients are declining over the year whereas basic senior pension program recipients are increasing. As Ansan City is progressing in terms of economic growth, the residents are becoming better off. However, aging population will be a concern over the long-term of period.

Implications and recommendations

Ansan City is providing basic needs of poor and marginalized groups. Economic growth is solid over the past 10 years and it is expected that it will be stable over the next 10 years. Ansan City is recommended to continue its support to poor and marginalized groups in order for them to maintain their livelihood and basic needs.

References

2015 Ansan City Statistical Yearbook, 2016, Ansan City



Food security and livelihood management

029 Livelihood programs

Description

This indicator measures the availability of programs, people, and budget to help enhance coastal livelihoods. It also looks into the sectors benefited and the impacts of these livelihood programs.

Rationale

Livelihood programs help optimize productivity of coastal areas and help households maximize their potential for income.

Data requirements

- Existing livelihood programs
- Staff and budget allocation for livelihood programs
- Accessibility and budgets
- Sectors covered
- Impacts of livelihood programs

Results

Creating jobs and securing livelihood are one of the top priorities of Ansan City. There are several livelihood support programs and job trainings are available in Ansan City. Table 31 summarized the major livelihood support programs and activities of Ansan City. Although table 31 shows only for 2015 activities, these activities have been continued from the previous years and will continue and grow.



Table 31. Major livelihood support programs of Ansan City (2015)

Program	Major activity	Results (2015)
Start-up company nurturing program	Provide supports to start-up companies through technical support, training on key technologies, work space, technicians, etc.	Supported 112 companies with 327 hired. Achieved sales of KRW 41.6B
Young college graduates company incubating program	Provide supports to young college graduates to open companies through consulting, mentoring, training and space for work	A total of 30 teams (102 persons) was selected and trained.
Public Work Employment Program	Provide employment opportunities to low-income and marginalized groups to public works	1,204 persons were employed (55% women and 40% over 60). KRW 3,458M spent.
Community-based cooperative project employment	Provide employment opportunities to poor and marginalized groups to community-based cooperative projects	783 persons were hired at 23 projects (Budget: KRW 2,785M)

(source: 2014-2015 Ansan City Whitebook)

Implications and recommendations

Ansan City is providing opportunities to marginalized groups of the City for their livelihood and welfare. The support extends to young graduates in their building business and start-up companies. It is recommended that Ansan City continue support the young people, marginalized group and the poor for their livelihood and welfare.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City



Pollution reduction and waste management

030 Pollution management plans and implementation

Description

This indicator accounts the presence of specific policies, plans and programs for pollution reduction and waste management. It further looks into the commitment of local government to implement the plans through allocation of human and financial resources.

Rationale

Specific strategies and action plans are essential to address issues on pollution and waste management. These action plans must be implemented through the commitment of facilities and equipment, as well as financial and human resources.

Data requirements

- Availability of pollution management plans and their scope (water, air, land)
- Monitoring programs
- Budget for pollution and waste management
- Staff allocation for pollution and waste management
- Adequacy of equipment/facilities

Results

Ansan City's pollution management is included in the Ansan City Comprehensive Environmental Protection Plan (2011-2020). Established in 2011, the Comprehensive Plan provides a framework for the environmental management of Ansan City including pollution management. The Plan comprises 8 components including: natural environment, water environment, soil and groundwater, air quality, solid waste management, harmful and noxious chemical management, energy management, and climate change response. Table 32 shows the major areas of the plan and corresponding budget plan.



Table 32. Major components and budget of the Ansan City Comprehensive Environmental Protection Plan

(unit: M KRW)

Component	2011	2016	2020	Total (2011-2020)
Natural environment	3,930	4,130	4,130	41,220
Water environment	10,530	12,470	12,470	118,100
Soil and ground water	100	120	220	2,020
Air quality	19,700	23,738	24,588	375,510
Solid waste management	920	1,450	1,960	15,400
Harmful and noxious chemical	170	70	70	1,000
Energy management	130	40	50	1,110
Climate change response	37,420	44,018	45,398	575,360

(source: Ansan City Comprehensive Environmental Protection Plan)

The Ansan City Comprehensive Environmental Protection Plan was incorporated in the Ansan City Development Master Plan (2015). The chapter 8 of the Master Plan lay down the environmental protection plan of the City. As the Comprehensive Plan and Master Plan have been approved by the Mayor and City Council, the budget for the implementation has been secured. The City will need to ensure the timely and smooth implementation of the plan in order to promote the sustainable development of the City.

Effective pollution management is an essential part of the Ansan City's sustainable development and for safeguarding the City's Vision: Green and Eco City. Ansan City has adequate facilities for environmental facilities including solid waste processing facilities, sewerage treatment plants, incinerating facility for domestic garbage, air quality monitoring stations and so on. The City will need to ensure the timely and efficient implementation of the planned activities in order to secure clean and livable environment.

Implications and recommendations

Ansan City already developed a comprehensive environmental management plan which includes pollution management plan. Budget for the implementation of the plan has been approved. Ansan City is recommended to implement the activities of the Plan in timely and efficient manner.

References

Ansan City Comprehensive Environmental Protection Plan (2011-2020),
2012, Ansan City



Pollution reduction and waste management

031 Water quality

Description

This indicator measures the level to which coastal waters and river waters that discharge into the coastal area are within the water quality standards prescribed for the specific water use (e.g., drinking, swimming, boating, fishing, aquaculture, etc.).

Rationale

Criteria and standards for water quality are based on scientific information related to water use and potential risks to human health (e.g., transmit waterborne diseases), productivity (e.g., decrease fisheries productivity) and/or the ecosystem health (e.g., destruction and degradation of habitats). Different parameters provide indications of ecosystem health and potential threats to water use.

Data requirements

Priority parameters

- Changes (temporal/spatial) in water transparency (secchi depth/total suspended solids) (marine/river/beach)
- Changes (temporal/spatial) in dissolved oxygen (DO) concentrations (marine/river/beach)
- Changes (temporal/spatial) in total/fecal coliform counts (marine/river/beach)

Secondary parameters

- Changes (temporal/spatial) in chlorophyll concentrations (marine/river/beach)
- Changes (temporal/spatial) in nutrient (nitrates, phosphates) concentrations (marine/river/beach)
- Changes (temporal/spatial) in biochemical oxygen demand (BOD) concentrations (marine/river/beach)
- Groundwater quality (nitrates and heavy metals)

Results

Water quality of Ansan City is monitored by few different entities. Freshwater quality is monitored by the Ministry of Environment whereas seawater quality is monitored by the Ministry of Oceans and Fisheries. Ansan City also regularly monitors the freshwater quality of major streams of the City. Water quality standards are set by both ministries through respective national laws. For freshwater standards, the Framework Act on Environmental Policy established the standards for: drinking water, natural water, groundwater, and lake water. The Table 33 shows the natural water standard.



Table 33. National Freshwater Quality Standards (natural waters)

Water quality level		기준								
		pH	Biological Oxygen Demand (BOD,mg/ℓ)	Chemical Oxygen Demand (COD,mg/ℓ)	Total Organic Carbon (TOC,mg/ℓ)	Suspended Solid (SS,mg/ℓ)	Dissolved Oxygen (DO,mg/ℓ)	Total phosphorus (T-P,mg/ℓ)	E Coli (MPN/100mℓ)	
									Total E. Coli	Fecal E. Coli
Very good	Ia	6.5-8.5	< 1	< 2	< 2	< 25	> 7.5	< 0.02	< 50	< 10
Good	Ib	6.5-8.5	< 2	< 4	< 3	< 25	> 5.0	< 0.04	< 500	< 100
Slightly good	II	6.5-8.5	< 3	< 5	< 4	< 25	> 5.0	< 0.1	< 1000	< 200
Acceptable	III	6.5-8.5	< 5	< 7	< 5	< 25	> 5.0	< 0.2	< 5000	< 1000
Slightly bad	IV	6.5-8.5	< 8	< 9	< 6	< 100	> 2.0	< 0.3	-	-
Bad	V	6.5-8.5	< 10	< 11	< 8	No trash should be seen	> 2.0	< 0.5	-	-
Very bad	VI	-	> 10	> 11	> 8	-	< 2.0	> 0.5	-	-

(source: Framework Act on Environmental Policy)

There are four major streams in Ansan City, namely: Ansan stream; Hwajung stream; Banwol stream; and Shingil stream. These streams are regularly monitored every month at 4 sampling stations (except for Banwol stream with 3 sampling stations). The trend of water quality at four major streams in Ansan City is shown in Figure 25 (BOD only).

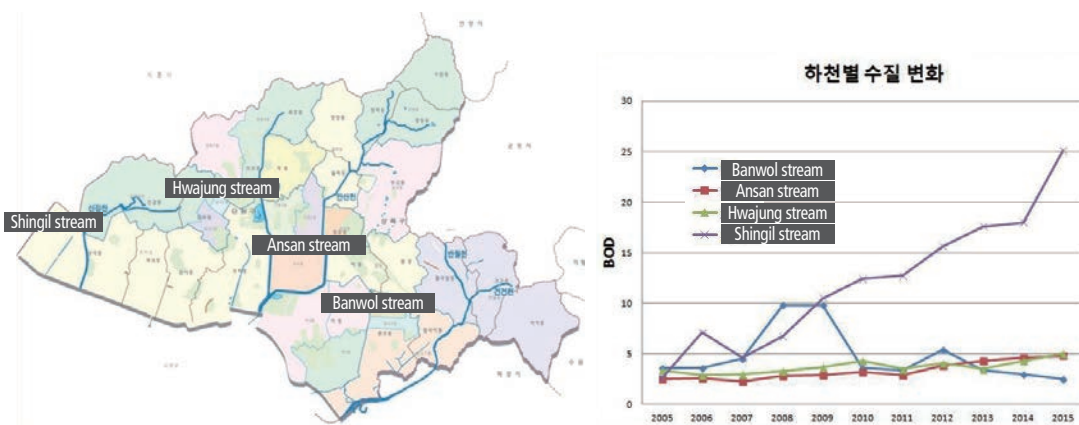


Figure 25. Water quality of 4 major streams of Ansan City (source: 2014-2015 Ansan City Whitebook)



As shown in the figure, Ansan City is maintaining acceptable (level III) water quality in major streams except for Shingil stream. The water pollution in Shingil stream is bit concern. This might be caused due to industrial complex in the area. Overall, the water quality of four major streams is stable but slightly degrading trend (3 out of 4 streams). Ansan City will need to enhance enforcement activity at the Shingil stream area in order to maintain good water quality of the recipient water body: the Shihwa Lake.



Major streams of Ansan City (left: Ansan stream; right: Hwajung stream)

Seawater quality standards were established by the Marine Environment Management Act (2007) which is managed by the Ministry of Oceans and Fisheries (MOF). MOF operates regular monitoring programs of seawater quality and provides the results in an integrated information system "The Marine Environment Information System (MEIS)." Over time, the presentation of seawater quality monitoring results has evolved significantly. Now, seawater quality is presented using an ecosystem-based water quality rating system called the "Water Quality Index (WQI)" since 2011. The introduction of WQI is to provide quick and easy understanding of sea water quality by lay persons. The WQI has five ranks, from level I to level V (see Table 34), and calculated as below:

$$WQI = 10 \times [\text{bottom DO}] + 6 \times [(\text{Chl-a} + \text{Transparency})/2] + 4 \times [(\text{DIN} + \text{DIP})/2]$$

Table 34. Water Quality Index level

Level	WQI
I (Very good)	below 23
II (Good)	24 – 33
III (Acceptable)	34 – 46
IV (Bad)	47 – 59
V (Very bad)	over 60

(source: Marine Environment Management Act)

According to the monitoring results, seawater quality of Lake Shihwa is maintained below COD 5mg/L level. There are 10 monitoring stations inside the Lake. The COD level is considered as level III which means suitable for industrial uses. The COD level of the Lake is improving trend over the past 5 years (Figure 26).



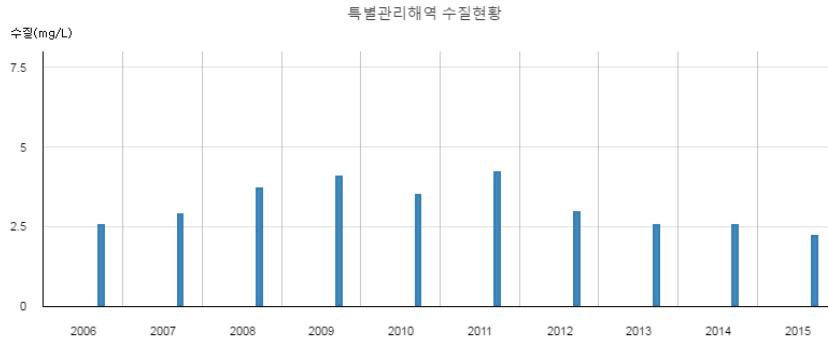


Figure 26. COD trend of the Shihwa Lake

(source: 2016 Korea Marine Environment Survey Yearbook, Ministry of Oceans and Fisheries)

However, according to WQI system, Shihwa Lake is categorized as level V (Figure 27). Although there were significant improvement in biochemical indicators such as pH, COD, BOD and others, the WQI suggests that Shihwa Lake is far from functioning well in terms of ecosystem as the WQI inside the Lake is in level V. The WQIs outside the Lake are maintained within level II and III. The interpretation of these results suggests that there are huge rooms for improvement to restore the ecosystem of the Lake.

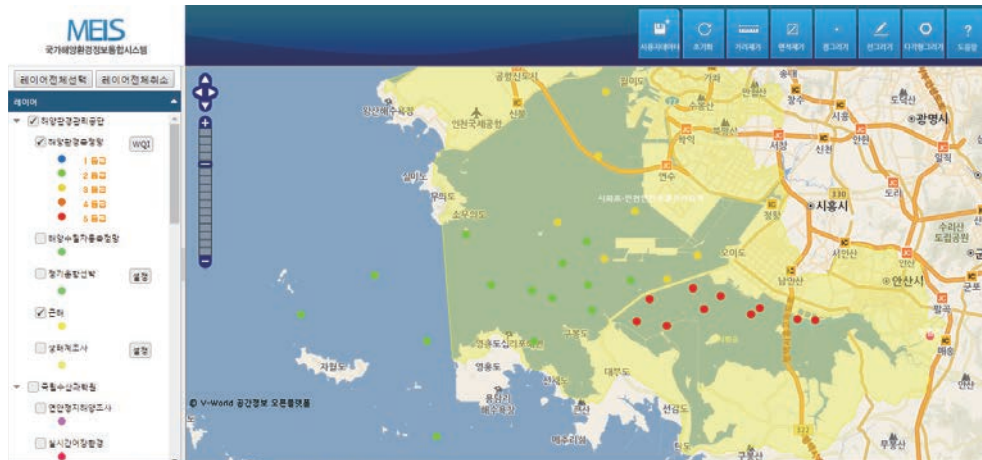


Figure 27. MEIS shows the WQI along the Ansan coasts including the Shihwa Lake. (Source: <http://meis.go.kr>)

Implications and recommendations

The freshwater quality of major streams of Ansan City shows gradual degrading trend. Also, seawater quality of Shihwa Lake is still in level 5 of WQI. Ansan City is recommended to provide more stringent enforcement and efforts to reduce pollutant loading to Shihwa Lake.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City
 The Framework Act on Environmental Policy, Ministry of Environment
 2016 Korea Marine Environment Survey Yearbook, Ministry of Oceans and Fisheries
 Marine Environment Information System, <http://meis.go.kr>, Ministry of Oceans and Fisheries

Pollution reduction and waste management

032 Air quality

Description

This indicator reports on the quality of air in terms of total suspended particulates, sulfur oxide, nitrogen oxide, carbon oxide and volatile organic carbon.

Rationale

Air pollution is harmful to human health and the quality of the environment.

Data requirements

Changes in concentration of total suspended particulates (TSP)

Changes in concentration of other air pollutants (particulate matter, sulfur oxide, nitrogen oxide, carbon oxide, volatile organic carbon)

Results

There are seven air quality monitoring stations in Ansan City. The monitoring is conducted for the six air quality parameters including PM10, PM2.5, O3, NO2, CO and SO2. Ansan City's long-term trend for air quality parameters are shown in Table 35. As shown in the table, air quality is improving over time. Figure 28 shows the trend of NO2 and SO2 of Ansan City. Both parameters are stable over time with minimal changes in concentration.

Table 35. Air quality indicators trend of Ansan City

Indicator	Standard	2010	2011	2012	2013	2014	2015
SO2	>0.02ppm	0.007	0.007	0.006	0.006	0.006	0.006
O3	>0.06ppm	0.026	0.025	0.025	0.024	0.023	0.026
NO2	>0.03ppm	0.029	0.030	0.031	0.029	0.032	0.031
PM10	>50micro g/m ³	53	57	47	51	52	53
CO	>9ppm	0.6	0.6	0.6	0.6	0.6	0.5



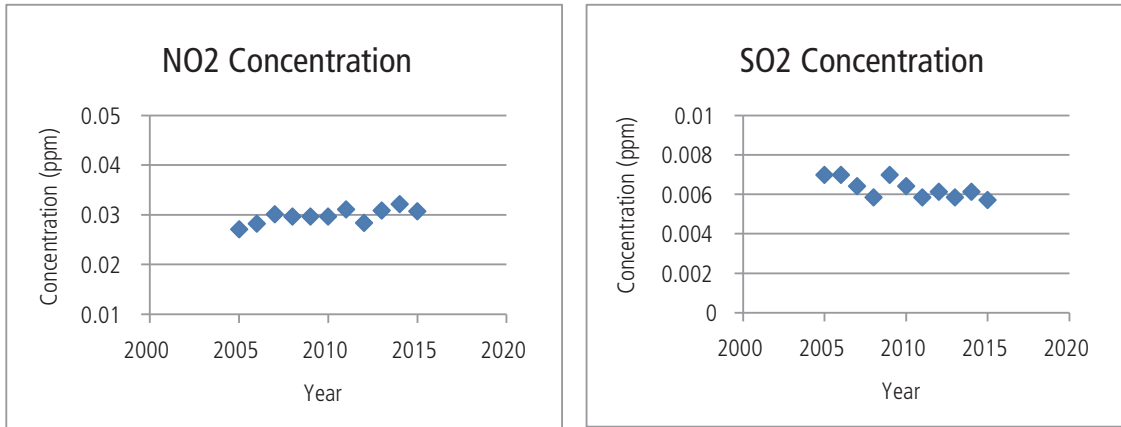


Figure 28. Concentrations of NO₂ and SO₂ of Ansan City in 6 monitoring stations.

The real-time measurements of the parameters are provided to the general public, as shown in Figure 29. As shown, Ansan City's air quality parameters are all level 1 as of 21 July 2016 which means that air quality is very good. The Comprehensive Air-quality Index (CAI) is developed to present air quality of the area in an easily understandable way. In the Figure 29, five out of seven monitoring sites show CAI level 1 whereas two sites are CAI level 2.



Figure 29. Information system showing the real-time air quality of Ansan City

(source: <http://air.gg.go.kr>)

Implications and recommendations

Ansan City is continuously monitoring the air quality parameters of the City in order to provide clean environment to the citizens. Various policy measures were implemented to reduce the air pollution of the City including promotion of Clean Natural Gas (CNG) buses, strict enforcement of air pollution regulation etc. Through these efforts, Ansan City was able to maintain good air quality.

It is recommended that Ansan City continue its efforts in maintaining good air quality through improved implementation of the air quality measures in order to cope with the changing environment such as yellow dust problems in the future.



References

Gyeonggi-do Institute of health and environment, air quality, <http://air.gg.go.kr>
2014-2015 Ansan City Whitebook, 2016, Ansan City

Pollution reduction and waste management

033 Sanitation and domestic sewerage

Description

This indicator reports the proportion of the population with access to sanitation and sewerage systems.

Rationale

The lack of sanitation facilities can affect human well-being and have negative impacts on the quality of the environment especially when disposed untreated to the coastal and marine environment. Moreover, data on access to sanitation also monitors progress in meeting one of the Millennium Development Goals (MDG) targets for environmental sustainability.

Data requirements

- Population with access to improved sanitation
- Households connected to septic tanks
- Volume of septage collected/treated
- Population served by public sewerage system (collection)
- Location of sewage treatment plants and discharge pipes
- Level of treatment and volume of sewage treated
- Volume of domestic wastewater generated, treated, recycled or reused

Results

The sewerage treatment is a priority of Ansan City as the City is connected to the Lake Shihwa which is vulnerable to water pollution by domestic and industrial wastewater inflow. The City owns the five wastewater treatment facilities which are equipped with advanced tertiary treatment capabilities. The capacity of wastewater treatment of the facilities is 537,000 ton/day. Actual treatment per day was 388,791 ton/day. Daily per capita sewage generation was about 0.30 ton/person in 2014, 0.29 ton/person in 2013 and 2012.

In 2015, the percentage of population served by public sewerage system was about 99.7%.





Ansan Wastewater Treatment facility (source: Ansan Internet News)

Implications and recommendations

Sewage treatment of Ansan City is carried out by Ansan Water and Wastewater Treatment Agency. The treatment capacity of the wastewater treatment is higher than the generated wastewater. Percentage of population connected to public sewerage system is more than 99.7%. It is recommended that Ansan City continue to put efforts in serving its citizens for sanitary treatment.

References

2015 Ansan City Statistical Yearbook, 2016, Ansan City
 2014-2015 Ansan City Whitebook, 2016, Ansan City



Pollution reduction and waste management

034 Municipal solid waste

Description

This indicator measures the tonnage of solid waste generated, the proportion being recycled or reused, and volume received in dumpsites or sanitary landfills.

Rationale

Improper waste management have negative impact on human and ecological health as well as the aesthetic and recreational values of coastal areas.

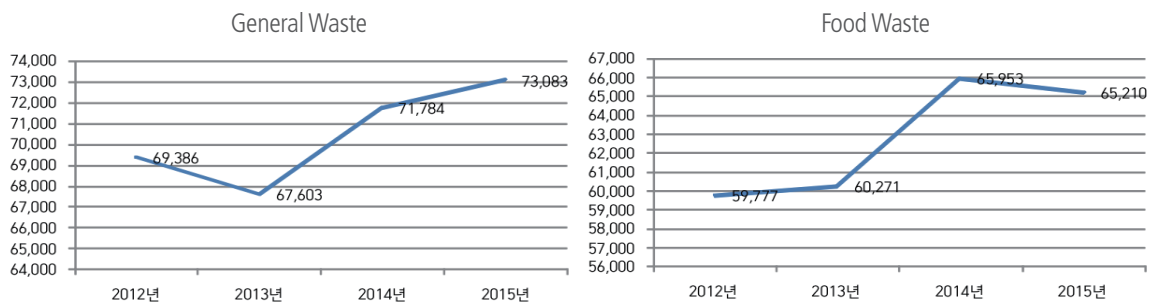
Data requirements

- Volume of solid waste generated
- Volume of solid waste received in landfills/dumpsites
- Volume of solid waste received at material recovery facilities

Results

Guided by the Ansan City Comprehensive Environmental Protection Plan (2011-2020), the City is implementing strict measures for waste management. The City is promoting the 3R (reduce, reuse and recycle) scheme to sustainably manage municipal solid waste. Collection of municipal waste is conducted in pre-set dates for the types of the waste. For example, general wastes and food wastes are collected every day except for Sunday; recyclables are every Tuesday and Friday; and bulky wastes are on Monday and Thursday.

The generation of municipal solid waste per capita of Ansan City was 0.217 ton for 2014 and 0.222 ton for 2015. The total waste generated was 165,669 ton for 2014 and 167,565 ton for 2015. The generation of domestic wastes is slightly on the rise. The recyclable materials cover about 7% of total waste generated for both 2014 and 2015. The city collected 100% of waste generated. Figure 30 shows the municipal waste generation trend for each type of waste. The collection of general wastes, recyclables and food wastes is on the rise due to efficient collection system. Also, littering of wastes is on the decreasing trend.



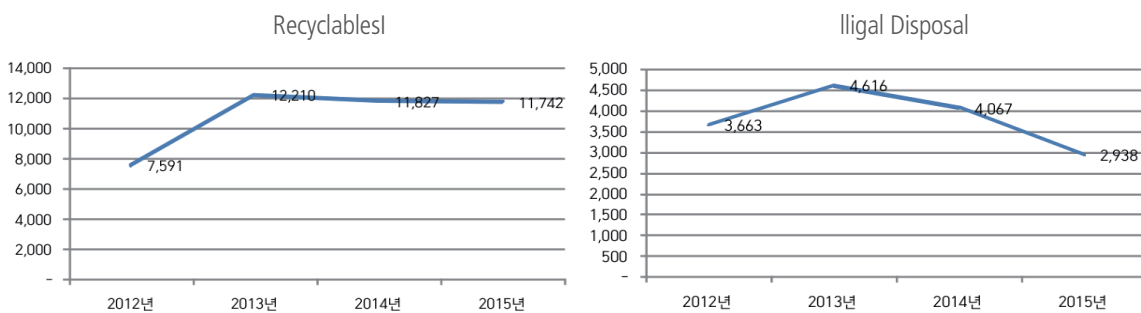


Figure 30. Waste generation trend in Ansan City

The recycle rate is defined by generation/recycled* 100. In 2014, the recycle rate for municipal and industrial waste combined was about 64.3%, whereas 43.5% for 2013, 49.8% for 2012, and 53.1% for 2011. Ansan City shows an average of about 53% of recycling rate. There are two types of recycling facilities in Ansan City: food waste recycling facility and material recycling facility. Food wastes are converted to compost for donating and selling to citizens and farmers. Materials are sorted and packaged to recycling.



Ansan Mayor campaigning for waste clean-up (left); Ansan Resource Recycling Center (right)

Implications and recommendation

Ansan City is increasing its capacity to collect waste generated at the City. Using its recycling facility, the City is promoting resource recycling and reuse. In order to cope with the overall trend of increasing waste generation, the City will need to increase the awareness on waste generation.

References

2014-2015 Ansan City Whitebook, 2016, Ansan City
 Ansan Statistical Yearbook 2011, Ansan City
 Ansan Statistical Yearbook 2015, Ansan City



Pollution reduction and waste management

035 Agricultural, industrial hazardous waste

Description

This indicator measures the quantity of agricultural, industrial and hazardous wastes being generated and properly managed within the local government's jurisdiction.

Rationale

Agricultural, commercial, institutional and industrial sectors generate income and employment but they also generate wastes that may affect human health and livelihoods in communities. Hazardous and toxic wastes (e.g., oily waste, pesticide residues; cleaning compounds; hospital wastes; etc.) are byproducts of various goods, services, processes and systems that customers/citizens demand. The proper management of these wastes is a major challenge to local governments and to sustainable development.

Data requirements

- Volume of industrial and agricultural wastes generated, handled, treated and disposed
- Volume of hazardous and toxic waste generated, handled, treated and disposed

Results

Founded on an industrial complex, the main source of hazardous and toxic wastes in Ansan City is the industry sector. In 2015, there are about 2,711 industrial waste generating facilities including hospital, industrial and construction in Ansan City. These industrial wastes are collected and treated by 185 treating and recycling facilities. Ansan City inspected about 1,564 industrial waste generating facilities in 2014-2015 and fined 76 violating facilities with penalty amounting to KRW 77,850K.

The generation of industrial wastes is shown in Table 36. As shown in this table, the industrial wastes generation trend is steady.

Table 36. Industrial waste generation in Ansan City

Year	2010	2011	2012	2013	2014
Generation (ton)	1,977	1,895	2,322	2,243	2,199



Implications and recommendation

Industrial wastes generation is at steady pace. Ansan City will need to encourage the industry sector to reduce the generation of industrial waste.



Pollution reduction and waste management

Agricultural, industrial hazardous waste

References

2014-2015 Ansan City Whitebook, 2016, Ansan City
2015 Ansan City Statistical Yearbook, 2016, Ansan City



Appendix 1. Coastal Management Act of RO Korea

COASTAL MANAGEMENT ACT

(Established in 1999; Wholly amended in 2009)

CHAPTER I. GENERAL PROVISIONS

Article 1 (Purpose)

The purpose of this Act is to prescribe necessary matters concerning the efficient preservation, use, and development of coasts, thereby contributing to enhancing the preservation of the coastal environment, facilitating the sustainable development of coasts, and creating pleasant and affluent coasts as the basis for people's lives.

Article 2 (Definitions)

The definitions of terms used in this Act shall be as follows:

1. The term "coast" means coastal sea areas and coastal land areas;
2. The term "coastal sea area" means the following:
 - (a) Beach (referring to land at the distance from the coast line under Article 6 (1) 4 of the Act on Construction, Management, etc. of Spatial Data to the area registered in the cadastral register);
 - (b) Sea (referring to the body of water at the distance from the coast line under Article 6 (1) 4 of the Act on Construction, Management, etc. of Spatial Data to the outer limits of the territorial waters);
3. The term "coastal land area" means the following:
 - (a) Uninhabited islets;
 - (b) Land areas (excluding river areas under subparagraph 2 of Article 2 of the River Act) at a range of 500 meters (in cases of harbors under subparagraph 1 of Article 2 of the Harbor Act, national fishery harbors under subparagraph 3 (a) of Article 2 of the Fishing Villages and Fishery Harbors Act, or industrial complexes under subparagraph 8 of Article 2 of the Industrial Sites and Development Act, 1,000 meters) from the boundary line of land in coastal sea areas, which are prescribed in the plan for integrated coastal management under Article 6 of this Act;
- 3-2. The term "coastal erosion" means a phenomenon in which the surface of the earth collapses or sand, etc. is washed away by waves, tidal or ocean currents, wind, an elevated sea level, installation of facilities, etc.;
4. The term "coastal maintenance project" means any of the following projects implemented in coasts, implemented in accordance with the implementation plan for coastal maintenance project under Article 25 (1):
 - (a) Any project for protecting the seashore from tidal waves, wave surges, sea water, coastal erosion, etc. and for maintaining a damaged seashore;
 - (b) Any project for preserving or improving coastal sea areas;

- (c) Any project for facilitating the pleasant use of coasts, such as the creation of recreational places;
5. The term "sea area for coastal use" means a coastal sea area determined under a plan for a coastal management area provided for in Article 9, the purpose of which is predetermined to prevent any overlap for the purpose of improving public welfare through efficient preservation, use, and development of coastal sea area;
6. The term "functional area for coastal sea area" means a coastal sea area determined by the status of use and function under a plan for a coastal management area provided for in Article 9 for the purpose of improving and supplementing functions of sea area for coastal use and of reasonably preserving, using, and developing coastal sea area;
- 6-2. The term "coastal erosion management area" means an area designated and publicly announced pursuant to Article 20-2;
7. The term "natural coast" means coast where natural coast line is well preserved without any structure, such as by artificial facilities, roads, etc.

Article 3 (Basic Principles for Coastal Management)

Coasts shall be preserved, used and developed under the following basic principles:

1. Coasts shall be preserved, used and developed from a comprehensive and future-oriented perspective to ensure that the public interest is satisfied and ecological, cultural, and economic value co-exist harmoniously;
2. Coasts shall be used and developed in a manner that harmoniously preserves the coastal environments;
3. The public shall be granted more opportunities to participate in formulating policies for preserving and managing coastal environments and in using coastal environments in a sound manner;
4. Beaches shall be efficiently managed to prepare against tidal waves, erosion, etc. due to climate change;
5. Inter-Korean cooperation and international cooperation shall be facilitated to realize integrated coastal management.

Article 4 (Duties of State, etc.)

- (1) The State and local governments shall formulate policies necessary to preserve, use and develop coasts in a sustainable manner.
- (2) The State and local governments shall endeavor to increase the public awareness about the basic principles for coastal management, and to prevent any damage to the coastal environment.
- (3) The public shall pro-actively cooperate in policies by the State and local governments for the purposes of preserving, improving and using the scenic and pleasant coastal environment in a sustainable manner.

Article 5 (Basic Research, etc. on Coasts)

- (1) The Minister of Oceans and Fisheries shall conduct basic research on the actual conditions of coasts (hereinafter referred to as "basic research on coasts") every five years for the efficient management of coasts: Provided, That research and measurement on actual conditions of natural coasts, beaches, etc. in the basic research on coasts may be conducted each decade.
- (2) The Minister of Oceans and Fisheries may conduct supplementary research on areas in which apparent changes are recognized to take place in coastlines, ecosystems, etc. based on the results of basic research under paragraph (1).
- (3) The Minister of Oceans and Fisheries shall conduct research on the actual conditions of coastal erosion each year, and conduct close research on areas deemed especially necessary for the execution of coastal maintenance projects.

- (4) Where the Minister of Oceans and Fisheries conducts research pursuant to paragraphs (1) through (3), he/she may request the heads of relevant administrative agencies to submit necessary documents. In such cases, the heads of relevant administrative agencies shall comply with such request unless any extenuating reason exists to the contrary.
- (5) The Metropolitan City Mayor, the Do Governor, the Governor of a Special Self-Governing Province (hereinafter referred to as the "Mayor/Do Governor") may conduct research on coasts under his/her jurisdiction, as prescribed by Municipal Ordinances of local governments. In such cases, the Major/Do Governor shall consult, in advance, with the Minister of Oceans and Fisheries, and notify the outcomes of research to the Minister of Oceans and Fisheries.
- (6) Details and methods of research, and other necessary matters under paragraphs (1) through (3) shall be prescribed by Presidential Decree.

CHAPTER II. INTEGRATED COASTAL MANAGEMENT

Article 6 (Formulation of Plan for Integrated Coastal Management)

- (1) The Minister of Oceans and Fisheries shall formulate a plan for integrated coastal management (hereinafter referred to as "integrated plan") each decade following deliberation by the Central Committee for Deliberation on Coastal Management under Article 30, in order to preserve, use, and develop coasts in a comprehensive manner.
- (2) Where the Minister of Oceans and Fisheries intends to formulate the integrated plan, he/she shall have a prior consultation with the heads of the relevant central administrative agencies after hearing opinions of the Mayor/Do Governor, the head of a Si/Gun/Gu (referring to the head of an autonomous Gu; hereinafter the same shall apply), and relevant experts.
- (3) Where the Minister of Oceans and Fisheries intends to formulate the integrated plan, he/she may request the heads of the relevant administrative agencies to submit materials necessary therefor. In such cases, the heads of the relevant administrative agencies shall, upon receipt of such request, comply therewith unless any extenuating ground exists otherwise.

Article 7 (Details of Integrated Plan)

- (1) The integrated plan shall include the following:
 1. Scope of coastal land areas;
 2. Areas subject to plan formulation;
 3. Basic policy directions concerning coastal management;
 4. Matters concerning the desired preservation, use, and development of coasts, such as the preservation of the coastal environment and sustainable development of coasts;
 5. Basic management directions for sea areas for coastal use, and functional areas for coastal sea areas;
 - 5-2. Basic direction-setting for designation and management of coastal erosion management areas;
 6. Management directions for natural coasts management by objective under Article 32;
 7. Basic directions for coast maintenance business;
 8. Other matters deemed necessary by Presidential Decree.

- (2) Where the scope of coastal land areas and areas subject to plan formulation under paragraph (1) 1 and 2 are prescribed, the following shall be considered:
1. Administrative districts and topography;
 2. Plans concerning the classification of use districts, etc., land use, etc. under other Acts and subordinate statutes;
 3. Water system and tides of rivers and seabed topography;
 4. Matters concerning the preservation of the natural environment, such as coastal environment, sceneries, etc;
 5. Status on the use of sea areas, such as the fisheries, mining, and tourism industries;
 6. Extent of diffusion of land-based sources of pollution;
 7. Correlation to social and economic activities.

Article 8 (Public Notification, etc. of Integrated Plan)

- (1) Where the Minister of Oceans and Fisheries formulates an integrated plan, he/she shall immediately notify such fact in the Official Gazette, and notify the heads of the relevant central administrative agencies and the relevant Mayors/Do Governors thereof.
- (2) Upon receipt of the notification under paragraph (1), the relevant Mayors/Do Governors (excluding the Governor of a Special Self-Governing Province) shall, without delay, have the heads of Sis/Guns/Gus allow public perusal of the integrated plan on their jurisdictional coasts: Provided, That upon receipt of the notification under paragraph (1), the Governor of a Special Self-Governing Province shall directly allow public perusal of integrated plans on their jurisdictional coasts.
- (3) Necessary matters concerning public announcement, notification, and perusal under paragraphs (1) and (2) shall be prescribed by Presidential Decree.

Article 9 (Formulation, etc. of Plans for Coastal Management Areas)

- (1) The Governor of a Special Self-Governing Province and the heads of Sis/Guns/Gus may formulate a plan for coastal management areas (hereinafter referred to as "local plan") on an area recognized necessary for the efficient preservation, use, and development of their jurisdictional coasts within the scope of the integrated plan.
- (2) Notwithstanding paragraph (1), the relevant Mayors/Do Governors (excluding the Governor of a Special Self-Governing Province; hereafter the same shall apply in this paragraph) may formulate a local plan on area recognized necessary for the efficient preservation, use, and development of their jurisdictional coasts within the scope of the integrated plan in two or more Sis/Guns/Gus (referring to an autonomous Gu; hereinafter the same shall apply): Provided, That where different Mayors/Do Governors have jurisdiction over the Sis/Guns/Gus, a joint local plan may be formulated through consultation between the relevant Mayors/Do Governors.
- (3) The Minister of Oceans and Fisheries may formulate guidelines necessary to systematically establish and manage local plans, and notify Mayors/Do Governors or the heads of Sis/Guns/Gus thereof.
- (4) When Mayors/Do Governors or the heads of Sis/Guns/Gus intend to formulate a local plan, hold a public hearing, in advance, as prescribed by Presidential Decree to hear opinions of local residents and relevant experts, they shall have a consultation with the heads of the relevant administrative agencies, and obtain approval from the Minister of Oceans and Fisheries following deliberation by the Committee for Deliberation on Local Coastal Management under Article 31.
- (5) Where the Minister of Oceans and Fisheries grants approval under paragraph (4), he/she shall undergo deliberation by the Central Committee for Deliberation on Coastal Management under Article 22.

(6) Deleted.

(7) Local plans formulated pursuant to paragraphs (1) and (2) shall be implemented by the Governor of a Special Self-Governing Province and the heads of Sis/Guns/Gus with jurisdiction over applicable coasts.

Article 10 (Details of Local Plans)

Local plans shall include the following:

1. Scope of jurisdictional coasts;
2. Coasts subject to policy formulation;
3. Policy directions for managing jurisdictional coasts;
4. Necessary coasts concerning implementation of integrated plans;
5. Designation and management of sea areas for coastal use and functional areas for coastal sea areas;
- 5-2. Management directions for jurisdictional coastal erosion management areas;
6. Matters concerning natural coasts management by objective under Article 32;
7. Directions for coast maintenance business for jurisdictional coasts;
8. Other matters recognized necessary by the heads of local governments who formulate local plans.

Article 11 (Public Announcement, etc. of Local Plans)

- (1) When the heads of Sis/Guns/Gus formulate local plans under Article 9 (1), they shall immediately give public notice of such plan in the official report, report it to the heads of the relevant administrative agencies, and make it available for public perusal.
- (2) When the Mayors/Do Governors (excluding the Governor of a Special Self-Governing Province) formulate local plans under Article 9 (2), he/she or they shall give immediate public notice of such plan in the official report, and report it to the heads of the relevant administrative agencies and the heads of Sis/Guns/Gus.
- (3) Upon receipt of the notification under paragraph (2), the heads of Sis/Guns/Gus shall make it available for public perusal without delay.
- (4) The Minister of Oceans and Fisheries may subsidize necessary expenses incurred in the formulation and implementation of the local plan within budgetary limits.

Article 12 (Amendments to Integrated Plans, etc.)

- (1) The Minister of Oceans and Fisheries may verify the feasibility of established and publicly announced integrated plans every five years, and take necessary measures, such as amendments thereto, etc.
- (2) Where deemed necessary to make amendments to the integrated plan or local plans, or where the heads of the relevant administrative agencies make a request for such amendments, the Minister of Oceans and Fisheries, Mayors/Do Governors, or the heads of Sis/Guns/Gus may make amendments thereto.
- (3) When the Minister of Oceans and Fisheries deems it necessary to amend a local plan due to any significant change in details of the relevant integrated plan, he/she may request Mayors/Do Governors or the heads of Sis/Guns/Gus to amend such local plan, and subsidize expenses incurred in amending such plan, within budgetary limits.
- (4) Articles 6 and 8 shall apply mutatis mutandis to amendments to an integrated plan under paragraphs (1) and (2), respectively: Provided, That Article 8 shall only apply mutatis mutandis to amendments to insignificant matters prescribed by Presidential Decree.
- (5) Articles 9 (4) and (5) and 11 shall apply mutatis mutandis to amendments to a local plan under paragraph (2), respectively: Provided, That only Article 11 shall apply mutatis mutandis to amendments to insignificant matters prescribed by Presidential Decree, such as changes in geographical features.

(6) Article 9 (7) shall apply mutatis mutandis to the implementation of local plans amended by the Mayors/Do Governors (excluding the Governor of a Special Self-Governing Province) pursuant to paragraph (2).

Article 13 (Relations with other Plans, etc.)

- (1) Integrated plans or local plans shall be established and/or amended by incorporating with the following:
1. An urban or Gun master plan under Article 22 of the National Land Planning and Utilization Act;
 2. Comprehensive plan for national environment under Article 14 of the Framework Act on Environmental Policy and the mid-term comprehensive plan for environmental preservation under Article 17 of the same Act;
 3. Comprehensive plan for maritime environment under Article 14 of the Marine Environment Management Act;
 4. Basic plan for maritime ecosystem preservation and management under Article 9 of the Conservation and Management of Marine Ecosystems Act;
 5. Basic plan for wetlands conservation under Article 5 of the Wetlands Conservation Act;
 6. Basic plan for parks under Article 11 of the Natural Parks Act;
 7. Basic plan for fishing ground under Article 3 of the Fishing Ground Management Act;
 8. Master plans for public waters reclamation under Article 22 of the Public Waters Management and Reclamation Act;
 9. Comprehensive plans for uninhabited islands under Article 6 of the Act on the Conservation and Management of Uninhabited Islands.
- (2) Where necessary for preservation of the coastal environment and sustainable development of coasts, the Minister of Oceans and Fisheries may request amendments to plans or use district, etc. formulated or designated under other Acts and subordinate statutes.
- (3) Where the heads of the relevant administrative agencies formulate or amend the plan on coastal land areas, related to environmental preservation and/or use of coasts and development thereof under other Acts and subordinate statutes, and such formulation and/or amendment concern integrated plans or local plans, they shall have a consultation with Mayors/Do Governors or the heads of Sis/Guns/Gus; and when plans are finalized, he/she shall give immediate notice of such details to the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus.
- (4) Upon receipt of the notification under paragraph (3), the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus shall amend the integrated plan or local plan without delay in a manner that appropriately corresponds to the details of such notification and publicly announce it in the Official Gazette or official report.

Article 14 (Compliance with Integrated Plan, etc.)

Where the heads of the relevant administrative agencies intend to conduct any act concerning coastal preservation, use, and development in coasts, they shall do so in a way that appropriately corresponds to the integrated plan and local plans.

CHAPTER III. DESIGNATION AND MANAGEMENT OF SEA AREAS FOR COASTAL USE

Article 15 (Classification of Use of Coastal Sea Areas)

Coastal sea areas shall be classified as the following sea areas for coastal use by considering the actual status of use, natural and environmental features, future directions for use, etc.:

1. Coastal sea areas for use: Sea areas whose use or development is determined, or expected, and where its use or development activities are preferentially allowed to the extent that it minimizes the impact on the marine environment;
2. Special coastal sea areas: Coastal sea areas falling under any of the following items:
 - (a) Coastal areas which require special management in order to protect military facilities and the main facilities of the State;
 - (b) Sea areas which require special management due to any damage to the marine environment or ecosystem or the risk of damage thereto;
3. Preserved coastal sea areas: sea areas which require special management in order to protect the coastal environment and resources and to preserve the marine culture;
4. Managed coastal sea areas: areas whose classification is impractical because the areas fall under neither of subparagraphs 1 through 3, or the areas fall under two or more categories thereof.

Article 16 (Designation of Sea Areas for Coastal Use)

- (1) The Mayors/Do Governors or the heads of Sis/Guns/Gus may designate or change sea areas for coastal use according to local plans under Article 9.
- (2) In cases of designation and change of sea areas for coastal use under paragraph (1), functional areas for coastal sea areas under Article 19 shall be taken into account.

Article 17 (Legal Fiction as Designation of Areas Designated and Publicly Notified in other Acts as Sea Areas for Coastal Use)

- (1) The following areas shall be deemed to have been designated as coastal sea areas for use under subparagraph 1 of Article 15:
 1. Harbor areas under subparagraph 4 of Article 2 of the Harbor Act, and areas where new harbor construction is to be conducted pursuant to Article 5 (1) of the New Harbor Construction Promotion Act;
 2. Fishing ports under subparagraph 4 of Article 2 of the Fishing Ground Management Act;
 3. Industrial complex under subparagraph 8 of Article 2 of the Industrial Sites and Development Act;
 4. Aggregate extraction complex under Article 34 of the Aggregate Extraction Act;
 5. Submarine mining areas under Article 3 of the Submarine Mineral Resources Development Act;
 6. Free economic zones under subparagraph 1 of Article 2 of the Act on Designation and Management of Free Economic Zones.
- (2) The following areas, etc. shall be deemed to have been designated as special coastal sea areas under subparagraph 2 of Article 15:
 1. Military bases and military facilities protection areas under subparagraph 6 of Article 2 of the Protection of Military Bases and Installations Act;
 2. Sea areas for special management under Article 15 (1) 2 under the Marine Environment Management Act;
 3. Electric source development project areas and prearranged areas for electric source development project

under Articles 5 and 11 of the Electric Source Development Promotion Act.

(3) The following areas shall be deemed to have been designated as preserved coastal sea areas under subparagraph 3 of Article 15:

1. Fishery resources protection areas under Article 40 of the National Land Planning and Utilization Act;
2. Marine environment preservation areas under Article 25 of the Conservation and Management of Marine Ecosystems Act;
3. Environment preservation sea areas under Article 15 (1) 1 of the Marine Environment Management Act;
4. Ecology and scenery preservation areas under Article 12 of the Natural Environment Conservation Act;
5. Wetlands protection areas under Article 8 (1) of the Wetlands Conservation Act;
6. Natural parks under Article 4 of the Natural Parks Act.

Article 18 (Evaluation of Appropriateness of Coastal Sea Areas)

- (1) In order to efficiently manage the sea areas for coastal use, the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus may evaluate the appropriateness of coastal sea areas concerning the characteristics, location, possibility of utilization thereof, etc.
- (2) Details, procedures, etc. concerning evaluation of appropriateness of coastal sea areas under paragraph (1) shall be prescribed by Ordinance of the Ministry of Oceans and Fisheries.

Article 19 (Designation of Functional Areas for Coastal Sea Areas)

- (1) In order to efficiently manage sea areas for coastal use, Mayors/Do Governors or the heads of Sis/Guns/Gus may designate or change the functional areas for coastal sea areas according to the following classification. In such cases, designation or change of functional areas for coastal sea areas shall be prescribed in accordance with local plans under Article 9:
 1. Coastal sea areas for use:
 - (a) Port area: An area necessary to construct ports and maintain functions thereof;
 - (b) Course: An area necessary to secure safe navigation of vessels;
 - (c) Fishing port area: An area necessary to construct fishing ports and maintain functions thereof;
 - (d) Leisure and tourism area: Area necessary to support leisure and tourism activities in coasts;
 - (e) Beach area: An area necessary to maintain functions of beaches;
 - (f) Mineral resources area: An area necessary to extract minerals or aggregate;
 - (g) Other functional areas prescribed by Presidential Decree;
 2. Special coastal sea areas:
 - (a) Marine water quality management area: An area necessary to manage the quality of marine water;
 - (b) Marine research area: An area necessary to conduct research of marine water quality or marine ecosystem;
 - (c) Disaster management area: An area requiring management due to frequent occurrence of tidal waves, wave surges, ground erosion, red tides, etc.;
 - (d) Military facility area: An area necessary to protect military facilities;
 - (e) Industrial facility area: An area necessary to maintain facilities of the mainstay industries of the State, such as energy related facilities, such as plants, etc., oil reserve facilities, etc.;
 - (f) Other functional areas prescribed by Presidential Decree;
 3. Preserved coastal sea areas:
 - (a) Fishery resources protection area: An area necessary to protect and foster fishery resources;
 - (b) Marine ecosystem protection area: An area necessary to maintain the habitats of marine life;

- (c) Scenery protection area: An area necessary to protect sceneries on the seashore, on the sea, in the sea, or under the sea;
 - (d) Park area: An area necessary to maintain functions of natural parks;
 - (e) Fishing ground area: An area necessary to maintain fishing ground for village fishing, aquaculture, etc.;
 - (f) Other functional areas prescribed by Presidential Decree;
4. Managed coastal sea areas: Functional areas according to the classifications under the subparagraphs of paragraph (1).
- (2) Where Mayors/Do Governors or the heads of Sis/Guns/Gus intend to designate or alter a functional area defined in paragraph (1) 4, they may designate or alter it for an overlapped functional area. In such cases, where they designate an overlapped functional area belonging to different sea areas for coastal use, they shall set priorities for management, taking into account the natural environment and socioeconomic conditions of the relevant area, and the current state, etc. of use and preservation of its neighboring sea areas.
- (3) Matters necessary to designate or change functional areas for coastal sea areas, other than those prescribed by paragraph (1) and (2), shall be prescribed by Presidential Decree.

Article 20 (Restriction on Changing Sea Areas for Coastal Use, etc. by Other Acts)

Where the heads of relevant administrative agencies intend to grant permission, authorization, approval or determine each of the following plans, they shall consult with Mayors/Do Governors or the heads of Sis/Guns/Gus according to the corresponding matters, as prescribed by Presidential Decree: Provided, That the same shall not apply where he/she consults with Mayors/Do Governors or the heads of Sis/Guns/Gus, or obtain approval therefrom in accordance with other Acts:

1. Plans which include legal fiction of determination of local plans under other Acts, concerning designation of or changes to sea areas for coastal use or functional areas for coastal sea areas under this Act;
2. Plans which include areas, etc. deemed to have been designated as sea areas for coastal use pursuant to Article 17.

CHAPTER III-2. DESIGNATION, MANAGEMENT, ETC. OF COSTAL EROSION MANAGEMENT AREAS

Article 20-2 (Designation, etc. of Coastal Erosion Management Areas)

- (1) The Minister of Oceans and Fisheries may designate as a coastal erosion management area, an area which requires special management as serious damage has occurred or is likely to occur due to coastal erosion (hereinafter referred to as "management area"), in accordance with the standards determined by Ordinance of the Ministry of Oceans and Fisheries.
- (2) In order to efficiently control management areas, the Minister of Oceans and Fisheries may designate management areas by categorizing them as either:
 1. Core management area: An area requiring urgent action as rapid coastal erosion is underway or consequent damage is serious;
 2. Buffer management area: An area, etc. bordering a core management area necessary so as to manage such core management area.

- (3) Where the Minister of Oceans and Fisheries intends to designate a management area pursuant to paragraph (1), he/she shall hear opinions of Mayors/Do Governors, the heads of Sis/Guns/Gus, or local residents, consult with the head of the relevant central administrative agency, and then undergo deliberation by the Central Committee for Deliberation on Coastal Management under Article 30.
- (4) Where the Minister of Oceans and Fisheries has designated a management area, he/she shall publicize, without delay, in the Official Gazette the name, location, and scope of the relevant area, and other matters prescribed by Ordinance of the Ministry of Oceans and Fisheries, and shall notify the head of the competent local government of such designation.
- (5) Mayors/Do Governors or the heads of Sis/Guns/Gus may request the Minister of Oceans and Fisheries to designate as a management area, any jurisdictional coast deemed to have substantial ground being designated as a management area under paragraph (1).
- (6) Matters necessary for designation of management areas and procedures for requesting designation under paragraphs (1) through (5) and other matters shall be determined by Ordinance of the Ministry of Oceans and Fisheries.

Article 20-3 (Cancellation or Alteration of Designation of Management Areas)

- (1) The Minister of Oceans and Fisheries may cancel or alter designation of a management area for either of the following:
 1. An area, the risk of damage to which by coastal erosion has decreased considerably;
 2. An area determined by Presidential Decree, for which it is inevitable to do so due to public interest or military purposes.
- (2) Article 20-2 (3) through (5) shall apply mutatis mutandis to cancellation or alteration of the designation of management areas under paragraph (1).
- (3) Matters necessary for procedures for cancellation and alteration of the designation of management areas under paragraphs (1) and (2) and other matters shall be prescribed by Ordinance of the Ministry of Oceans and Fisheries.

Article 20-4 (Formulation and Implementation of Management Plans)

- (1) If necessary to effectively respond to damage from erosion in management areas, the Minister of Oceans and Fisheries may formulate and implement plans for management areas (hereinafter referred to as "management plans") which include the following matters:
 1. Research on the actual status of preservation, use, and development of coasts within management areas;
 2. Research on causes of erosion and damage within management areas;
 3. Measures for erosion prevention and restoration within management areas;
 4. Other matters determined by Ordinance of the Ministry of Oceans and Fisheries.
- (2) Matters necessary for the formulation, implementation, etc. of management plans shall be determined by Ordinance of the Ministry of Oceans and Fisheries.

Article 20-5 (Restrictions, etc. on Activities in Management Areas)

- (1) No one shall engage in any of the following activities in any core management area designated and publicly notified pursuant to Article 20-2: Provided, That the same shall not apply to any activity regarding coastal maintenance projects:

1. Newly constructing or extending a building or other structure (limited to extending a building or structure by at least twice the total floor area of that as at the time the relevant management area is designated);
 2. Altering the form and quality of public waters or land;
 3. Extracting sea sand, sediment. or soil and stone;
 4. Other acts prescribed by Presidential Decree which affect coastal erosion.
- (2) Where the Minister of Oceans and Fisheries, Mayors/Do Governors, or the heads of Sis/Guns/Gus deem that activities falling under the subparagraphs of paragraph (1) in buffer management areas designated and publicly notified pursuant to Article 20-2 significantly contribute to erosion of core management areas, they may restrict such acts, as prescribed by Presidential Decree.
- (3) Paragraphs (1) and (2) shall not apply to any of the following cases, approval for which has been obtained from the Minister of Oceans and Fisheries or Mayors/Do Governors (in cases of the head of the relevant central administrative agency, referring to cases where he/she has consulted with the Minister of Oceans and Fisheries):
1. Where erosion control works in coastal areas are executed under subparagraph 2 of Article 3 of the Erosion Control Work Act;
 2. Cases necessary for activities to prevent and recover from a natural disaster defined in subparagraph 2 of Article 2 of the Countermeasures against Natural Disasters Act, relief therefrom, etc.;
 3. Where it is necessary to implement a park project or to install park facilities defined in subparagraphs 9 and 10 of Article 2 of the Natural Parks Act;
 4. Cases determined by Presidential Decree, inevitable for public interest or military purposes.
- (4) Matters necessary for the procedures and requirements for approval or consultation referred to in paragraph (3) and other matters shall be prescribed by Presidential Decree.

Article 20-6 (Order for Suspension, Reinstatement, etc.)

The Minister of Oceans and Fisheries, Mayors/Do Governors, or the heads of Sis/Guns/Gus may issue an order against a person who has performed any activity in violation of Article 20-5 (1) or (2) in a management area to suspend such activity or to reinstate the area within a reasonable period, and where it is impracticable to reinstate the area, they may issue an order to take action corresponding thereto.

Article 20-7 (Temporary Restrictions on Access to Management Areas)

- (1) Where the Minister of Oceans and Fisheries, Mayors/Do Governors, or the heads of Sis/Guns/Gus deem it necessary to take urgent action because harm to people or damage to property is likely due to coastal erosion, they may restrict access to the all or part of the relevant management area for a specified period: Provided, That the same shall not apply in any of the following cases:
1. Access to such area to take action necessary for activities for disaster prevention, emergency countermeasures, restoration, etc. or for relief, etc. under the Framework Act on the Management of Disasters and Safety;
 2. Access to such area for military purposes;
 3. Other cases where permission for access has been obtained from the Minister of Oceans and Fisheries, Mayor/Do Governor, or the head of a Si/Gun/Gu because it is deemed necessary within the realm of the purpose of designation of the management areas.
- (2) Where the Minister of Oceans and Fisheries, a Mayor/Do Governor, or the head of a Si/Gun/Gu intends to restrict access pursuant to paragraph (1), he/she shall publicly notify such fact, as prescribed by Ordinance of the Ministry of Oceans and Fisheries.

- (3) Where it is deemed necessary to restrict access under paragraph (1), the Minister of Oceans and Fisheries, a Mayor/Do Governor, or the head of a Si/Gun/Gu shall immediately cancel restriction of access and publicly notify such fact.
- (4) Matters necessary for the procedure, method, etc. for obtaining permission for access under paragraph (1) 3 shall be prescribed by Ordinance of the Ministry of Oceans and Fisheries.

Article 20-8 (Vicarious Execution)

- (1) In either of the following cases, the Minister of Oceans and Fisheries, a Mayor/Do Governor, or the head of a Si/Gun/Gu may require the owner or occupant of the relevant building, structure, etc. to take necessary action, such as removal thereof:
 1. Where he/she engages in any conduct, in violation of Article 20-5 (1) or (2);
 2. Where he/she fails to comply with an order to suspend or reinstate the area under Article 20-6.
- (2) Where a person required to take action, such as removal, under paragraph (1) fails to comply with such order, and when it is deemed that public interest will be harmed and control of management areas hindered if no action is taken otherwise, the Minister of Oceans and Fisheries, Mayor/Do Governor, or the head of a Si/Gun/Gu may vicariously execute such order, in accordance with the Administrative Vicarious Execution Act.

Article 20-9 (Preferential Implementation of Coastal Maintenance Projects)

Where the Minister of Oceans and Fisheries implements a coastal maintenance project to prevent erosion and reinstate eroded coasts, he/she shall do so, giving priority to management areas.

CHAPTER IV. COASTAL MAINTENANCE PROJECTS

Article 21 (Formulation of Basic Plans for Coastal Maintenance)

- (1) The Minister of Oceans and Fisheries shall formulate a basic plan for coastal maintenance (hereinafter referred to as "basic plan for coastal maintenance") every ten years for the sake of efficient and systematic coastal maintenance projects.
- (2) When the Minister of Oceans and Fisheries intends to formulate a basic plan for coastal maintenance, he/she shall hear opinions of Mayors/Do Governors, in advance, and undergo deliberation by the Central Committee for Deliberation on Coastal Management under Article 30 after consultations with the heads of the relevant central administrative agencies.
- (3) When the Minister of Oceans and Fisheries formulates a basic plan for coastal maintenance, he/she shall publicize such plan without delay in the Official Gazette.

Article 22 (Details of Basic Plans for Coastal Maintenance)

A basic plan for coastal maintenance shall include the following:

1. Direction-setting for the implementation of coastal maintenance projects;
2. Mid- and long-term plans of coastal maintenance projects;
3. Yearly details of coastal maintenance projects and implementation plans thereof;
4. Matters concerning coordination among coastal maintenance projects;

5. Other matters deemed necessary by the Minister of Oceans and Fisheries.

Article 23 (Amendments to Basic Plans for Coastal Maintenance)

- (1) The Minister of Oceans and Fisheries shall review the feasibility of a basic plan for coastal maintenance established and publicly notified, every five years, and shall take necessary measures, such as amendments to the basic plan for coastal maintenance, etc.
- (2) The Minister of Oceans and Fisheries may amend a basic plan for coastal maintenance, where deemed necessary to amend such plan due to designation of management areas, changes in coastal conditions, or other grounds, or where the heads of relevant administrative agencies request to make changes thereto.
- (3) Article 21 (2) and (3) shall apply mutatis mutandis to amendments to a basic plan for coastal maintenance under paragraph (2): Provided, That only Article 21 (3) shall apply mutatis mutandis to amendments to insignificant matters prescribed by Presidential Decree.

Article 24 (Implementer of Coastal Maintenance Projects)

- (1) The Minister of Oceans and Fisheries shall implement coastal maintenance projects within port areas under subparagraph 4 of Article 2 of the Harbor Act: Provided, That in cases of coastal maintenance projects prescribed by Ordinance of the Ministry of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus may implement such projects.
- (2) Mayors/Do Governors or the heads of Sis/Guns/Gus shall implement coastal maintenance projects on coasts, other than the port areas under subparagraph 4 of Article 2 of the Harbor Act as prescribed by Ordinance of the Ministry of Oceans and Fisheries: Provided, That in any of the following cases, the Minister of Oceans and Fisheries may implement such projects:
 1. Projects with a scale exceeding that prescribed by Presidential Decree;
 2. Projects requiring state-of-the-art technology;
 3. Projects that need to be implemented in two or more overlapping Metropolitan Cities or Dos;
 - 3-2. Projects within management areas;
 4. Other projects prescribed by Presidential Decree, which exert a huge influence on the public interest.
- (3) Where the Minister of Oceans and Fisheries intends to implement the coastal maintenance projects under the proviso to paragraph (2), he/she shall hear opinions of the relevant Mayors/Do Governors or the heads of Sis/Guns/Gus in advance.
- (4) Any person, other than the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus, may implement coastal maintenance projects in the relevant coasts after having been designated by the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus according to the following classification:
 1. Coasts within the port areas designated under subparagraph 4 of Article 2 of the Harbor Act: The Minister of Oceans and Fisheries;
 2. Coasts, other than those prescribed in subparagraph 1: Mayors/Do Governors or the heads of Sis/Guns/Gus, who are implementers of coastal maintenance projects under the main sentence of paragraph (2).
- (5) Matters necessary to designate implementers of coastal maintenance projects pursuant to paragraph (4) shall be prescribed by Ordinance of the Ministry of Oceans and Fisheries.

Article 25 (Formulation, etc. of Implementation Plans for Coastal Maintenance Projects)

- (1) Where any implementer of a coastal maintenance project under Article 24 (hereinafter referred to as

"implementer of coastal maintenance project") intends to implement a coastal maintenance project, he/she shall formulate an implementation plan for coastal maintenance project (hereinafter referred to as "maintenance implementation plan") within the scope of the maintenance plan, as prescribed by Presidential Decree.

- (2) Where any implementer of a coastal maintenance project, other than the Minister of Oceans and Fisheries, a Mayor/Do Governor, or the head of a Si/Gun/Gu, intends to formulate a maintenance implementation plan, he/she shall obtain approval from the Minister of Oceans and Fisheries. The same shall also apply to any proposed amendment thereto.
- (3) When the Minister of Oceans and Fisheries, a Mayor/Do Governor, or the head of a Si/Gun/Gu formulates a maintenance implementation plan or when the Minister of Oceans and Fisheries intends to grant approval of the maintenance implementation plan or grant any change thereto under paragraph (2), they shall have prior consultation with the heads of the relevant administrative agencies: Provided, That the same shall also apply in emergencies prescribed by Presidential Decree or where he/she makes amendments to insignificant matters.
- (4) When the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus formulate or amend the maintenance implementation plan, or when the Minister of Oceans and Fisheries grants approval thereto or grants approval to any change thereto under paragraph (2), he/she or they shall publicly announce the same in the Official Gazette or official report without delay and give notice thereof to the heads of the relevant administrative agencies.
- (5) Where the Minister of Oceans and Fisheries intends to grant approval to the maintenance implementation plan or grants approval to any change thereto under paragraph (2), he/she may require the relevant specialized institution to examine whether the maintenance implementation plan is appropriate.

Article 26 (Legal Fiction of Authorization, Permission, etc.)

- (1) Where the Minister of Oceans and Fisheries, Mayors/Do Governors, or the heads of Sis/Guns/Gus publicly announce the maintenance implementation plan under Article 25 (4), the following permission, authorization, decision, license, consultation, agreement, approval, reporting or cancellation, etc. (hereafter referred to as "authorization, permission, etc." in this Article) shall be deemed to have been granted or made, and authorization, permission, etc. under the relevant Acts falling under each subparagraph shall be deemed to have been publicly notified or announced:
 1. Consent to building permission, etc. under Article 7 (1) of the Installation, Maintenance, and Safety Control of Fire-Fighting Systems Act, reporting on fire-fighting system installation under Article 13 (1) of the Fire-Fighting System Installation Business Act, and permission for the installation of a manufactory, etc. under Article 6 (1) of the Safety Control of Dangerous Substances Act;
 2. Approval of the use of agricultural production infrastructures for purposes, other than their original purposes under Article 23 of the Rearrangement of Agricultural and Fishing Villages Act;
 3. Permission for diversion of farmland under Article 34 of the Farmland Act;
 4. Permission for deforestation, etc. within erosion control region under Article 14 of the Erosion Control Work Act and cancellation of designation of erosion control region under Article 20 of the same Act;
 5. Permission for and reporting of mountainous district conversion, and temporary use of a mountainous district under Articles 14, 15, and 15-2 of the Mountainous Districts Management Act, permission for extracting rock materials under Article 25 of the same Act, permission for and reporting of the cutting of standing trees, etc. under Articles 36 (1) and (4) of the Creation and Management of Forest Resources Act, and permission for and reporting of activities within forest reserves district (excluding forests for protection of forest hereditary resources) under Article 9 of the Forest Protection Act, and cancellation of designation of

- forest reserves district under Article 11 (1) 1 of the same Act;
6. Permission for changing the form and quality of land, etc. under Article 21-2 of the Grassland Act and permission, reporting or consultation on grassland conversion under Article 23 of the same Act;
 7. Approval of the implementation of construction works within protected waters under Article 47 (2) of the Fishery Resources Management Act;
 8. Authorization or reporting of constructions plans for electronic equipment for electric business under Article 61 of the Electric Utility Act, and permission or reporting of construction plans for private-use electronic equipment under Article 62 of the same Act;
 9. Permission for development under Article 56 of the National Land Planning and Utilization Act, designation of implementer of urban planning facility business under Article 86 of the same Act, authorization of implementation plan under Article 88 of the same Act;
 10. Permission for installation of facilities or structures under Article 24 of the Sewerage Act;
 11. Permission for implementation of road construction for a person other than the road management agency under Article 36 of the Road Act, permission for occupation and use of roads under Article 61 of the same Act, or consultation with the road management agency or approval under Article 107 of the same Act;
 12. Permission for installation, etc. of private roads under Article 4 of the Private Road Act;
 13. Permission for occupation and use of public waters under Article 8 of the Public Waters Management and Reclamation Act, consultation or approval under Article 10 of the same Act, approval or reporting of implementation plans for occupation and use of public waters under Article 17 of the same Act, reclamation license for public waters under Article 28 of the same Act, consultation or approval for reclamation to be implemented by the State, etc. under Article 35 of the same Act, and approval for implementation plans for public waters reclamation under Article 38 of the same Act;
 14. Deleted;
 15. Permission for implementation of small river construction under Article 10 of the Small River Maintenance Act;
 16. Permission for extraction of aggregate under Article 22 of the Aggregate Extraction Act;
 17. Permission for moving graves under Article 27 (1) of the Act on Funeral Services, etc;
 18. Consultation on permission, etc. by administrative agencies under Article 13 of the Protection of Military Bases and Installations Act;
 19. Permission for occupation and use of urban parks under Article 24 of the Act on Urban Parks, Greenbelts, etc.
- (2) Where the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus intend to formulate or amend the maintenance implementation plan, where the Minister of Oceans and Fisheries intends to grant approval thereto under Article 25 (2), and where matters falling under the subparagraphs of paragraph (1) are included in the relevant maintenance implementation plan, he/she shall have a prior consultation with the heads of the relevant administrative agencies.

Article 27 (Appropriation and Use of Land, etc.)

- (1) Any implementer of a coastal maintenance project may, where necessary for the execution of coastal maintenance projects, appropriate or use land, goods, or rights under Article 3 of the Act on Acquisition of and Compensation for Land, etc. for Public Works Projects: Provided, That an implementer designated under Article 24 (4) shall purchase land whose size is equivalent to 2/3 of the land subject to coastal maintenance project and obtain consent from persons, the number of which is equal to or greater than 1/2 of that of land owners.

- (2) The provisions of the Act on Acquisition of and Compensation for Land, etc. for Public Works Projects shall apply mutatis mutandis to the expropriation or use of land, goods, or rights under paragraph (1), except as otherwise provided for in this Act.
- (3) Where the public announcement under Article 25 (4) is made, project approval under Articles 20 (1) and 22 of the Act on Acquisition of and Compensation for Land, etc. for Public Works Projects and the public announcement of project approval shall be deemed to have been granted and made, and applications for adjudication may be filed within the implementation period of the project, notwithstanding the provisions of Articles 23 (1) and 28 (1) of the Act on the Acquisition of Land, etc. for Public Works and the Compensation therefor.

Article 28 (Bearing Costs, etc.)

- (1) Any implementer of a coastal maintenance project shall bear expenses incurred in the implementation of a coastal maintenance project.
- (2) The Government may fully or partially subsidize expenses borne by Mayors/Do Governors or the heads of Sis/Guns/Gus under paragraph (1) or provide loans thereto within budgetary limits.
- (3) The Minister of Oceans and Fisheries, Mayors/Do Governors, and the heads of Sis/Guns/Gus may have a coastal maintenance project required to be implemented due to construction or activity other than the coastal maintenance project, carried out by an implementer or performer of such construction. In such cases, the expenses incurred in carrying out the project shall be borne by the implementer or performer of such construction.
- (4) Deleted.

Article 29 (Ex Post Facto Management, etc. of Coastal Maintenance Project Structures)

- (1) Implementers of coastal maintenance project shall perform ex post facto management of structures installed under the coastal maintenance project: Provided, That the relevant Mayors/Do Governors and the heads of Sis/Guns/Gus shall perform ex post facto management of structures installed under a coastal maintenance project implemented by the Minister of Oceans and Fisheries pursuant to the proviso to Article 24 (2).
- (2) The Minister of Oceans and Fisheries may inspect and evaluate the actual conditions and effects of ex post facto management of structures under paragraph (1).
- (3) Matters necessary for inspections and evaluation under paragraph (2) shall be prescribed by Ordinance of the Ministry of Oceans and Fisheries.

CHAPTER V. COMMITTEE FOR DELIBERATION ON COASTAL MANAGEMENT

Article 30 (Central Committee for Deliberation on Coastal Management)

- (1) The Central Committee for Deliberation on Coastal Management shall be established under the control of the Minister of Oceans and Fisheries to deliberate on the following matters concerning coastal management:
1. Formulation of and amendment to the integrated plan and local plans;
 2. Designation and amendment to sea areas for coastal use and functional areas for coastal sea areas;
 - 2-2. Designation, or cancellation or alteration of designation, of management areas;

3. Natural coasts management by objective under Article 32;
 4. Formulation of and amendment to a basic plan for coastal maintenance;
 5. Matters subject to deliberation by the Central Committee for Deliberation on Coastal Management by other Acts and subordinate statutes;
 6. Other matters deemed necessary by the Minister of Oceans and Fisheries.
- (2) If necessary, the Central Committee for Deliberation on Coastal Management may establish and operate sub-committees by area.
 - (3) Necessary matters concerning the composition, criteria, and methods for deliberation, etc. of the Central Committee for Deliberation on Coastal Management shall be prescribed by Presidential Decree.

Article 31 (Local Committee for Deliberation on Coastal Management)

- (1) Local committees for deliberation on coastal management shall be established under the control of Mayors/Do Governors to deliberate on the formulation of and amendment to the local plans and other significant matters concerning the management of jurisdictional coasts.
- (2) Necessary matters concerning the functions, composition, operation, etc. of local committees for deliberation on coastal management shall be prescribed by Municipal Ordinances of the relevant local governments.

CHAPTER VI. EFFICIENT MANAGEMENT OF COASTS

Article 32 (Natural Coasts Management by Objective)

- (1) For the purposes of efficient preservation of natural coasts, improvement of functions of the coastal environment, etc., the Minister of Oceans and Fisheries may undergo deliberation by the Central Committee for Deliberation on Coastal Management under Article 30, and establish natural coast management objectives.
- (2) Mayors/Do Governors and the heads of Sis/Guns/Gus may establish natural coast management objectives after undergoing deliberation by the local committees for deliberation on coastal management under Article 31, in consideration of management objectives under paragraph (1).
- (3) In order to fulfill natural coasts management objectives, the Minister of Oceans and Fisheries, Mayors/Do Governors and the heads of Sis/Guns/Gus may conduct the natural coast restoration projects as part of the coastal maintenance project.
- (4) Matters necessary to implement the natural coast management objectives and natural coast restoration projects shall be prescribed by Presidential Decree.

Article 33 (Coastal Management Officer)

- (1) Where deemed necessary to efficiently manage coasts, Mayors/Do Governors or the heads of Sis/Guns/Gus may appoint a coastal management officer.
- (2) Necessary matters concerning the qualifications, methods of appointment, scope of duties, etc. of a coastal management officer under paragraph (1) shall be prescribed by Presidential Decree.

Article 34 (Periodic Inspection of Coasts)

- (1) The Minister of Oceans and Fisheries shall have public officials under his/her control inspect the actual conditions of implementation for the integrated plan, local plans, and basic plans for coastal maintenance on a periodic basis.
- (2) The Governor of a Special Self-Governing Province, and the heads of Sis/Guns/Gus shall submit annual self-evaluation reports on the actual status of implementation of local plans to the Minister of Oceans and Fisheries. <Amended by Act No. 11690, Mar. 23, 2013>
- (3) Where deemed especially necessary to take corrective measures based on the results of inspection and evaluation results under paragraphs (1) and (2), the Minister of Oceans and Fisheries may request the heads of relevant administrative agencies to take corrective measures. In such cases, the heads of central administrative agencies shall comply therewith unless any extenuating reason exists otherwise, and give notice of such corrective measures and the results thereof to the Minister of Oceans and Fisheries.
- (4) Details and methods of inspection, the scope of evaluation and methods therefor under paragraphs (1) and (2) and other necessary matters shall be prescribed by Presidential Decree.

Article 34-2 (Establishment, Management, etc. of Coastal Information System)

- (1) In order to reasonably formulate and implement integrated plans, local plans or coastal management policies, the Minister of Oceans and Fisheries shall establish and manage a coastal information system which includes the following matters:
 1. Location and characteristics of topography, natural features, etc. in coastal areas;
 2. Current status of coastal use;
 3. Geographical information on coastlines, etc;
 4. Cultural and social information on ports, fishing ports, roads, industry, cities, maritime resources, etc.
- (2) The Minister of Oceans and Fisheries may request the heads of relevant administrative agencies to submit documents necessary to establish and manage the coastal information system.
- (3) Other matters necessary for establishing and managing the coastal information system shall be prescribed by Presidential Decree.

Article 34-3 (Research and Development)

The Minister of Oceans and Fisheries shall conduct research and development necessary to efficiently manage coasts, prevent coastal erosion, and reduce damage, etc.

Article 34-4 (Education and Public Relations on Coasts)

- (1) In order to enhance public interest in, and understanding of, coasts and to promote efficient coastal management, the State and local governments may formulate and implement policies on education and publicity, such as development of educational and publicity programs.
- (2) To promote education and publicity under paragraph (1), the Minister of Oceans and Fisheries may designate a coastal education center, as prescribed by Presidential Decree.
- (3) Matters necessary for the standards, procedure, method, etc. for the designation of the coastal education center, shall be prescribed by Ordinance of the Ministry of Oceans and Fisheries.

Article 34-5 (Purchase of Land, etc.)

(1) If necessary to prevent coastal erosion or recover eroded coasts in management areas, the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus may purchase land, buildings, other goods in such management areas, and rights such as mining and fishing rights (hereafter referred to as "land, etc." in this Article) following consulting with the owners thereof.

(2) If deemed particularly necessary to purchase a mining right under paragraph (1), the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus may purchase the mining right by dividing it after consulting with the Minister of Trade, Industry and Energy thereabout, notwithstanding the provisions of the Mining Industry Act.

(3) Where the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus purchase land, etc. pursuant to paragraph (1), the purchase price shall be as calculated under the Act on Acquisition of and Compensation for Land, etc. for Public Works Projects.

(4) Where the utility of land, etc. has considerably decreased due to designation of a management area, the owner of land, etc. in such management area may request the Minister of Oceans and Fisheries, the Mayor/Do Governor or the head of a Si/Gun/Gu to purchase such land, etc. In such cases, he/she shall purchase such land if it satisfies the standards determined by Presidential Decree.

(5) Matters necessary for the purchase procedure and purchase request procedure for land, etc. under paragraphs (1) through (4) and other matters shall be prescribed by Presidential Decree.

CHAPTER VII. SUPPLEMENTARY PROVISIONS

Article 35 (Access, etc. to Land, etc.)

(1) Any implementer of coastal maintenance project and public officials who engage in conducting research under Article 5 and inspection under Article 34 may conduct the following acts, where necessary to carry out coastal maintenance projects or coastal research, etc.:

1. Access to land or coastal sea areas possessed by other parties (hereafter referred to as "land, etc." in this Article);

2. Using land belonging to other parties as a material stockyard or provisional roads for a specified period;

3. Where especially necessary, changing or removing trees, sand, rocks and other obstacles.

(2) Where any person who intends to have access to land, etc. possessed by other parties under paragraph (1), he/she shall give notice of the date and place of access to such possessor seven days before he/she intends to have access to such land: Provided, That the same shall not apply where the possessor or manager of such land is unknown or any inevitable ground exists to the contrary.

(3) No person shall have access to land, etc. belonging to other parties which are surrounded by housing sites, borders, or fences without the consent of the possessor, manager of land, etc. before sunrise or after sundown.

(4) Where any implementer of coastal maintenance project or public official who engages in conducting research, etc. conducts activities under subparagraph 2 or 3 of paragraph (1), he/she shall obtain consent of the owner, possessor, or manager of such land or obstacles: Provided, That the same shall not apply where the owner, possessor, or manager of such land or obstacles is unknown or any inevitable ground exists to the contrary.

(5) No owner, possessor or manager of land may hinder or refuse any access, temporary use, act of changing or removal of obstacles under paragraph (1) without justifiable cause.

(6) Any person who intends to conduct an act under paragraph (1) shall show a certificate indicating his/her identity to interested parties, as prescribed by Ordinance of the Ministry of Oceans and Fisheries.

Article 36 (Compensation for Loss)

- (1) Where any person who suffers loss exists due to an act under Article 35 (1), an administrative agency the actor belongs to or an implementer of coastal maintenance project shall compensate such loss.
- (2) With regard to the compensation for loss under paragraph (1), the person who is to compensate such loss and a person who suffers loss shall have a consultation thereabout.
- (3) Where a consultation under paragraph (2) fails or a consultation is likely to fail, applications for adjudication may be filed to the competent committee for land appropriation, as prescribed by Presidential Decree.

Article 37 Deleted.

Article 38 (Delegation and Entrustment)

- (1) Some of the authority of the Minister of Oceans and Fisheries under this Act may be delegated to his/her subsidiary institutions or Mayors/Do Governors, or the heads of Sis/Guns/Gus, respectively or entrusted to the heads of the relevant administrative agencies, as prescribed by Presidential Decree. <Amended by Act No. 11690, Mar. 23, 2013>
- (2) The Minister of Oceans and Fisheries may fully or partially entrust his/her duties prescribed in the following subparagraphs, to relevant specialized institutions, as prescribed by Presidential Decree: <Amended by Act No. 12089, Aug. 13, 2013>
 1. Research on the actual conditions of coastal erosion under Article 5 (3);
 2. Evaluation of the appropriateness of coastal sea areas under Article 18;
 3. Evaluation of the appropriateness of a maintenance implementation plan under Article 25 (5);
 4. Inspection and evaluation of the actual conditions and effects of ex post facto management of structures for a coastal maintenance project under Article 29 (2);
 5. Periodic inspection of coasts under Article 34;
 6. Establishment and management of the coastal information system under Article 34-2.
- (3) Deleted.

CHAPTER VIII. PENAL PROVISIONS

Article 38-2 (Penal Provisions)

Any of the following persons shall be punished by imprisonment for not more than three years or by a fine not exceeding 50 million won:

1. A person who violates Article 20-5 (1);
2. A person who violates restrictions on acts under Article 20-5 (2);
3. A person who violates an order to suspend, to reinstate the original state, or to take an action under Article 20-6.

Article 38-3 (Joint Penal Provisions)

Where the representative of a corporation, or an agent, employee, or any other servant of a corporation or individual commits any offence under Article 38-2 in connection with the affairs of the corporation or the individual, not only shall the offender be punished, but the corporation or the individual also shall be punished

by a fine prescribed in the relevant provisions: Provided, That the same shall not apply where such corporation or individual has not been negligent in giving due attention and supervision regarding the relevant affairs to prevent such offence.

Article 39 (Administrative Fines)

- (1) Either of the following persons shall be punished by an administrative fine not exceeding three million won, as prescribed by Presidential Decree:
 1. A person who accesses a management area, in violation of Article 20-7;
 2. A person who obstructs or refuses access, temporary use, the changing for removal of obstacles, etc., in violation of Article 35 (5).
- (2) Administrative fines under paragraph (1) shall be imposed and collected by the Minister of Oceans and Fisheries, Mayors/Do Governors or the heads of Sis/Guns/Gus.

Addenda

Article 1 (Enforcement Date)

This Act shall enter into force one year after the date of its promulgation.

Article 2 (Applicability concerning Authorization of Implementation Plan for Coastal Maintenance Project)

The amended provisions of Article 25 shall apply to an implementation plan for coastal maintenance project established or amended on or after this Act enters into force.

Article 3 (Applicability concerning Appropriation and Use of Land, etc.)

The amended provisions in the proviso to Article 27 (1) shall apply to an implementer of coastal maintenance project designated pursuant to amended provisions of Article 24 (4) on or after this Act enters into force.

Article 4 (Applicability concerning Post-Management of Structures of Coastal Maintenance Projects)

The amended provisions in Article 29 shall apply to structures installed under the coastal maintenance projects on or after this Act enters into force.

Article 5 (Transitional Measures concerning Basic Research concerning Actual Conditions of Coasts)

Basic research conducted pursuant to the previous provisions of Article 4 as at the time this Act enters into force shall be deemed to have been conducted according to the amended provisions of Article 5.

Article 6 (Transitional Measures concerning Plan for Integrated Coastal Management)

The plan for integrated coastal management established under the previous provisions of Articles 5 through 7 as at the time this Act enters into force shall be deemed to have been established according to the amended provisions of Articles 6 through 8 on the date it was announced in the Official Gazette pursuant to the previous provisions of Article 7 (1).

Article 7 (Transitional Measures concerning Local Plans for Coastal Management Areas)

Local plans for coastal management areas established pursuant to the previous provisions of Articles 8 and 9 as at the time this Act enters into force shall be deemed to have been established pursuant to the amended provisions of Articles 9 through 11.

Article 8 (Transitional Measures concerning Coastal Maintenance Plans)

Coastal maintenance plans established under the previous provisions of Article 13 as at the time this Act enters into force shall be deemed to have been established pursuant to the amended provisions of Article 21.

Article 9 (Transitional Measures concerning Coastal Management Officer)

The coastal management officer commissioned under the previous provisions of Article 24 as at the time this Act enters into force shall be deemed to have been commissioned under the amended provisions of Article 33.

Articles 10 Omitted.

Article 11 (Relations to Other Acts and Subordinate statutes)

Where the previous Coast Management Act or the previous provisions thereof are cited in other Acts and subordinate statutes as at the time this Act enters into force, and corresponding provisions exist in this Act, the corresponding provisions in the Act shall be deemed to have been cited in place of the previous provisions.