
The Status of Conservation of Mangroves in the Krueng Reuleng River Area, Leupung, Aceh Besar Regency, Indonesia

The Status of Conservation of Mangroves

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Abstract

Purpose – The purpose of this paper is to know the types of mangrove and the status of the conservation of mangrove ecosystems in the area of Krueng Reuleng River, Leupung, Aceh Besar Regency.

Design/Methodology/Approach – Data collection on mangroves was retrieved using a Quadrat Sampling Method, the acquisition of information about the status of conservation of mangrove ecosystems was done using the interview method.

Findings – The results showed that there are four types of mangroves, and mangrove ecosystem conservation efforts have not been made by the people of Leupung. The conclusions of this study are as follows: the types of mangroves found in the area of Krueng Reuleng River are *Nypa fruticans*, *Sonneratia alba*, *Acrostichum aureum*, and *Thespesia populnea*. Conservation measures have not been undertaken to preserve the mangrove ecosystem in the area of Krueng Reuleng River.

Research Limitations/Implications – The location can be used as a site of practical research on the type of mangroves in the Krueng Reuleng River area for students studying biology.

Originality/Value – In addition to upgrading the data on the types of mangroves, this paper could be a reference field for any relevant field.

Keywords Mangrove, conservation, Leupung, Krueng Reuleng

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1. Introduction

Krueng Reuleng is the river which crosses the Gampong Meunasah mosques and Meunasah Lamsenia, Leupung, Aceh Besar Regency. It is located on the Reuleng mountain which is a cluster of the Bukit Barisan mountains and empties into the river of Leupung. It has a length of approximately 2,300 m and a width of more than 80 m (Ali, 2010). The area of the Krueng Reuleng river is also an area that has high biodiversity and has one of the distinctive biota in the river. One of the biota which can be found in the region is mangroves. These plants live



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in brackish waters in association with makrozoobenthos such as the gastropod and bivalvia (Afkar *et al.*, 2014).

Zoning of mangroves is influenced by the climate and hydrological factors that form the structural development of mangrove growth (Lira-Medeiros *et al.*, 2010). The mangrove ecosystem consists of trees and shrubs which are classified according to 8 (eight) familia, with 12 (twelve) genera of flowering plants namely Avicennia, Sonneratia, Bruguiera, Ceriops, Rhizophora, Xylocarpus, Lummitzera, Languncularia, Aegiatilis, Snaeda, Aegiceras, and Conocarpus (Bahagia, 2009).

The mangroves have important roles with regard to ecological, socio-economic, and social-cultural factors. The role of ecology includes maintaining the stability of the beach from abrasion, the source of fish and prawns as well as biodiversity. In addition, the mangroves function as a source of firewood as well as serve the purpose of conservation, education, ecotourism, and cultural identity (Setyawan, 2006). Based on the results of the observation, it can be seen that most people who are located in the Krueng Reuleng River utilize the mangroves for food, medicines, fodder, materials of farm animals' cages, and as a windbreak. The utilization of the mangrove by the people has impacted the destruction of mangrove habitats, because excessive utilization could decrease the mangrove biodiversity. According to Daru *et al.*, 2013, endangered mangrove plants require conservation efforts. A major challenge faced in conservation today is how to involve aspects of biodiversity and ecosystems when creating and managing protected and reserve areas (Tornroos *et al.*, 2013).

Conservation is one of the efforts to enhance and maintain the ecosystem. Conservation of mangroves in the coastal areas and river sides need to be done because the mangrove is the best plantation in resisting abrasion and wind. The status of the conservation of mangroves in the area of Krueng Reuleng River is not yet known. Therefore, this research aims to know the types of mangroves and the status of conservation of mangroves in the area of Krueng Reuleng River, Leupung, Aceh Besar Regency.

2. Methods

This research was done in the area of the Krueng Reuleng River, Leupung, Aceh Besar Regency. The method used, namely the survey method with purposive sampling technique, i.e. the determination of the respondent who are the targets for the interview. Sampling on the vegetation of mangroves was done using the Quadrat Sampling Method with sampling plot sizes of 10 m × 5 m. The data used were primary and secondary data. Primary data were obtained directly by interviews or the dissemination of questionnaires in accordance with the standard protocol, while the secondary data were obtained from the results of previous surveys, statistical data, as well as existing reports.

3. Result and discussion

3.1. Types of Mangroves

Mangrove is a typical ecosystem in the coastal area, which is diverse and is located in tropical and subtropical areas with partially or completely the roots arise to the ground in the substrate contained salts and waters (Hijbeek *et al.*, 2013). Mangroves have a role in reducing the impact of a tsunami and provide essential nutrients for fish larvae. Although the benefits of maintaining a healthy mangrove ecosystem is already well known, the mangrove ecosystem is still severely threatened (Gomes *et al.*, 2010).

The characteristic of a mangrove is that it has roots, including breathing roots and kneed roots, which on the surface of the ground for the benefit of breathing or taking in the plant's oxygen needs, so that it can survive even if submerged in water. The shape of the leaf is

usually thick, to hold much water, so that it can survive in an environment containing high salt (Romimohtarto and Yuwana, 1999). The results showed that mangroves in the region of the Krueng Reuleng River consists of four types (Table 1).

3.1.1. *Nypa fruticans* This type of mangrove has a palm form which forms clumps on the surface and has the rod in the ground. The height could reach 4–9 m. It has leaves like coconut leaves, shaped like a lancet with the tip tapered. The fruits are globose, in brown color, and fibrous. *Nypa fruticans* grow on a smooth substrate and on the banks of the river that are inundated and also in the river zone with low concentration of salt. This mangrove tends to live and grow in clusters. It has a strong rooting system.

3.1.2. *Sonneratia alba* *Sonneratia alba* is a kind of tree-shaped mangrove with a height of 15 m. It has an old white bark color with brownish roots that sink into the ground and the tip of the root sticks to the surface of the soil as these are the breathing roots. The leaves are oval shaped and have rounded edges. This kind of mangrove is found in muddy habitats and is a bit cobbled. It is also often found in the areas where the water is not too wavy.

3.1.3. *Acrostichum aureum* This mangrove is grown on the river sides and embankment dykes. It is also often found on dry land. This type tends to grow in open areas that are exposed to sunlight, compared to other types of mangrove habitats which prefer to be protected from the sunlight. *Acrostichum aureum* is in the form of bunches. The leaves are long, and the end of the leaves are dull and brown. At the bottom of the leaves, there is a large sporangium. This is the most abundant type of mangrove found in the region of the Krueng Reuleng River.

3.1.4. *Thespesia populnea* This mangrove has a height of approximately 3–8 m. It has thick leaves that are shaped like a heart with a tapered end. This mangrove is found in the dry land area and is mostly found in an area with little floods.

3.2. The Conservation Status of Mangroves

The results of the interviews with the people of Leupung showed that the status of the Krueng Reuleng River conservation is that conservation was not made by the people. So far, mangroves grew naturally. There has been no efforts at reforestation and no delineation of mangrove conservation zones in particular by the people. The importance of the role of the mangrove ecosystems is equivalent to the importance of coral reef ecosystems under the sea. Coral reef ecosystems in one of the islands in Aceh has been segregated as conservation zones (Aldyza *et al.*, 2015). These zones could be a core zone, utilization zone, and rehabilitation zone. Therefore, similar efforts need to be done on the mangrove ecosystems as conservation zones of Krueng Reuleng River, Leupung, Aceh Besar Regency.

In addition to conservation efforts, local wisdom associated with the conservation of mangrove ecosystems also has not been established. So the people are free to fish and carry out logging activities in the mangrove. When local people and newcomers continue to utilize the mangrove ecosystem without regulations, then it is feared that the number of mangrove

No.	Family	Local Name of the Species	Species
1	Arecaceae	Nipah	<i>Nypa fruticans</i>
2	Sonneratiaceae	Berembang	<i>Sonneratia alba</i>
3	Pteridaceae	Paku laut	<i>Acrostichum aureum</i>
4	Malvaceae	Waru laut	<i>Thespesia populnea</i>

Table 1. Types of Mangroves Found in the Region of the Krueng Reuleng River.

species will be reduced and lead to the occurrence of the rarity of biota. This is in accordance with the statement of Manalu (2010) that an area will be preserved due to the compliance of people based on the customary law of the restrictions and limitations imposed on accessing the existing resources in that area.

4. Limitation and implications

The field of science that has relevance to this research is aquatic ecology. The role of mangrove ecosystems as storm retreats and erosion plugs in coastal areas has been studied and referenced as a mitigation of natural disasters such as floods, tidal water and tsunamis. Considering that the observation of the types of mangroves is only done in the Krueng Reuleng river area, it is necessary to have further studies for data collection of mangrove types in other coastal areas.

5. Conclusion

Based on the results of the study, it can be concluded that the types of mangroves found in the area of Krueng Reuleng River are *N. fruticans*, *S. alba*, *A. aureum*, and *T. populnea*. The status of the mangrove ecosystems in the area of Krueng Reuleng River is that conservation efforts have not been made.

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