

Identification of threats on Mangrove forests in Gabrik International Wetland for Sustainable Management

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Abstract: In this study, destructive threats on mangrove forests in Gabrik international wetland were studied and suitable solutions were presented. Identification of threats is very important for mangrove management. This area is located in southeast of Iran in Oman sea. Results showed there are natural and anthropogenic threats in this area. These threats are invasion of sand dunes, grazing camels of mangrove leaves, construction of fishing port in this wetland and construction of Gegin dam in upstream of wetland.

Keywords: Mangrove, Gabrik wetland, Threats

1. Introduction

Mangrove forests are very important ecosystems that established along the intertidal zone in tropical and subtropical regions and these ecosystems are found in coastal rivers, estuaries and bays (Yim and Tam, 1999). These ecosystems have very benefits. They are a barrier against cyclones, protect coastal and provide good nursery ground for some of important aquatic organisms (Raman et al., 2007). Biodiversity in these ecosystems is very high (Lugo and Snedaker, 1974; Boto et al., 1984). Unfortunately there are many threats in mangrove ecosystems. Mangrove ecosystems are near the coastal cities and industrial centers, so there are some threats such as metal contamination (Mackey et al., 1992; Lacerda et al., 1993; Rivail et al., 1996., Lacerda, 1998; Tam and Yao, 1998). Identification of these threats is important for mangroves management. The main goal of this study is identifying destructive threats on mangrove ecosystem in Gabrik International Wetland for sustainable management of them.

2. Materials and methods

2.1. Study area

This survey was conducted in Gabrik International Wetland. The forest covers an area of 220 ha (Taghizadeh, 2007) and is located in southeast of Iran in Oman sea (25° 33' to 25° 38' N, 058° 08' to 058° 35' E). Mangrove forests in Gabrik, include *Avicennia marina* trees. Gabrik mangrove forest is located in an arid environment

with approximately 190 mm precipitation per year. The climate of this area is hot and arid, with a mean annual air temperature of 25.8°C and mean annual relative humidity of 63%. Gabrik mangrove forest is important for wintering waterfowl, especially shorebirds and *Pelecanus crispus* (a globally threatened species).

2.2. Identification of threats

For identifying the main threats in Gabrik mangrove forests, we used of field observations for 6 months and we used of native expert comments in this area as well as the former studies.

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3. Results

Results showed that there are natural and anthropogenic threats in study area. One of the most important natural threats in mangrove forests in this area is invasion of sand dunes. Invasion of sand dunes has led to drying mangrove trees .

3.1. Anthropogenic threats

Main anthropogenic threats in Gabrik mangrove forest are listed below:

- a) Grazing camels of mangrove leaves: Camel is the main livestock in this area, and because of palatability of mangrove leaves, camels graze of mangrove leaves.
- b) Construction of illegal fishing port in this wetland: pollution of fishing boats has adverse effects on mangrove forests in this area especially oil spill from boats.
- c) Construction of Gegin dam in upstream of wetland: mangrove forests need to runoffs and sediments from uplands for survival but construction of this dam has restricted the runoff movement from upland to mangrove forests.

3.2. Solutions

- a) Mulch scattering and implantation of suitable trees such as *Prosopis juliflora*, *Tamarix stricta*, *Salvadora persica* and *Acacia nilotica* for stabilization of sand dunes.
- b) There are 1292 camels in this area and Government must encourage native ranchers and give low - interest loans to change traditional ranching to industrial ranching centers, and replacement camels with cows.
- c) For reduce of adverse effects of Gegin dam, massive study is needed, but one of the solutions is construction of diversion channels for conducting some of runoff to lowland and mangrove forests.
- d) For combat with adverse effects of fishing port, this illegal fishing port must be closed but native fishermen need to this port for their livelihood, so central government must construct alternative fishing port in another place.

4. References

- [1] K. G. Boto, J.S. Bunt, and J.T. Wellington. Variations in mangrove forest productivity in northern Australia and Papua New Guinea. *Estuar. Coast. Shelf Sci.* 1984, 19 (3): 321–329.
- [2] L.D. Lacerda, C.E.V. Carvalho, K.F. Tanizaki, A.R.C. Ovalle, and C.E. Rezende. The biogeochemistry and trace metals distribution of mangrove rhizospheres. *Biotropica*. 1993, 25: 251-256.
- [3] L.D. Lacerda. Trace metals biogeochemistry and diffuse pollution in mangrove ecosystems. *ISME Mangrove Ecosystems Occasional Papers*. 1998, 2: 1-61.
- [4] A.E. Lugo, and S.C. Snedaker, Properties of a mangrove forest in southern Florida. In: G.E. Wash, S.C. Snedaker, and H. J. Teas (eds.). *Proceeding of the International Symposium on Biology and Management of Mangrove, vol. 1*. Institute of Food and Agriculture Sciences, University of Florida, Gainesville, Florida, 1974, pp. 170–212
- [5] A.P. Mackey, M. Hodgkinson, and R. Nardella, Nutrient levels and heavy metals in mangrove sediments from the Brisbane River, Australia. *Marine Pollution Bulletin*. 1992, 24 (8): 418-420.
- [6] D.J. Raman, M.P. Jonathan, S. Srinivasalu, J.S. Altrin, A.S.P. Mohan, and V.R. Mohan, Trace metal enrichments in core sediments in Muthupet mangroves, SE coast of India: Application of acid leachable technique. *Environmental Pollution*. 2007, 145: 245-257.
- [7] D.M. Rivail, M. Lamotte, O.F.X. Donard, E.J. Soriano-Sierra, and M. Robert. Metal contamination in surface sediments of mangroves, lagoons and Southern Bay in Florianopolis Island. *Environmental Technology*. 1996, 17 (10):1035-1046.

- [8] A.R. Taghizadeh. Environmental management of Sirik mangrove forest. M.sc thesis,*Islamic Azad University,Iran*. 2007, 158p
- [9] N.F.Y. Tam, and M.W.Y. Yao. Normalization and heavy metal contamination in mangrove sediments. *Science of the Total Environment*. 1998, 216 (1-2): 33-39.
- [10] M.W. Yim, and N.F.Y. Tam. Effects of wastewater-borne heavy metals on mangrove plants and soil microbial activities. *Marine Pollution Bulletin*. 1999, 39: 179– 186.