

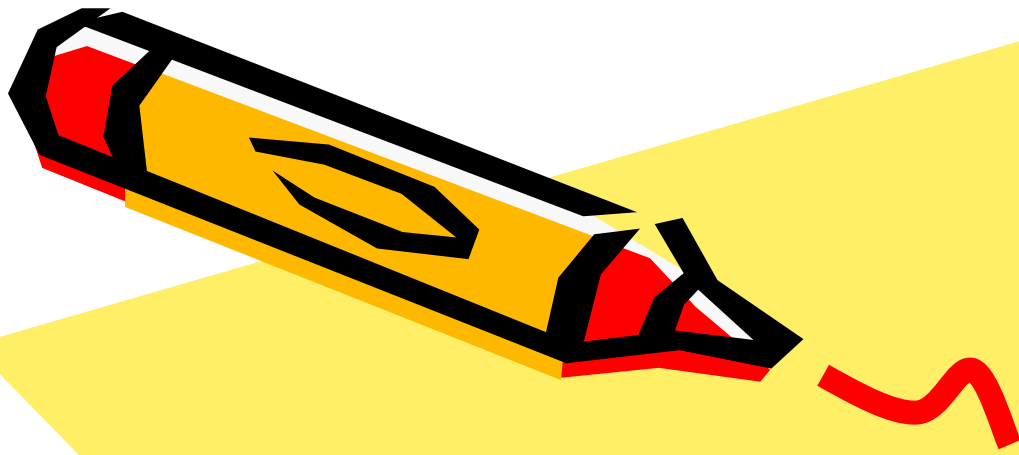
Aquaculture & Fishery Biology



VI Sem B.Sc. Zoology - Elective Paper

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AQUACULTURE & FISHERY BIOLOGY

INTRODUCTION




AQUACULTURE

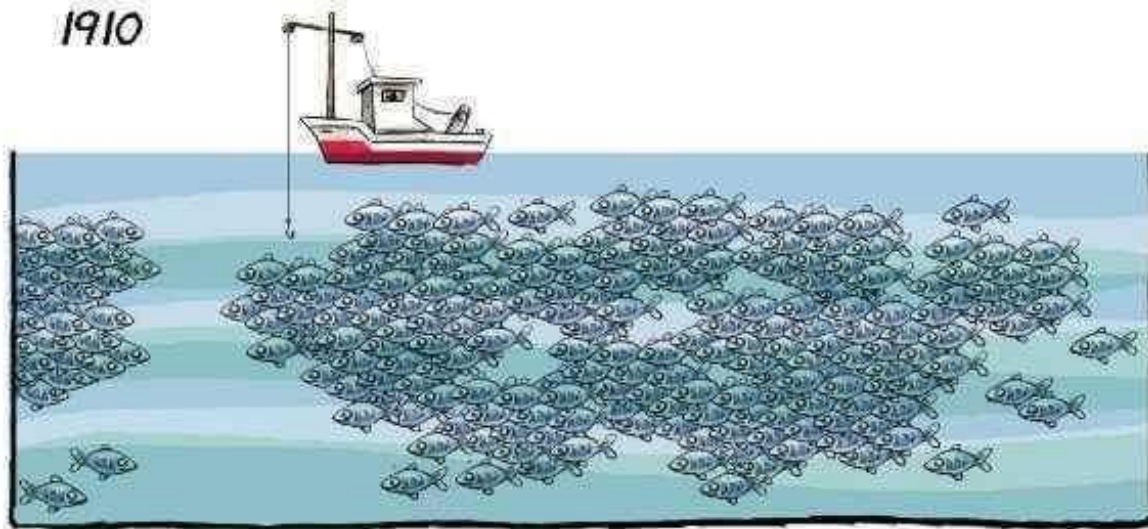
INTRODUCTION

- Water covers 70% earth's surface.
- One fourth land – agriculture – decreasing – population explosion – industrialization – anthropogenic activities
- Efforts to boost up food production – advanced farming techniques – not achieving global target
- Aquatic Habitats – Fresh water, Brackish water & Marine water bodies

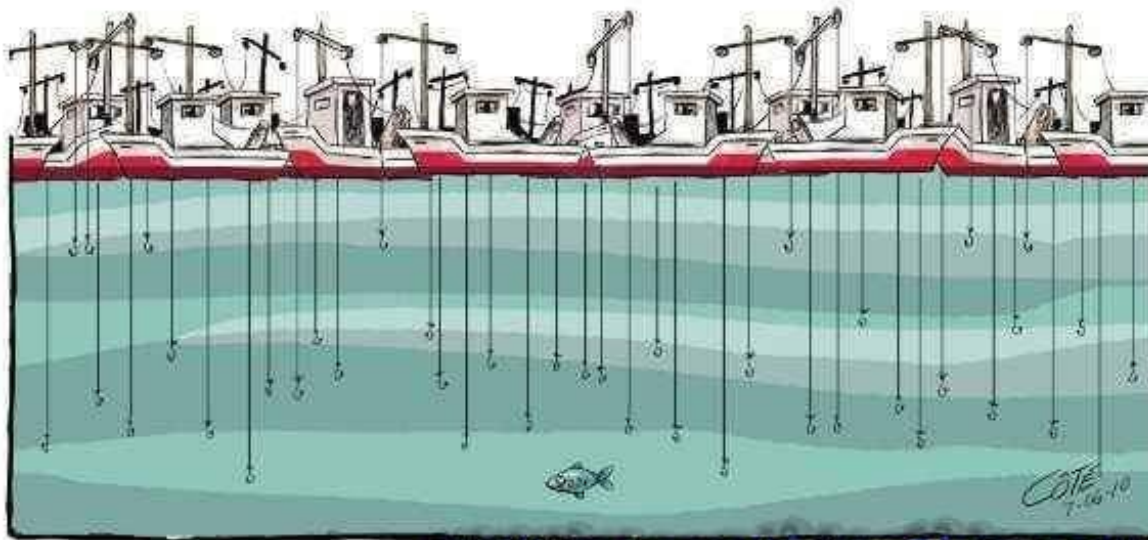
INTRODUCTION

- Offer rich source of food for human existence
 - Since ages – man utilizing water bodies – thirst & hunger
 - Provides enough nutrients, particularly proteins.
 - Quantity decreasing- overexploitation & pollution
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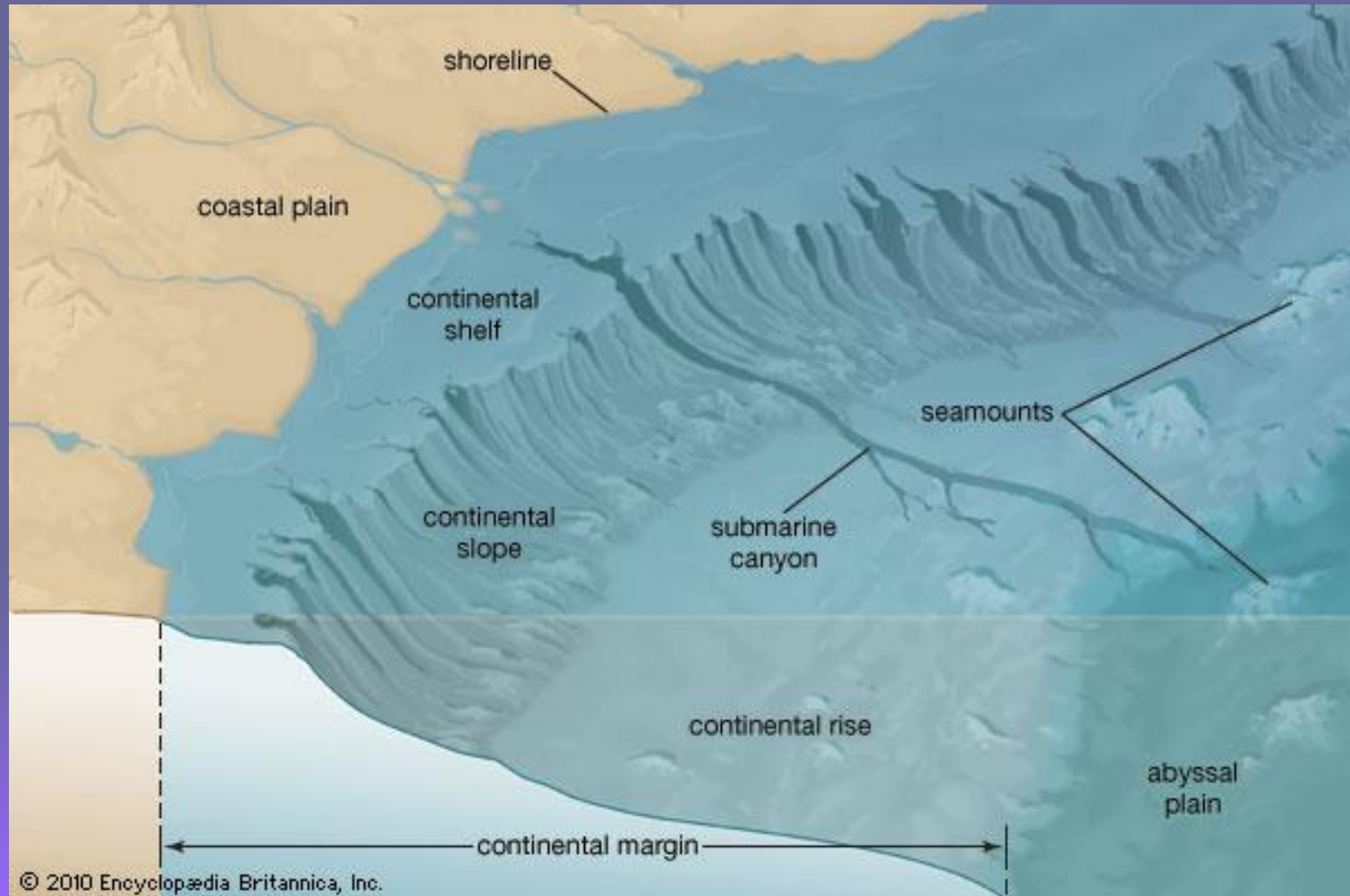
POINTS

- MARITIME COUNTRIES - STATES
- CAPTURE & CULTURE FISHERIES
- INDIAN COAST LINE 8041 KMS (7516.6 KM)– 9 STATES, 2 UT, 2 ISLAND GROUPS
- CONTINENTAL SHELF – EAST COAST (30m) & WEST COAST (200m)
- EEZ – Exclusive Economic Zone – UN convention – 2.02 million sq.km
- PELAGIC, DEMMERSAL/ BENTHIC
- FIN FISH & SHELL FISH

Maritime states of India



Sea Bed



Maritime Zones

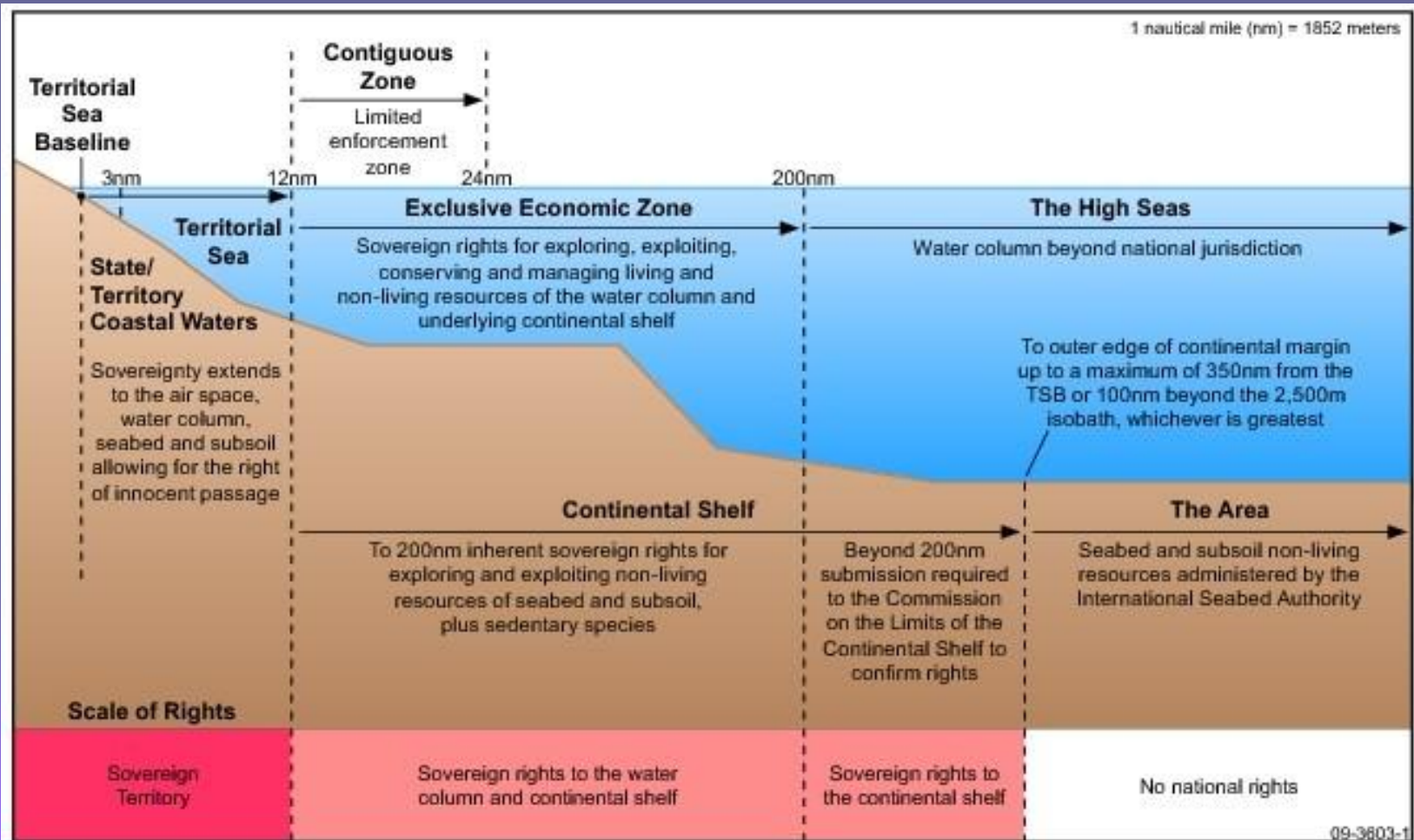
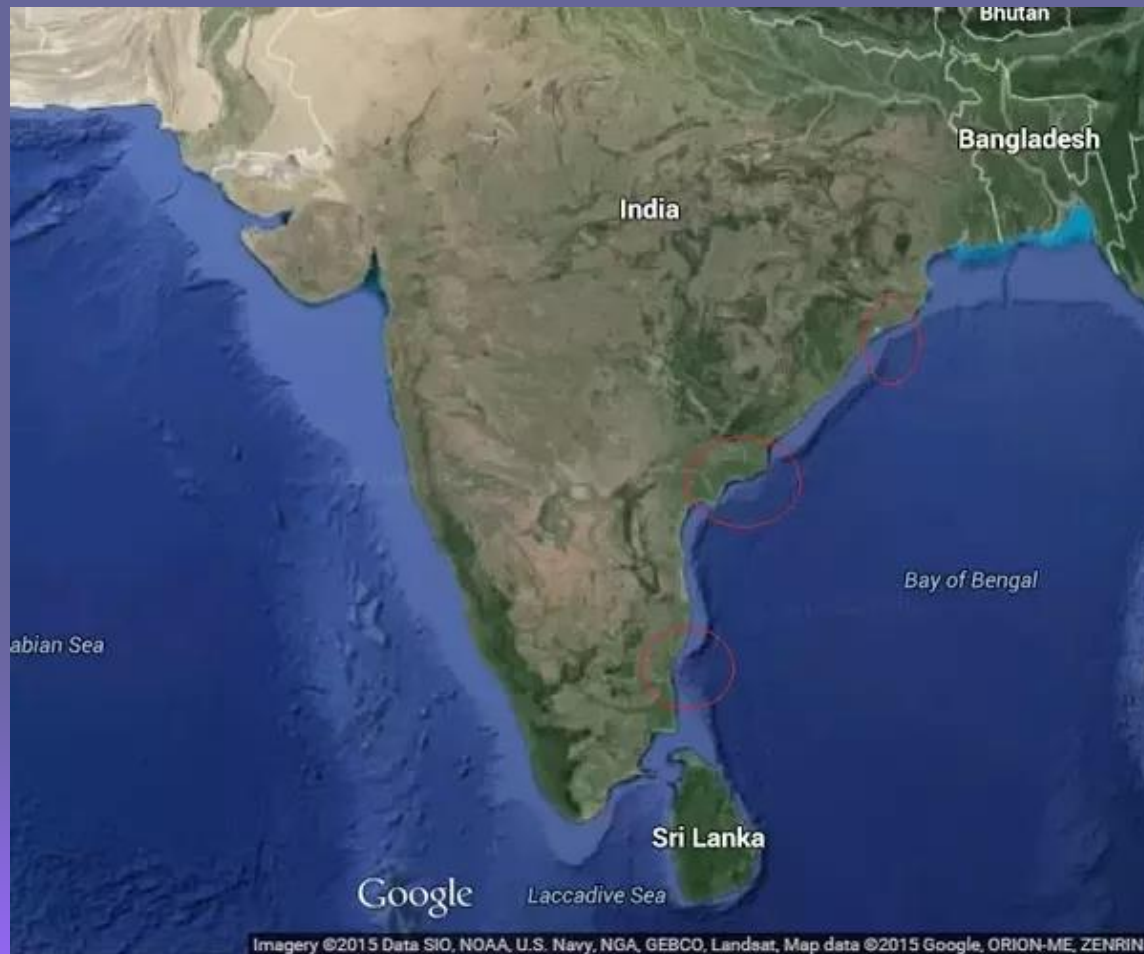


Figure 1: Offshore extent of the maritime zones recognized under international law

Indian Continental Shelf



Aquaculture

Aquaculture is the **commercial farming**, **husbanding** and **harvesting** of economically important **aquatic animals** and **plants** **under controlled conditions**.



Significance

- Sustained supply of desired species all year around
- Supplements agriculture in food production
- Aquaculture cheaper-Efficient food conversion in fishes
- Use three dimensional nature of water bodies
- Fewer waste in fishes
- Integrated with agriculture & animal husbandry
- Provide income and employment for rural population
- Recycling agricultural and domestic wastes
- Desired quantity for high market demand
- Enhancing productivity of natural water bodies-aqua range farming
- Utilization of unproductive areas-marshes, barren paddy fields, swamps, etc.
- Foreign exchange for commercially important items.



DIVERSITY OF AQUACULTURE

- ***NATURE OF ENVIRONMENT***
- **Freshwater Aquaculture** – water below 5 ppt
 - ❖ Rivers, ponds, lakes, reservoirs, irrigation canals, tanks, etc.
- **Brackish water Aquaculture** – water varies between 5-30 ppt
 - ❖ Estauries, backwaters, lagoons, lakes, etc.
- **Mariculture** – water varies between 30-35 ppt.
 - ❖ Shores, coastal & open seas



TEMPERATURE

➤ Warm water Aquaculture

❖ Temperature above 20° C

➤ Coldwater Aquaculture

❖ Temperature below 20° C and above 914m mean sea level

COMMERCIAL & ECONOMIC CONDITIONS

□ Extensive Aquaculture

- Traditional method of farming in natural water bodies.
- No artificial feeds
- Low production

□ Intensive Aquaculture

- Produce maximum quantity of organism from a limited area.
- Farms are well managed and fed with artificial feeds
- High stocking density

□ Semi-intensive Aquaculture

- Between above two.
- Maintained in natural ponds with artificial feeds
- Moderate stocking density
- Moderate production



TYPE OF CULTURE ***TECHNIQUES USED***

- **POND CULTURE**
- **CAGE CULTURE**
- **PEN CULTURE**
- **RAFT CULTURE**
- **RACK CULTURE**
- **POLE CULTURE**
- **LONG-LINE CULTURE**

POND CULTURE

- Aquaculture in artificial or natural ponds
- Commonest method



CAGE CULTURE

- Placed in cages of metal frames & nylon meshes or bamboo frame and split bamboo meshes.
- Fixed or left floating
- False bottom, covered on all sides
- Great stocking capacity- plenty of food materials and removes wastes
- Great production



PEN CULTURE

- ❑ Built near river banks or shore lines.
- ❑ Natural bottom
- ❑ Always fixed
- ❑ Made of bamboo or other materials



RACK CULTURE

- Fixed structure, attached to bottom using wooden poles
- Frame made on the poles
- Culturing mussels and oysters in shallow sea.



RAFT CULTURE

- Made of timber or fibre glass
- Culturing mussels & oysters
- Ropes suspended from the raft used for keeping mussel seeds for growth
- Also called rope culture



LONG LINE

- Culturing bivalve molluscs in open seas
- Series of floats in open sea connected with a long rope
- Vertical strings attached to long line



POLE CULTURE

- Poles driven into bottom of seas
 - Culturing mussels and oysters
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NUMBER OF SPECIES CULTIVATED

○ MONOCULTURE

- ❖ Single species culturing system

○ MONOSEX CULTURE

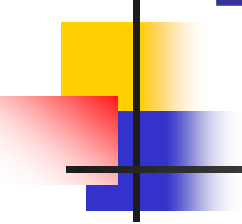
- ❖ Single sex either males or females reared alone
- ❖ Prevent energy expenditure for reproduction for getting maximum harvest
- ❖ Egs. Tilapia (highly prolific sps.)



- POLYCULTURE (COMPOSITE CULTURE)

- ❖ Different species in same culture system
- ❖ Different feeding habits.
- ❖ Example- Catla, Rohu & Mrighal
- ❖ - Silver carp, Grass carp & Common carp

INTEGRATED AQUACULTURE

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- ❖ Fish farming with agriculture and live stock
 - ❖ Waste recycling, more economical

THANK YOU

