

Developing sustainable mangrove management through community-based ecotourism in North Sumatra, Indonesia

M. Basyuni*, Y. Bimantara, M. Siagian and R. Leidonald

Department of Forestry, Faculty of Forestry, University of Sumatera Utara, Medan 20155 Indonesia. * *E-mail*: m.Basyuni@usu.ac.id



Introduction

- Mangrove plants comprise a heterogeneous group of independently derived lineages that are defined ecologically by their location in inter-tidal zones of tropical and sub-tropical climates and physiologically by their ability to withstand high concentrations of salt or low levels of soil aeration (Tomlinson 1986).



Spalding et al. 2010

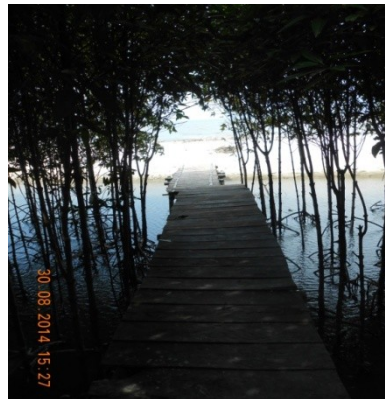
SN	Country	Area (ha)	% of global total	Cumulative %	Region
1	Indonesia	3,112,989	22.6	22.6	Asia
2	Australia	977,975	7.1	29.7	Oceania
3	Brazil	962,683	7.0	36.7	South America
4	Mexico	741,917	5.4	42.1	North and Central America
5	Nigeria	653,669	4.7	46.8	Africa
6	Malaysia	505,386	3.7	50.5	Asia
7	Myanmar (Burma)	494,584	3.6	54.1	Asia
8	Papua New Guinea	480,121	3.5	57.6	Oceania
9	Bangladesh	436,570	3.2	60.8	Asia
10	Cuba	421,538	3.1	63.9	North and Central America
11	India	368,276	2.7	66.6	Asia
12	Guinea Bissau	338,652	2.5	69.1	Africa
13	Mozambique	318,851	2.3	71.4	Africa
14	Madagascar	278,078	2.0	73.4	Africa
15	Philippines	263,137	1.9	75.3	Asia

Giri et al. 2011

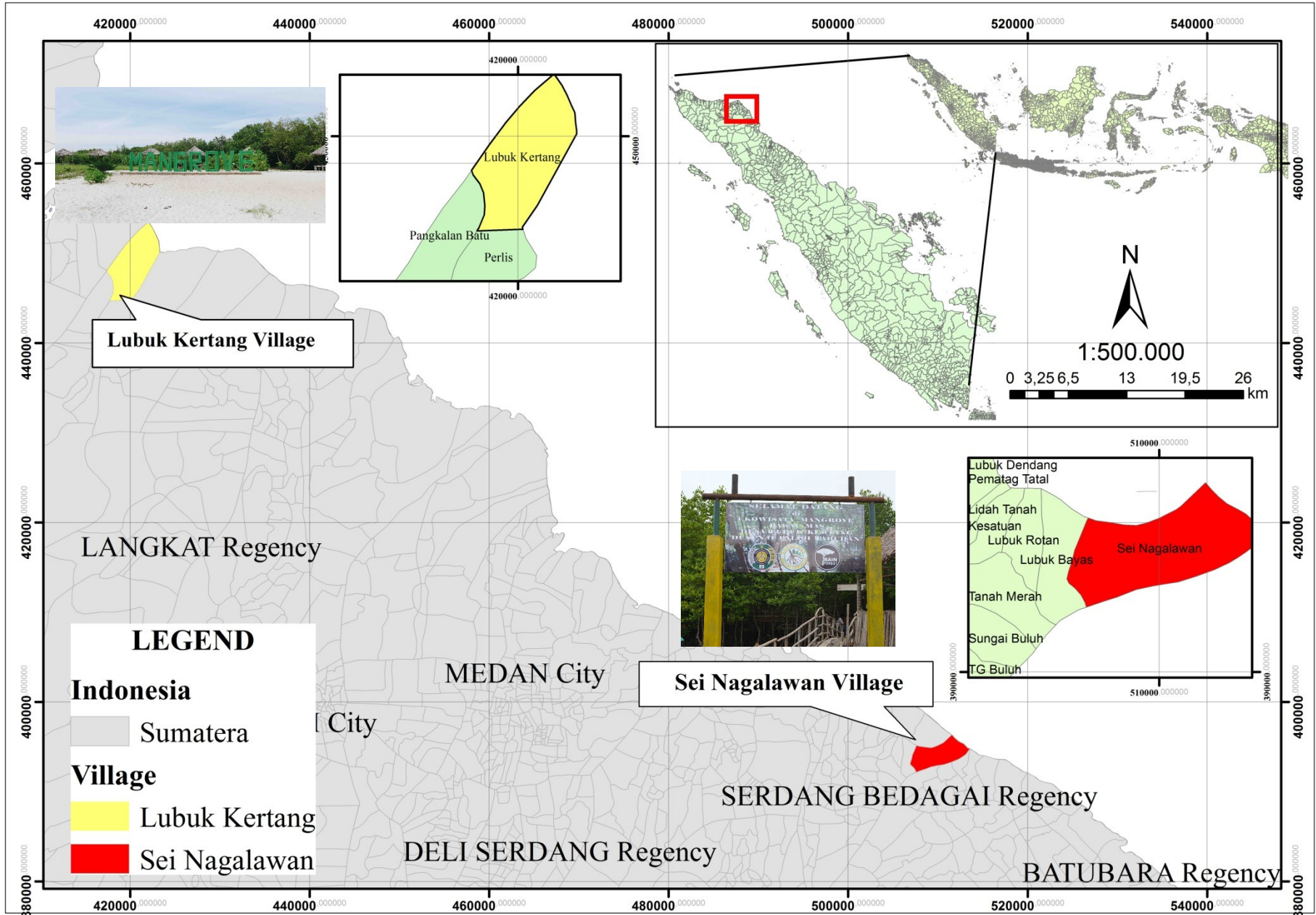
- Indonesia has 22.6% of the world's mangroves, however, that area has been degraded from 4.2 million in 1980 to only 3.1 million in 2011 (Spalding et al. 2010; Giri et al. 2011).

Introduction (Cont.)

- Mangrove forests in North Sumatera, Indonesia existed in the east coastal of Sumatera Island and commonly thrived in Langkat, Deli Serdang, Batubara, Tanjung Balai, Asahan, Labuhanbatu until Serdang Bedagai (Basyuni et al. 2015).
- Because of its position along the land-sea interface, mangroves is high potency to promote ecotourism.
- The present study describes the developing sustainable mangrove management through community-based ecotourism in two locations, Lubuk Kertang of Langkat and Sei Nagalawan of Serdang Bedagai, North Sumatra, Indonesia.



Study site



Mangrove ecotourism

Parameters for promoting ecotourism

Community
and
perspective

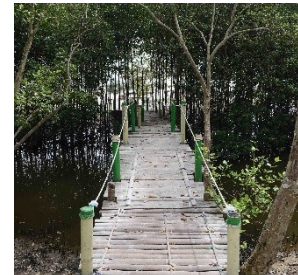
Analysis of
mangrove
ecosystem

Ecological
suitability

Analysis of
carrying
capacity

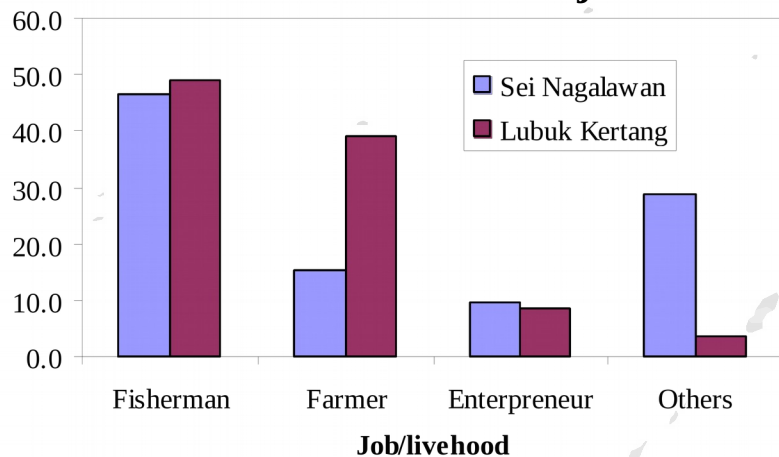
SWOT
Analysis

To determine mangrove ecotourism

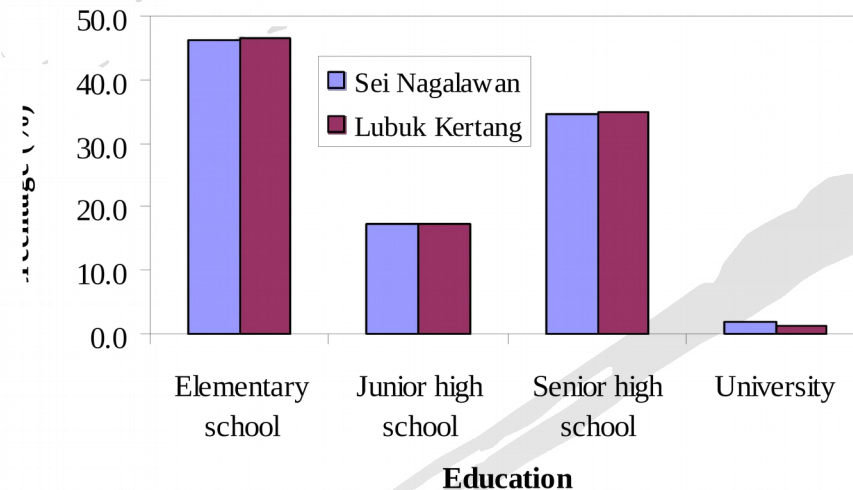


Characteristic and perspective of community

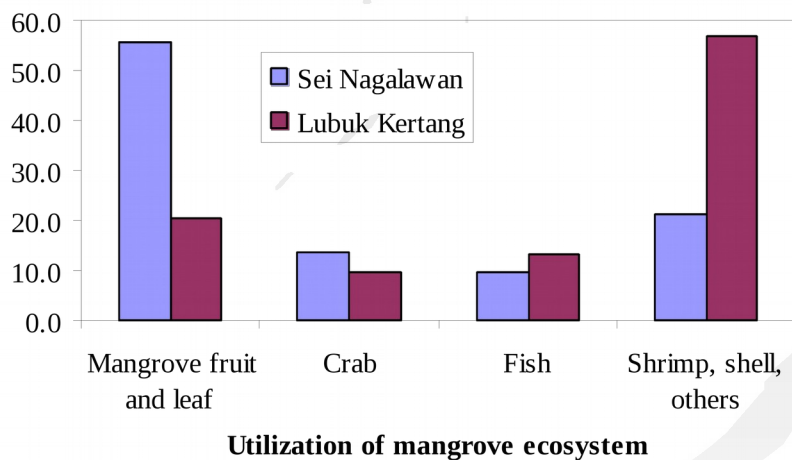
Characteristic of job



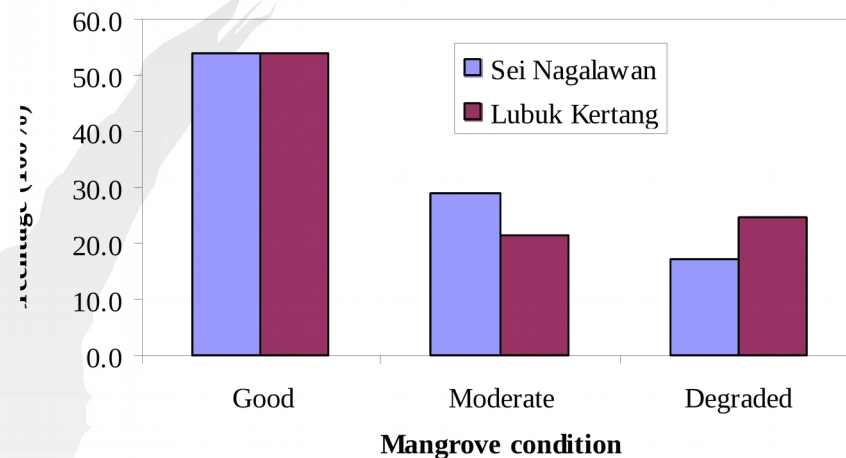
Characteristic of education



Perspective on mangrove utilization

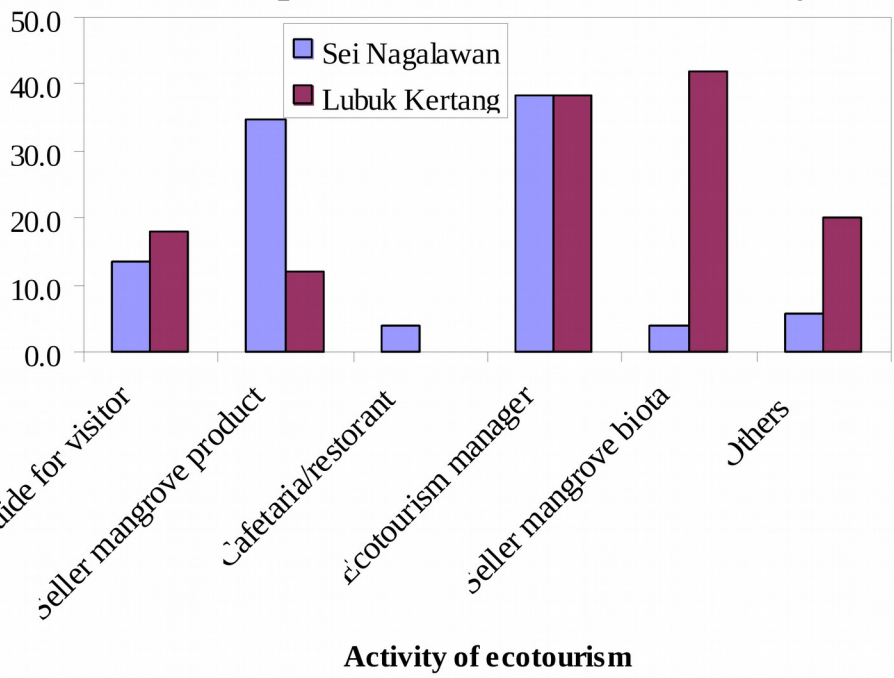


Perspective on mangrove condition

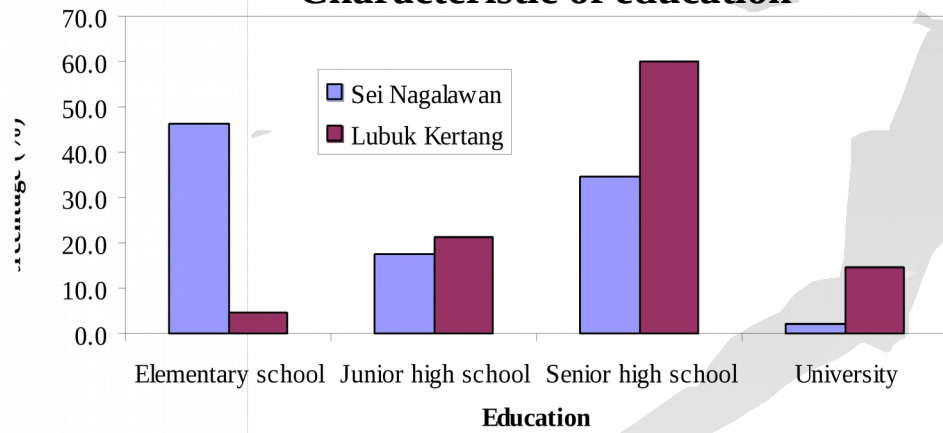


Characteristic and perspective of visitor

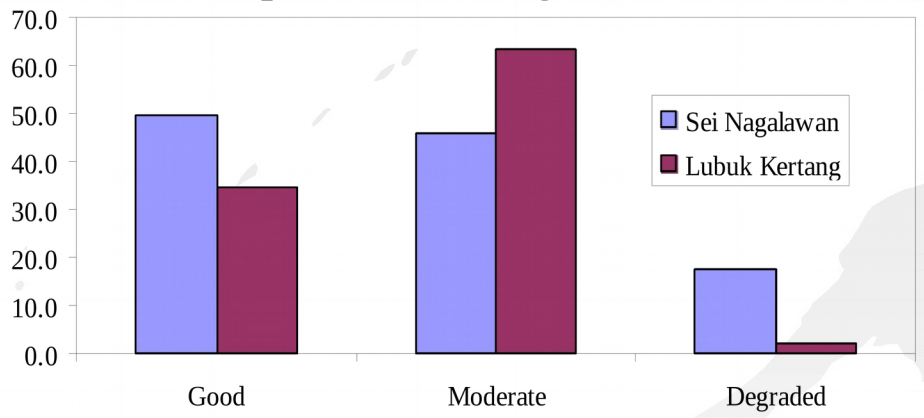
Perspective on ecotourism activity



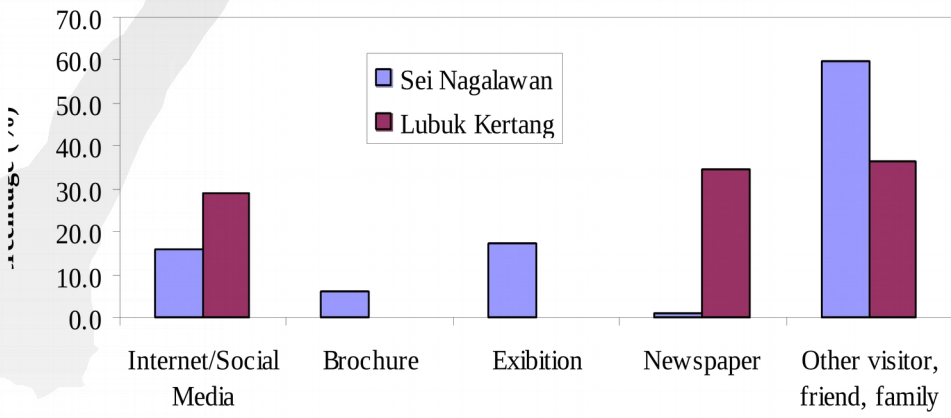
Characteristic of education



Perspective on mangrove condition



Perspective on ecotourism information





Mangrove species diversity @ mangrove ecotourism



Species	Sei Nagalawan	Lubuk Kertang
<i>Acanthus ilicifolius</i>	Available	Available
<i>Avicennia marina</i>	Available	Available
<i>A. lanata</i>	Not detected	Available
<i>A. officinalis</i>	Available	Available
<i>Bruguiera gymnorrhiza</i>	Available	Available
<i>B. cylindrica</i>	Available	Not detected
<i>B. sexangula</i>	Not detected	Available
<i>Ceriops tagal</i>	Not detected	Available
<i>Excoecaria agallocha</i>	Not detected	Available
<i>Lumnitzera racemosa</i>	Not detected	Available
<i>R. apiculata</i>	Available	Available
<i>R. mucronata</i>	Not detected	Available
<i>Scyphiphora hydrophyllacea</i>	Not detected	Available
<i>Sonneratia caseolaris</i>	Available	Available
<i>Xylocarpus granatum</i>	Not detected	Available

Ecological suitability and carrying capacity

Parameter	Sei Nagalawan	Lubuk Kertang
Suitability level of mangrove ecosystem for ecotourism development	Conditionally suitable (53.8%)	Suitable (89.7%)
Carrying capacity for mangrove ecotourism	36 people/day	36 people/day



SWOT analysis on internal and external factor

- Both locations of mangrove ecotourism have a potential ecotourism attraction.
- Both have high mangrove biodiversity,
- Potential human resources for both locations
- Good people's perception on the importance of mangrove conservation
- Both mangrove ecotourism have relatively easy access to be visited.



Ecotourism facility

Facility	Sei Nagalawan	Lubuk Kertang
Tracking	Available	Available
Aula	Available	Available
Lodgment	Available	Available
Toilet	Available	Available
Cafeteria/restaurant	Available	Available
Praying place/Mushollah	Available	Available
Home stay	Available	Not available
Gallery	Available	Not available
Parking lot	Available	Available
Souvenir/mangrove product	Available	Available



Mangrove product



Mangrove product



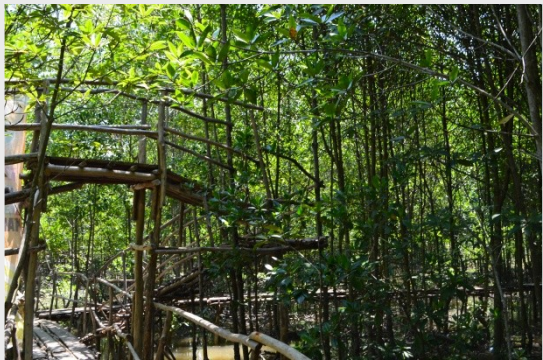
Praying place



Parking lot

Proposed strategy

- To increase the efforts to manage the mangrove ecosystem through ecotourism activities.
- To keep the mangrove ecotourism by establishing the carrying capacity area.
- To promote the mangrove ecotourism using internet or mass media to attract a large number of tourists.



Challenges and lesson learned

- Implementation of ecotourism in mangrove ecosystem indicated as a sustainable development approach by increasing local income, reducing fishing pressure, and mangrove conservation.
- Mangrove ecotourism is a sustainable form of land use, to contributing the environmental conservation, providing socio-economic benefits to the local people through indirect values of the natural resources.



Conclusions



- Ecotourism potential of mangrove ecosystem in Sei Nagalawan and Lubuk Kertang produced mangrove product from mangrove resources. Both locations are supported by the existence of community groups.
- Alternative strategy for prioritized mangrove ecotourism management in Sei Nagalawan and Lubuk Kertang by increasing efforts to manage the mangrove ecosystem through ecotourism activities, keeping the mangrove with regard to the carrying capacity of the region and use the internet and social media to attract tourists to visit mangroves.

Acknowledgements

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Thank you for
your attention