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# Call for Papers Winter Issues Journal of Environmental Management and Tourism

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### Abstract:

Mangrove ecosystems have components of landscapes, flora, fauna, and local communities to form a unified ecosystem. Bandar Bakau Dumai (BBD) is a mangrove conservation and ecotourism area located on the outskirts of Dumai City, Indonesia. This study aimed to analyze the current and past conditions of the area and develop strategies for developing it in the future. The research was carried out by observing, interviewing, non-structured in-depth interviewing, and studying literature. The condition and potential of the mangrove ecotourism area were analyzed from the attractiveness, infrastructure, facilities and services, market potential, institutional elements, and socio-economic conditions of the community. The development strategy is formulated using a SWOT (strength, weakness, opportunity, and threat) analysis by systematically identifying various factors to determine the priority of the development strategy. The BBD conservation area is still relatively good and has not changed from previous years. However, the role of mangrove ecotourism is far removed. The supporting facilities and infrastructure are generally not maintained. The following recovery and development strategies are recommended: increasing human resource capacity; strengthening the role of the government, industry, and sponsors in the development of facilities and infrastructure; proper promotion and marketing; and varying ecotourism services and products; and construction coastal abrasion protectors.

**Keywords:** conservation infrastructure; ecotourism facilities; ecotourism services; SWOT analysis; tourism management.

**JEL Classification:** Q26; Q56; Q29; Q01; R11.

## Introduction

Mangrove ecosystems have the importance of the function and role of the mangrove forest, it is urgent for mangrove forests to be immediately managed according to their functions and land use through sustainable exploration, conservation and rehabilitation efforts (Friess 2017; Ginantra *et al.* 2020; Effendi *et al.* 2021). Mangrove ecotourism has the main object of landscapes, biodiversity of flora, and fauna. The concept of ecotourism in general is expected to reduce destruction of the area by the community and have an effect on increasing the economy by increasing regional economic growth (Subur *et al.* 2022; Effendi *et al.* 2018; Effendi *et al.* 2019).

Bandar Bakau Dumai (BBD) is located on the outskirts of Dumai City, Riau Province, Indonesia. It can be accessed very easily by road and has a large area of mangrove forest (31 ha). The existing mangrove forest area has become a tourist destination with very minimal facilities and infrastructure. The area has been visited by tourists since this mangrove forest has been managed by a village tourism awareness group (Susanto *et al.* 2016; Mulyadi *et al.* 2021). The availability of toll road access from Pekanbaru to Dumai is a separate factor that cannot be ignored. In addition, this area also has sufficient biota diversity. These facts create conditions where a planning for the development of mangrove ecotourism in this area is needed.

### 1. Literature Review

Mangroves cover 75% of the tropical coastline and provide many ecosystem services. The importance of mangroves has been studied extensively around the world, but the degradation of mangrove forests continues at an alarming rate. The extent of mangroves and their interrelationships require multiscale and sustainable management (Gilania *et al.* 2021; Walker *et al.* 2022). Community-based mangrove management is very necessary and affects mangrove biodiversity. Regular and long-term and sustainable maintenance strategies increase the survival of mangroves. Additional hydro-physical protection for mangroves is needed in abrasion prone areas (Damastutia *et al.* 2022; Idajati *et al.* 2015).

Through the increase of ecotourism operations, the uniqueness of the mangrove habitat has contributed to the economic development of a number of countries. Careful consideration is very important to ensure the mangrove ecosystem is well maintained and protected through ecotourism activities. The formation of ecotourism products is very influential for the national, local and international mangrove ecotourism industry. Ecotourism products consist of physical products, activities, and facilities and services (Azis *et al.* 2018).

Despite overwhelming evidence of advantages for conservation, climate mitigation, and human livelihoods, mangroves continue to be threatened by loss and degradation around the world. In the tropics, where institutional capability for administration and protection is relatively weak, such pressures are especially common (McIntyre, 2006). For effective management of mangrove ecosystems, it is critical to understand the dynamic patterns of changing land cover patterns. Land use activities have an impact on the loss of mangrove vegetation cover. To prevent further loss of mangrove areas, proper management is required, as well as suitable land cover management planning (Idris *et al.* 2021).

The ecosystem services framework identifies the advantages of ecosystems to communities and offers support for the preservation of local systems. However, by addressing the community's economic and social elements, which are more reliant on its resources. At various spatial and temporal ranges, mangroves give vital and valuable commodities and services to society. Overexploitation of natural resources, on the other hand, can lead to new poverty traps, in which rural households are unable to rely on ecosystems for food security or income (Afonso *et al.* 2022). Economic incentives play a major role in a number of locations leading to on the partial success of ecotourism. Economic incentives, on the other hand, will not aid conservation unless they are accompanied by socio-cultural reforms and competent site management. Putting the environment ahead of people will not help with natural resource conservation. The interactions of the three key stakeholders, resources, communities, and tourists are critical to the success of ecotourism and must be carefully managed (Das and Chatterjee 2015).

SWOT analysis (strengths, weaknesses, opportunities, and threats) is an analysis that systematically identifies various factors to determine the priority of the most appropriate development strategy to be implemented. This analysis is based on internal and external factors to maximize strengths and opportunities and can minimize weaknesses and threats. This analysis has been used extensively in designing strategies for developing mangrove conservation zones that simultaneously serve as ecotourism destinations (Panigrahi and Mohanty 2012; Lurati and Zamparini 2018; Navarro-Martinez *et al.* 2020).

## 2. Methodology

### 2.1. Research Location and Time

This research was carried out from May to December 2021 in the Mangrove Conservation area of Bandar Bakau Dumai, Dumai City, Indonesia. The determination of the mangrove vegetation observation station was carried out based on the representativeness of the mangrove location, Station 1, Station 2 and Station 3.

### 2.2 Research Design

The research was a survey method, namely by conducting observations, structured interviews using questionnaires, and non-structured in-depth interviews and literature studies.

### 2.3 Analysis of Mangrove Flora and Fauna

A mangrove area of 300 M from the shoreline to the mainland and a width of 100 M is plotted as an observation station. Each station has 3 line transects (100x100 M), and at each line transect consisted of 3 plots (10x10 M). The number of individuals for each plot were counted for every species and then differentiated between trees, tillers and seedlings. Identification of mangrove species was carried out by observing and photographing some parts of the mangrove morphology such as roots, stems, leaves, flowers and fruit (Noor *et al.* 2006; Kitamura *et al.* 1998; DPKKD 2008; IUCN 2020; Mulyadi and Amin 2016). The fauna was identified through observation, interviews with local communities and literature studies from several sources. Included mammals, reptiles, birds and coastal invertebrates. Identification works were carried out by referring to some references (Giesen *et al.* 2006; Aragonés *et al.* 1998; IUCN, 2020).

### 2.4 Mangrove Ecotourism

The condition and potential of the BBD mangrove ecotourism area were analyzed from the elements of object attractiveness, infrastructure, facilities and services, market potential, security, socio-economic conditions of the community, institutional elements, environmental quality and accommodation. Data on potential visitor requests were collected directly at the research site through direct interviews with respondents and filling out questionnaires.

### 2.5 SWOT Analysis and Ecotourism Management and Development Strategies

The directions and strategies for developing ecotourism in BBD areas are formulated using a SWOT (strength, weakness, opportunity, threat) analysis. The analysis systematically identifies various factors to determine the priority of the most appropriate development alternative strategies to be implemented. This analysis is based on internal and external factors to maximize strengths and opportunities and can minimize weaknesses and threats (Lurati and Zamparini, 2018).

## 3. Results and Discussion

### 3.1 BBD as a Mangrove Conservation Area

The BBD area overgrown by mangrove forest and was originally a development area for PT. Indonesian Port I, Dumai Branch. The plotting of this area as a mangrove conservation area began around 1998. At that time the condition of the mangrove forest in this area was in a state of severe damage due to abrasion and was used by the community without considering the role of the carrying capacity of the area's ecosystem. Timber trees are cut down for building materials, charcoal making and other encroachment activities. Based on the Riau Province Regional Regulation Number 10 of 2018 concerning the Regional Spatial Planning of the Riau Province of 2018-2038, and the Decree of the Minister of Environment and Forestry Number 903 of 2016 concerning Riau Spatial Planning and the Dumai City Regional Regulation Number 15 of 2019 concerning Spatial Planning Dumai City Area in 2019-2039, the BBD mangrove conservation area has been plotted in an area of 31 hectares which is located at estuary of the Dumai River. This regional regulation has confirmed the status of BBD mangrove land as Limited Production Forest (Mulyadi *et al.* 2021; Susanto *et al.* 2016).

When viewed from the perspective of mangrove conservation, the current condition of BBD has not changed much compared to previous years. From observations of all 3 stations, it can be seen that there are still quite a lot of mangrove species, namely 14 true mangrove species and 15 associated mangrove species (Table 1 and Table 2). All of these plant species are still of least concern (LC) or have not been endangered according to the International Union for the Conservation of Nature (IUCN).

Table 1. True mangrove species recorded in BBD.

No.	Common Name	Scientific name
1.	Red mangrove	<i>Rhizophora apiculata</i>
2.	Loop-root mangrove	<i>Rhizophora mucronata</i>
3.	Spotted mangrove	<i>Rhizophora stylosa</i>
4.	Large-leaved orange mangrove	<i>Bruguiera gymnoriza</i>
5.	Small-leaved orange mangrove	<i>Bruguiera parviflora</i>
6.	Black mangrove	<i>Lumnitzera littorea</i>
7.	Tonga mangrove	<i>Lumnitzera racemosa</i>
8.	Grey mangrove or white mangrove	<i>Avicennia marina</i>
9.	Api-api putih or white api-api	<i>Avicennia alba</i>
10.	Spurred mangrove or Indian mangrove	<i>Ceriops tagal</i>
11.	Cannonball mangrove or cedar mangrove	<i>Xylocarpus granatum</i>
12.	Apple mangrove	<i>Sonneratia alba</i>
13.	Nipa or mangrove palm	<i>Nypa frutican</i>
14.	Greek Scyphiphora	<i>Scyphiphora hydrophyllacea</i>

Table 2. Associated mangrove plant species recorded in BBD.

No.	Common name	Scientific name
1.	Melastoma	<i>Melastoma candidum</i>
2.	Senduduk	<i>Melastoma septemnerium</i>
3.	Odor pandanus	<i>Pandanus odoratissimus</i>
4.	Beach pandanus	<i>Pandanus tectorius</i>
5.	Black wattle or hickory wattle	<i>Akasia mangium</i>
6.	Sea mango	<i>Cerbera manghas</i>
7.	Taro	<i>Collocacia esculenta</i>
8.	Chinese banyan	<i>Ficus microcarpa</i>
9.	Whip vine or hell tail	<i>Flagellaria indica</i>
10.	Climbing vine	<i>Gymnanthera paludosa</i>
11.	Sea hibiscus or beach hibiscus	<i>Hibiscus tiliaceus</i>
12.	Indian almond	<i>Terminalia catappa</i>
13.	Portia tree	<i>Thespesia populne</i>
14.	Noni	<i>Morinda citrifolia</i>
15.	Vitex tree	<i>Vitex pubescens</i>

Some of the mammals found in this mangrove forest were permanent and some were only for a certain time. The bird species found at the research site included *Prinia familiaris*, *Copsychus saularis*, *Rhipidura javanica*, *Leptocoma calcostetha*, *Haliastur hindicus*, *Halcyon smyrnensis*, and *Corvus enca*.

Tabel 3. Species of birds recorded in BBD.

No.	English Name	Scientific name
1.	The barn swallow	<i>Hirundo rustica</i>
2.	Blue-eared kingfisher	<i>Alcedo meninting</i>
3.	Brown-throated sunbird	<i>Anthreptes malacensis</i>
4.	Little spiderhunter	<i>Arachnothera longirostra</i>
5.	Long-billed spiderhunter	<i>Arachnothera robusta</i>
6.	Oriental magpie-robin	<i>Copsychus saularis</i>
7.	Slender-billed crow	<i>Corvus enca</i>
8.	Little egret	<i>Egretta garzetta</i>
9.	White-throated kingfisher	<i>Halcyon smyrnensis</i>
10.	Brahminy kite	<i>Haliastur indicus</i>
11.	The buffy fish owl	<i>Ketupa ketupu</i>
12.	The copper-throated sunbird	<i>Leptocoma calcostetha</i>
13.	Blue-crowned hanging parrot	<i>Loriculus galgulus</i>
14.	Stork-billed kingfisher	<i>Pelargopsis capensis</i>
15.	Bar-winged prinia	<i>Prinia familiaris</i>
16.	Malaysian pied fantail	<i>Rhipidura javanica</i>
17.	Crested serpent eagle	<i>Spilornis cheela</i>



These birds can be seen directly or hear the sound of the species. The most common birds found in mangrove areas are storks, which have long legs and include predators such as sea eagles, swallows and fish-eating eagles. Kingfishers and bee-eaters are colorful birds that commonly appear or are seen in mangrove forests (Table 3). Reptile species found at the research site included *Varanus salvator*, *Emoia astrocastata* and *Trimeresurus* sp (Table 4).

Tabel 4. Reptile species found in BBD.

No.	Common Name	Scientific name
1.	Lizard	<i>Emoia astrocastata</i>
2.	Crab-eating macaque	<i>Macaca fascicularis</i>
3.	Cobra	<i>Naja sp.</i>
4.	Asian water monitor	<i>Varanus salvator</i>

The number and composition of flora and fauna species are not much different from those reported by previous researchers in this area and its surroundings. For example, Susanto et al (2016) reported that the condition of mangrove forests in BBD, Pangkalan Sesai Village, West Dumai District was in moderate condition. Found 14 true mangrove species and 15 associated mangrove species. Rahmadany et al (2014) reported that the mangrove in the Village of Purnama, Dumai Barat District area had 6 families with 10 species, *i.e.* *X. granatum*, *R. apiculata*, *B. gymnorrhiza*, *B. cylindrica*, *C. tagal*, *L. littorea*, *A. marina*, *S. alba*, *E. agallocha* and *N. fruticans*. The mangrove species that dominated in this area was *X. granatum* and *R. apiculata*. Based on the diversity, density and water quality parameters indicated the condition of the mangrove in the study area of was at the medium stage. The same thing also happened to the species of birds, mammals and reptiles that inhabit this mangrove area at the time this research was carried out (Susanto et al. 2016; Zulpikar et al. 2014).

### 3.2 BBD as a Mangrove Ecotourism Area

According to surrounding residents, the use BBD mangrove conservation area as an ecotourism area began around 1998. Regional Regulation of Riau Province Number 10 of 2018, Decree of the Minister of Environment and Forestry Number 903 of 2016 and Regional Regulation of Dumai City Number 15 of 2019 emphasize the status of mangrove conservation land BBD is also a mangrove forest ecotourism area. This area is very strategically located, close to the city center of Dumai, the road to the location is good, close to the port of PT. Indonesia Port I, Dumai Branch, and Dumai Fishing Port. The tourist activities carried out by the visitors today are enjoying the panorama of nature and the sea, while enjoying drinks and culinary delights in stalls, gazebos/family halls and relaxing tables without umbrellas. Meanwhile, mangrove tourism activities utilize the diversity of mangrove vegetation, cool and comfortable air, selfies and exploring in the mangrove area.

The potential of mangrove ecotourism products can be categorized into mangrove special interest ecotourism products and mangrove ecotourism supporting products. Ecotourism products of special interest to mangroves that already exist include: walking through the mangrove forest while enjoying the beauty of the vegetation and mangrove atmosphere through the courtyard, enjoying the coolness and humidity of the mangrove ecosystem, photography with the background of the beauty and uniqueness of mangrove vegetation and panoramic views of natural beauty, and animal watching (Mulyadi et al. 2021; Harto et al. 2021; Rahmadany et al. 2016).

Currently, the BBD management is a non-government organization (NGO) of Marine Nature Lovers (MNL). This NGO has applied for a management permit from the Dumai City Government several years ago. In the past there were 5 (five) programs implemented by the MNL in maintaining the BBD mangrove ecosystem, namely a) Bandar Bakau Natural School; b) Mangrove Bank; c) Action to clean rivers and beaches; d) Environmental-based community activities, and e) Exploration of conservation areas into tourist destinations. Based on the agreement, MNL manages this mangrove forest area as a conservation and ecotourism area. Until the beginning of 2019, MNL's activities in managing mangrove ecotourism areas were quite high. The NGO has received environmental awards from various institutions, including the Environmental Conservation Group, Adibakhti Minabahari, and Conservation Cadre. However, entering the beginning of 2021, the Covid 19 pandemic outbreak has severely restricted people's activities outside the home. As a result, community tourism activities are almost non-existent and ecotourism infrastructure facilities are not being used.

Supporting facilities and supporting facilities are determining factors in the development of an ecotourism area (Effendi et al. 2021; Ginantra et al. 2018). Ecotourism supporting facilities in BBD, include: restaurants, stalls/shops, outlets, main building, home stay (1 unit), library library building, family hall/gazebo, relaxing table without umbrella, courtyard or jetty, and arts and cultural facilities. In 2018, although these supporting facilities

were still lacking in number compared to the available area, most of them were still in good condition. However, by 2021 this facility is too old and almost unusable (Table 5). Likewise with supporting facilities such as toilets, prayer rooms, information centers and souvenir centers, the numbers are not sufficient, and the condition is not maintained.

This condition is exacerbated due to the Covid 19 pandemic which has not yet subsided. Mangrove ecotourism activities can be said to have stopped. The visitors who come just to enjoy the nature of the sea, eat drink and sit back while enjoying the beach atmosphere. This condition cannot be allowed to drag on. Existing facilities must be repaired, supplied and properly maintained. Conditions like this will cause a negative public image of BBD ecotourism. Considering the condition of the coastal ecosystem, it is better if these facilities and infrastructure buildings are specially designed with permanent construction. Ecotourism management in BBD clearly will not be able to build this facility. For this reason, a help from the government, the industrial world or the tourism business is a recommended solution (Harto *et al.* 2021; Purwowibowo *et al.* 2020; Mulyadi *et al.* 2021).

Table 5. Name and status of supporting facilities for BBD ecotourism

No.	Tourist Facilities	Amount	Condition in 2018	Condition in 2021
1.	Main office	1 unit	Good	Good
2.	Home Stay	1 unit	Well maintained	Unmaintained
3.	Library	1 unit	Well maintained	Unmaintained
4.	Gazebo	41 units	Well maintained	Unmaintained
5.	Relaxing table without umbrella	12 units	Well maintained	Unmaintained
6.	Tourist restaurant	1 unit	Maintained	Maintained
7.	Food stall	7 units	Good	Less maintained
8.	Food outlet	8 units	Good	Less maintained
9.	Mangrove wood bridge	200 m	Good	Broken
10.	Art/cultural facilities	1 unit	Good	Unmaintained
11.	Planting platform	1 unit	Good	Less maintained
12.	Toilet	2 units	Good	Unmaintained
13.	Islamic prayer room	1 unit	Good	Less maintained
14.	Information centre	1 unit	Good	Unmaintained
15.	Souvenir center	1 unit	Good	Unmaintained
16.	Parking area	1 unit	Good	Good
17.	Rubbish bin	10 units	Well maintained	Broken
18.	Ecotourism location plate	1 unit	Good	Good
19.	Nature School Program	1 unit	Well organized	Stop

### 3.3 SWOT Analysis and BBD Development Strategy

SWOT analysis is an analysis that identifies internal strengths and weaknesses and analyzes the opportunities and threats of an entity. From this identification and analysis, the entity can then formulate the strategy it wants to pursue in order to seize the existing external opportunities while avoiding and suppressing external threats. The results of the SWOT analysis cross between strengths, weaknesses, opportunities and threats. Through this approach, four strategies for developing BBD mangrove ecotourism have been formulated (Table 6).

From this SWOT table, it can be seen that the strategy group 1 S-O, is a strategy for utilizing existing internal advantages (strengths) in order to seize opportunities (opportunities) that exist externally. Existing strengths continue to be grown and developed so that they can seize possible opportunities (Nelly *et al.* 2020). For this reason, there are at least three recommended strategies, namely; implementation of appropriate and accurate BBD promotion and marketing, strengthening the role of stakeholders in building and developing BBD and developing types of BBD ecotourism services and products by MLN. While the 2 S-T strategy group, is a strategy for utilizing existing internal advantages (strengths) in order to avoid and overcome business threats (threats) that come from outside externally (Hastuti and Yuliati 2018; Henri and Ardiawati 2020). Existing strengths continuesly to be developed so that they can seize opportunities that may be achieved while also being able to face several things that pose a threat to the sustainability and development of BBD ecotourism areas. For this reason, there are at least three strategies in this group, namely; invites MNL and managers to diversify existing tourism services and products, passing the government and industry the main role in building anti-abrasion sheeting and let the government and industry a major role in the construction of main and supporting facilities. It is recommended, among other things, to strengthen the role of development stakeholders and fulfill the necessary infrastructure. Breakwaters and abrasion barriers need to be planned for construction.

Tabel 6. Analisis SWOT dan strategi pengelolaan ekowisata mangrove BBD

INTERNAL FACTORS		STRENGTH (S)	WEAKNESS (W)
EXTERNAL FACTOR		1. The legal status of BBD that has been determined through the spatial layout of the City of Dumai in 2019-2039. 2. Very strategic location on the outskirts of Dumai City. 3. Strong commitment of LAB as manager.	1. Supporting facilities are still lacking. 2. Limited financing from the manager (LAB). 3. Professional and managerial limitations of the managers.
	OPPORTUNITY (O)	S-O	W-O
	1) Potential to improve the economy of the surrounding community. 2) The opening of the Pekanbaru – Dumai toll road. 3) The need for natural tourism is increasing.	1. More intensive and precise promotion and marketing. 2. Strengthening the role of stakeholders in developing BBD. 3. Development of BBD ecotourism services and products by ecotourism managers and operators.	1. Strengthening the skills of BBD ecotourism managers. 2. Strengthening the skills and professionalism of BBD ecotourism managers. 3. Improving of supporting facilities for BBD mangrove ecotourism
THREAT (T)	S-T	W-T	
1. The existence of natural tourist sites in other locations. 2. Coastline abrasion due to tidal waves and sea transportation. 3. Possible conversion of mangrove forest functions.	1. Construction of anti-abrasion sheeting by the government or other stakeholders. 2. Construction of facilities by the government or other stakeholders.	1. Adding the attraction of BBD ecotourism. 2. Increasing professionalism and skills of BBD ecotourism managers and operators.	

The mentality and creativity of BBD ecotourism operators clearly need to be strengthened. Existing loyalty continues to be nurtured so that gradually it can be expected to withstand pressure and threats of business development from outsiders. The role of stake holders is an important aspect and becomes the main pillar in the development of mangrove ecotourism. Tourism products are an attraction for visitors who come to enjoy ecotourism in a place. Ecotourism products offered are in accordance with the potential of natural resources, facilities and available accessibility (Uddin *et al.* 2013; Mirsanjari 2012).

Group 3 W-O strategy, namely the strategy of making improvements to existing internal weaknesses in order to seize opportunities that exist externally. Weaknesses are corrected and developed so that they can seize possible opportunities (Kombo 2016). The approach is to strengthen the weaknesses they have to get opportunities that come from outside the BBD. For this reason, the strategy taken include; strengthening the skills of BBD ecotourism operators, strengthening the professionalism of BBD ecotourism managers and developing supporting and supporting facilities for BBD mangrove ecotourism by stakeholders.

While the 4 W-T strategy group, where this strategy is pursued by improving existing internal weaknesses in order to face and overcome threats (threats) that come externally (Rudianto and Ridho 2019). The recommended strategies include; increasing the attractiveness of BBD ecotourism through enrichment of tourism products and services and increasing the professionalism and skills of BBD ecotourism managers and operators. There are 3 internal weaknesses faced, namely the lack of supporting and supporting facilities, limited funding and professionalism of operator (MNL). For this reason, the recommended steps to be implemented are strengthening the role of stake holders (government, industry and sponsors) in developing the facilities, and infrastructure needed by BBD. The technical and managerial capabilities of ecotourism managers and actors is still very weak. For this reason, it is necessary to carry out regular guidance on human resources, namely through serial training, apprenticeship assistance and so on.

The threat of coastal abrasion and competition with similar locations elsewhere in the Dumai City area will gradually be overcome. The development of facilities and infrastructure is very important in tourism activities so that every visitor who comes gets convenience and comfort in traveling (Khakhim *et al.* 2021; Hamuna *et al.* 2018). Supporting facilities at the BBD mangrove ecotourism area still need improvement and need to be initiated for procurement and development for the sake of convenience and making it easier for visitors to travel.

## Conclusion

Analysis on physical condition of the area, mangrove flora and fauna shows that the BBD mangrove conservation area is still relatively good and has not changed from previous years. However, the role of mangrove ecotourism that has been far removed from BBD. The supporting facilities and infrastructure are generally damaged and no longer maintained. The recommended recovery and development strategies for BBD development include; a) Increasing the capacity of human resource managers and business actors for ecotourism and mangrove conservation in BBD. b) Strengthening the role of stake holders (government, industry and sponsors) for the development of facilities and infrastructure needed by BBD. c) Proper promotion and marketing through various mass media and facilities owned by the local government. d) Add, complete and vary BBD ecotourism services and products by ecotourism managers and operators. e) Construction of sheet pile or embankment retaining coastal abrasion by the government, industry and society.

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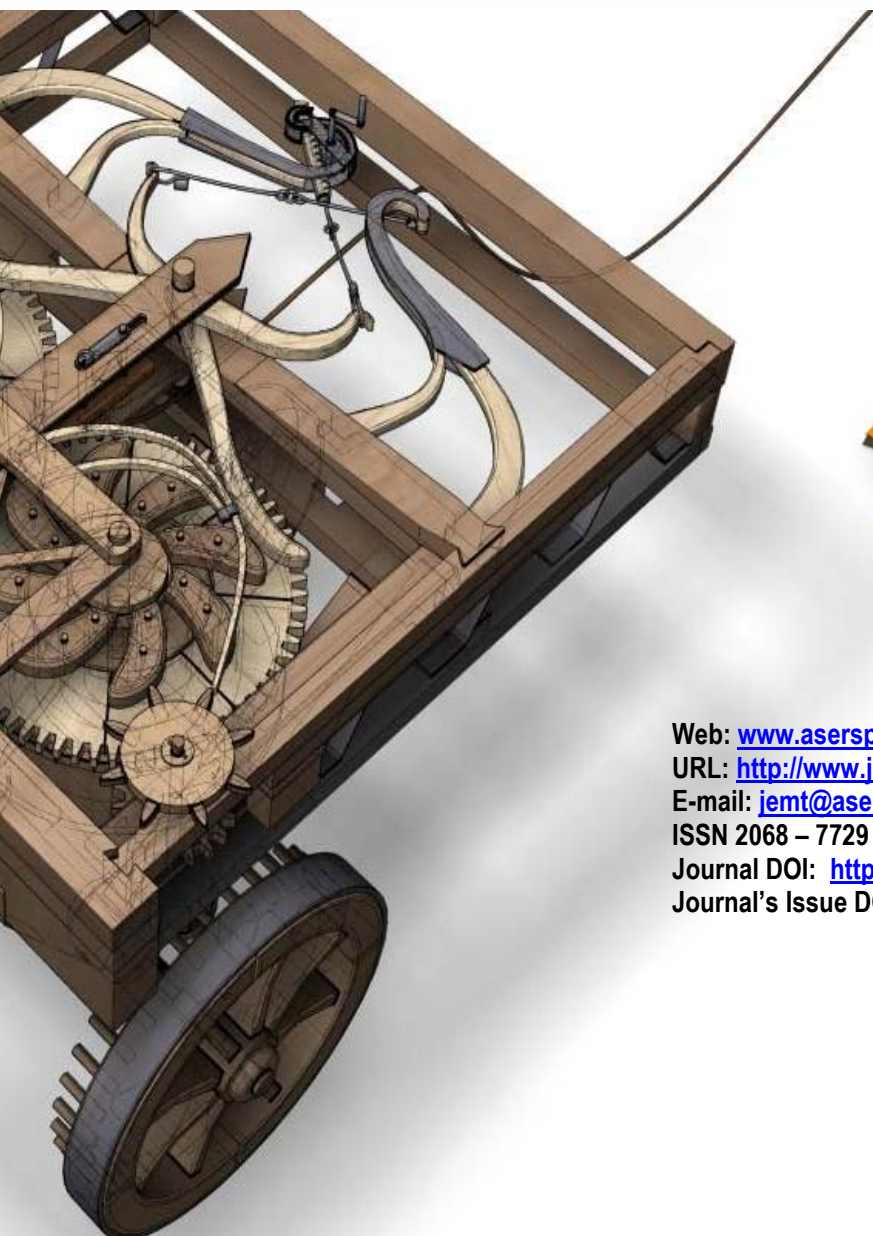
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