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30. CLIMATE CHANGE AND ITS IMPACTS ON MARINE FISHERIES LIVELIHOOD – A SPECIAL VIEW ON ERIPURAKARAI VILLAGE

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ABSTRACT

Eripurakarai is a large village located in Pattukkottai Taluk of Thanjavur district, Tamil Nadu with total 995 families residing. The Eripurakarai village has population of 4285 of which 2047 are males while 2238 are females as per Population Census 2011. In Eripurakarai village population of children with age 0-6 is 554 which makes up 12.93 % of total population of village. Average Sex Ratio of Eripurakarai village is 1093 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the Eripurakarai as per census is 1037, higher than Tamil Nadu average of 943. Eripurakarai village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Eripurakarai village was 74.51 % compared to 80.09 % of Tamil Nadu. In Eripurakarai Male literacy stands at 82.59 % while female literacy rate was 67.18. In Eripurakarai village out of total population, 1548 were engaged in work activities. 95.54 % of workers describe their work as Marine Work (Employment or Earning more than 6 Months) while 4.46 % were involved in Marginal activity providing livelihood for less than 6 months. Of 1548 workers engaged in Main Work, 12 were cultivators (owner or co-owner) while 300 were Agricultural labourers.

The Marine Education Trust has produced a new education pack called Explore the Sea, which is a series of resources for young people that is intended to be very practical and hands-on while not requiring a great deal of additional equipment or materials. It's not meant to be a course, just ideas that can be mixed, matched and adapted depending on what individual organization need at the time. Explore the Sea is a resource pack containing a series of practical activities to teach young people about the different habitats, marine life and environmental pressures affecting tropical coral reef ecosystems. It is arranged in seven topic areas that cover five particular ecosystems (reefs and lagoons, sandy beaches, rocky shores, mangroves and the open ocean) as well as introducing general ecological concepts and highlighting important conservation concerns.

According to Census 2011 information the location code or village code of Eripurakarai village is 614701. Eripurakarai village is located

in Pattukkottai Taluk of Thanjavur district in Tamil Nadu, India. It is situated 14km away from sub-district headquarter Pattukkottai and 61km away from district headquarter Thanjavur. As per 2009 stats, Eripurakarai is the gram panchayat of Eripurakarai village. The total geographical area of village is 829.27 hectares. Eripurakarai has a total population of 4,285 peoples. There are about 995 houses in Eripurakarai village. Adiramapattinam is nearest town to Eripurakarai. There are 105 craft owners in Eripurakarai. The craft owners comprise of two categories viz., mechanized boat owners and country boat owners. Out of 105 craft owners there are 85 mechanized boat owners and 20 country boat owners. In Eripurakarai there are 250 middlemen. The middlemen comprise two categories namely wholesaler and retailer out of 250 middlemen there are 50 wholesalers and 200 retailers. The socio-economic condition of fishermen families in the study area is analyzed in the project. 50 fishermen are chosen at random for this study. These socio-economic conditions of their families are analyzed and focused in this study.

INTRODUCTION

According to Census 2011 information the location code or village code of Eripurakarai village is 614701. Eripurakarai village is located in Pattukkottai Taluk of Thanjavur district in Tamil Nadu, India. It is situated 14km away from sub-district headquarter Pattukkottai and 61km away from district headquarter Thanjavur. As per 2009 stats, Eripurakarai is the gram panchayat of Eripurakarai village. The total geographical area of village is 829.27 hectares. Eripurakarai has a total population of 4,285 peoples. There are about 995 houses in Eripurakarai village. Adiramapattinam is nearest town to Eripurakarai. There are 105 craft owners in Eripurakarai. The craft owners comprise of two categories viz., mechanized boat owners and country boat owners. Out of 105 craft owners there are 85 mechanized boat owners and 20 country boat owners. In Eripurakarai there are 250 middlemen. The middlemen comprise two categories namely wholesaler and retailer out of 250 middlemen there are 50 wholesalers and 200 retailers. The socio-economic condition of fishermen families in the study area is analyzed in the project. 50 fishermen are chosen at random

for this study. These socio-economic conditions of their families are analyzed and focused in this paper.

The Thanjavur District lies between Bay of Bengal in East, Trichy district in the west, Pudukkottai District and Palk straight in the South and Arcot District in the North.

Thanjavur is the headquarters of the district. Nagapattinam district is one of the fishing harbors in Tamil Nadu.

OBJECTIVES OF THE STUDY

- 1.To study whether the mechanized boat owners are high in numbers.
- 2.To examine the educational background of the fishermen households in the study village.
- 3.To study the income and expenditure of the fishermen families in Eripurakarai.

HYPOTHESIS OF THE STUDY

- 1.Number of mechanized boat owners is higher than the traditional boat owners.
- 2.Educational background of the fishermen is poor in the study area.

When the Income increases the expenditure also increases in the study area. Population of ERIPURAKARAI

Total Population - 4,285

Male Population - 2,047

Female Population - 2,238

CONNECTIVITY OF ERIPURAKARAI

| Type | Status |
|---------------------|-------------------------------------|
| Public Bus Service | Available within <5 km distance |
| Private Bus Service | Available within < 5 km distance |
| Railway Station | Available within 500 metre distance |

ERIPURAKARAI – POPULATION

Eripurakarai is a large village located in Pattukkottai Taluk of Thanjavur district, Tamil Nadu with total 995 families residing. The Eripurakarai village has population of 4285 of which 2047 are males while 2238 are females as per Population Census 2011.

In Eripurakarai village population of children with age 0-6 is 554 which makes up 12.93 % of total population of village. Average Sex Ratio of Eripurakarai village is 1093 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the Eripurakarai as per census is 1037, higher than Tamil Nadu average of 943. Eripurakarai village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Eripurakarai village was 74.51 % compared to 80.09 % of Tamil Nadu. In Eripurakarai Male literacy stands at 82.59 % while female literacy

rate was 67.18 %. As per constitution of India and Panchyat Raj Act, Eripurakarai village is administrated by Sarpanch (Head of Village) who is elected representative of village. Our website, don't have information about schools and hospital in Eripurakarai village.

WORK PROFILE

| | Worker (Among total population) | Main Worker (Among workers) | Marginal Worker (Among workers) | Non Worker (Among total population) |
|--------|---------------------------------|-----------------------------|---------------------------------|-------------------------------------|
| Total | 36.1% | 34.5% | 1.6% | 63.9% |
| Male | 54% | 52.7% | 1.3% | 46% |
| Female | 19.7% | 17.9% | 1.9% | 80.3% |

In Eripurakarai village out of total population, 1548 were engaged in work activities. 95.54 % of workers describe their work as Marine Work (Employment or Earning more than 6 Months) while 4.46 % were involved in Marginal activity providing livelihood for less than 6 months. Of 1548 workers engaged in Marine Work, 12 were cultivators (owner or co-owner) while 300 were Agricultural labourers.

ERIPURAKARAI VILLAGE

| | Total | General | Schedule Tribe | Child |
|--------|-------|---------|----------------|-------|
| Total | 4,285 | 3,192 | 1,093 | 0 |
| Male | 2,047 | 1,526 | 521 | 0 |
| Female | 2,238 | 1,666 | 572 | 0 |

THE PURPOSE OF STUDY

The Marine Education Trust has produced a new education pack called Explore the Sea, which is a series of resources for young people that is intended to be very practical and hands-on while not requiring a great deal of additional equipment or materials. It's not meant to be a course, just ideas that can be mixed, matched and adapted depending on what individual organization need at the time. Explore the Sea is a resource pack containing a series of practical activities to teach young people about the different habitats, marine life and environmental pressures affecting tropical coral reef ecosystems. It is arranged in seven topic areas that cover five particular ecosystems (reefs and lagoons, sandy beaches, rocky shores, mangroves and the open ocean) as well as introducing general ecological concepts and highlighting important conservation concerns. The pack contains Educators' Notes, which provide background information about the different subject areas, and Student Sheets, which provide instructions for the activities. The activities range from art and science to

role plays, and are designed to be an ideas base rather than a comprehensive ecology course to follow. They are intended to be flexible – an activity suggested for one topic can easily be adapted for another – and should be appropriate for formal or informal education settings.

MANAGING THE MARINE ENVIRONMENT

Managing the marine environment can be a real challenge for politicians, as there are so many conflicting arguments about how seas and coasts should be used. The scientific evidence clearly shows that we need to use our oceans more sustainably: if we don't try to conserve marine species and habitats now, there will be little left for the future. In this activity, you will put yourselves in the shoes of people involved in making decisions about marine resource management. The scenario Lamorelle is a remote tropical island in the Indian Ocean. It is a small island, 12 miles long and 5 miles wide. The island is mountainous and rocky and is difficult to farm. Tobacco, coffee, limes and onions are grown to some extent. The weather is sub-tropical with occasional cyclones during the summer. However, water is very short due to poor collection and storage facilities. There are connecting flights to a nearby larger island twice a day and a ship that comes once a fortnight with essential supplies. The island has many beautiful beaches which have so far not been developed. Three hotels have been built on the island, but room occupancy is low. Since the island was first permanently settled in 1742, the islanders have relied to a large extent on the sea and lagoon for their subsistence and livelihood. As the population grew during the 18th and 19th centuries several large fishing operations established themselves on the island and caught large quantities of fish that they exported to the mainland. Now, many of the stocks have been fished out. The island was once rich in forest, but this was cut down by colonial navies on their way to the Spice Islands. Lack of vegetation has caused a large build up of silt and mud in the lagoon. The lagoon has been under increasing pressure recently. Silt has run off into the lagoon and smothered many corals. The lack of fish has led many women to start collecting octopus on foot, at the same time crushing corals. A new Government has just been elected with a bold new Chief Commissioner. He is keen to tackle decades of poor and inadequate management to ensure that fish stocks and the marine environment can be sustainably managed. He is also keen to ensure that there is a better economy on the island with more tourists and agriculture. In particular, the Government has been advised that the best way of managing

resources is through the creation of a Marine Protected Area.

HUMAN PRESSURE ON ENVIRONMENT

Human pressure on the marine environment has brought several species to the edge of extinction. Their numbers have declined mainly as a result of fishing, which either targets the animals directly or catches them accidentally when pursuing different species. Their survival is also threatened by the loss of their habitats – the places where they feed and shelter and where their young develop. Endangered marine species include turtles, whales, sharks and blue fin tuna. Our oceans, lagoons and shores have always provided a very wide range of different foods. Some of these foods remain very popular, like octopus curry in Mauritius, but sometimes people forget about the old ways. We must be very careful to exploit our resources sustainably so that they can still be used by future generations. One way to do this is to use lots of different species for food instead of just a few. There have been great changes in recent years in the availability of preserved foods, in refrigeration and in transport. With all these changes sometimes old traditional recipes and ways of using foods collected from the beach or lagoon can be lost.

IMPACT ON FISHING COMMUNITIES

Coastal and fishing populations and countries dependent on fisheries are particularly vulnerable to climate change. Low-lying countries such as the Maldives and Tuvalu are particularly vulnerable and entire communities may become the first climate refugees. Fishing communities in Bangladesh are subject not only to sea-level rise, but also flooding and increased typhoons. Fishing communities along the Mekong river produce over 1 million tons of basa fish annually and livelihoods and fish production will suffer from saltwater intrusion resulting from rising sea level and dams

While climate change increases the effects of human activities, the inverse is also applicable. Human activities also increase the impact of climate change. Human activity has been linked to lake nutrition levels, which high levels are correlated to increasing vulnerability to climate change. Lake Annecy, Lake Geneva, and Lake Bourget were subject to experiments related to their zooplankton. Lake Geneva and Lake Bourget had relatively high levels of nutrients and responded at a significant level towards factors related to climate change, such as weather variability. Lake Annecy had the lowest amount of nutrition levels and responded comparatively poorly. Fisheries and aquaculture contribute significantly to food security and livelihoods. Fish provides essential nutrition for 3 billion people

and at least 50% of animal protein and minerals to 400 million people from the poorest countries. This food security is threatened by climate change and the increasing world population. Climate change changes several parameters of the fishing population: availability, stability, access, and utilization. The specific effects of climate change on these parameters will vary widely depending on the characteristics of the area, with some areas benefiting from the shift in trends and some areas being harmed based on the factors of exposure, sensitivity, and ability to respond to said changes. The lack of oxygen in warmer waters will possibly lead to the extinction of aquatic animals. Worldwide food security may not change significantly, however rural and poor populations would be disproportionately and negatively affected based on this criteria, as they lack the resources and manpower to rapidly change their infrastructure and adapt. Over 500 million people in developing countries depend, directly or indirectly, on fisheries and aquaculture for their livelihoods - aquaculture is the world's fastest growing food production system, growing at 7% annually and fish products are among the most widely traded foods, with more than 37% (by volume) of world production traded internationally.

ADAPTATION AND MITIGATION

The impacts of climate change can be addressed through adaptation and mitigation. The costs and benefits of adaptation are essentially local or national, while the costs of mitigation are essentially national whereas the benefits are global. Some activities generate both mitigation and adaptation benefits. Adaptation Several international agencies, including the World Bank and the Food and Agriculture Organization have programs to help countries and communities adapt to global warming, for example by developing policies to improve the resilience of natural resources, through assessments of risk and vulnerability, by increasing awareness of climate change impacts and strengthening key institutions, such as for weather forecasting and early warning systems. The World Development Report 2010 - Development and Climate Change, shows that reducing overcapacity in fishing fleets and rebuilding fish stocks can both improve resilience to climate change and increase economic returns from marine capture fisheries by US\$50 billion per year, while also reducing GHG emissions by fishing fleets. Consequently, removal of subsidies on fuel for fishing can have a double benefit by reducing emissions and overfishing. Investment in sustainable aquaculture can buffer water use in agriculture while producing food and

diversifying economic activities. Algal biofuels also show potential as algae can produce 15-300 times more oil per acre than conventional crops, such as rapeseed, soybeans, or jatropha and marine algae do not require scarce freshwater.

OVER-FISHING

Although there is a decline of fisheries due to climate change, a related cause for this decrease is due to over-fishing. Over-fishing exacerbates the effects of climate change by creating conditions that make a fishing population more sensitive to environmental changes. Studies show that the state of the ocean is causing fisheries to collapse, and in areas where fisheries have not yet collapsed, the amount of over-fishing that is done is having a significant impact on the industry. Over-fishing is due to having access to the open sea, it makes it very easy for people to over fish, even if it is just for fun. There is also a high demand for sea food by fishermen, as well modern technology that has increased the amount of fish caught during each trip. If there was a specific amount of fish that people were allowed to catch then this could very well solve the problem of over fishing. This type of limit system is in place in a few countries including New Zealand, Norway, Canada, and the United States. In these countries the limit system has successfully helped in fishing industries. These types of limit systems are called Individual fishing quota. This means that the areas where this quota exist, the government has legal entity over it and in these boundaries they are entitled to utilize their ocean resources as they wish.

SUGGESTIONS

There is a conservation issue called 'shifting environmental base lines'. This refers to the situation where each generation thinks that what is familiar to it is the natural state of the environment. In failing to take account of the experience of older people, we can miss the big picture and fail to appreciate the seriousness of environmental change. For this activity, you will be a fisheries scientist and do some research to record fishers' recollections of their catches in the past compared to those now. Talk to different fishermen (and women). Try to find the oldest fishermen you can, as well as some younger ones who have just started, and some in between. Write down the fisherman's age, and ask him about his catches. Ask what year he first started fishing, and then ask about the type of fish he caught, where he found them, and how big his catches were. Then ask the same questions about the situation now. Make a list of all the different sea foods that you have eaten. Talk to your parents and grandparents

about the different sorts of seafood they used to eat. It might help to show them a book and get them to point things out Ask in particular how they used to cook them.

CONCLUSION

Eripurakkarai is the gram panchayat of Eripurakkarai village. The total geographical area of village is 829.27 hectares. Eripurakkarai has a total population of 4,285 peoples. There are about 995 houses in Eripurakkarai village. Adiramapattinam is nearest town to Eripurakkarai. There are 105 craft owners in Eripurakkarai. The craft owners comprise of two categories viz., mechanized boat owners and country boat owners. Out of 105 craft owners there are 85 mechanized boat owners and 20 country boat owners. In Eripurakkarai there are 250 middlemen. The middlemen comprise two categories namely wholesaler and retailer out of 250 middlemen there are 50 wholesalers and 200 retailers. The socio-economic condition of fishermen families in the study area is analyzed in the project. 50 fishermen are chosen at random for this study. These socio-economic conditions of their families are analyzed and focused in this study.

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