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Mangrove zonation and utilization by the local people in Ajuy and Pedada Bays, Panay Island, Philippines

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Abstract The study was conducted in order to establish and describe the mangrove zones and the resource uses in Ajuy and Pedada Bays, Panay Island, Iloilo, Philippines. Plot or quadrat method coupled with informal community folk interviews were done. Cluster and principal component analyses indicated four mangrove zones: Zone 1 – Avicennia–Sonneratia zone; Zone 2 – Avicennia–Rhizophora zone; Zone 3 – Avicennia–Excoecaria–Bruguiera–Ceriops zone; and Zone 4 – Avicennia zone. Fishpond establishment was the main dominant activity. Additionally, subsistent and apparently sustainable localized fuel wood gathering was still evidently practiced by the fisherfolks. With the bays' natural mangrove landscape greatly deformed and transformed, the study recommends two strategies which could serve as its turning point leading to a more sustainable utilization and conservation of the mangroves. First we recommend the creation of a landscape corridor and secondly, adoption of a mangrove aquasilviculture system as an alternative to the current extensive fishpond practice. Implementation of these two strategies can be facilitated by a strong biodiversity education program and a local ordinance.

Introduction

The mangrove ecosystem is a unique type of forest characterized by its highly specialized vegetation and a typical and limiting environment (Walsh, 1974). The distribution of individuals within it, as well as factors which have molded this habitat have become a recurrent concern in studies on mangrove ecology. Vegetation zonation of the mangroves, a frequently conspicuous feature, has long attracted scientific interest (e.g., see reviews by Walsh (1974), Snedaker (1982),

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Tomlinson (1986) and Hutchings and Saenger (1987), (Bunt et al., 1991). Incidentally, the zonation of mangrove ecosystems in Ajuy and Pedada, Iloilo, considered as vital areas in the province's remaining stretch of mangrove belt is poorly known.

This paper examined the mangrove zones occurring in Ajuy and Pedada bays and recorded current utilization of the mangroves.

Methodology

Study area

The bays of Ajuy and Pedada are located in the coastal municipality of Ajuy (11°10'30'' N, 123°1'16'' E) in the northeastern part of Iloilo, a province in Panay Island, Philippines. Ajuy Bay borders the municipality of Ajuy in the south while Pedada Bay is situated further down, adjacent to the municipality of Barotac Viejo which borders Ajuy on the west. This municipality has a total land area of 17,557.19 ha and has a shoreline length which stretches to an estimated 74.83 km. As of 2007, the mangrove area in the municipality was reported to occupy 117.7 ha (Ajuy Municipal Agriculture Office, 2007).

Methods

Field method

Ten sampling plots (20 × 20 m) were established randomly on the seaward and inland mangrove portions of the two bays. Plots 1–5 were located in Ajuy Bay (Fig. 1) and with plots 6–10 in Pedada Bay Fig. 2). Individual plants found within the plot were identified following primarily the nomenclature of Primavera et al. (2004). Other identification references were consulted as well (e.g., Doydee et al., 2008). Basic vegetation parameters were measured for each identified species: (a) diameter at breast height (dbh) in cm, (b) basal area in m^2, (c) density, and (d) height in m (minimum, maximum and average).

The vegetation data were supplemented with few socio-economic data gathered through a survey. The 153 respondents, who were fisherfolks residing in the barangays, and selected key informants, provided the necessary information on the current utilization of the mangroves in the area. Respondents were both men and women who were doing mangrove activities with no due consideration on gender and age bias. Survey was documented by the questionnaire answer sheets and no voice recoding was done. Assessing the mangroves as a resource likewise involved simple recordings of direct observations on the surrounding environment of each plot and the mangrove landscape in general (e.g., the presence/absence of other bodies of water and the extent of anthropogenic influence). The permit to do field work and interviews was provided by the village head.

Data analysis

Species richness (S) was used for both the cluster and ordination analyses. Each sample plot was compared pairwise by computing for the Srensen coefficient (Sørensen, 1957) defined as follows:

$$S_s = 2c/a + b \quad (1)$$

where: S_s = Srensen coefficient of similarity, c = the number of species common to both plots, a = the number of species in plot 1 and b = the number of species in plot 2.

A similarity matrix for all the plots was prepared and was then subjected to hierarchical cluster analysis and principal component analysis (PCA). The outputs were a dendrogram by average linkage clustering method and a two-dimensional component plot. For the socio-economic information, the analyses made were chiefly descriptive in nature since the primary data were obtained through purposive and convenience sampling. In this process, only frequency and percentage distri-

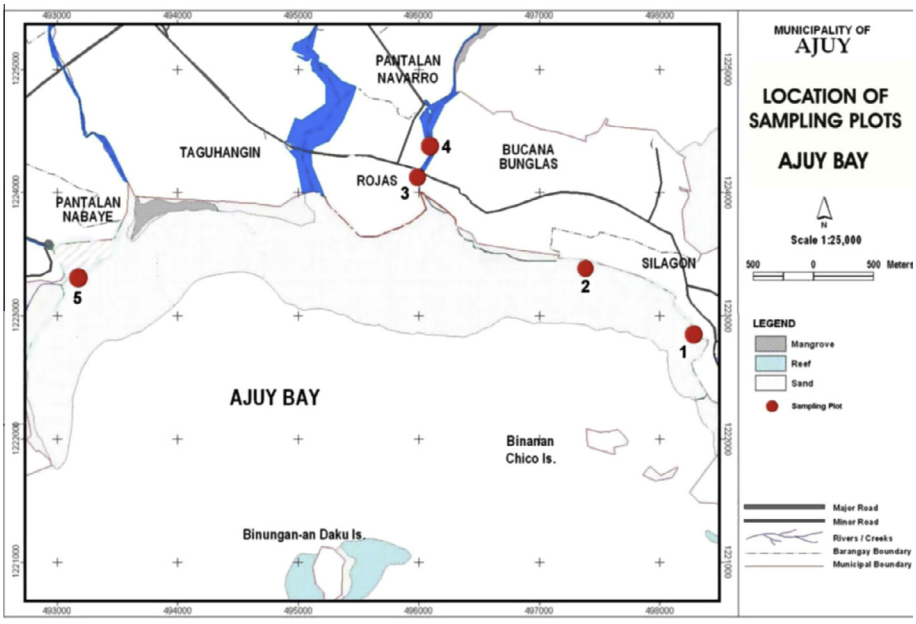

Fig. 1 Study areas at Ajuy Bay, Panay, Island (in red dots) (NAMRIA, 2003).