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Combined Study of Indian Geography with Marine Fisherry Resources under the Integrated Teacher Education Programme (ITEP)

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***Abstract* - Geographically India is three sided covered by sea (western side, Souther Side and Eastern side). Large quantities of marine resources are available in all three sides. In northern side the Himalayan hills, Aravali hills & other hills The Indian Geography are in the Indian Geography. Integrated study of Indian Geography ocean and marine fisheries may be considered as the Interdisciplinary part of the Geography & Biology (Fishery science). A large number of fishery resources are marine resources categorized as capture fisheries (Coastal, deep sea) and cultural fisheries. The cultural fisheries are studies under aquaculture. The geography of India is closely related to its economy and the way of life of its people. Under integrated study the fishery science may be studied with the study of Indian Geography and Ocean. This study also recommends that the awareness of environment will be also increased in learner's and trainers mind as well as higher researches in environmental and fishery Sciences.**

Keywords: Geography, Ocean, Fishery and ITEP.

Introduction

The Indian subcontinent is separated from the rest of the Asian land mass by a nearly continuous barrier of mountain ranges, shaped like a giant pear with its tapering and dipping into the Indian ocean, this region is also known as South Asia, Densely populated, with nearly one-sixth of the world's population living in India alone, the region has a enormously Varied history, culture and to landscape.

The physical landscape of the subcontinent is incredibly diverse. Its more At the 4,000,000 sq km of land encompasses tall mountains, desert wastelands, tropical islands, densely populated flood plains and busting cities, Geomorphologically, the subcontinent can be divided into three basic regions; the northern mountain rim including the Himalayas, the great Indo-Gangatic Plain and the Decan plateau.. Most of the India front and parts of of Bangladesh and Pakistan sit on a massive peninsula that just south into the Indian Ocean.

The three primary categories of fish are bony, cartilaginous, and jawless. Hagfish and lampreys are within the jawless category. Sharks and rays are classified as cartilaginous, but the majority of fish are classified as bony, which includes both lobe-finned and ray-finned species.

The majority of fish are protected by scales. Fins are used for swimming by almost all fish. Some fish, like the walking catfish, use their fins to crawl on land, while flying fish can fly for brief periods of time.

The majority of fish breed by fertilizing eggs laid by the female outside of the female's body. Nonetheless, a lot of sharks conceive internally, delivering their offspring from the mother's body.

Like sharks, fish are ruthless predators who hunt huge marine mammals, but many fish also eat algae, insect larvae, and other small animals.

Typically, schools or shoals of fish travel together. The researchers found schools of about 32 million fish using low-frequency sonar.

Indian Geography: > The geography of India is closely related to its economy and the way of life of its people. For example, the black soil of the Deccan Plateau is particularly conducive to cultivation of cotton, leaching to the concentration of textile industries in those regions and their consequent prosperity. India's economy heavily relies on the appropriate utilization of its wealth of natural resources. However, much of India's population lives in poverty inefficient economic policies, overstretched infrastructure and soarting populations are contributing factors. The government is now actively encouraging better environmental legislation,

Ocean: More than 70% of the Earth's surface is covered with salt water; in the form of oceans and seas, some are turbulent

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and dangerous while others are calm and teeming with plants and animals. They all play an essential role in protecting our planet's ecosystem.

Marine waters do not stand still, but are subject to tides and currents. Tides move water daily under the gravitational pull of the moon. Currents, large bands of living water, swirl around the globe.

There are two types of currents: surface currents, carried by the wind, and deep-water currents, created by density differences (the colder and saltier the water, the greater its density).

In the open ocean, currents flow clockwise in the Northern Hemisphere and anticlockwise in the Southern Hemisphere. This is the Carioles effect, caused by the direction of the planet's rotation. Ocean currents have a major influence on the climate. The warm Gulf Stream, for example, gives northwestern Europe relatively mild winters.

Only about 20% of land species live in the oceans, of which about 90% are bottom-dwelling and shallow-water species. In most marine waters, especially in the 1,000-meter zone, where there is no life, the rarity is extreme.

There are two main habitats in the ocean: the water itself, or pelagic habitat, and the seafloor, called benthic habitat. Both habitats are divided into several zones based on how much sunlight can reach the water. Most life is concentrated in the top 200 meters, where tiny plants and animals called plankton congregate and provide a rich source of food. Yet some animals survive in the dark, almost icy waters at depths of more than 4,000 meters.

Marine Fishery Resources: Fish can be caught from aquatic resources or raised and domesticated in small or large enclosures for capture and use when needed. These may be categorized in following two headings,

(i) captured Fisheries and (ii) Aqua-culture.

Capture Fisheries in Marine waters: Most of the fish and other products in the aquatic system come from marine habitats (almost 85–90%). The ocean contains more than 97% of the total free-flowing water on this planet and covers an area of 361 million square kilometers. The total annual productivity of our oceans is estimated to be about 55 billion tons of dry biomass. The oceans provide an excellent habitat for the growth of aquatic organisms. Fishing activities in the marine environment can be classified into the following groups:

Coastal fishing: This category includes fishing activities near the coast that can be carried out using small boats and watercraft. The shallow water area near the coast is generally a very productive region as it contains a large amount of nutrients from the soil as well as from surface water runoff. A good plant life thrives in this area, which allows for a rich harvest of fish and other animals. However, productivity in coastal areas is limited by the pollution of the water bodies caused by the discharge of waste and sewage. In several developing countries where fishing is largely carried out by artisanal fishers, coastal catches account for a significant proportion of marine catches.

Fish production is much greater along the west coust than the east coust. The west produces a number of commercially important species such as the sardines, mackerels, scianids, pomfrets, Bombay duck, polynemids and prawans, There is regional variation in the catch competition along the west coast. The east coast does not support any commercially large fishery, but substantial quantity of several small fisheries is included in the catch. These are clupeids including Hilsa, Engrauli's, Pellona, Trichiurus, stromateus, cybium, silver belling, flying fishes, perches and sharks. The marine fish landing of Tamil Nadu form about 15% of the total landings (Sathiadhas, 1997).

Deep Sea Fisheries - A large part of the total annual catch of fish and other marine products comes from fishing in deep waters accessible only to large boats. In developed countries where fishing is an organized industry, large boats are used for this purpose. Due to high costs, deep-sea fishing is limited and contributes little to the overall harvest of the marine environment. Deeper areas of the sea are relatively spared from pollution, an important factor in coastal fishing. However, since many fish migrate to the coast for breeding purposes, the overall population can be affected by adverse conditions in shallow waters near the coast.

In contrast to coastal regions, primary production or biomass of green plants can be negatively affected due to nutrient deficiency in deeper waters. This naturally affected the biomass of fish.

In deep sea the ecological conditions are entirely different and this into three zones:

(i) Mesopelagic zone where light is every dins and fades away gradually. The temperature Varies between 4-8 °C. Dissolved oxygen content is reduced and there is increase in pressing. The amount of food available is not sufficient for the fauna. This region extends from 200 - 1000 meters,

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(ii) Bathy pelagic zone, which is dark and extends from 1000-3000 meter depth,

(iii) Benthic or abyss pelagic zone, which is the deepest part of the ocean beyond 3000 meters,

Thus 'deep sea' is a vast area of sea water and contains a large variety of fish species, which show a number of peculiarities and specializations. These fishes & are eels, spiny eels, viper fishes, dragon fishes, hatchet fishes, angler fishes and the lantern fishes, fishes. The structure, habits and physiology of the fishes diving in deep sea are modified to cope with the ecological conditions of their habitat.

Aqua-Culture: It involves the training and cultivation of freshwater and marine organisms. In many regions of the world, aquaculture and marine farming are very old occupations. However, the global potential of aquaculture as a source of food and other industrial products has only recently been recognized.

Aquaculture is a labor-intensive activity. It is particularly suited to poor, sparsely populated countries around the world where labor is cheap and per capita income is low. Unlike capture fisheries, where the size of the culture is determined by the size and availability of populations, aquaculture is limited only by the size of the area concerned. The natural productivity of the waters concerned does not play a major role in aquaculture, since food for developing populations can be obtained from external sources.

Fish Culture: Production of fish in a given body of water such as a pond, lake or reservior, using scientific methods of feeding, breeding, etc., so as to enhance the output, is called fish culture. There are a large number of ponds, lakes and tanks in India, which can be utilized for fish culture.

Physical Factors Affecting Fish Culture

(i) Depth of water :- A pond about 2 meter deep is considered suitable for fish culture, as it allows sunlight to penet rate upto the bottom increasing productivity by photosynthesis.

(ii) Temperature: - Animal's various metabolic activities like feeding, respiration, and breeding are influenced by temperature. Low temperature reduces, all the activities, which rise in temperature of water reduces the dissolved oxygen content.

(iii) Light: Light is an important factor that influences the productivity of pond. In shallow ponds, light reaches up to the bottom and Causes heavy growth of vegetation by photo synthesis. Growth of plantation depends upon light indirectly influencing growth of fish, Presence of shady trees along the shore prevents light, thus reducing pracu productivity of water.

(iv) Turbidity: Water becomes turbid during rainy season due to increase in silt and clay. This reduces penetration of light and affects productivity due to reduced Photosynthesis. Turbidity affects respiration in fish as the gills are injured and choked by drift and mud. Turbidity due to high plankton growth also affects fishes.

Chemical Factors Influencing Fish culture

(i) **Dissolved oxygen:** Oxygen is absorbed by water at the surface, and as also available through the photosynthetic activity of plants. Plants consume carbon dioxide and release oxygen during day time A reasonable balance of oxygen is maintained but variations occur due to several factors.

Deficiency of oxygen → Death of large number of fishes,

Excess of oxygen → Fatal to the fishes to the due to over metabolism.

(ii) **Carbon Dioxide :** Carbon dioxide forms Carbonic acid (H_2CO_3) with water water, which dissociates in H+ and HCO_3- ions and calcium bicarbonate ($Ca(HCO_3)_2$ is formed by by the action of lime ($CaCO_3$) and carbonic acid. Mydroxides, normal carbonates and bicarbonates influence the organic communities of water as they affect the total alkalinity of water.

(iii) **pH Level:** pH of water influences the metabolism of cell organisms living in it.

pH = 7 = Neutral
pH below 7 = Acidic
pH above 7 = Alkaline
Low pH is harmful to fishes.

Acidic water reduces the growth rate of the fishes,

(iv) **Hardness of Water:** Hardness of water due to calcium and Magnesium salts favours productivity of pond. It has been found that pond water having a hardness of 15 ppm or more is suitable for the growth of fish, while less than ppm $CaCO_3$, slows, down growth of fish and may be fatal.

Discussion and conclusion

Indian Geography in not a single type of Geography, but it is multitype of Geography: Grassland, Desert, Hills, sea showers Platues, Rain forests, cold forests, cold deserts etc. In India, there is not a single type of climate found, but various

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kinds of climate are occurred in various kind is Environmental Conditions.

The National Council for Teacher Education (NCTE) has introduced Teacher Education Programmes (ITEPs) in 57 teacher training institutions across the country for the academic session 2023–2024; this is the flagship programme of NCTE under NEP 2020. The ITEP course has been designed with the crucial objective of preparing teachers to adapt their skills to the new school structure which symbolises levels 5-3-3-4, Structure, Foundation, Intermediate and Secondary. This new structure has emerged from the NEP 2020 and has the central objective of attracting talented and competitive students to transform their effective teachers. One of the strengths of the Integrated Teacher Education keeps them closer to the spirit, values, culture and traditions of India. STEP helps students understand Indian languages and their diversity and offers them tremendous opportunities to be advancement in teaching.

The marine habitat exhibits clear horizontal stultification. It is broadly divided into two regions pelagic region and benthic region.

The pelagic region includes the entire body of water. It is divided into two regions: the narcotic zone and the oceanic zone.

The neritic zone is the shallow water area of the coast. It lies on the continental shelf, which corresponds to the gradual slope of the coast to the sea. It extends over a width of 16 to 240 km and a depth of 200 meters. Since this area is connected to the earth, it is greatly influenced by earth's environmental factors.

The oceanic zone refers to the continental shelf of the open ocean, which includes all the body of water beyond 200 meters depth and constitutes the oceanic zone.

The benthic region consists of the sea floor. It is divided into two regions: (i) the coastal zone and (ii) the high seas. The coastal zone is divided into two regions, namely the enlittoral zone (intertidal zone) and the sublittoral zone. The deep sea is divided into three regions, namely bathylic, apsial and hadal.

It is concluded that the integrated study of Indian Geography and Marine Fisheries under the Integrated Teacher Training Programme along with the study of Indian Geography and Marine Fisheries Science will be effective.

1. Indian Geography,
2. Ocean,
3. Marine Resources,
4. Marine Fisheries.

Recommendations

Rapid advancements in science and technology have put scientists and technicians on alert to deal with the simultaneous changes that have taken place in the last few decades of decline. Various kinds of revisions, corrections, modifications and sometimes even innovative ideas developed in many disciplines had to be incorporated in the advanced concepts to keep pace with the recent research advancements in the relevant taken research to a consistent level of ‘thinking’ and ‘rethinking’ to consider higher concepts related to biology.

Based on the present study, the following recommendations can be suggested as integration of the geographical and fisheries units of India plays an important role in this:

1. Health and hygiene awareness by cleaning marine resources, coastal areas, drainages etc.
2. Raising awareness about protecting the flora and fauna of marine habitat.
3. Awareness about the rare and endangered species from Marine habitat and coastal regions.
4. Combined study of Geography and Fishery as well as Biology under Integrated Teacher Education Programme is recommended by Indian Education System.

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