POTENTIAL MANGROVES FOREST AS NATURE-BASED ATTRACTION

Baharum Zainal & Azlizam Aziz

Introduction

Pulau Tengah is densely populated by mangroves stands which cover an area of 597 hectares. It is located at Klang district that was assessed for its potential as nature based tourism attraction. Pulau Tengah mangroves has been selected by the Selangor State Forestry Department to be initiated as forest gene pool zone for mangrove and nature-based tourism attraction. This area were densely covered with *Avicennia* species include *Avecennia alba* and *Avecennia marina*. Besides, the mangroves were also interspersed with Sonneratia and Rhizopharia species.

Increment of human populations and development particularly in the coastal region has created conflict such as direct human intervention and destruction to mangroves component which then led the ecosystem into jeopardy. Gilbert and Janssen (1998) argued that underestimation of their values and inadequate links of information has contributed to the widespread loss and degradation of such ecosystem.

Considering magnitude of the problem, Fallon and Kriwoken (2003) suggested nature-based tourism as significance tools in protecting the ecological and cultural resources that can be achieved by providing local economic opportunity, greater environmental understanding and awareness as option for rural development. Therefore, a study was conducted which objected the providing of important information regarding particular function and characteristic of the wetland. In other words, Pulau Tengah is targeted to be developed as nature-based tourism attraction. Nature-based tourism simultaneously invites not only spending time, but exercising hand on experience by getting in touch physically on nature of mangroves and activities serve.

Multi-criteria decision making, Expert Choice 2000 analysis package in Analytical Hierarchy Process (AHP) were applied for analyzing and proceeding into several stages consists of (i) Pre survey stage (ii) Actual stage (iii) Post- survey stages.

Methodology

Data collection framework

In achieving the stated goals, the functionalized system of this environment has to be transformed into nature attraction criteria. In light of limited nature tourism research which relates to mangroves forest, six physical criteria were assess in context of nature tourism and these six criteria were chosen based on study by Bauer et al. (2002) The assessment based on its importance criteria, sub criteria, activities and zone. Refer to Table 1 below:

Table 1: Site assessment process

Level 1: Criteria & Sub criteria	Level 2: Activities & Outcomes		Level 3: Zones (Alternatives)
Resources • Landform • Flora Diversity • Fauna Diversity • Scenic view	Casual Adventure Nature Appreciation Environmental Education	Quality Suitability Knowledge Social Skills Psychomotor	Zone 1 • Sandbar Zone
Environment • Protection • Maintenance • Supplier • Dependant	Casual Adventure Nature Appreciation Environmental Education	Quality Suitability Knowledge Social Skills Psychomotor	

Level 1: Criteria & Sub criteria	Level 2: Activities & Outcomes		Level 3: Zones (Alternatives)
Culture • Historic site • Religious • Social activities	Casual Adventure Nature Appreciation Environmental Education	Quality Suitability Knowledge Social Skills Psychomotor	Zone 2 • Vegetative Zone
Facility • Education • Recreation • Infrastructure	Casual Adventure Nature Appreciation Environmental Education	Quality Suitability Knowledge Social Skills Psychomotor	Zone 3 • Esthetic Zone
Safety • Human • Nature	Casual Adventure Nature Appreciation Environmental Education	Quality Suitability Knowledge Social Skills Psychomotor	Zone 4 • Succession Zone
Accessibility • Types • Mode	Casual Adventure Nature Appreciation Environmental Education	Quality Suitability Knowledge Social Skills Psychomotor	

Zoning

Cocklin *et al.,* (1989) adopted a procedure in delineation of site into unit boundaries and suggested that the identification of unit boundaries were achieved through the use of topographic sheet. With regards to this study, the similar procedure was adopted in selection of site rather than using topographic sheet, Geography Information System Map (GIS) were utilized in delineation of site and site was identified and justified into zones.

The homogeneity and difficulties to assess this type of forest, made GIS map yielding meaningful information in identification and zoning of site. From the differentials textures of images produced by the GIS map, the study site can be justified into four zones, namely sandbar zone, vegetative zone, aesthetic zone, and succession zone. For validation purposes, grounds trotting of zones are carried out. This was done to ensure that their potential for recreation and tourism, and their significance enabled the complex region to be aggregated into zones of different characters. Zoning of site is shown in Appendix 1.

Data Analysis

It was mentioned previously that data are analyzed by utilizing Analytical Hierarchy Process (AHP) methodology that was developed by Satty in early 1980's. Curry and Moutinho (1991) stated that a powerful approach allowed subjective measurement into objectivity assessment of relevant factors and suited to multi-criteria decision-making. Previous study by Saaty (1980), Saaty & Vargas (1982), Satty & Kearns (1985) and Schmoldt & Peterson (1997) indicated that there were three important components of AHP that facilitate the analysis complex problem which namely (i) the structuring of a problem into a hierarchy consists of a goal and subordinates features of a problem and (ii) pairwise comparison between element at each level, and (iii) constructing an overall priority rating (Kovace *et al.*, 2004).

Conclusions

Findings from research indicated that the most potential and preferred zone were **"succession zone"**, followed by **"aesthetic zone"** ranked second, the e **"sandbar zone"**, and the fourth ranked was **"vegetative zone"**. This proved that AHP is one of the most effective tools in problem solving involving multi dimensional attributes. By coordinating this methodology to the planning of tourism attraction at mangroves forest with diverse characters, new dimension in tourism research particularly in the context of nature-based tourism are provided.

Reference

Gilbert, A.J. and Janssen, R. (1998). Use of environmental function to communicate the value of a mangroves ecosystem under different management regim. *Ecological Economic* Vol. 25. pp 323-346.

Fallon, L.D. and Kriwoken, L.K. (2003). Community involvement in tourism infrastructure- the case of the Strahan Visitor Centre, Tasmania. *Tourism Management*, Vol. 24. 289-308.

Bauer, T., King, B., Deng, J. (2002).Evaluating natural attraction for tourism, *Annals of Tourism Research*, Vol. 29. No. 2, pp. 422-438.

Cocklin, C., Harte. M., and Hay. J (1989). Resources assessment for recreation and tourism: A New Zealand Example. *Landscape and Urban Planning*, Vol. 19, pp. 291-303.

Saaty, T.L. (1980). The analytical hierarchy process, planning, priority setting, resources allocation. McGraw-Hill Inc.

Curry, B. and Moutinho, L. (1991). Environmental issue in tourism management: Computer modeling for judgment decision, *Tourism Management*, Vol. 3, No. 1 pp. 57-69.

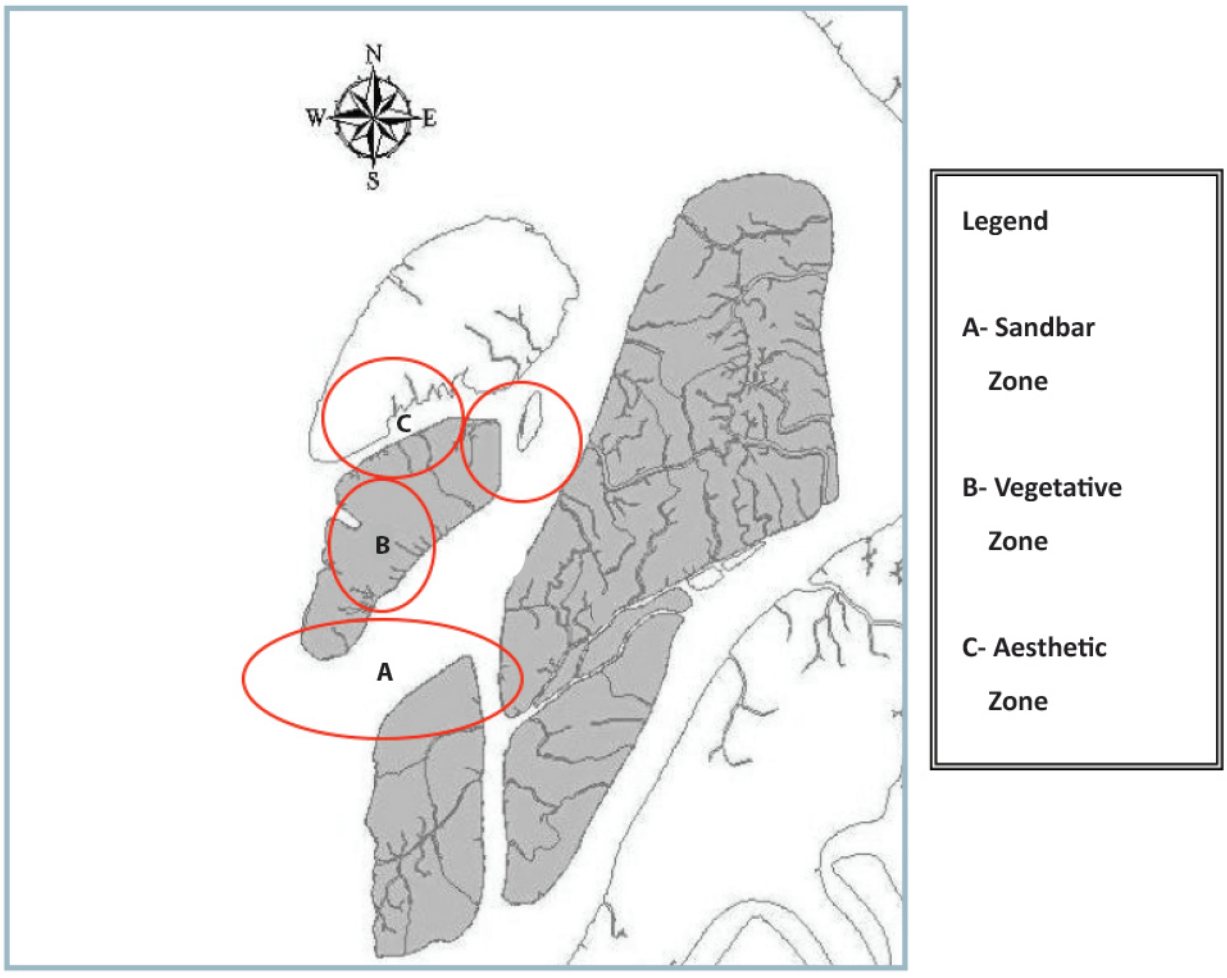
Saaty, T.L. and Vargas, L.G. (1982). The logic of priorities, application in business, energy, health, and transportation. Kluwer-Nijhoff Publishing.

Saaty, T. L. and Kearns, K. P. (1985). Analytical planning, the organization of system, Modern Applied *Mathematic and Computer Sciences, Volume 7*. No.2 pp 34-42(cp2)

Schmoldt, D. L. and Peterson, D. L, (1997). Using the analytical hierarchy process for decision- making in ecosystem management. *WO/Ecosystem Management Analysis Centre Fort Collin, Colorado.* Vol.7 Issue. 1. pp 254-266.

Kovacs, J.M., Malczewski, J., and Flores-Verdugo F. (2004). Examined local ecological knowledge of hurricane impact in the mangroves forest using analytical hierarchical approach. Journal of Coastal Research. Vol. 20, No. 3, pp 792-800.

Appendix 1



Author:
Mr. Baharum Zainal
Science Officer
Laboratory of Sustainable Bioresource Management
Institute of Tropical Forestry and Forest Products (INTROP)
Universiti Putra Malaysia
Email: bahseraya@gmail.com