

Degradation of Mangroves in the Coastal Zones of Ratnagiri, Maharashtra

Balu L. Rathod, Jagdish B. Sapkale

Abstract— The present investigation is an attempt to make an in depth study of seven sample villages i.e. Anusure, Purngad, Ganeshgule, Jakemerya, Kolthare, Dhabol, Anjarle in Ratnagiri district of Maharashtra. The data for mangroves was collected from villages and tehsil revenue department. The data collected, was converted into percentage. The primary data was collected through questionnaires on the basis of perceptions of farmers and villagers. Besides this, personal visits were made to selected sample villages and observations are noted for acquiring correct information. Questionnaire has covered various aspects related to mangroves i.e. Function of mangroves, mangroves species, uses of mangroves for livelihood, mangrove protection/ conservation, etc.

Index Terms— Mangrove Degradation, Perception of Villagers, Mangrove species, Coastal Resource Management.

1 INTRODUCTION

ON the earth's ecosystems many natural resources are on the way of deterioration. Some are under heavy pressures due to increasing Industrial and Urbanization encroachments. Consequently protection and conservation of resources are the primary need in the present context. In view of this, coastal tract of Maharashtra is more vulnerable to mangrove degradation. Most of the mangroves patches have been degraded as a result of transforming the wetlands into agricultural fields and prawns' farming. Violations of coastal regulation zone have seen in the coastal areas of Maharashtra. Therefore, mangroves are more prone to degradation in future. In coastal areas mangroves can be protected by adopting the appropriate managements techniques, so that degradation of mangroves can be minimize. By adopting various management plans, the people's perception towards the mangrove ecosystem is to be considered. Permitting the views and perceptions of the local people, the basic in-depth knowledge about the mangroves; their species; their problems and many other inter-related processes can be a part of concrete output for the strategic plans. Therefore, present research work has been attempted.

Mangrove is a tree or shrub which grows in tidal, chiefly tropical, coastal swamps, having numerous tangled roots that grow above ground and form dense thickets [1]. "Mangrove is large tropical evergreen tree/forest, genus Rhizophora that grows on muddy tidal flats and along protected ocean shorelines. Mangroves produce from their trunks aerial roots that become embedded in the mud and form a tangled network; this serves both as a support for the tree and as a means of aerating the root system. Such roots also form a base for the deposits of silt and other material carried by the tides, and thus land is built up which is gradually invaded by other veg-

etation. The mangrove forests also can protect inland coastal-areas as by absorbing the effects of storm and some tsunami waves, but many mangroves have been harvested destructively on a large scale" [2]. Now-a-days the Mangrove ecosystem is affected by climatic factors as well as by human interferences. Directly or indirectly, climatic change influences on mangrove growth. Many studies determined that variations in sea level, storm, cyclones, uneven distribution of rainfall, temperature variations are the climatic factor that effects on mangrove. Most of the mangrove covered area is converted into Kharland area [3], [4]. In many other countries the pioneering work on mangroves are appreciable, some studies have attempted on the basis of questionnaire survey. In the present research work partial methodology and questionnaire was used that is the adopted questionnaire designed by the Mangrove Management group at VUB and IFP, Wageningen, also used by Hirani and Maniatis in 2005 [5], [6], [7]. The case studies and standard questionnaire designed by them is very useful for the actual present status of the mangroves in any region. On the basis of field visits and observations, differentiate investigations revealed that mangrove growth and its area is decreasing due to change in climate and human interventions. Global warming is one of the dominant events of climate change which causes sea level rises and tends to reduce the mangrove swamps. The mangrove vegetation also protects the coasts from erosion. In the coastal area of Ratnagiri district (Maharashtra), it has seen that mangrove vegetation protects the agricultural lands/settlements and reduces the risks of catastrophic events (fig 1, 2, 3). In recent years, the study of coastal ecosystem has become very essential that provides information to enable sustainable condition of coastal resources [8], [9]. Therefore, the present study aims to assess the status of mangroves in view of coastal resource management at some sites of Ratnagiri coasts.

2 MATERIALS AND METHODS

In the coastal area of Maharashtra, it has observed that, the degradation of Mangroves has increased tremendously. In view of this, an attempt has been made to assess the actual status of mangroves in the coastal zones of Ratnagiri district

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(Maharashtra). The Random sampling methods was chosen and considered total 54 respondents from selected seven sample villages. Questionnaire has covered various aspects related to mangroves i.e. Function of mangroves, mangroves species, uses of mangroves for livelihood, mangroves and malaria relationship, mangrove and fishing, fuel wood, constructional use, agricultural use, mangrove protection/ conservation, etc. The data collected through Primary and Secondary sources have been processed and represented by GIS and Remote Sensing Software.

logical context.

Graph no. 01 shows the responses for the "term" used for mangroves by the villagers. Most of the people know mangroves as a wood. The percentage in villages like Anusure, Purngad, Jakemerya, Kolthere and Anjarle is 88.88%, 88.88%, and 92.30%, 100% and 75% respectively. In Ganeshgule and Anjarle villages, respondents distinguish mangrove as an ecosystem and its percentage is 28.28% and 16.16%. About 11.11% respondents know mangrove as 'vegetation' in the villages Anusure, Purngad and Anjarle.



Figure: 1 Aare village - Mangroves



Figure: 3 The mangroves of Harnai which is polluted.



Figure: 2 Mangroves along Ganpatipule road.

3 DISCUSSIONS AND RESULTS

On the basis of results and analysis for the present status of mangroves, the table and graphs have prepared. Table no. 1 and graph no. 01 to 15 have brief discussed and gives the relationship between man and mangroves in view of ethno eco-

Graph 02 shows the functions of mangroves. Most of the people think that the function of mangroves is wave breaking. In Anusure 50%, in Ganeshgule 33.33%, in Jakemerya 33.33%, in Kolthere 33.33% and in Anjarle village 28.27% people believe that wave break is the main function of mangrove.

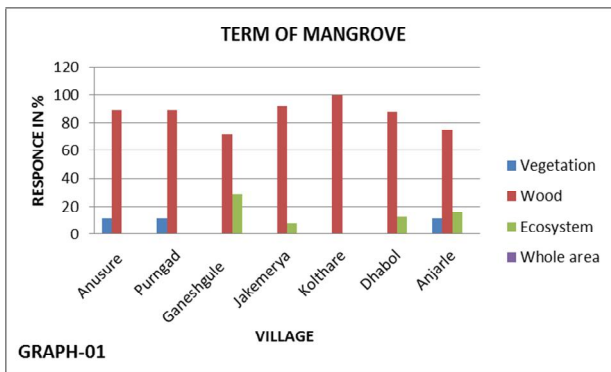
In Purngad, Ganeshgule and Anjarle villages, respondents know that the function of mangrove is water break and its percentage is 50%, 33.33% and 42.85%. In Anusure and Purngad 50% and 25% respondents reflects that mangrove acts as a barrier. Some people said that the function of mangroves is wind break. Finally, these people have very less knowledge about functions of mangroves.

Table No.1 reveals the knowledge of local peoples about the differentiate mangrove species in their localities. Mangroves are known by different local names at different locations. Sonkanjal, Chipi, Kandal, Khajan, Tiwar, Udan, Kharphuti, Marvel, Maradi etc. are the diverse local names of mangroves. Most of the people in the villages Anusure, Jakemerya and Kolthere villages call mangroves as Kanjal and its percentage in these villages is 43.75%, 33.33%, 30% respectively. Mostly, the mangroves species are known as kanjal, tiwar and chipi.

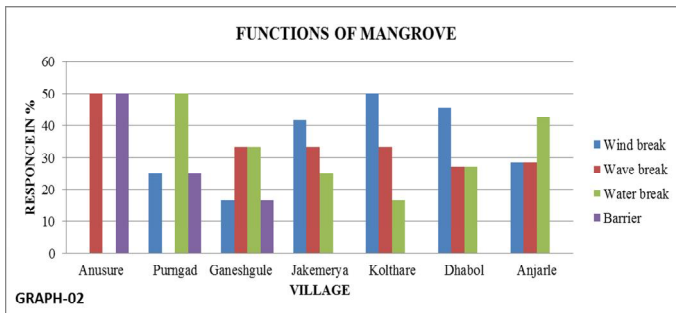
The relationship between mangroves and dengue / malaria has shown in graph no. 03. Most of respondents answered as there is 'NO' relation between mangrove and dengue / malaria. In Anusure, Purngad, Jakemerya Kolthere, 100%, people

Table 1 : Perceptions for Mangrove Species

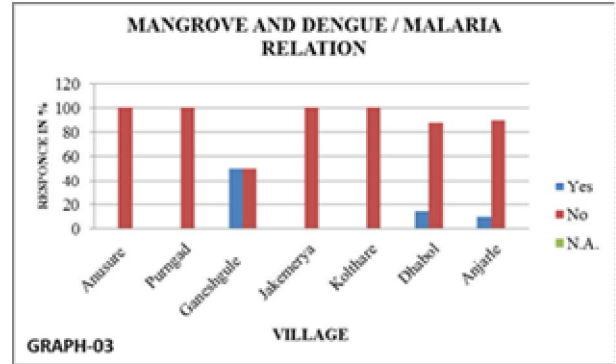
Sr.No.	Particulars / Response	Anusure	Purnagad	Ganeshgule	Jakemerya	Kolthare	Dhabol	Anjarle
1	Sonkanjal	12.5	10	-	-	20	-	-
2	Tiwar	12.5	-	-	-	-	-	28.57
3	Kandal	43.75	50	-	6.66	20	10	14.28
4	Chipi	31.25	40	-	33.33	30	-	-
5	Udan	-	-	36.36	-	-	-	-
6	Marvel	-	-	18.18	40	-	-	-
7	Suruchi	-	-	45.45	20	-	30	-
8	Kharputi	-	-	-	-	10	10	19.04
9	Khajan	-	-	-	-	-	50	4.75
10	Kirchipi	-	-	-	-	20	-	-
11	Maradi	-	-	-	-	-	-	33.33
	Total	100	100	100	100	100	100	100



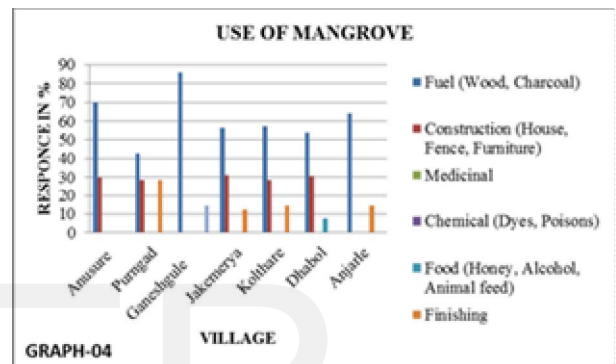
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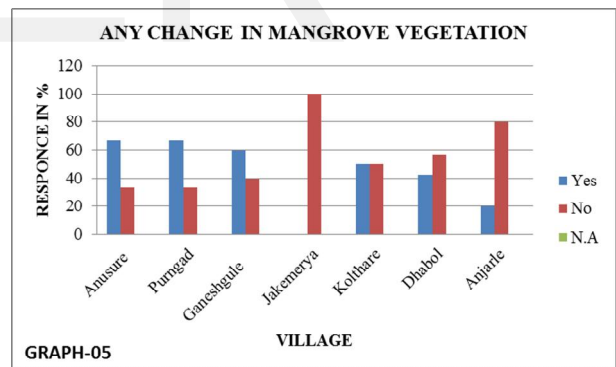
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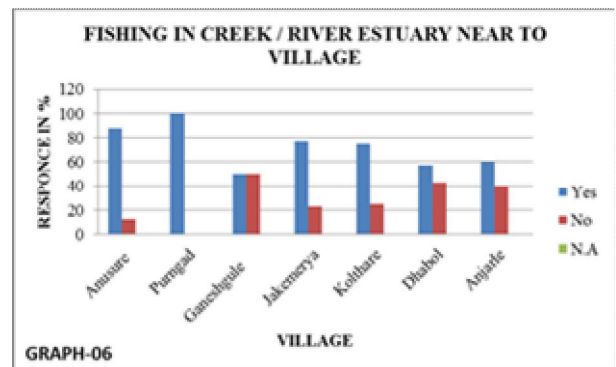
GRAPH-03



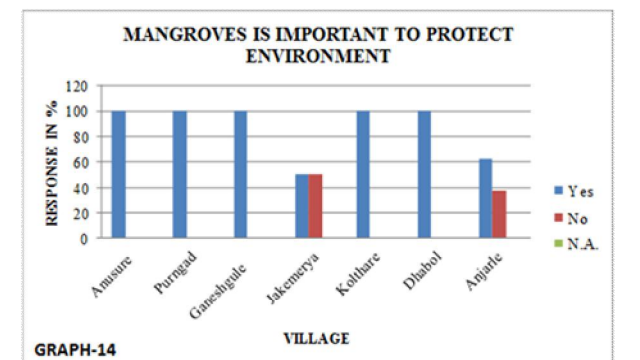
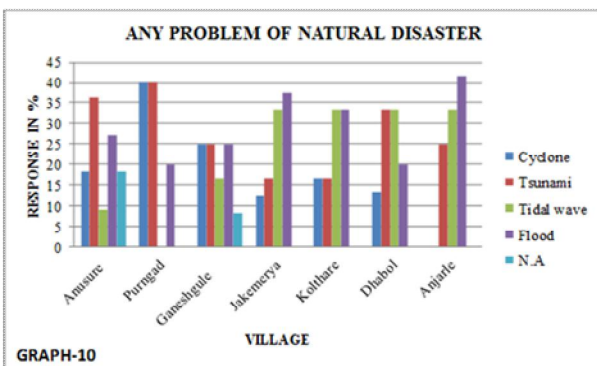
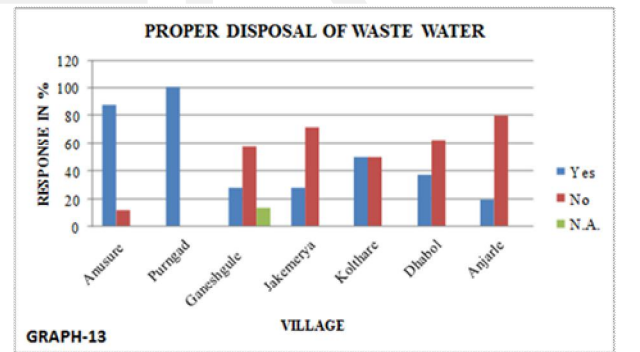
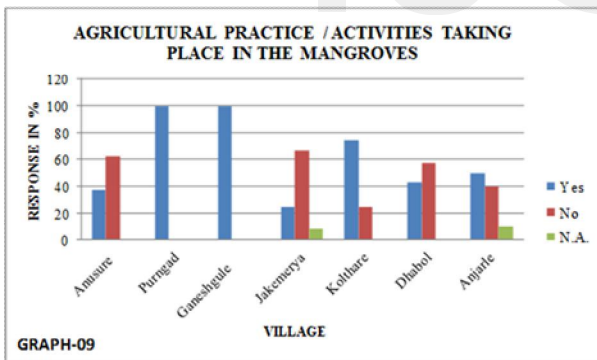
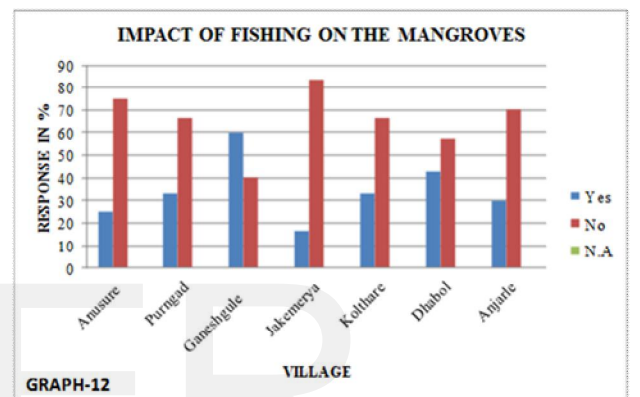
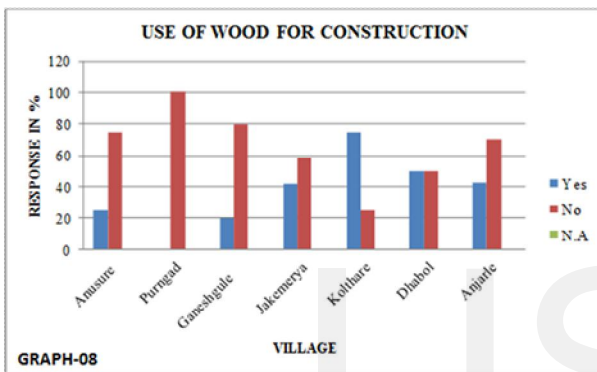
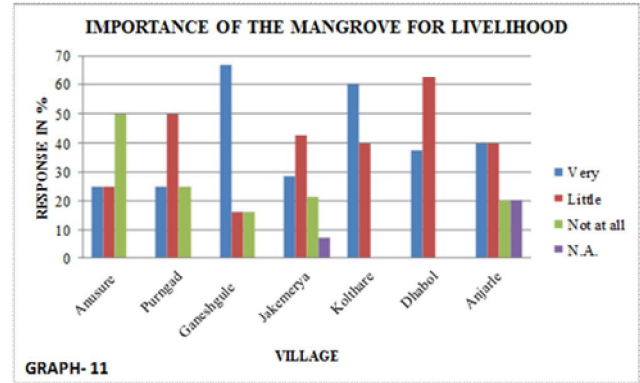
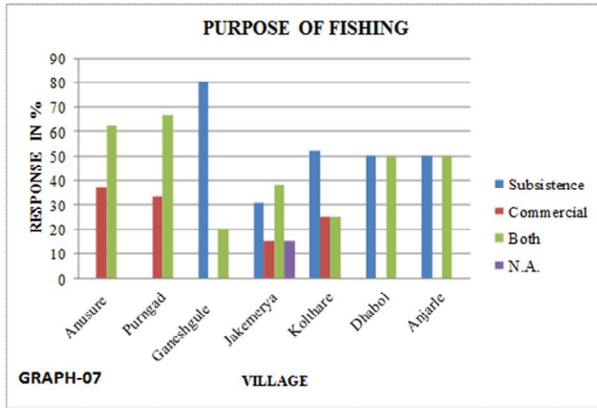
GRAPH-04

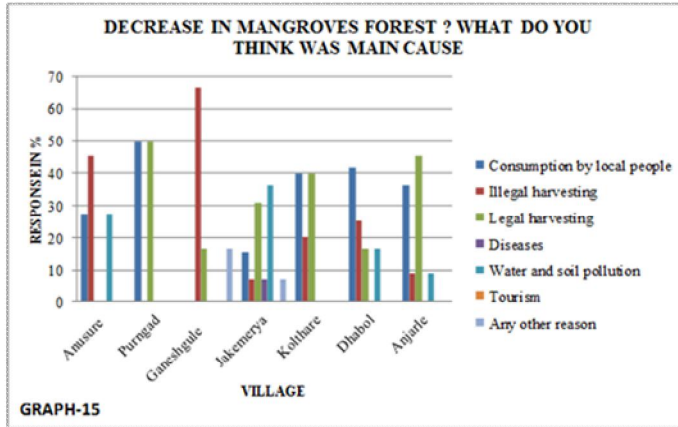


GRAPH-05



GRAPH-06





and in Anjarle, 90% people believe that there is no relationship between mangrove and dengue/ malaria. Very few respondents think that 'YES' mangroves and dengue/ malaria relationship is almost there. Some people did not respond. The diseases like Dengue and Malaria are caused by mosquitos. These are mosquito borne diseases and due to mangroves the mosquitoes have increased. To overcome such disease problem, the people are trying to cut down the mangroves near to their houses, but they are not admitting for these activities.

Most of the people who live near mangroves forest use mangrove as a fuel wood. The perceptions in Anusure are 70%, Purngad it is 42.85%, Jakemerya 85.71% and in Anjarle it is 64.28%. The respondents gave preference to the usages of mangrove as fuel wood, then for fishing and then construction (graph 04).

One more important question was asked about the existing status of mangroves, whether there is a change in mangroves forest vegetation, that means whether there is an increase or decrease in the mangrove growth. Most of the people i.e. 66.66% in Anusure and Purngad; 42.85% in Dhabol answered as 'YES', means changes are found in mangrove forest vegetation. In Jakemerya 100% people in Anjarle 80% people answered 'NO'. Some people did not respond as they are frightened of the strict rules and regulations about the mangrove protection (graph 05). Fish, Crab, shrimps etc are available for fishing, it has observed that, fishing is done in creek / river estuary near the villages (graph 06).

Graph no. 07 reveals about the perceptions for question 'what is the purpose of fishing?' Most of people answered that fishing is used for both purposes (subsistence and commercial) and its percentage in Anusure, Purngad, Jakemerya, Dhabol and Anjarle is 62.5%, 66.66% 38.46%, 50% and 50% respectively. Some people answered that they are fishing for individual subsistence and commercial use. Most of the villagers are not using wood of the mangroves for the house construction (graph 08).

The graph no. 09 displays that how many people think that agricultural practices / activities are taking place in mangroves. Most of the people from Purngad, Ganeshgule, Kolthare and Anjarle that is 100%, 100%, 75% and 50% respectively gave a positive response. But 75% in Anusure, 66.66% in

Jakemerya, 25% in Kolthare and 40% in Dhabol answered as 'NO'. Finally, it is observed that, agricultural practices and activities are taking places in mangroves.

Graph no. 10 exposes that whether there is a problem of natural disaster or not, which occurs at the most; and the role of mangrove to minimize the problem. Cyclone is the dominant disaster in the coastal area of Ratnagiri. Tidal wave and flood in Jakemerya, Kolthare and Anjarle villages are the major problem, mangroves reduces the intensity of these disasters.

In Anusure, Ganeshgule, Kolthare and Anjarle that is 25%, 66.66%, 60% and 40% respectively, the respondents think that mangroves are very important for their livelihood. In villages Anusure and Purngad 25% and 50%, respondents considered that mangroves are of little importance for livelihood (Graph no. 11).

As per the opinion of the people, i.e. 75% in Anusure, 66.66% in Purngad, 83.33% in Jakemerya and 70% in Dabhol said that there is 'NO' impact of fishing on mangroves. Some people are answered as 'YES' i.e. in villages Anusure, Ganeshgule and Anjarlethe responses are 25%, 60%, and 30% respectively (Graph no. 12).

Graph no. 13 has given information about the availability of proper disposal system for waste water in their localities. Some people answered 'YES' in villages Anusure, Purngad, Ganeshgule, Kolthare, Dhabol and Anjarle that is 87.5%, 100%, 28.5%, 50%, 37.5% and 20% respectively.

Graph no. 14 displays the perceptions of villagers towards the importance of mangroves for the protection of the environment. Most of the people answered 'YES'. in villages Anusure, Purngad, Ganeshgule, Kolthare and Dhabol that is in all 100%. Only few people answered 'NO' in villages Jakemerya and Anjarle that is 50%, and 37.5% respectively.

Graph no. 15 indicates that there is a decrease in mangrove forest. Most of people answered 'yes' because of consumption of mangrove by local people, illegal harvesting, legal harvesting, water and soil pollution. Overall villagers are opined that, Mangroves forest is decreasing in various ways in the study region.

It has also observed that mangroves in the study area are continuously used for the various purposes, but the local people are not giving the correct information about the degradational activities of mangroves. Some villagers are afraid of the existing strict rules and regulations that is implemented by the government. Therefore, in many parts of the coastal tracts of Ratnagiri, mangrove degradation has reduced at some extent.

4 CONCLUSION

The mangroves of Ratnagiri coasts are very sensible and vulnerable to the effects of human activities. The use of mangroves for fishing, fuel wood and agricultural practices is the probable threats to mangrove ecosystem. Therefore, it is necessary to formulate strategy for ecological conservation and proper development of these valuable resources. This natural vegetation minimizes the adverse and severe effects of tsunami, cyclone, tidal waves and floods. As a result of this, these

valuable natural resources directly or indirectly protect the agricultural land and settlements of coastal zone from the natural calamities. Government should motivate the local people to protect the mangroves and participate in its conservation programme. Awareness programmes should be carried out for the growth of mangroves.

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