

STATUS of AQUACULTURE in REPUBLIC of KOREA



West Sea Mariculture
Research Center



National Fisheries
Research &
Development Institute,
South Korea



Regional Working
Group-Fisheries,
UNDP/GEF Yellow Sea
Large Marine Ecosystem
Project



INTRODUCTION



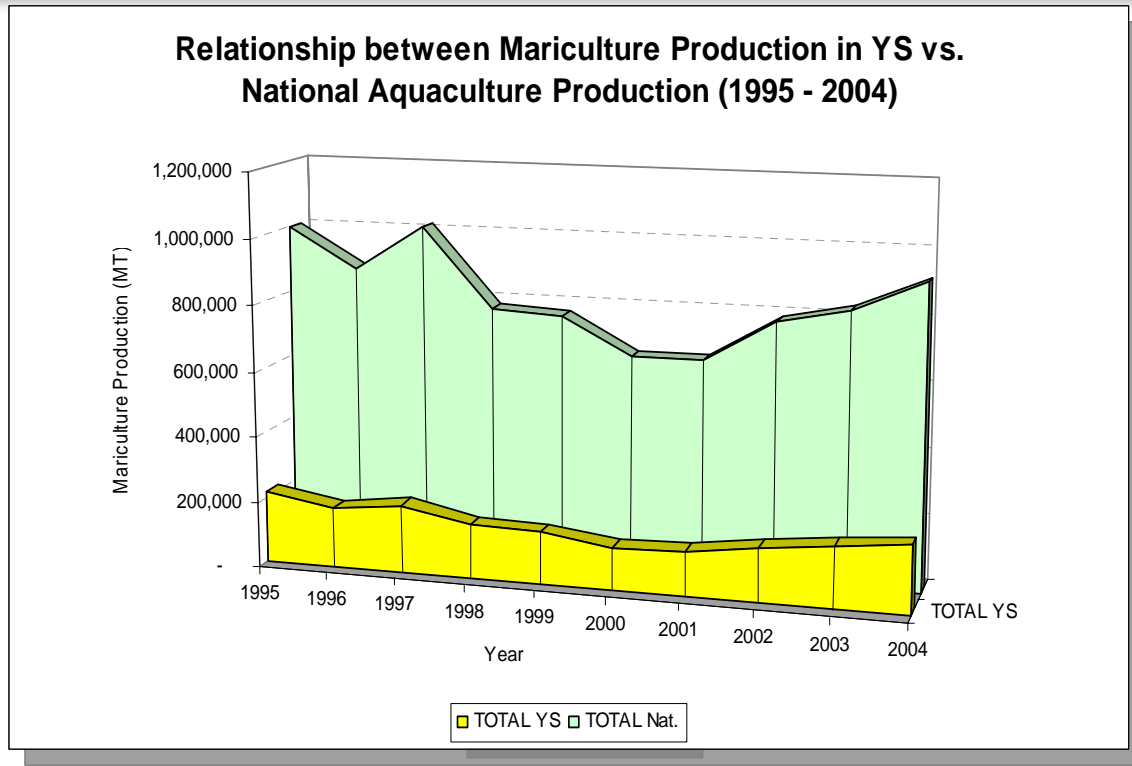
- Aquaculture has already become an important source of marine protein for Korean. Because the capture fishing industry has peaked and is likely to decline as wild stocks are diminished, aquaculture will become a growing source of seafood products.
- Already, a considerable percentage of all aquatic products consumed in Korea are coming from aquatic farms.
- For some species, the production totally comes from aquaculture activities in the country.
- The aquaculture industry of Korea, however, is not without problems. Outbreaks of diseases, coastal eutrophication and harmful algal blooms in the farming grounds occur annually.
- However, efforts to get through the problems are continuous, using environmentally sound aquaculture practices. Approach to molecular biology and genetics is of recent interest in the practice of modern aquaculture



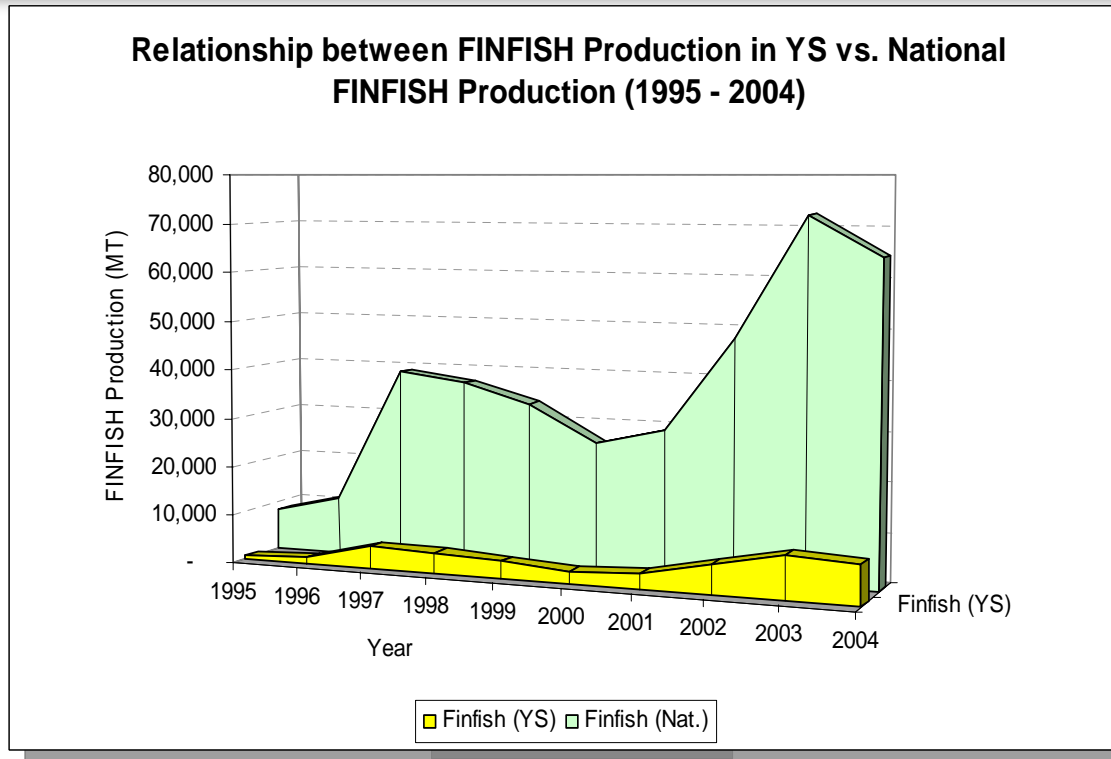
MAP SHOWING FIVE PROVINCES BORDERING THE YELLOW SEA COAST OF SOUTH KOREA



Comparison of the Yellow Sea vs. National Aquaculture Production in Total Farmed Production during 1995-2004



	Production (M/T)				YS/TSW(%)	YS/(TFW+TSW)(%)
	YS	TFW	TSW	TFW+TSW		
1995	215,763	29,228	996,451	1,025,679	21.65	21.04
2004	208,214	25,299	917,715	943,014	22.69	22.08
Increase(%)	-3.2	-13.6	-7.9	-8.1	4.8	4.9



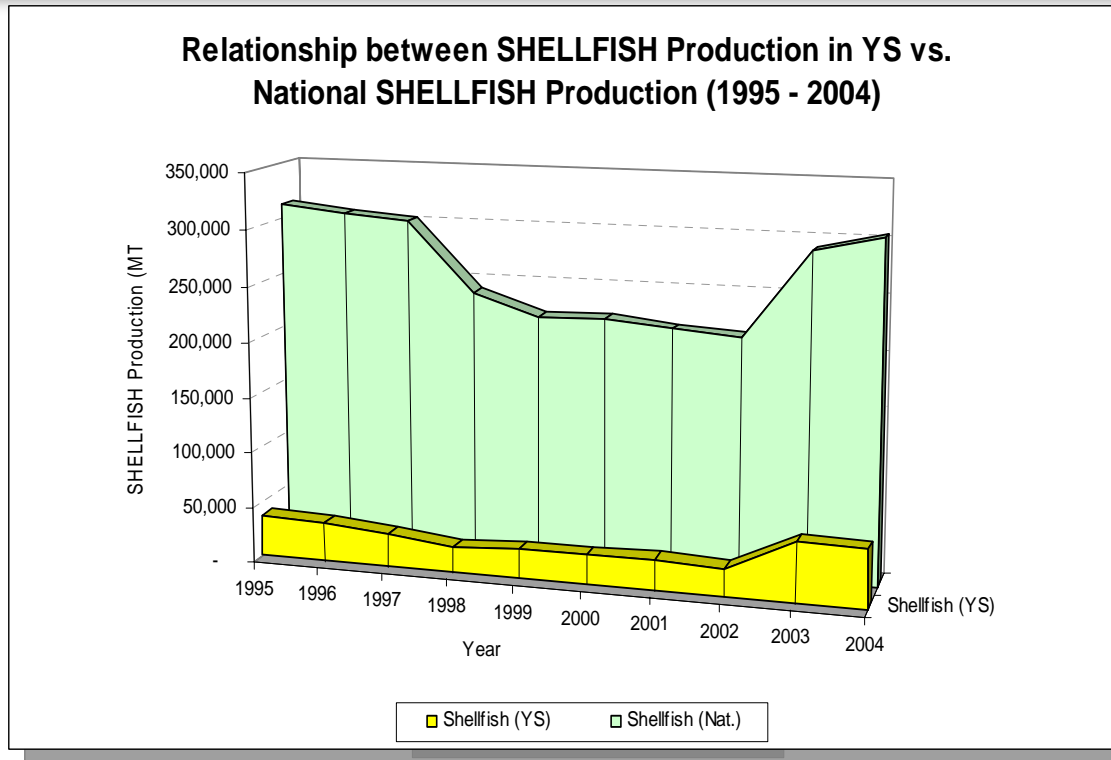
	Production (M/T)				YS/TSW(%)	YS/(TFW+TSW))(%)
	YS	TFW	TSW	TFW+TSW		
1995	718	28,057	8,360	36,417	8.59	1.97
2004	8,049	20,415	64,476	84,891	12.48	9.48
Increase(%)	1021	-27.1	671	133	45.3	381

kind	species	1995		2004	
		YS	Total	YS	Total
Finfish	<i>Paralichthys olivaceus</i>	380.3	6,733.0	2,316.5	32,141.0
	<i>Sebastes schlegelii</i>	111.8	985.0	3,812.8	19,576.0
	other finfish	226.0	633.0	1,920.0	12,759.0
	total	718.0	8,351.0	8,049.3	64,476.0

- The total farmed finfish production in YS coast reached 8,049 MT in 2004 and occupied comparatively small parts of total mariculture production.
- Two marine finfish, olive flounder and black rockfish, occupy 76.1% of total finfish production in the YS region.
- Other minor farmed species are sea bass (*Lateolabrax japonicus*), mullet (*Mugil cephalus*), black sea bream (*Acanthopagrus schlegelii*) and parrot fish (*Oplegnathus fasciatus*)



Comparison of the Yellow Sea vs. National Aquaculture Production in SHELLFISH during 1995-2004



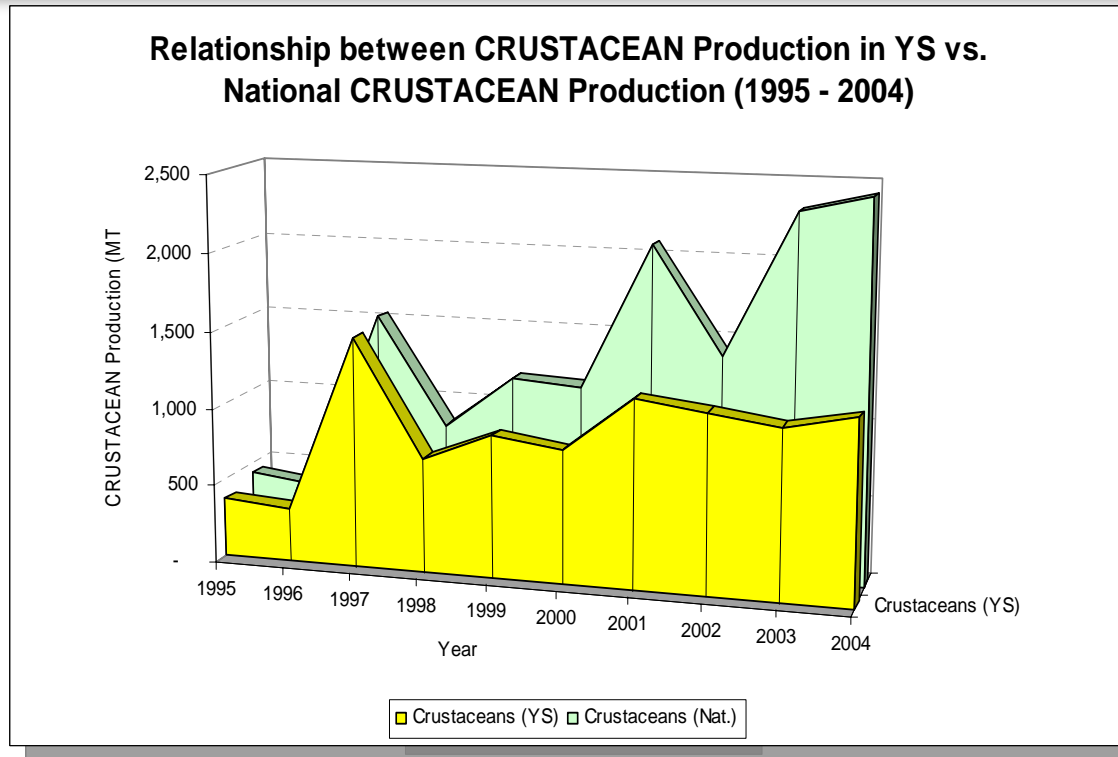
	Production (M/T)				YS/TSW(%)	YS/(TFW+TSW)) (%)
	YS	TFW	TSW	TFW+TSW		
1995	37,281	933	312,252	313,185	11.94	11.90
2004	53,091	4,670	304,889	309,559	17.41	17.15
Increase(%)	42.4	400.5	-2.6	-1.3	45.8	44.1

kind	species	1995		2004	
		YS	Total	YS	Total
Shellfish	<i>Crassostrea gigas</i>	17,252.3	191,156.0	23,479.8	239,270.0
	<i>Ruditapes philippinarum</i>	7,329.5	15,260.0	25,218.0	27,570.0
	other shellfish	12,699.3	105,836.0	4,393.3	38,049.0
	total	37,281.1	312,252.0	53,091.0	304,889.0

- Production of shellfish in the YS coast in 2004 reached 53×10^3 MT, making up 27.2% of the national shellfish production.
- Two shellfish species, Pacific oyster and Manila clam occupied 91.7% of the total YS shellfish production.
- Other shellfish : *Haliotis discus hannai*, *Chlamys farreri nipponensis*, *Cyclina sinensis*, *Macra chinensis*, *Scapharca subcrenata*



Comparison of the Yellow Sea vs. National Aquaculture Production in CRUSTACEANS during 1995-2004



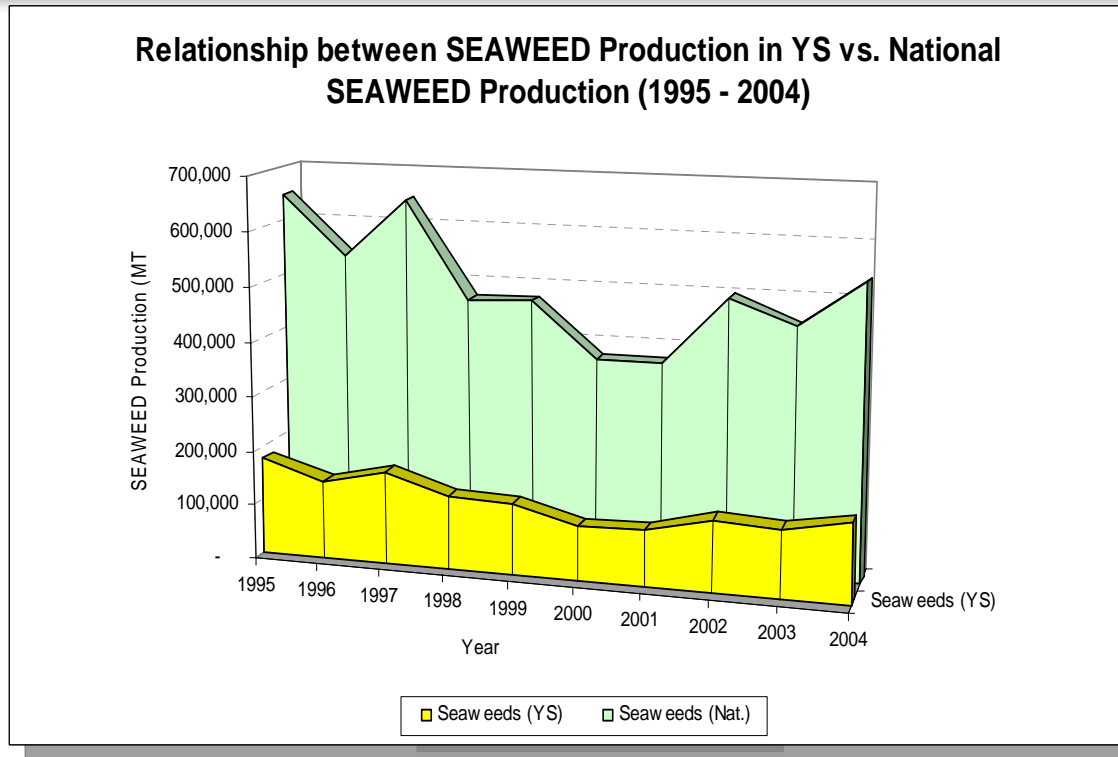
	Production (M/T)				YS/TSW(%)	YS/(TFW+TSW))(%)
	YS	TFW	TSW	TFW+TSW		
1995	378.1	218.0	438.0	656.0	86.32	57.64
2004	1,179.0	78.0	2,426.0	2,504.0	48.60	47.08
Increase(%)	211.9	-64.2	453.8	281.7	-43.7	-18.3

kind	species	1995		2004	
		YS	Total	YS	Total
Crustacean	<i>Fenneropenaeus chinensis</i>	352.8	404.0	1,179.0	2,426.0
	<i>Penaeus japonicus</i>	25.3	34.0	0.0	0.0
	other crustacean	0.0	0.0	0.0	0.0
	total	378.1	438.0	1,179.0	2,426.0

- Two species, fleshy shrimp and Japanese Kuruma shrimp had been cultured before the middle of 1990s, but Kuruma shrimp had not been cultured since the introduction of WSSV into Korea in 1993.
- Pacific white shrimp (*Litopenaeus vannamei*) was introduced from U.S.A. in 2003.



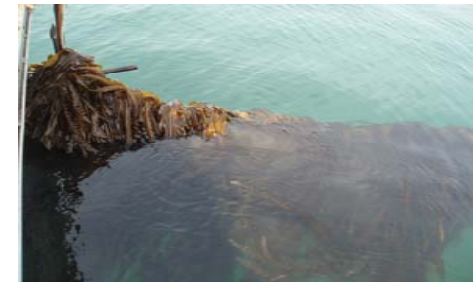
Comparison of the Yellow Sea vs. National Aquaculture Production in SEAWEEDS during 1995-2004

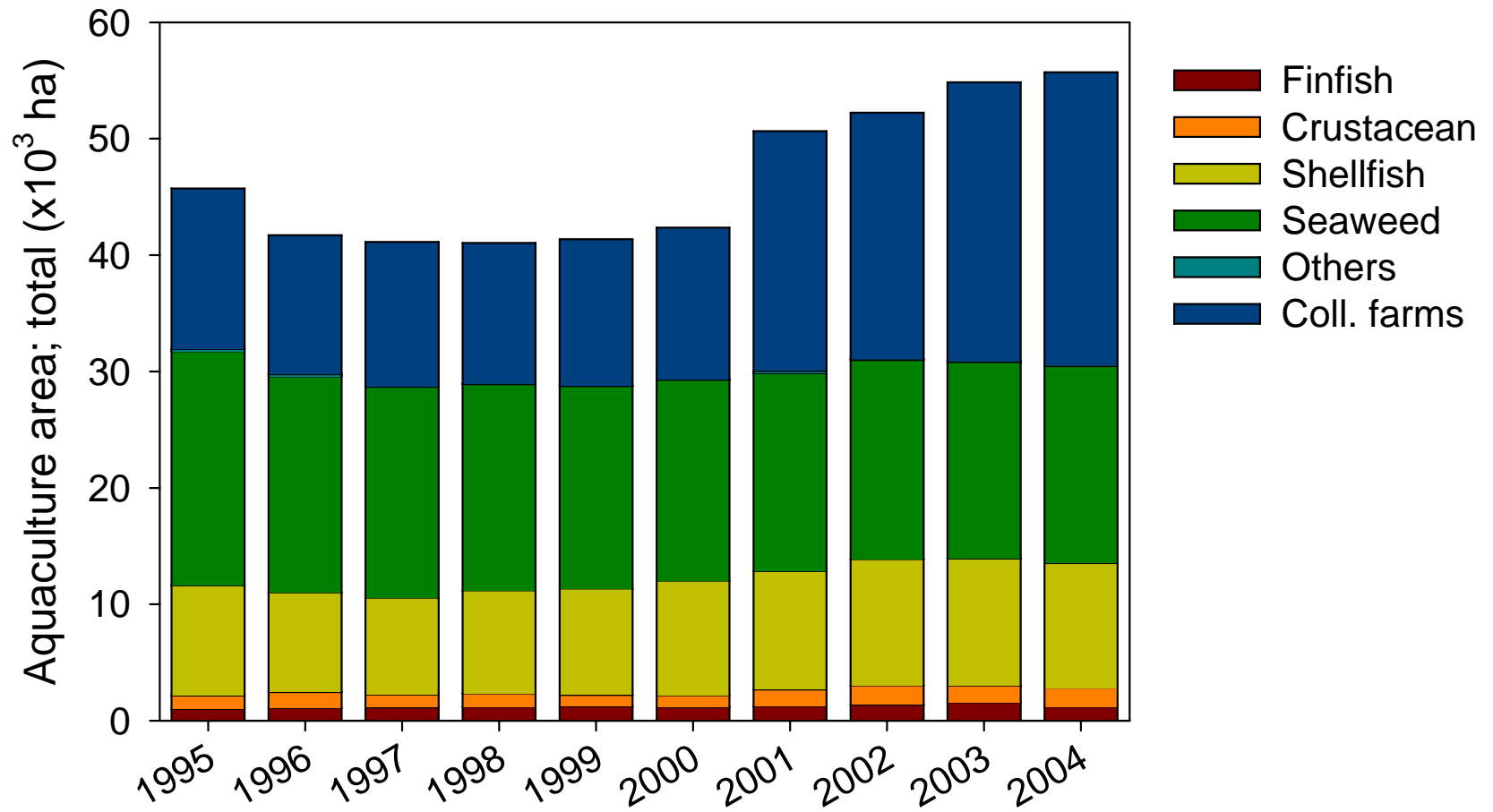


	Production (M/T)				YS/TSW(%)	YS/(TFW+TSW)(%)
	YS	TFW	TSW	TFW+TSW		
1995	177,386	5.0	649,099	649,104	27.33	27.33
2004	145,895	0.0	536,748	536,748	27.18	27.18
Increase(%)	-18.1	-	-17.4	-17.4	-0.5	-0.5

kind	species	1995		2004	
		YS	Total	YS	Total
Seaweeds	<i>Porphyra</i> spp.	67,757.5	192,960.0	80,191.0	228,554.0
	<i>Undaria pinnatifida</i>	93,658.3	386,819.0	54,686.5	261,574.0
	other seaweed	15,970.8	69,320.0	11,018.0	46,620.0
	total	177,386.5	649,099.0	145,895.5	536,748.0

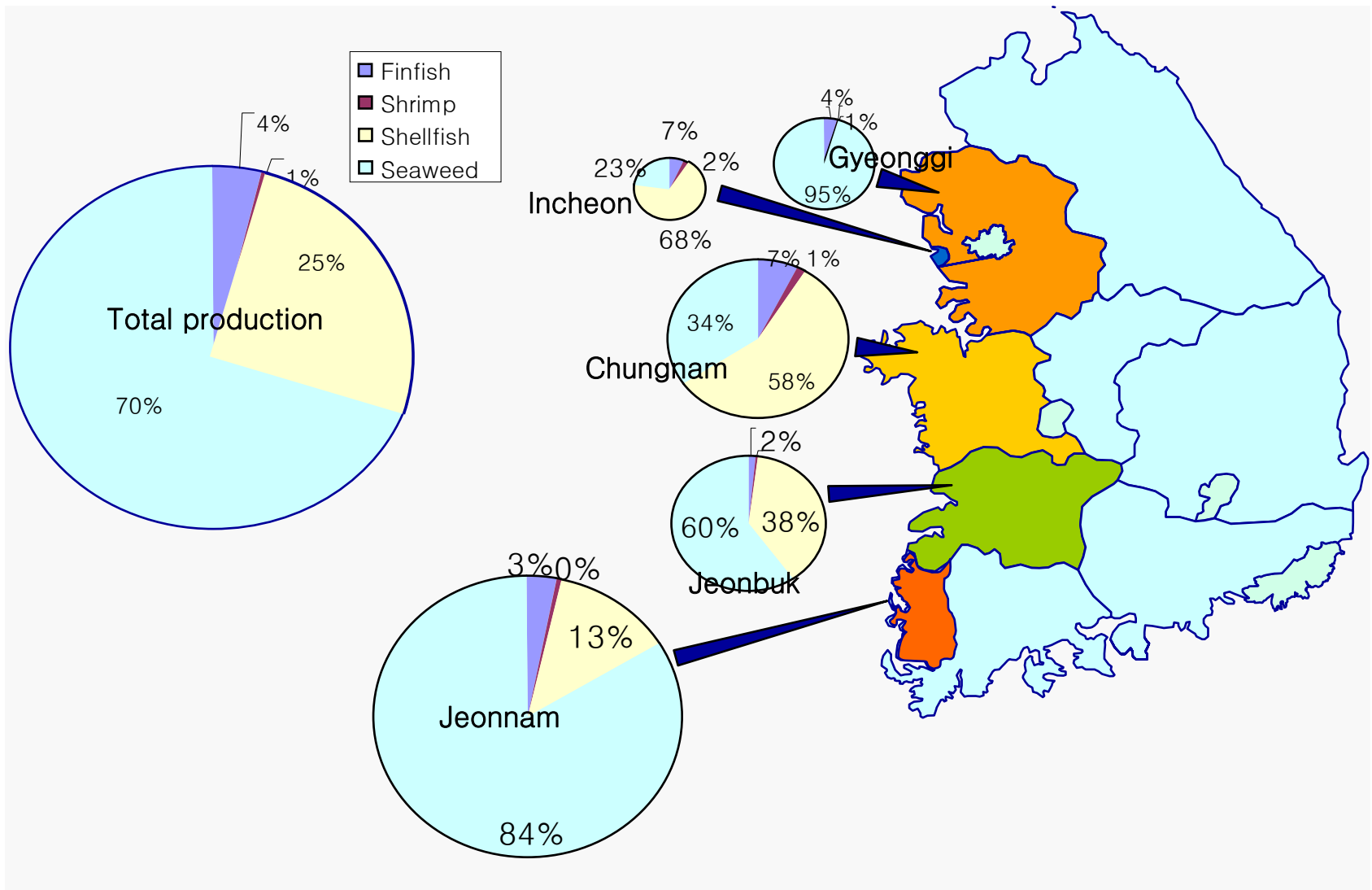
- The seaweed production in YS coast reached 145.9×10^3 MT in 2004 and occupied 70.1% of the total mariculture production in the west coast
- The two species, laver (*Porphyra*) and sea mustard (*Undaria*) occupied 92.5% of the total seaweed production.
- Other minor cultured species are kelp (*Laminaria*), fusiforme (*Hijikia fusiforme*), and green algae (*Enteromorpha*).







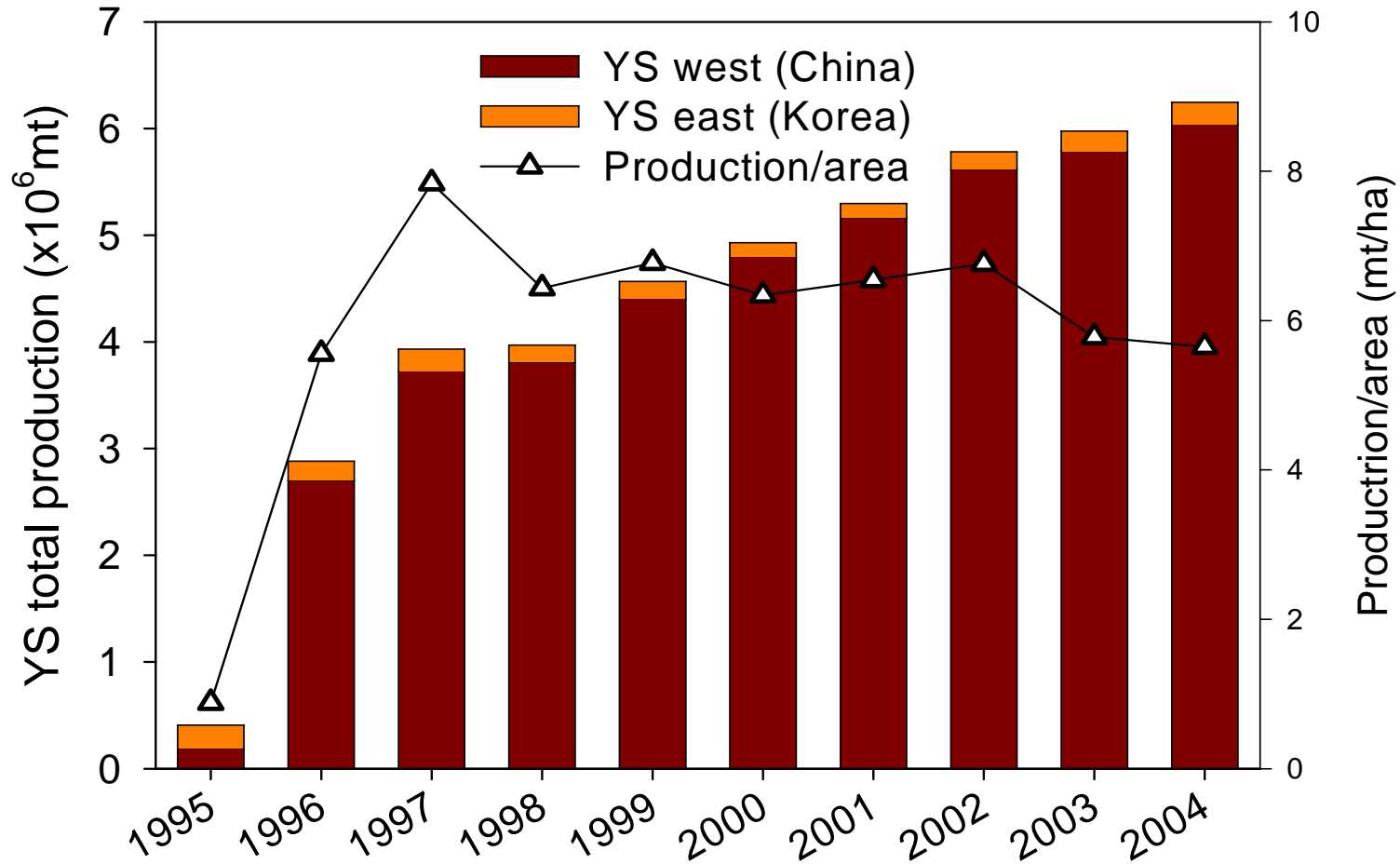
Production Ratio of Marine Farmed Organisms from the West Coast of Korea in 2004



Groups	no. Species
Fish	18
Shellfish	15
Seaweeds	10
Crustaceans	2
Others	3
TOTAL	48

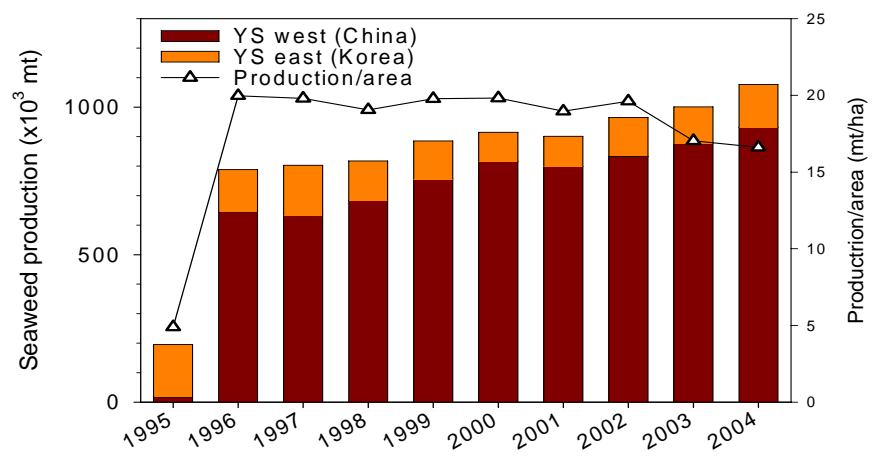
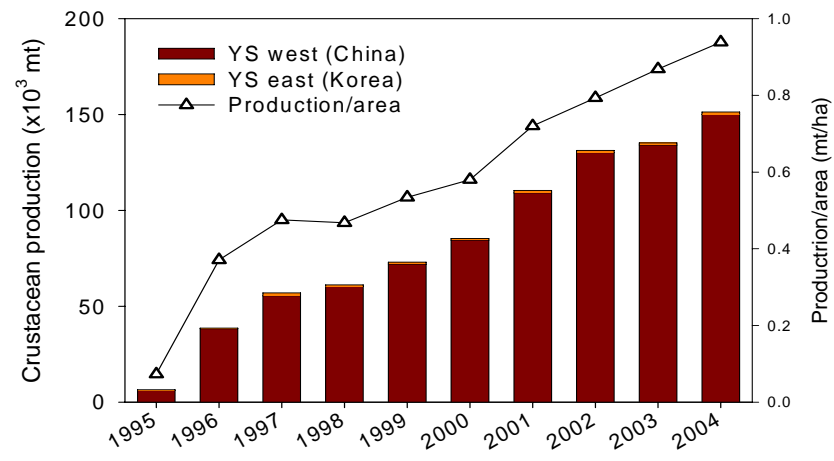
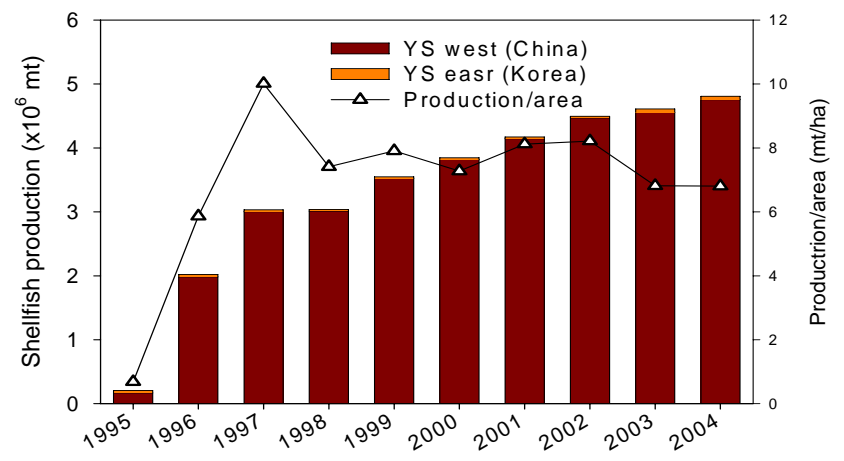
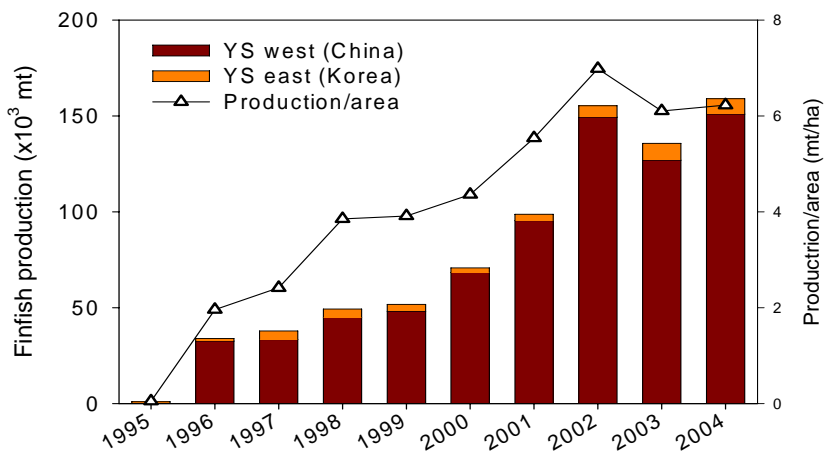


Comparison of Total Farmed Production and per Unit Area Production in the Yellow Sea Region between Korea and China for Last 10 Years.





Comparison of Mariculture Production of Korea and China Regions in the Yellow Sea Coast for Last 10 Years





Group of species	Culture methods	Impacts on environment	Current culture activities
Seaweeds	Bottom culture	Low	Low
	Suspended culture (long-line, raft, net)	Low	High
Shellfish	Hanging or rack culture	Low or medium	High
	Bottom culture	Low or medium	High
	Land-based tank culture	Low	Low
	Sea ranching	Low	Low
Finfish	Cage culture	High	High
	Pond and tank culture	High	High
	Recirculation systems	Low	Low
	Offshore culture	Low	Initial phase
	Sea ranching	Low	Initial phase
Shrimp	Pond culture	High	High
	Raceway culture using heterotrophic method	Low	Initial phase

- During 1995-2004, total mariculture production a little decreased by 3.2% and 7.9% in the Yellow Sea and national area respectively.
- Of these, the total national mariculture production of finfish and crustaceans greatly increased by 671% and 453% respectively. That of shellfish and seaweeds decreased by 2.6% and 17.4% respectively.
- Mariculture production in the Yellow Sea (YS) coast reaches 208×10^3 M/T, or 22.7% of total national mariculture production in 2004. The ratio of YS area to national mariculture production increased by 45.3% during the same period.
- To reduce the environmental stress caused by increased mariculture activities, the central and local governments of Korea have been conducting Integrated Coast Governance in many ways

Planning Control of coast development for ecosystem-based, environmentally-sustainable management and use of the coast in Korea, beginning from Aug. 2000.

- Designate ten Large Scale Coastal Areas(LSCA)
 - Four west LSCA, 3 south LSCA, 2 east LSCA and a Jeju LSCA
- Designate Bio-Belts to conserve and manage coastal ecosystems
 - Wetland conservation area (7), Preserved island area (3), Wildlife conservation area (13) and Ecosystem conservation area (18)
- Manage special areas for acceptable coastal pollutant levels
 - Special managing area (3), environment conservation area (3), coastal pollutant control area (11)
- Revise coastal development plans based on carrying capacity
 - Abolishing or revising 22 industry development plans, 6 large-scale reclamation projects, and many small scale reclamation plans
- Develop ten 'Coast-Fronts' in the west coast



MANAGEMENT OF AQUACULTURE ACTIVITIES



- Restrict or manage the exploitation of coastal area for new marine farms (finfish, shrimp) based on 'Integrated Coastal Governance'
- Financially or politically support the environmentally-friendly aquafarms or farming practices
- Develop Offshore Aquaculture Farms to reduce pollutants in near shore area, supported by NFRDI
 - Six offshore aquaculture units built in 2005 near Jeju Island
- Develop Ecosystem Based Management (EBM) for aquaculture

Thank you!

非常謝謝!

*YSLME project is aiming
to reduce Environmental Stress
in the Yellow Sea Large Marine Ecosystem*



An underwater photograph showing a large, dark, rectangular spar structure. A white vertical spar is visible on the left, with a coiled yellow cable at its base. Two divers are seen in the distance on the right, illuminated by a bright light source. The water is clear and blue. The text "Ocean Spar Technologies" is overlaid in white in the center.

Ocean Spar Technologies