

# Rural Livelihood and Mangrove Degradation: A Case Study of Namkhana Block, West Bengal, India

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**Abstract:-** Mangroves are a diverse group of trees, shrubs, palms, and ferns growing in the marine intertidal zone or estuarine margins zone where they formed transitional environmental links between inland terrestrial landscape and nearshore marine environment. It plays the role of a dynamic habitation between land and sea (Buffer coastal ecosystem). In my study area, Namkhana block in W.B. (near about world biggest Mangrove environment Sundarban), here I saw that Mangrove is more degraded due to this area's people's livelihood. So, I write a paper and find out what is the relation of this area's Mangrove environment and people's livelihood. Mainly, focused temporally changing the land cover situation of the Namkhana block area's Mangrove and how the rural livelihood was affected this area's mangrove? and finally include conservation policy also. Because It feels that, 'A sea coast without a Mangrove, it looks like a tree without any root!'

**Keywords:-** Deforestation; Rural livelihood; Mangrove use; South 24 Pargana.

## I. INTRODUCTION

Mangroves are a diverse group of trees, shrubs, palms, and ferns growing in the marine intertidal zone or estuarine margins zone where they formed transitional environmental links between inland terrestrial landscape and nearshore marine environment. The total mangrove area of the world has been estimated to be approximately 18.15 mill. ha (MAP, 2000). In this present time, worldwide mangroves are heavily threatened (Duke, 2007) by the agriculture and charcoal production (Giri & Muhlhausen, 2008; Jones, 2016), and harvesting of mangroves for aquaculture, fuelwood, and urbanization, charcoal production in underdeveloped and developing countries (UNDP, 2014). But this Mangrove ecosystem play the role of, a dynamic habitation between land and sea (Buffer coastal ecosystem), filtering pollutants to protect seagrass and coral, a living bio shield and protector against storms and Tsunami, with a carbon storage bank, reduce coastal erosion, a critical food sources, Provide a green economics services especially livelihood, eco-tourism, etc. (MAP, 2000).

In spatially, Sundarban mangrove offers coastal protection to millions of peoples in India and Bangladesh. The forests lie in a zone of cyclonic storms and tidal bores that originate in the Bay of Bengal and periodically devastate coastal areas (Islam et al., 1997). At the beginning of the colonial era (1757-1947) in India, the Sundarbans mangrove forest occupied approximately twice its current extent (Islam et al.,1997). Currently, the Sundarbans cover approximately 10,000 km<sup>2</sup>, 40% of which is in India and the rest is in Bangladesh (WCMC, 2005). I complete a case study of the Sundarban Mangrove area spatially Namkhana block in South 24 Pargana, West Bengal. And try to focus this area's mangrove deforestation and this area's socio-economic conditions (especially people's livelihood). Overall views that, to displayed this block area's socio-ecological configuration of mangrove. The main causes of this area's mangrove distortion are shrimp farming and population pressure.

## II. OBJECTIVES

- To know about the changing situations of the Namkhana block area's mangrove environment.
- To find out the relation between rural livelihood and mangrove degradation.

## III. DATABASE AND METHODOLOGY

I consider the data from the primary ground level survey to collect this block area's Population and Livelihood configuration in June 2019 I was arranging a 200 household sample survey of this area. And another issue is that, to identify of this mangrove deforested area, here using the secondary database mainly used Space-based Remote sensing technique Satellite image (Data set: USGS EarthExplorer's Landsat 8 OLI/TIRS C1 Level-1).

Therefore, firstly, I showing this area's changing coverage of Mangrove it is the pre-findings matter, in this time I also used the 'Supervised Classification'. But the prime focus is that this block area's livelihood conditions, here I also used the so many statistical and cartographic techniques and clearly explained it.

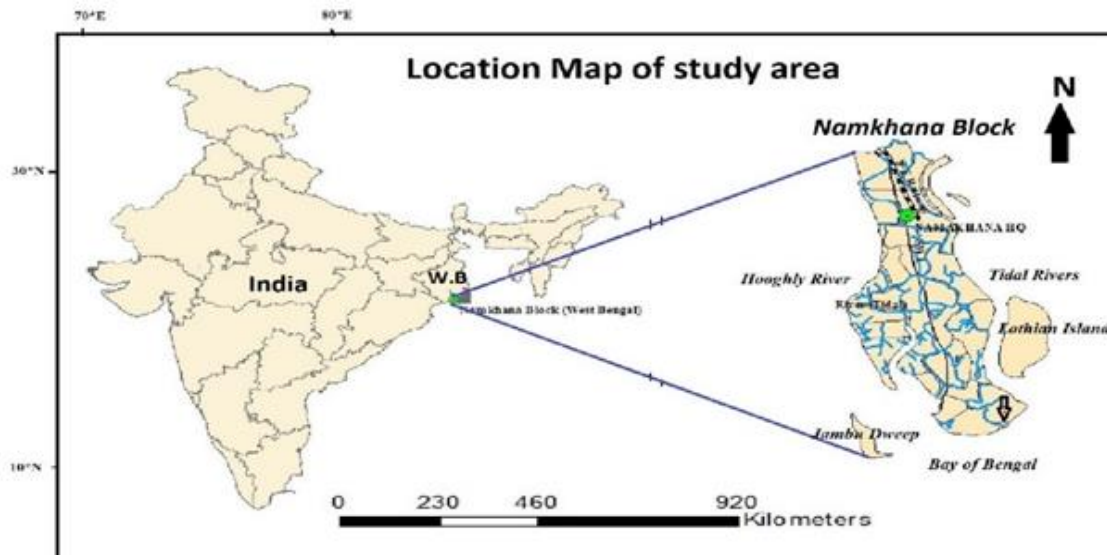


Fig 1:- Location Map of Namkhana Block

**IV. NAMKHANA BLOCK IS THE STUDY AREA**

The block of ‘Namkhana’ (fig.1) is my study area it is situated at the south of South 24 Pargana district in West Bengal, 104 km south from Kolkata A-One city. It is the periphery part of the Sundarban mangrove area and it is adjoining the Bay of Bengal and their three sides are surrounded by tidal river water and elevation is 4 mts. (13ft.) from m.s.l. and the total area of this block 370.62 sq. km (143.10 sq. mi.). There are 39 villages around this block (DCHB, 2011) with a total population of 1.60 lacks (Census of India, 2011). This block area’s 30% area is covered under the Mangrove. But the problem is that, in this present time, this mangrove coverage was declining due to population pressure and their allied socio-economic works.



**V. MANGROVE USE IN NAMKHANA BLOCK**

Mangrove is declining for the three main purposes: Primarily, the construction of people’s habitation houses and fuel (plate-1). Secondly, shrimp farming (plate-2) of the coastal area and thirdly, to construct agricultural land for food (plate-3). Shrimp farming and the Growth of agricultural land are the main causes of this area’s mangrove deforestation. And this type of livelihood is affected by this area’s socio-economic conditions also.

Plate 1: Construction of people’s habitation houses,  
Plate 2: Shrimp farming and  
Plate 3: Construct agricultural land (Namkhana Block,  
West Bengal) respectively.



**VI. MANGROVE LAND COVER CHANGE**

In Namkhana block, here we have seen the temporal changes of mangrove land cover and on this place acquisition of people’s activities like constructed houses, agriculture land and aquaculture also. I also comparatively analyze the following two maps and explain mangrove land cover change and land use also. This figuration help to the next step discussion of the relationship between rural

livelihood and mangrove degradation. Therefore, when following the classified map (fig. no 2), it is figuring out the changing conditions of mangrove land coverage. In 1990 most of the area were covered mangrove coverage but in timely it degraded and a huge loss of mangrove due to population pressure and their livelihoods (they developed their habitation houses, agricultural land, using fuel, shrimp farming, road construction, pollutions, established tourism field, etc.). Most of the mangrove area was used to agricultural land and shrimp farming. River basin area was occupied shrimp farming aquaculture and people continue their livelihood and another field is that agriculture land is gradually increasing core region to periphery region of this block and losses the mangrove environment causes of population pressure. As a result, mangrove biodiversity gradually loses its identity and environmental perspectives.

**VII. MANGROVE LAND COVER CHANGE AT NAMKHANA BLOCK (1990 TO 2019)**

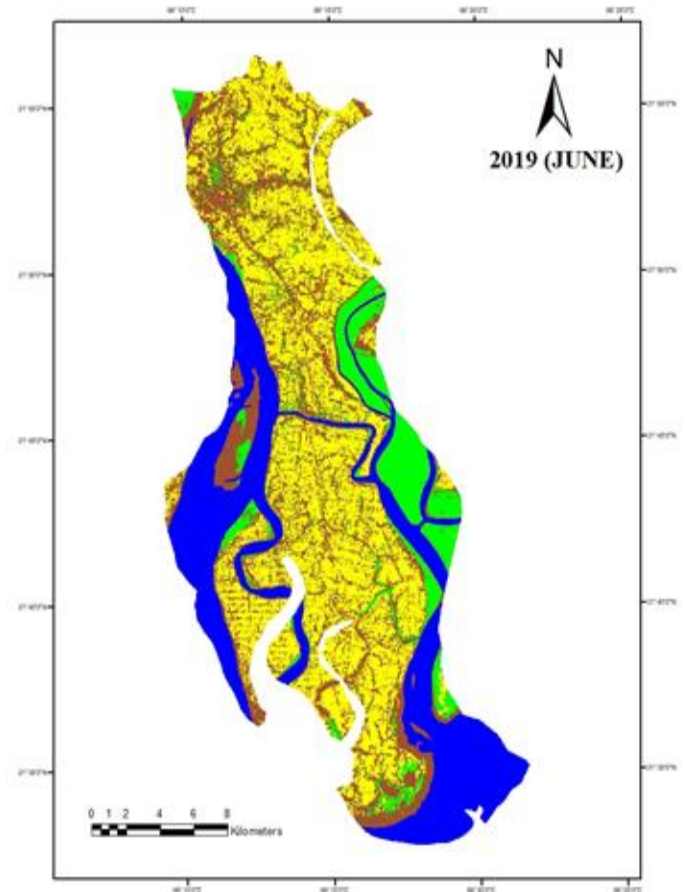
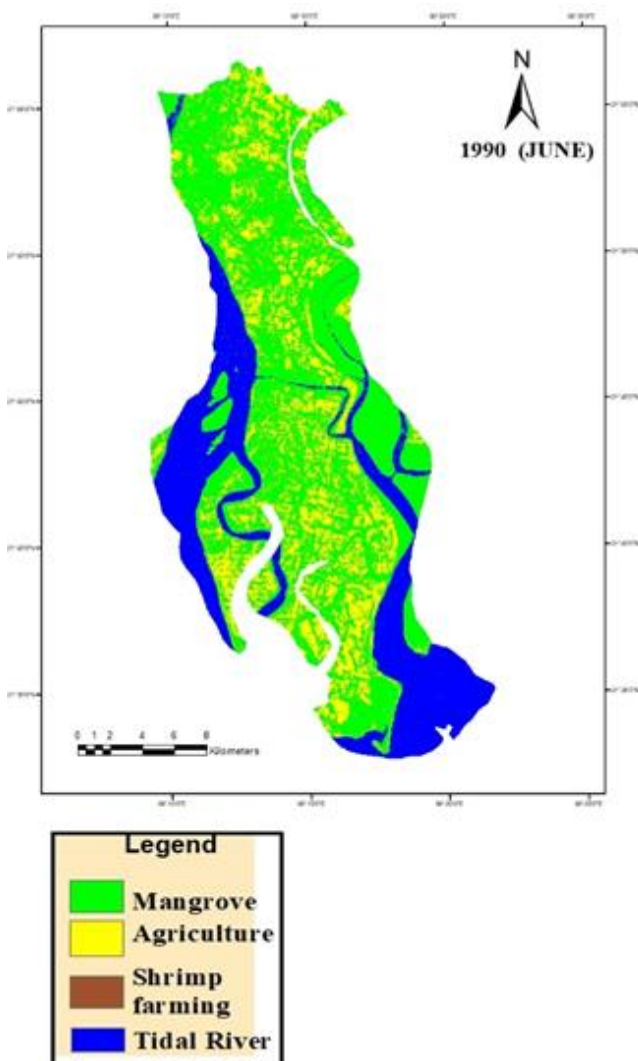


Fig 2:- Mangrove land cover change at Namkhana Block (1990 to 2019)

**VIII. RELATION BETWEEN RURAL LIVELIHOOD AND MANGROVE DEGRADATION**

*A. Construction of People’s Habitation Houses and Allied Works*

In this present time, is one of the biggest problems in India is that, population pressure. The thinkable theme is that it is gradually increased. In my study area, Namkhana block here population growth rate gradually increase, in 2011 population growth rate 12.14 %, 9.25 is 2001, 7.89 % is 1990 and 2019, June the rate of population increase is 13.66 %. So, this area’s population will increase. This increasable population falls the effect on this area’s Mangrove environment. Primarily, Peoples' activities destroyed this area’s mangrove like, they developed their habitation houses, agricultural land, using fuel, shrimp farming, road construction, pollutions, established tourism field, etc. In this diagram (fig. 3), the population increase rate gradually increases and the Trend line will be focused on the positive (+ve) way (fig 3). This types of first aid demand of peoples are degraded this environment. The overview theme is that the increasable population growth rate affected in this area’s Mangrove environment. So, the relation between people’s primarily works and mangrove environment are gradually decreased (-ve).

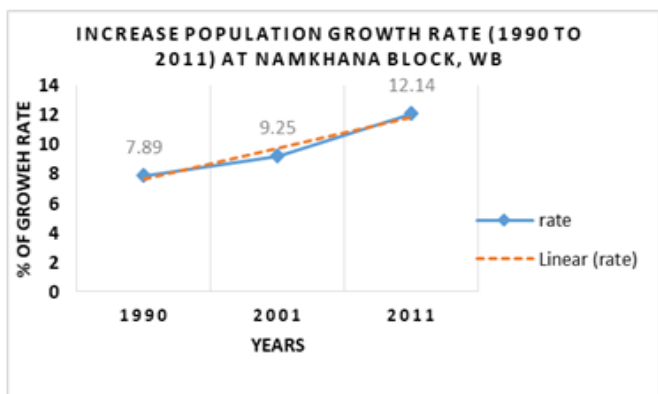


Fig 1:- Increase Population growth rate at Namkhana block, WB

**B. Shrimp Farming and Mangrove Degradation**

Shrimp farming is another aquaculture in marine and freshwater environments. In my study area, Namkhana block, peoples have engaged this farming culture and complete their livelihood conditions also. And this type of livelihood pattern affected by this area’s Mangrove. Peoples cut the mangrove trees in tidal river basin areas and coastline areas and create the field of shrimp farming land. In my sample survey (June 2019), more than 68% of families people engaged this farming and complete their livelihood, these types of livelihood destroy the normal mangrove environment and degraded also. So, following the field area’s mangrove land use comparative map (1990 to 2019) (fig. 4) and demarcate the changing place also.

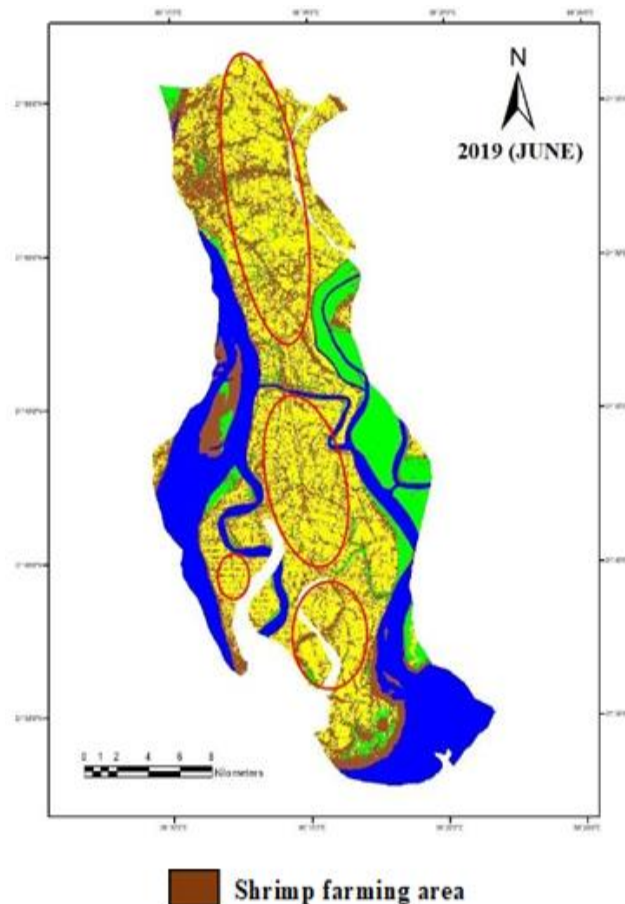
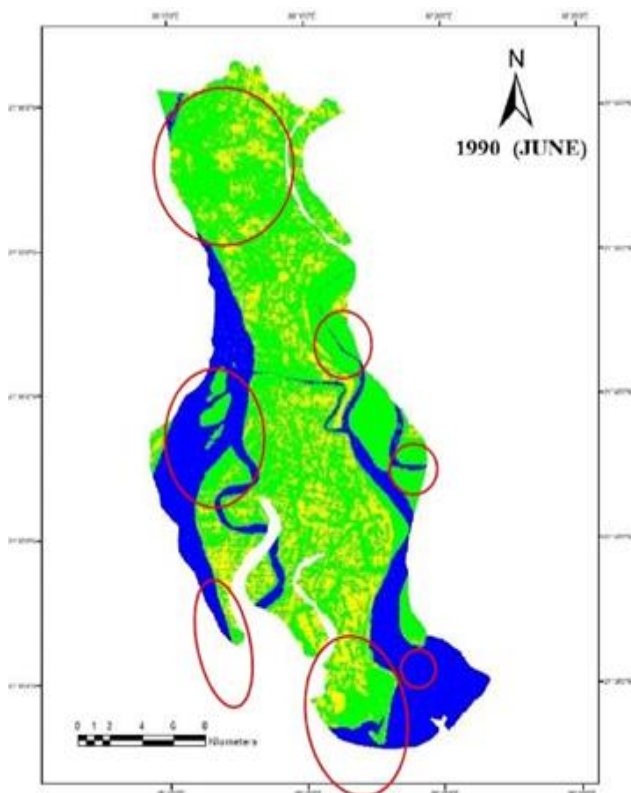


Fig 4:- Mangrove degradation and create Shrimp farming field (Namkhana Block, South 24 Pargana, W.B.)

**C. Growth of Agricultural Land and Mangrove Degradation**

Due to the population pressure, peoples try to solve their food security conditions and some peoples take their livelihood condition is grown of agricultural food and allied crops. Therefore, they are creating new agricultural land and continue their livelihood and try to maintain their food security but the problem is that when peoples created the new agricultural land in this time he destroyed mangrove. In my sample survey (June 2019), newly 6.85 sq.km agricultural lands are formed from loss of mangrove environment. So, following the field area’s mangrove land use comparative map (1990 to 2019) (fig. 5) and demarcate the changing place also.

**IX. THE RELATION BETWEEN RURAL LIVELIHOOD AND MANGROVE DEGRADATION**

Therefore, the find out a matter is that this study area’s mangrove is degraded and negatively (-ve) developed it. And human activities the main causes of this degradation. So the subjective relation is drawing (fig no. 6). Primarily, peoples help this livelihood system but sustainably they will facing many environmental problems. In the present time, many environmental problems are created, lack of mangrove coverage. soil erosion, flood, no

resist cyclone, lack of social medicine, finally degraded homeostasis condition also.

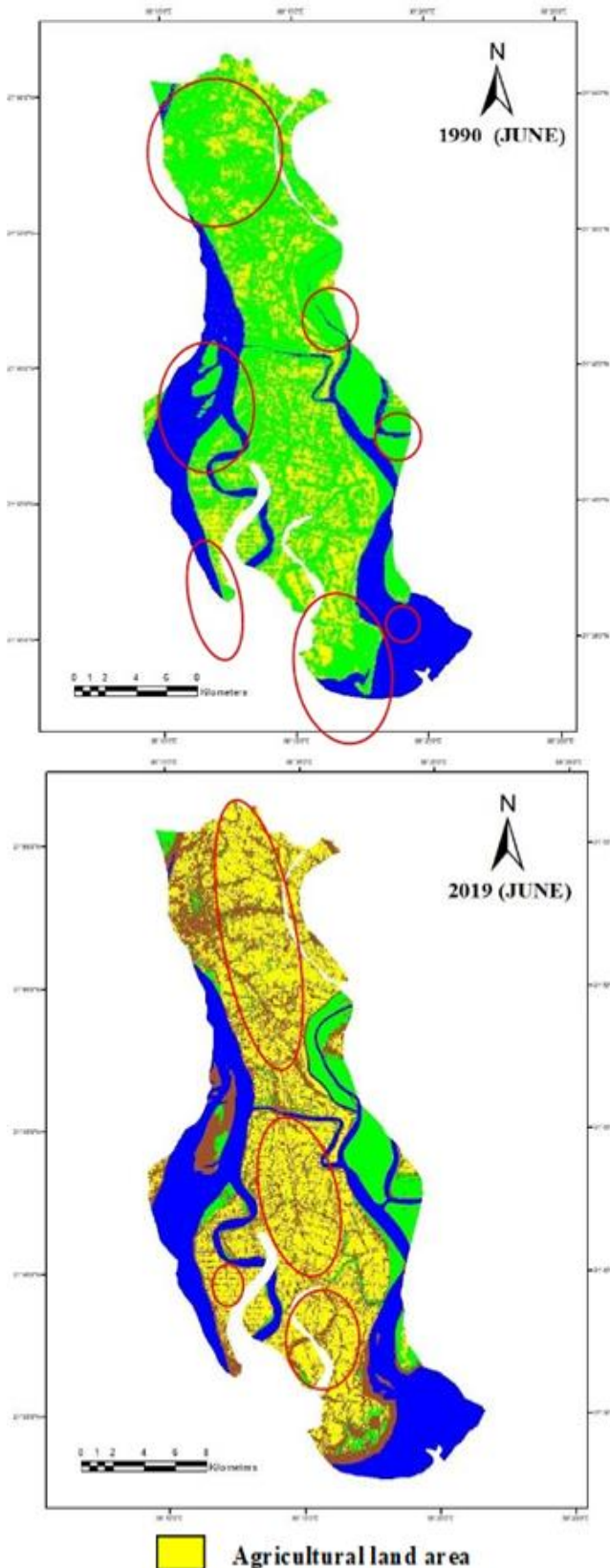


Fig 5:- Mangrove degradation and construct agricultural land field (Namkhana Block, South 24 Pargana, W.B.)

**X. MANGROVE USE AND ENVIRONMENTAL POLICY IN THE BLOCK OF NAMKHANA**

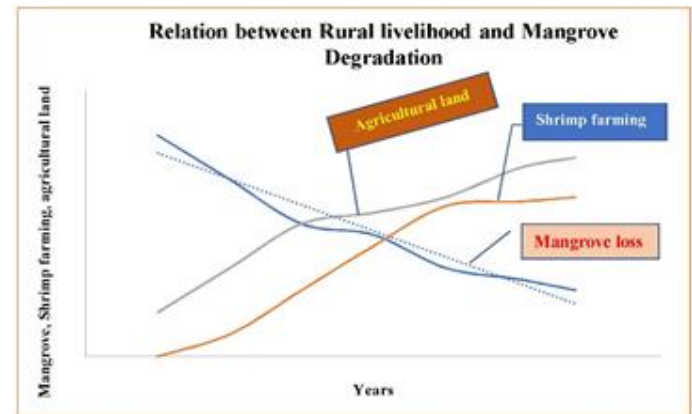


Fig 6:- Relation between rural livelihood and mangrove degradation

Mangrove ecosystem play the role of a dynamic habitation between land and sea (Buffer coastal ecosystem), filtering pollutants to protect seagrass and coral, a living bio shield and protector against storms and Tsunami, with a carbon storage bank, reduce coastal erosion, a critical food sources, Provide a green economics services especially livelihood, eco-tourism, etc. So, this Namkhana block especially loses this mangrove causes of this area’s improvident development of livelihood systems. Therefore, I’ll pray to take some policy to the development of this environment, there are such as; primarily, to controlled growth of populations, here take action on health care and family planning also. Secondly, take action of this block’s forest department to the conservation of this mangrove. Thirdly, create aquaculture field environmentally and developed public awareness, etc. If, not conserved this situation, in future people face various socio-ecological problems. At this time I feel that “A sea coast without a Mangrove, it looks like a tree without any root!!”

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**REFERENCES**

- [1]. DCHB (District census Handbook) [http://censusindia.gov.in/2011census/dchb/DCHB\\_A/19/1917\\_PART\\_A\\_DCHB\\_SOUTH%20TWENTY%20FOUR%20PARGANAS.pdf](http://censusindia.gov.in/2011census/dchb/DCHB_A/19/1917_PART_A_DCHB_SOUTH%20TWENTY%20FOUR%20PARGANAS.pdf)
- [2]. Duke, N.C., Meynecke, J.O., Dittmann, S., Ellison, A.M., Anger, K., Berger, U. (2007) “A World Without Mangroves?” *Science*, 317, 41–42.
- [3]. Friess, A.D., Scales, I. R., Glass, L., and Ravaoarinorotsihoarana, L., (2016) “Rural livelihoods and mangrove degradation in south-west Madagascar: lime production as an emerging threat”, *Fauna & Flora International*, pp-1-5.

- [4]. Giri, C. & Muhlhausen, J. (2008) “Mangrove Forest Distribution Sand Dynamics In Madagascar (1975 – 2005)”, *Sensors*, vol-8, pp.2104 –2117.
- [5]. Map Library (MAP) (2000) (<http://www.maplibrary.org/library/stacks/Africa/Madagascar/Mahajanga/Mahajanga%20Urban/index.htm>)
- [6]. UNEP (2014) “The Importance of Mangroves: A Call to Action”, United Nations Environment Programme–*World Conservation Monitoring Centre*, Cambridge, UK.
- [7]. World Conservation Monitoring Centre (WCMC) <https://www.unep-wcmc.org/>