

## Socio-economic aspects of people and Mangroves vegetation utilization in mudflat based villages of Krishna district

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**Abstract:** Mangroves are highly productive ecosystems with important economic and environmental functions. Based on vegetation status on three mudflat based villages the present study is to identify the species wise utilization and social-economic aspects among three villages i.e, Interu, Kruthivenu and Nidamaru. The socio-economic situation and resource utilization among all three mudflat based field stations is studied with the help of questionnaire, the base line data consisting of community status, life style, occupation etc. are developed. From the data, the living conditions and dependency on mangrove forests are analyzed. The relationship between utilization of resources and socio-economic conditions in each field station are compared. It is observed that the mangrove forests are utilized for fire/fuel wood, thatching of houses, temporary walls, boat manufacturing, traditional furniture, medicinal, fodder, tannin, fish nets, fish poisoning extracts etc. by the inhabitants.

**Keywords:** Mangroves, Mudflats, socio-economic, resource utilization

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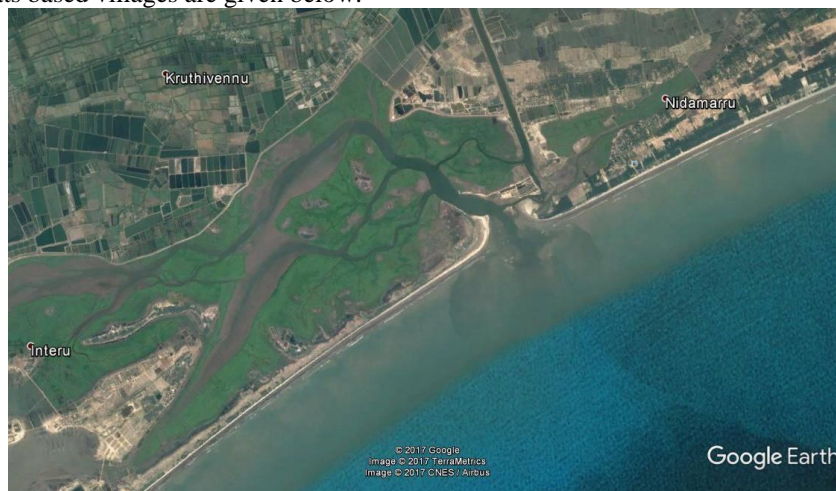
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### I. Introduction

Mangroves comprise salt tolerant plant species that occur along inter-tidal zones of rivers and seas in the form of narrow strips or as extensive patches in estuarine habitats and river deltas of tropical and sub-tropical regions. Allen (1987), Luther and Greenburg (2009) identified that mangroves have been used by coastal inhabitants for centuries with the earliest reports. Mangroves provide a suite of provisioning ecosystem services, including: (i) fisheries production, Nagelkerken et al., (2000), Dorenbosch et al., (2004, 2005) (ii) aquaculture production Minh et al., (2001) (iii) pharmaceutical generation Abeysinghe, (2010) (iv) production of timber and fuelwood (the latter being important in the Caribbean and Pacific Lugo, (2002), Walters, (2005) and Walters et al., (2008). Human uses of mangrove resources have been categorized into traditional, commercial and destructive uses Field (1995). Uses of mangroves can be direct, involving the tangible benefits of mangrove forest products and mangrove-associated fisheries, or indirect, involving the intangible benefits of ecosystem services Saenger et al., (1983), Ewel et al., (1998), Hogarth (2007) and Walters et al., (2008). The former would entail the direct use of products from the ecosystem and the latter would rely on the use of the mangrove ecosystem as a whole Bandaranayake (1998).

### II. Study Area

The present study is carried out to identify Mangroves vegetation utilization and socio-Economic aspects of people in mudflats based villages are given below.



**Figure-1: Satellite map showing the study areas**

**Interu:**

Interu is a mid-sized village located at a distance of 36.5 km from Machilipatnam, it is under Kruthivenu mandal has 3 km coast line with high tide and low tide zone.

**Kruthivenu:**

Kruthivenu is a large village located at a distance of 44.7 km from Machilipatnam it is under Kruthivenu mandal has 5 km coast line with high tide and low tide zone.

**Nidamaru:**

Nidamaru is a large village located at a distance of 43 km from Machilipatnam, it is under Kruthivenu mandal has 2km coast line with high tide and low tide zone.

### **III. Materials And Methods**

The socio-economic aspects Nabi et al (2012) and mangrove species utilization base line data are gathered from various selected houses in and around the field stations, by way of obtaining answers to the questionnaire, household form issued to each family. The data are analyzed from family to community and the socio-economic status and mangrove species utilization is estimated. The data on the aspects are generated with the help of physical observations, records of forest department and interviews with natives and NGOs. In addition, the parameters such as type of forestry operation in area and size and distance from the patch of natural vegetation or human habitation are also taken into consideration.

### **IV. Results**

Mangrove vegetation in the study area consisting of 9 genera and 9 species of 5 families has been recorded as 6 trees, 1 shrubs and 2 herbs Prabhakar V.V et al (2017). The socio-economic situation among all field stations is studied with the help of questionnaire. From the responses to the questionnaire, the base line data consisting of community status, life style, occupation etc. are developed. From the data, the living conditions and dependency on mangrove forests are analyzed and the relationship between utilization of resources and socio-economic conditions in each field station are compared. It is observed that the mangrove forests are utilized for fire/fuel wood, thatching of houses, temporary walls, boat manufacturing, traditional furniture, medicinal, fodder, tannin, fish nets, fish poisoning extracts etc. by the inhabitants.

#### **Socio- Economic status of the people in the study areas:**

##### **Socio-economic aspects of Interu:**

In Interu village out of total population, 692 were engaged in work activities. 71.97 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 28.03 % were involved in Marginal activity providing livelihood for less than 6 months. Of 692 workers engaged in Main Work, 12 were cultivators (owner or co-owner) while 120 were Agricultural labourers.

Most of the families have more than 4 members. Male to female sex ratio is 1:1. About 60.43% of the population is literate. Male literacy stands at 66.67 % while female literacy rate was 54.31 %. The annual income of most of the people is below ₹60000.

The plant species are used for traditional purpose and as subsistence for livelihood. The species *Avicennia marina*, *Bruguiera gymnorrhiza*, *Bruguiera cylindrica*, *Rhizophora mucronata*, *Acanthus ilicifolius*, *Ceriops decandra* are used for firewood, fodder, timber, tannin and medical purposes.

##### **Socio-economic aspects of Kruthivenu:**

In Kruthivenu village out of total population, 3847 were engaged in work activities. 50.82 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 49.18 % were involved in Marginal activity providing livelihood for less than 6 months. Of 3847 workers engaged in Main Work, 277 were cultivators (owner or co-owner) while 1158 were Agricultural labourers.

Most of the families have more than 4 members. Male to female sex ratio is 1:1. About 65.66% of the population is literate. Male literacy stands at 68.28 % while female literacy rate was 63.07 %. The annual income of most of the people is below ₹60000.

The plant species are used for traditional purpose and as subsistence for livelihood. The species *Avicennia marina*, *Bruguiera gymnorrhiza*, *Bruguiera cylindrica*, *Rhizophora mucronata*, *Acanthus ilicifolius*, *Ceriops decandra* are used for firewood, fodder, timber, tannin and medical purposes.

##### **Socio-economic aspects of Nidamaru**

In Nidamaru village out of total population, 3735 were engaged in work activities. 65.62 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 34.38 % were involved

in Marginal activity providing livelihood for less than 6 months. Of 3735 workers engaged in Main Work, 86 were cultivators (owner or co-owner) while 1325 were Agricultural labourer

Most of the families have more than 4 members. Male to female sex ratio is 1:1. About 58.37% of the population is literate Male literacy stands at 62.20 % while female literacy rate was 54.62 % . . The annual income of most of the people is below ₹ 60000.

The plant species are used for traditional purpose and as subsistence for livelihood. The species *Avicennia marina*, *Bruguiera gymnorrhiza*, *Bruguiera cylindrica*, *Rhizophora mucronata*, *Acanthus ilicifolius*, *Ceriops decandra* are used for firewood, fodder, timber, tannin and medicinal purposes.

**Table –2: Socio-economical status in the Study area**

Detail Data		Interu	Kruthivenu	Nidamaru
House Hold - Families		180	2150	528
Total Population		692	7585	3735
Sex Ratio	Male	349	3763	1468
	Female	311	3822	2267
Family Size	4	135	1098	278
	>4	45	1052	300
Major Occupation	Agriculture	30	1158	1325
	Fishing	528	277	100
Literate Population		60.43%	65.66%	54.62%
Family Annual Income	<60000	120	50	508
	60000-100000	50	70	10
	>100000	20	30	10

**LAND RESOURCE UTILIZATION**

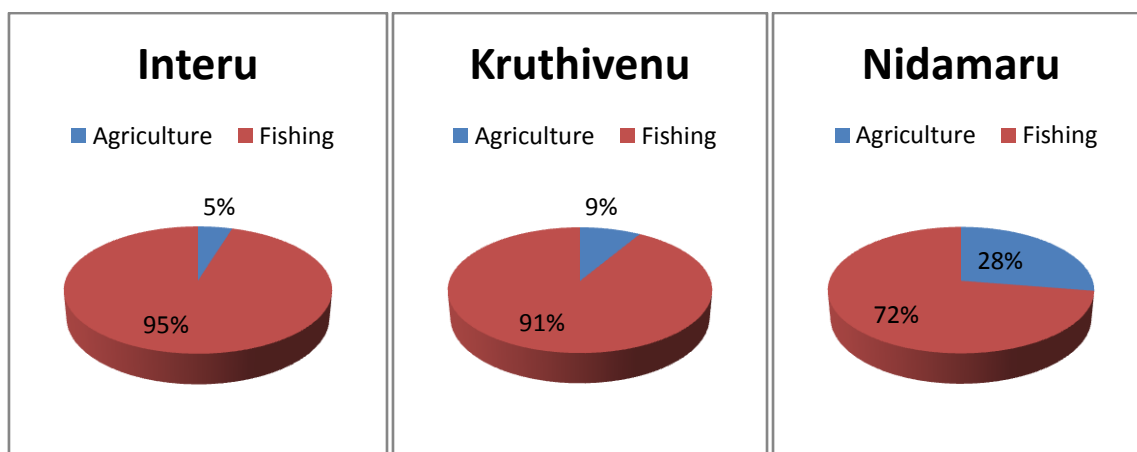
The land resource utilization in mudflats (Figure-2 a,b,c) is used for aquaculture and agriculture (mainly for paddy growing only very less amount of aquaculture ponds are reconverted into agricultural land in the recent years.

**Cropping pattern:**

The major agricultural crop that is cultivated in coastal villages near mangrove areas is paddy. Irrigation is mainly done by means of canals, channels, drains of Krishna river and upputeru. The forest department has raised casuarina plantation under its “Shelter-belt Programme” .The plantations are being raised by Vana Samrakshana Samiti (VSS), a village level society formed under Joint Forest Management programme of the Andhra Pradesh Forest Department in the non-sanctuary area.

**Aquaculture:**

Coastal aquaculture has been practiced for several hundred years both in revenue lands and forest areas; it has been part of the traditional livelihood for people living in mangrove areas. “Trapping and holding “operations, wild shrimp and other aquatic species, were carried into the pond by tidal flow, and were then harvested after a suitable interval of residence by the fishermen. In some places, paddy fields have been converted to prawn, crab farms; in other areas the same farms have been reconverted into paddy fields.



**Figure-2: Land resource utilization in study area**

## V. Discussion

In study area over one-third of the households use wood from the mangroves for cooking Allen et al(2001) and Naylor et al( 2002).The two species extracted primarily for fuel wood and also used as fences are *Rhizophora apiculata* and *Bruguiera gymnorhiza*.

The bark of *Ceriops decandra* is used for making dye for tanning fishing nets in Nidamaru .The bark of *Ceriops decandra* yields a brown coloured dye, which the fishermen use to preserve cotton fishing nets Raju et al., (2008) and also the ribs and keels of larger vessels such as the traditional boats like dhows are built from *Sonneratia alba*, *Heritiera littoralis* or *Avicennia marina* in Kenya Dahdouh-Guebas et al., (2000).

*Excoecaria agallocha* are used to catch fish, while branches and twigs with intact leaves are used mainly to catch shrimp in Kruthivenu regions Kapetsky (1981) As brush park fisheries require intensive labour, the introduction of brush parks as a fishing method creates employment and also used for pulp and paper Alam (2006).which is found in the study area which is used for paper making.

Cattle were fed with foliage of *Avicennia marina* (leaves, twigs and sometimes propagules) in both the regions and they been used for increasing milk production. It is evident that *Avicennia* foliage can be served both as feed and salt nutrient supplement for dairy cattle Maxwell & Lai (2012). The dependency of people and utilization of resources in this region were observed in a traditional and subsistence pattern.

## VI. Conclusion

Socio-economic condition of the people in the study areas are poor, unemployment, seasonal agriculture and income generated is not sufficient to survive and to provide needs to family .this situation made them to shift to the income generating activity such as prawn seed collection, aquaculture, which are introduced in the recent past, have become popular, even though these are ecologically unsound. Recent development activities such as construction of bridge, roads and the proposal of major port and Satellite launching station threaten the existence of mangrove vegetation in this region.

Developmental activities will have a serious impact on the mangroves in study area. It is now increasingly recognized as neither politically feasible nor ethically justifiable to deny the poor from the use of natural resources without providing them alternative means of livelihood. In this context, ecological studies and the socio economic evaluation study in the area are needed for conservation, restoration and management practices.

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