



THE EAST ASIAN SEAS CONGRESS 2015

**Global Targets**  
**Local Benefits**

Setting the Sustainable Development Agenda  
for the Seas of East Asia beyond 2015

16-21 November 2015 • Danang, Vietnam

# A Preliminary Assessment on the Ocean Economy and Marine Ecosystem Services in Korea

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## Workshop 3.3: Blue Economy Development: Where are we now? Where are we headed?

### Scope of Ocean Economy

➤ 14 sectors, 40 Sub-sectors

Sectors	
Ocean Based Sector	Fisheries and aquaculture
	Marine chemical and salt
	Marine electric power
	Marine construction
	shipping
Ocean related Sector	machine equipment
	Ship building
	Marine services (mapping, surveying, consultation)
	R&D
	Government education
	Seafood retails
	Phamaceuticals, Biotechnology etc
	Port
	Marine tourism

Source : MOF (2011)

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### Contribution to National Economy

Year	Value added (million USD)	GDP contribution (%)
'08	37,845.0	3.8
'10	37,826.6	3.3
'11	39,795.4	3.3

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### Contribution to National Economy (2010, I-O table)

Sector	Total gross output		Value added	
	0.1 million USD	(%)	0.1 million USD	(%)
Entire Industry	31,240,374	100	11,525,808	100
<b>Ocean Industry</b>	<b>1,338,468</b>	<b>4.3</b>	<b>378,226</b>	<b>3.3</b>
Fisheries and aquaculture	75,153	5.6	32,264	8.5
Marine chemical and salt	5,637	0.4	3,631	1
Marine construction	28,350	2.1	12,723	3.4
shipping	345,555	25.8	32,878	8.7
machine equipment	101,201	7.6	26,417	7
Ship building	530,084	39.6	159,192	42.1
Marine services (mapping, surveying, consulting)	14,486	1.1	9,356	2.5
R&D	6,019	0.4	4,047	1.1
Government education	42,946	3.2	28,057	7.4
Seafood process & retails	89,264	6.7	23,122	6.1
Phamaceuticals, Biotechnology etc	70	0	31	0
Port	35,226	2.6	17,470	4.6
Marine tourism	64,478	4.8	29,037	7.7

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### Marine Ecosystem services

- Costanza et al. (1997) categorized services and goods from ecosystems into seventeen.

- ✓ gas regulation
- ✓ climate regulation
- ✓ disturbance regulation
- ✓ water regulation
- ✓ water supply
- ✓ erosion control and sediment retention
- ✓ soil formation
- ✓ nutrient cycling
- ✓ waste treatment
- ✓ pollination
- ✓ biological control
- ✓ refugia
- ✓ food production
- ✓ raw materials
- ✓ genetic resources
- ✓ recreation
- ✓ cultural services

#### • marine ecosystem services

- ✓ disturbance regulation
- ✓ erosion control
- ✓ nutrient cycling
- ✓ waste treatment
- ✓ biological control
- ✓ refugia
- ✓ food production
- ✓ raw materials
- ✓ genetic resources
- ✓ recreation
- ✓ cultural services
- +
- ✓ non-use value

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### Marine Ecosystem services

Marine ecosystem		Marine ecosystem services (goods and services)
Coastal waters	beach, national park	recreation, cultural services
	Coastal waters	food production raw materials( aggregate, natural gas )
Estuaries		food production, waste treatment, refugia, recreation, Indirect-use value, non-use value
Tidal flats		food production, waste treatment, refugia, recreation, disturbance regulation, non-use value (conservation value)

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### ■ The methods used

- Market price method
- Non-market valuation method+ benefit-transfer method
- replacement cost method
- This study reports **annual economic value** of marine ecosystem services.

\* the value is calculated based on December 2012.

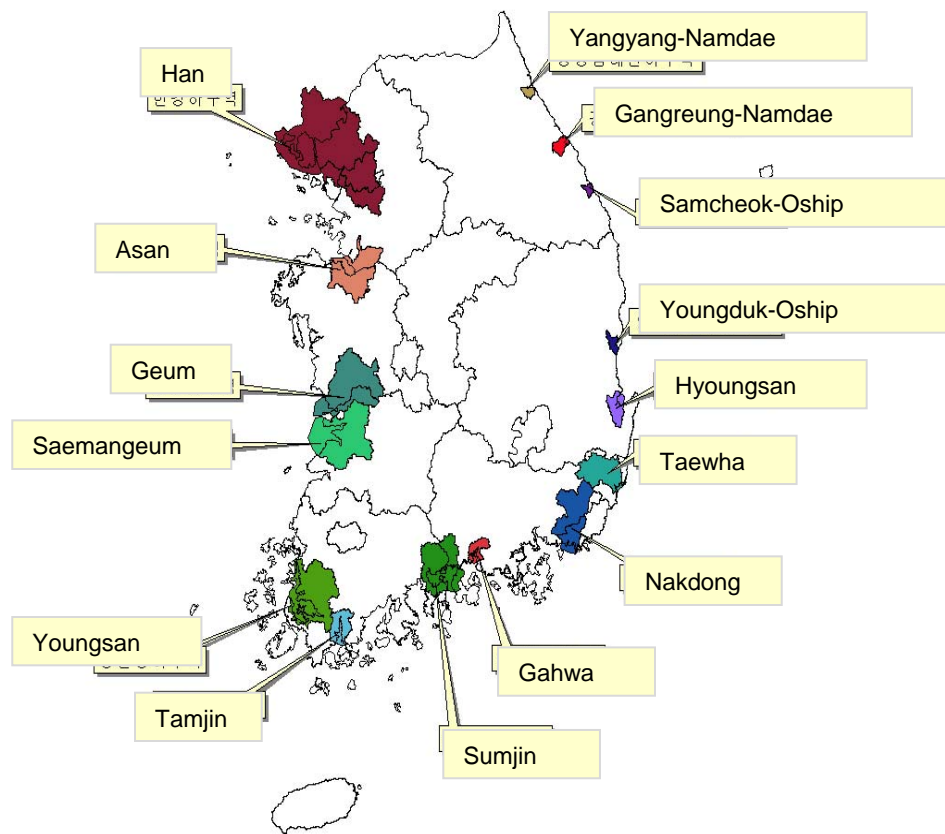
Marine ecosystem		Marine ecosystem services (goods and services)	Methods
Coastal waters	Beach national park	Recreation, cultural services Conservation value	Non-market (contingent valuation method, CVM)
	Coastal waters	food production raw materials(aggregate, natural gas)	Market price
Estuaries		food production Waste treatment Refugia Recreation Indirect-use value, non-use value	Market price Replacement cost Non-market (CVM) Non-market (Travel cost Method, CVM) Non-market (CVM)
Tidal flats		food production waste treatment refugia recreation disturbance regulation non-use value (conservation value)	Market price Non-market



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### Estuaries

15 estuaries in Korea, 2,126 km<sup>2</sup> (1,413 km<sup>2</sup> excluding tidal flat)



Korea Environment Institute (2005),  
『Development of sustainable estuary  
management strategy in Korea』

It estimated environmental value of three major estuaries  
such as Han estuary, Youngsan estuary, Sumjin estuary by  
benefit-transfer methods using meta-analysis.

→estuaries' unit values into area(ha)  
of 15 estuaries.

→ **12.8 ~24.0 thousand USD/yr/ha**

•The areas of 15 estuaries do not include tidal flats.

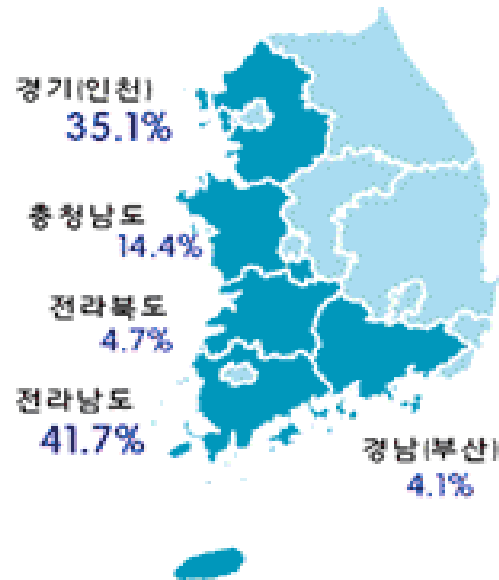
→Total value of estuaries :  
**2,380.1 ~ 4,463.8 million USD/year**



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### Tidal flat

- Total areas : 2,489.4 km<sup>2</sup> (2008)
  - Western coast : 2,080 km<sup>2</sup> (84%)
  - Southern coast : 403.4 km<sup>2</sup>



Source : <http://tidalflat.ecosea.go.kr/index.jsp>

Source: Ministry of Maritime Affairs and Fisheries (2013)

### Protected Area of Coastal Wetland 304.84 km<sup>2</sup>

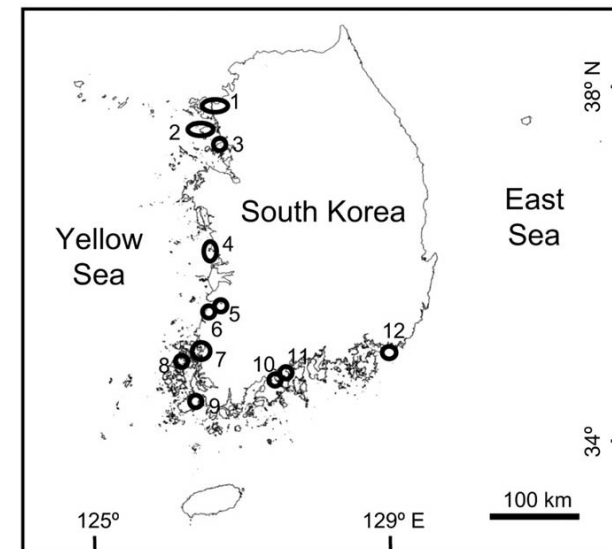


Fig. 1. Coastal territory of South Korea and the location of Coastal Wetland Protected Areas (CWPAs): 1) Han River Estuary WPA, 2) Jangbong WPA, 3) Songdo WPA, 4) Seocheon WPA, 5) Julpo WPA, 6) Gochang WPA, 7) Muan WPA, 8) Jeungdo WPA, 9) Jindo WPA, 10) Beolgyo WPA, 11) Suncheon WPA, 12) Nakdong River Estuary WPA.

Source: Nam et al (2010), Designation processes for marine protected areas in the coastal wetlands of South Korea

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### Tidal flat

- Annual economic value of wetland per 1 km<sup>2</sup> (Dec.2012.) (Unit: ten USD/km<sup>2</sup>/year)

services	Food production	Waste treatment	recreation	refugia	Disturbance regulation	Conservation value	<b>Totals</b>
Economic Value	2,727.6	719.8	198.7	931.6	255.9	1,846.7	<b>6,680.2</b>

- Annual economic value of wetland (Dec.2012.) (Unit: ten USD/year)

services	Food production	Waste treatment	recreation	refugia	Disturbance regulation	Conservation value	<b>Totals</b>
Economic Value	6,790.1	1,791.9	494.6	2,319.1	637.0	4,597.2	<b>16,629.9</b>

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### Beaches

Areas	Total benefits of beaches (million USD/year)
Incheon·Gyunggi	297.6
Chungnam	4,229.9
Jeonnam	262.5
Jeonbuk	163.3
Gyeongnam	96.4
Busan	6,049.2
Gyeongbuk	585.3
Gangwon	4,783.0
Jeju	147.4
<b>Total</b>	<b>16,614.6</b>

*Note : Total benefits are measured by multiplying visitors by each benefits of beaches.*

### National parks

National park	Areas (km <sup>2</sup> )	Estimated annual value (Unit: million USD/year)
Hallyeo	545.6	101.0
Taeon	326.6	60.5
Dadohae	2,321.5	429.7
<b>Total</b>	<b>3,193.7</b>	<b>591.2</b>

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### Summary of economic value of marine ecosystem (Dec.2012.)

(Unit: million USD or billion KRW)

Marine ecosystem		Annual economic value
Coastal waters	Food production	5,710.3
	Aggregate(sand etc.)	250.0
	Natural gas	256.8
	Beaches	16,614.6
	National parks	591.2
Tidal flats		16,629.9
Estuaries(excluding tidal flats)		2,380.0 ~ 4,463.8
<b>Totals</b>		<b>40,460.1 ~ 42,543.9</b>