Study of Human Impacts on Mangrove Habitats in Egypt

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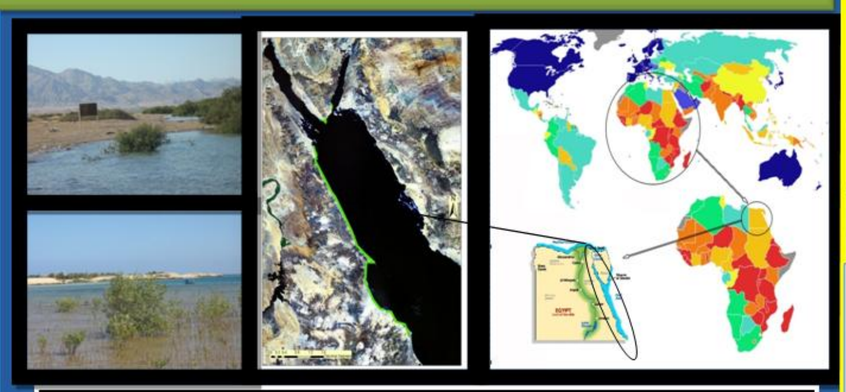
PARKS EGYPT

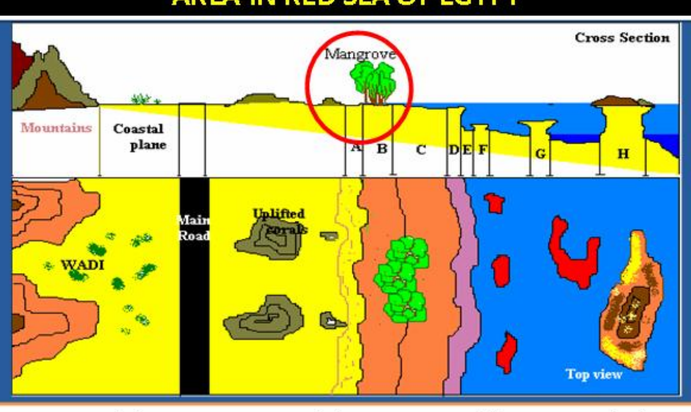
THE MANGROVE FOREST ALONG EGYPTIAN COAST

Mangrove forests in Egypt are estimated to cover approximately 700 hectares. The northernmost mangroves in the Indo-Pacific-East African mangrove realm are located in South Sinai at Gulf of Aqaba in Egypt with only pure forests of *Avicennia marina* and are consist of five mangrove stands.

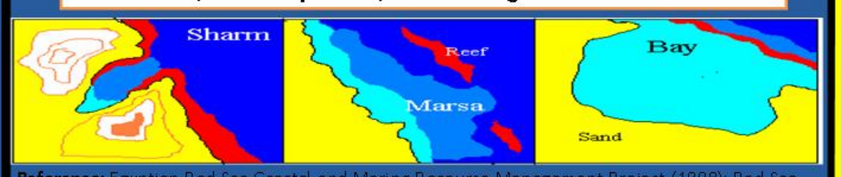
The mangrove along Egyptian-African Red Sea coast are consist of twenty three stands along the coast, out of them five stands are found on the offshore islands. Most of the mangrove stands (nineteen stands) are purely *A. marina* and four stands are mixed populations of *Avicennia marina* and *Rhizophora mucronata* far to the south at Shalateen and Halaib in the southern part of the Red Sea.



CROSS SECTION DIAGRAM OF THE COASTAL- MARINE AREA IN RED SEA OF EGYPT



A = supra tidal zone; B = intertidal zone; C = reef flat; D = reef edge; E = reef wall; F = coral patches; G = submerged reefs and H = islands

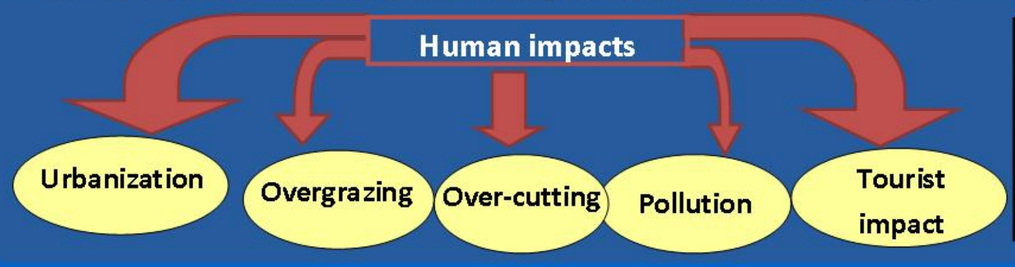


Reference: Egyptian Red Sea Coastal and Marine Resource Management Project (1998): Red Sea Coastal and Marine Protected Area Strategy (part 1), GEF & World Bank.

The mangrove in Egypt are generally, dispersed along the Egyptian Red Sea coastline in sheltered bays and lagoons protected behind coral reefs and ranged in length from hundreds of meters to several kilometers.

THE HUMAN IMPACTS ON MANGROVE FOREST IN EGYPT

The negative impacts on mangroves in Egypt includes; overgrazing, over-cutting to use as firewood source, oil and solid waste pollution, urban development in the coastal zone, changes in hydrological patterns which threaten the survival of the mangroves and tourist impact.

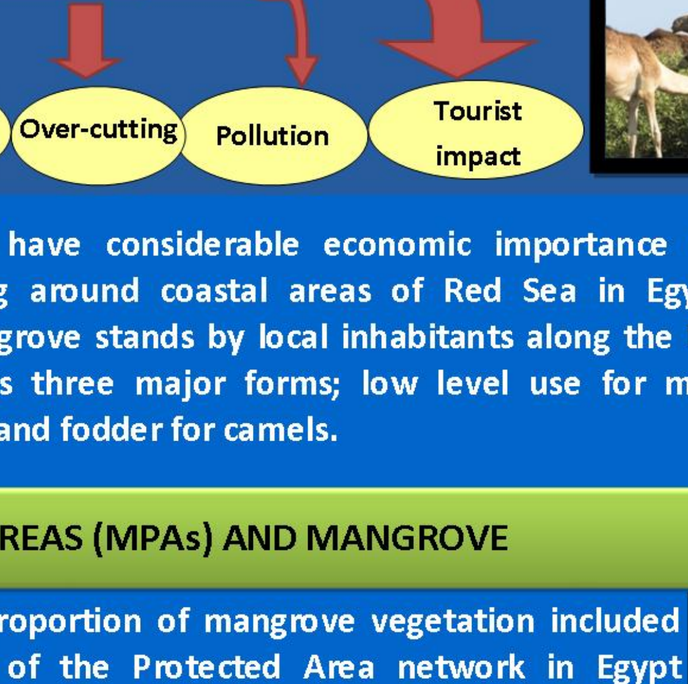


The mangrove forests have considerable economic importance to local communities that living around coastal areas of Red Sea in Egypt. The exploitation of the mangrove stands by local inhabitants along the Egyptian Red Sea coastline takes three major forms; low level use for mangrove timber, use as firewood and fodder for camels.

MARINE PROTECTED AREAS (MPAs) AND MANGROVE

Egypt has the largest proportion of mangrove vegetation included within the boundaries of the Protected Area network in Egypt administered by the Nature Conservation Sector (NCS) of the EEAA and the Ministry of State for the Environment. Natural Protectorates that encompass mangrove stands within their boundaries (Ras Mohammed National Park, Nabq Managed Resource Protected Area, Red Sea islands Protected Area, Gebel Elba Protected Area and Wadi El Gemal National Park) are supported by an array of legal instruments that permit the EEAA and its Nature Conservation Sector to manage these areas.

The Government of Egypt has taken some serious steps to protect the mangrove ecosystems through the inclusion of the majority of Egyptian mangrove stands within the boundaries of Protected Areas along the Gulf of Aqaba and the Red Sea African coast.



Map of protected areas in Egypt that including of MPAs that encompass mangrove stands within their boundaries

Location of the study area

دراسة النظم البيئية للبقاء البشرى للمجتمعات العربية

A Study of Human Subsistence Ecosystems in Arab Societies

To Combat Livehood Degradation for the Post-Oil Era (2009-2013)

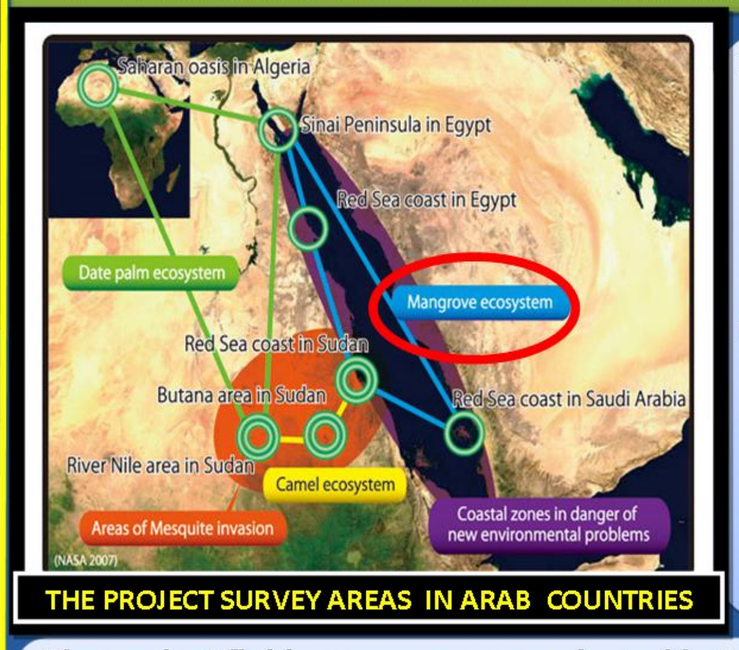
The Research Institute for Humanity and Nature (RIHN) , Kyoto, Japan

RESEARCH OBJECTIVES AND BACKGROUND

Japan and the oil-rich countries of the Middle East have put excessive pressures on the Earth's energy, water, and food resources. In prioritizing their own economic prosperity, these countries have exploited irreplaceable resources, such as fossil fuel and fossil water.

The project examined life support mechanisms and self-sufficient modes of production among Arab peoples who have survived in dryland environments for more than a millennium. Using the research results, we proposed a scientific framework to strengthen subsistence productivity and combat livelihood degradation in local Arab communities in preparation for the post-oil era.

RESEARCH METHOD COMBINED TWO MAIN APPROACHES:



THE PROJECT SURVEY AREAS IN ARAB COUNTRIES

(1) analysis of subsistence ecosystems, focusing on keystone species such as camels, date palm, dugong, mangrove, and coral reefs.

(2) examination of the sustainability and fragility of Arab societies, focusing on the ecotones such as wadi beds, riverbanks, mountainsides, and seashores.

The project field surveys were conducted in Sudan, Egypt, Saudi Arabia, and Algeria. with compared keystone species, ecotones, and traditional knowledge and examined differences in the sustainability of subsistence economies under site-specific conditions.

The research project title in Egypt: Study of Human Impacts on Mangrove Habitats in Egypt (2009-2013).

The research objective

Examine the current status of the biological environment and the social environment of the Red Sea coast in Egypt, focusing on the detailed status of human impacts on mangrove habitat

The studies of the research project in Egypt

- Study of Genetic Diversity
- The forest structure study
- Water-use Efficiency study
- Study growth and morphology
- Anthropological Study

Abstract: Teraminami *et al.* (2013)* examined the effects of shoot position on shoot growth and morphology of *Avicennia marina* (Forssk.) Vierh. in the Red Sea coastal region of Egypt. To determine differences in morphological characteristics, we collected shoots from the upper and lower canopies of A. *marina* individuals in the wild and compared the morphological characteristics of these shoots. The study plot was established in an A. *marina* mangrove forest. Heights and diameters of individual trunks (n = 14) in the plot were measured at ground level. Then, five shoots with young but fully expanded leaves were collected from the upper and lower canopies of the individuals. We measured shoot length, and dry weight and also area, dry weight, thickness, and Soil Plant Analysis Development (SPAD) value of collected leaves. Our measurements showed that leaf area, dry weight, specific leaf area, and SPAD value of leaves from the upper canopy were smaller than those of lower-canopy leaves in most individuals. From the differences in traits between upper and lower leaves, we concluded that leaves in the upper canopy are typically adapted to high light levels, whereas leaves in the lower canopy exhibit adaptations to low light conditions. In addition, soil-water salinity at the study site was far higher than the optimum salinity for A. marina. Hence, it is also suggested the salinity level at this site may have influenced the reduced leaf size in the upper canopy.

*Tomohiro Teraminami, Atsushi Nakashima, Mao Ominami, Naoko Matsuo, Ryo Nakamura, Hiroshi Nawata, Abdelwahab A. Abdelwahab, Amgad A. El-Shaffai and Ken Yoshikawa (2013): Effects of shoot position on shoot and leaf morphology of Avicennia marina in the hyperarid Red Sea coastal region of Egypt. Landscape and Ecological Engineering, Volume 10, Issue 2, pp 285-293