



# Marine Ranching Project in Yellow Sea, Korea

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# Introduction

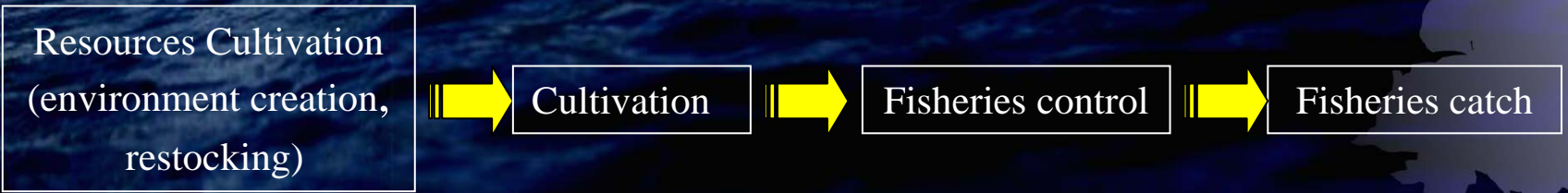
## ◆ What is Marine ranching?

- To culture fishes in designated zone under specific conditions in the sea, equipped with certain facilities
- a production system of fisheries to artificially control and manage the establishment of marine eco-system, stocking the sea with fisheries resources and fisheries catch
- While proactively conserving eco-system, it enables for sustainable stability for fisheries resources and management.
- To achieve economic rationality and socio-economic goals together



# Introduction

## ◆ Concept of Marine Ranching



Fisheries with catching
Resources Looting
Inability in fisheries catch
Cultivation in a fenced zone

past



Fisheries with cultivation
Eco-friendly
Manageable fisheries catch
Cultivation without a fence

future

Sustainable production, stable management, affluent fishing village

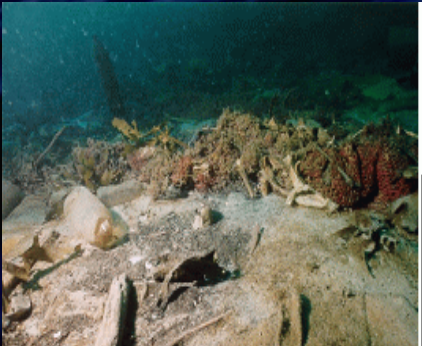


# Introduction

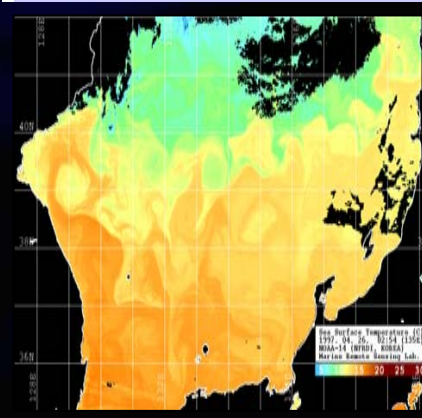
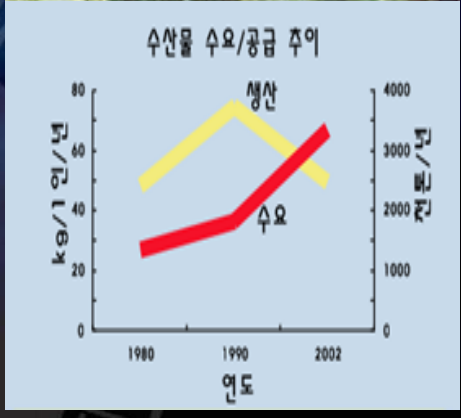
## Why necessity?



Marine resources depletion



Fishing grounds pollution



Marine ranching

EEZ agreement,  
A fisheries agreement

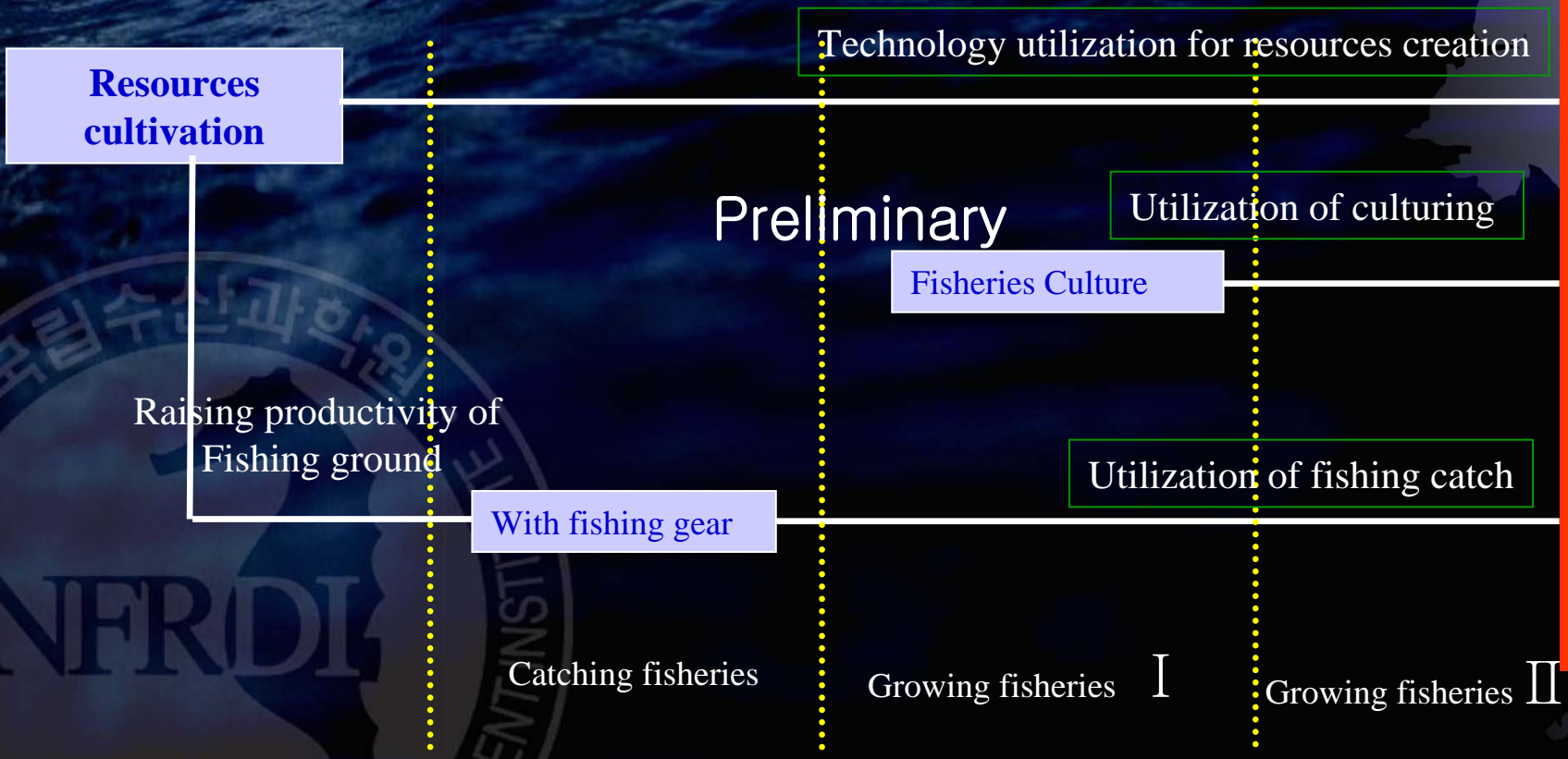
Increase in marine products  
demand

Increase of seawater temperature



# Introduction

## ◆ Comparison of Marine Ranching and Fisheries



Marine Ranching

# Introduction

## Comparison of Fisheries Culture, Resource Creation, Marine Ranching

Ref.		Fisheries culture	Resources creation	Marine ranching
Resources culture	Adjust quantity environmental resources	artificial	artificial	Natural
	Resources addition	Yes	yes	yes
	Culture method	artificial	natural	Natural
Resources use & control	Target water area	Small	large	middle
	Objects of users	specific	Many and unspecified persons	Possible specification
	Objects of control	individual	Public organizations	Public organizations, specific individuals
	Scale of business costs	small	large	middle
	Payout period	Short-term	Long-term	Long-term
	Adjust a catch	possible	impossible	possible

# Creation Process of Marine Ranching



## Characteristics of eco-system

biological, physical, chemical characteristics Ecosystem model  
Biological capacity

## Fishing Grounds



Artificial fish bank



Marine forest

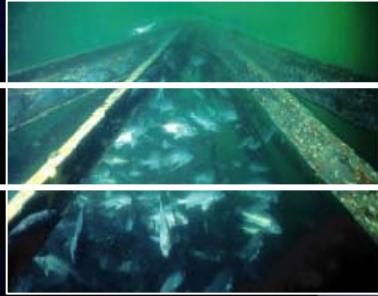
## Resources creation

Seeding production

Interim rearing

Seeding release

Resources control



## Establishment for use & controlling system



Designation of Fishery protective area and others

Autonomous control on fishermen



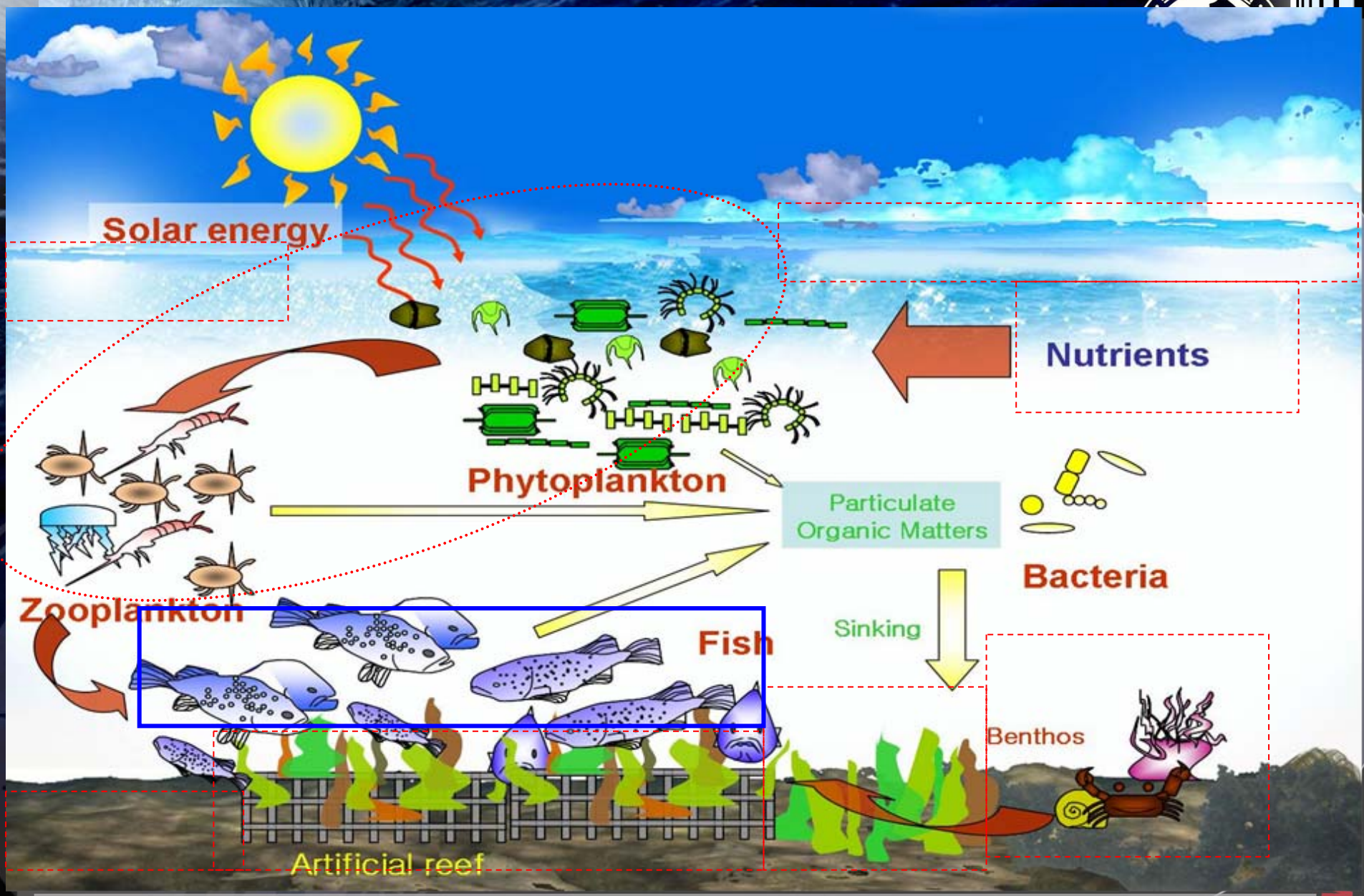
## Catch & Autonomous control



WSFKI AQUACULTURE RESEARCH TEAM



# Research Fields for the Creation of Marine Ranching 8



## ◆ Long-term Development Plan for the Marine Ranching Project

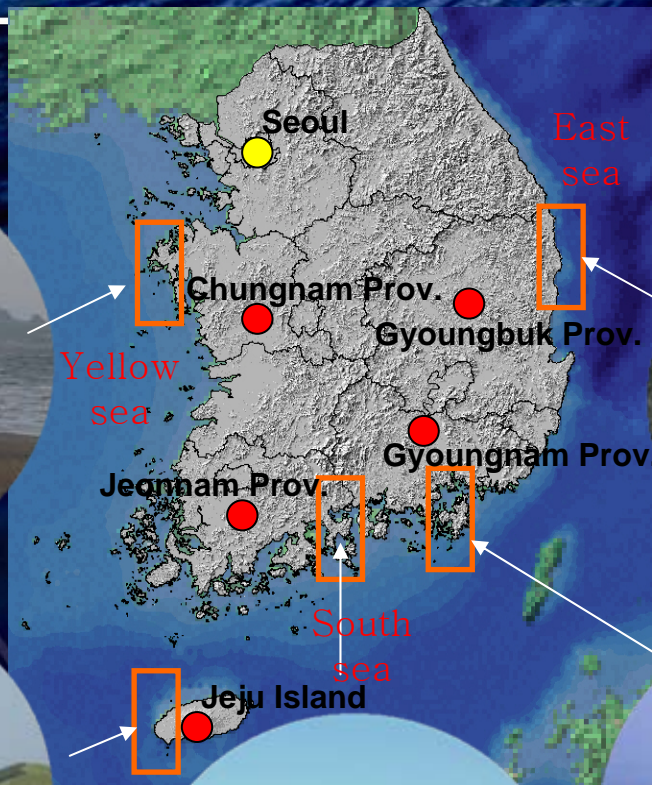
Ref.	1 stage	2 stage	3 stage
Target	Infrastructure set-up	Marine ranching expansion	Making the entire Korean coast marine ranching
Characteristics	Pilot project	Development project	Generic project
Subjects	country	Local governments	fishermen, civilians
Objects	Sedentary-type resources	Sedentary-type + migration-type resources	All of coastal resources
Quantity	5	50	500
Period	1998 ~ 2010(for 13 yr)	2005 ~ 2014(for 10yr)	2015 ~ 2030(for 16yr)



# ◆ Preliminary Marine Ranching



# ➤ Preliminary Marine Ranching



**Taean**  
(mud flat-type)



**Uljin**  
(sightseeing-type)



**Northern part of Jeju Island**  
(archipelagic type)



**Yeosu**  
(archipelagic type)

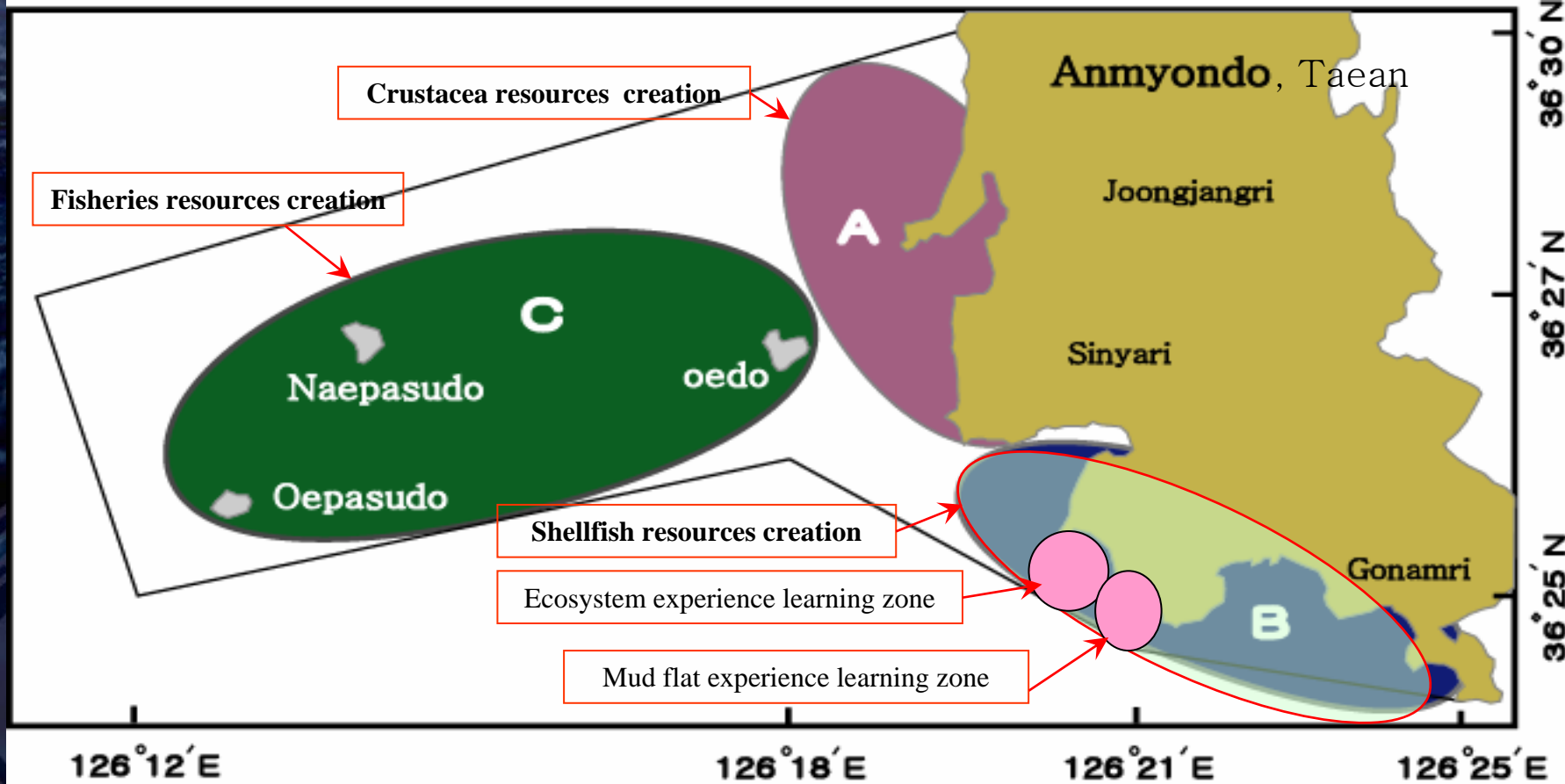


**Tongyeong**  
(fishing-type)

# Investment Plan

Ref.	Total	Tongyeong	Jeonam Province (Yeosu)	East Sea (Uljin)	West Sea (Taean)	Jeju Island
<b>Estimated costs (KRW: billion)</b>	<b>1,589</b>	<b>240</b>	<b>307</b>	<b>355</b>	<b>337</b>	<b>350</b>
Period	'98~'10	'98~'07	'01~'09	'02~'11	'02~'11	'02~'11
<b>Investment figures by 07 (KRW: billion)</b>	583	240	197	48	51	47
<b>Project Stage by '08</b>	-	complete	3 stage technology application & effectiveness study	2 stage fishing grounds & resources creation	2 stage fishing grounds & resources creation	2 stage fishing grounds & resources creation

# Marine Ranching Project in Yellow sea coast of Korea

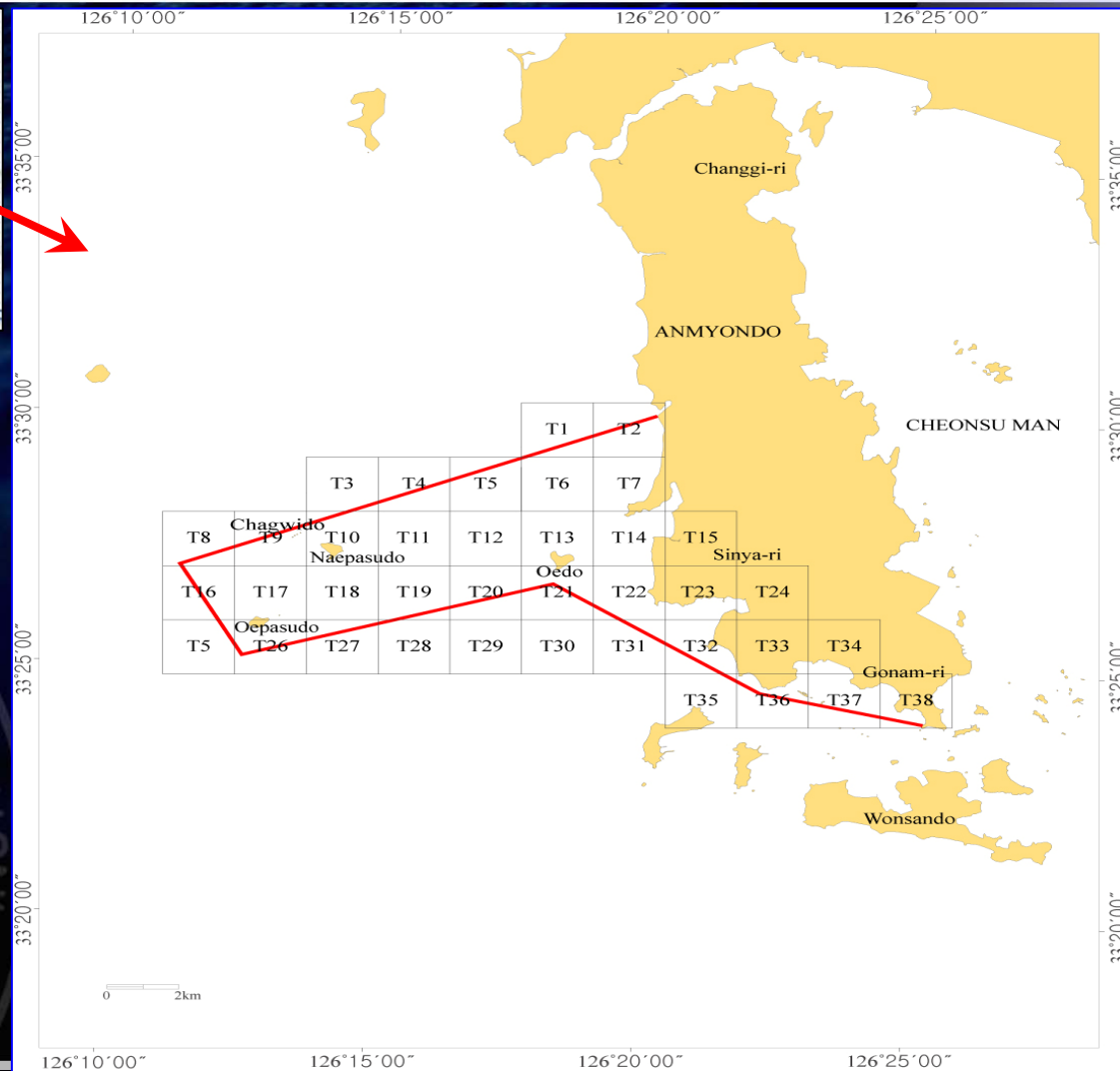
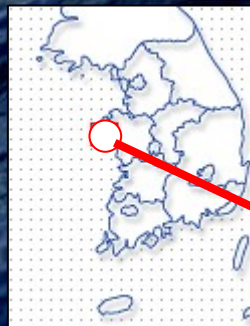


□ Target species : olive flounder, rockfish, greenling, shortneck clam, oyster, Korean scallop, sea cucumber, abalone, fleshy prawn, swimming crab

□ Area : 8,500ha



# Ocean Trenches of the West Coast of Korea



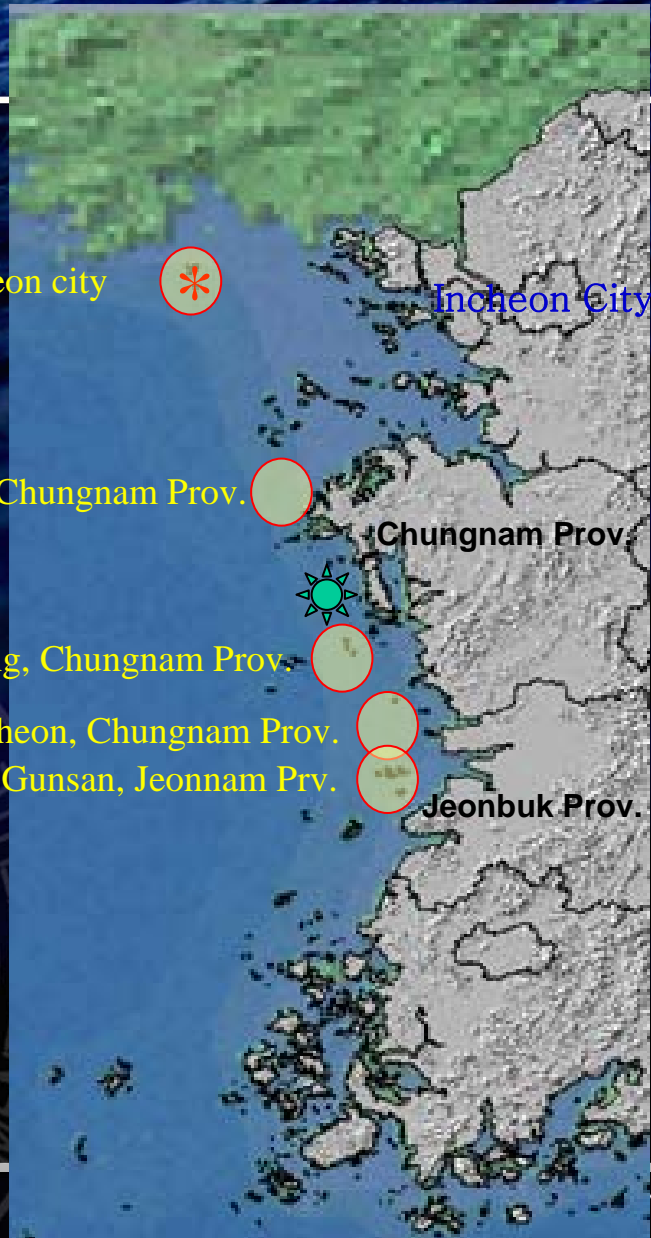
※ Data base of all research data available by each ocean trench



# ◆ Small sale Marine Ranching



# Small Scale Marine Ranching



Yenpyengdo, Incheon city



Incheon City

Taeon, Chungnam Prov.



Chungnam Prov.

Boryeng, Chungnam Prov.



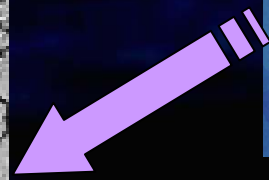
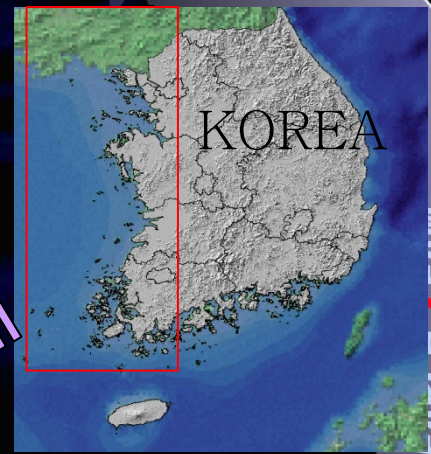
Seocheon, Chungnam Prov.



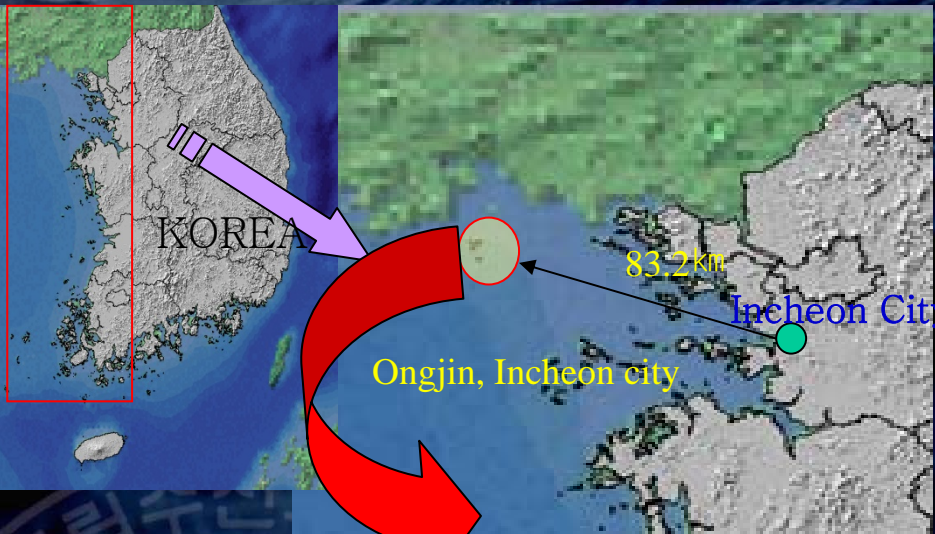
Gunsan, Jeonnam Prv.



Jeonbuk Prov.



# Yenpyeng Island



- ❖ Distance : 83.2 km (from Incheon city)
- ❖ Area : 7.29 km<sup>2</sup>
- ❖ Ageing and decrease in fishermen population



- ❖ Number of households : 440
- ❖ Number of population : 674
- ❖ Number of fishing ship : 81
- ❖ Fishery license : 26 case, 285.4 ha
- ❖ fishery product yield : 580m/t (2006)

## Small Scale Marine Ranching Plan(Yenpyeng Island, Incheon)

(KRW: one hundred)

Ref.	Total	1st year (2008)	2 <sup>nd</sup> year (2009)	3 <sup>rd</sup> year (2010)	4 <sup>th</sup> year (2011)	5 <sup>th</sup> year (2012)
National Expenditure	2,500	500	500	500	500	500
Provincial expenditure	2,500	500	500	500	500	500
Total	5,000	1,000	1,000	1,000	1,000	1,000

# Model



Horizontal-net facilities for true oysters culture

## Seed bank of Oyster

- ✓ Individual oyster culture(2ha)
- ✓ Investment figures :  
KRW 11 billion
- ✓ Economical effect : 81,000\$/per year

# Model



## Seed bank of Shortnek clam

- ✓ Seed dissemination(10ha)
- ✓ Investment figures :  
KRW 3.7 billion
- ✓ Economical effect : 38,000\$/per year

Yenpyeng Island

sediment improvement for Short neck clams fishing grounds



seed bank of Short neck clams

Venus clam seed bank



# Model



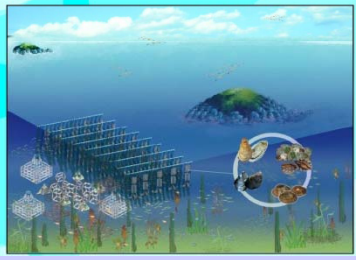
## Seed bank of Korean scallop

- ✓ Creation of original resources for seed culture(4ha)
- ✓ Investment figures : KRW 3.7 billion
- ✓ Economical effect : 186,000\$/per year

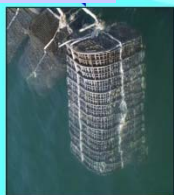
Yenpyeng Island



Korean scallop seed bank



Map of Shellfish seed bank facilities



# Model



## Seed bank of seaweed

- ✓ Long line-type(4ha)
- ✓ Investment figure : KRW 2.5 billion
- ✓ Economical effect : 24,000\$/per year



# Model



## Seed bank of artificial reef

- ✓ Creation of fishing grounds(8ha)
- ✓ Investment figure : KRW 14 billion





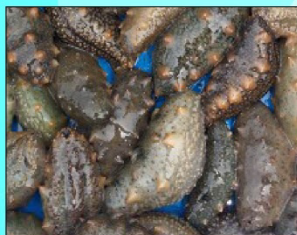
# Model



## Seed bank of sea cucumber

- ✓ Fish culture(4ha)
- ✓ Investment figure : KRW 2 billion
- ✓ Economical effect : 100,000\$/per year

Yenpyeng Island



Sea cucumbers seed bank using a pond culturing technology



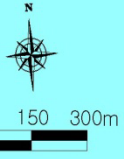
# Model

## Sea Fishing park

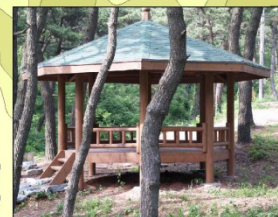
- ✓ Fishing park creation
- ✓ Investment figure : KRW 35 billion

- Employment effect : 9,500 person
- Annual revenue : \$675,000

Yenpyeng Island



Fishing park driveway



Recreation-purpose natural park linking to a fishing park



Sea fishing angling site



Sea fishing park moorage



THANK YOU !!