Sustainability challenges in developing marine-based adventure tourism in Ambon

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Abstract. There has been growing demands for nature-based tourism involving diverse activities. Marine-based adventure tourism is one of it, which is based on a unique combination of marine biodiversity, scenic beauty, and sea activities such as sea kayaking and diving. The consequences of rapid growth destroy the natural resources because in many cases, any type of tourism industry only focusing on economic development. Sustainable marine-based adventure tourism should balance with many local factors, especially the residents' socioeconomic activities. The unplanned marine-based adventure tourism development can gradually destroy its natural environmental resources on which it depends, the marine ecosystem. In this paper, the authors describe the possible effects of marine-based-adventure tourism development on natural resources along with solid waste pollution challenges and finally, how the residents are involved in overcoming these sustainability challenges.

Keywords: marine-based adventure tourism; solid waste; sustainability challenges

1. Introduction

Indonesia is the largest archipelagic and maritime country in the world consisting of 17,508 islands. The water area is larger than the land area, where 5.8 million m² is the ocean from the total area of the country reaches 7.1 million km² with the coastline length 81,000 km [1]. One of the high potential resources in an archipelago is the tourism sector [2]. Based on this natural potential, Indonesia has remarkable options in developing natural-based tourism such as an ocean. Tourism is one of the fastest-growing sectors in developing the economy which has both positive and negative environmental impacts. Tourism also makes people travel from their place of origin to the designated place where they can enjoy a natural environment and interact with the local people. Marine is one of those resources which has become more attractive than just its sun, sea, and sand type of tourism. Marine-based tourism is a form of nature-based tourism that needs to be sustainable, includes the quality of socio-cultural responsibility, visitors' satisfaction, economic viability, and environmental integrity. Marine tourism is closely related to the concept of coastal tourism but also includes ocean-based tourism such as deep-sea fishing and yacht cruising. Marine tourism defines as including those recreational activities that involve travel away from...
one’s place of residence and which have as their host or focus the marine environment (where the marine environment is defined as those waters which are saline and tide-affected) [5]. There is a new type of tourism whose media is seawater along with its features such as currents and winds, namely marine-based adventure tourism. This marine resource for tourism is one of among other resources that need to be developed for residents’ economic development. Moreover, tourism development is viewed as an instrument of employment generation and income [6].

Marine as part of the human-nature interaction place has become an admirable place for tourism destination. Marine tourism is one of the fastest-growing tourism market segments. The environmental impacts of marine tourism have gained increasing attention in recent years. With the rise in sustainable tourism and an increased number of initiatives for being environmentally friendly, tourists and residents alike are now recognizing the importance of environmental management in the tourism industry.

Ambon Island is part of Maluku Province, has enormous potential for marine-based adventure tourism development which can contribute to the residents’ economic development. This island and its natural environment surrounding provide the tourist with beautiful diving spots and strong seasonal currents which are perfect for sea kayaking. The development of technology, especially in social media exposure relates to the increasing demand for these marine-based adventure tourism activities. On the other hand, the increased interest in this marine-based adventure tourism has the potential to set a burden on coastal and marine areas if the aspects of resources sustainability are set aside. The residents need to develop this tourism based on the sustainable development paradigm which takes into consideration the coastal and marine problems along with the environmental issues. Therefore, this paper aims at analyzing the positive and negative factors affecting marine-based adventure tourism in Ambon island focusing on the socio-economic activities of the residents.

2. Methodology
This paper is based on primary and secondary data sources that include literature reviews collected from related journals and articles on the marine-based adventure tourism area of Ambon island in Maluku Province. The literature review discusses the basic concepts. The methodology is useful in identifying the positive as well as negative impacts that make sustainability issues more challenging in terms of tourism development. The area map where the samples of wastes taken as a result of residents’ socioeconomic activities are presented in figure 1.

Figure 1. Part of Ambon Island photo where solid waste samples were taken.
3. Literature review

Indonesia is a country that is very dependent on its natural resources. Types of marine-based adventure tourism or small islands are in great demand by foreign tourists. Activities undertaken in particular tourism in small islands has economic impacts improvement of the standard of living on residents. On the other hand, the sustainability challenges appear significantly as this type of tourism gradually in high demand over the years. Therefore, the involvement of residents needs to be achieved. The tourism industry depends on resident involvement, through their role as employees or local entrepreneurs, and on resident goodwill towards tourists [7, 8]. However, most of the literature is contented with a brief note that tourism will be more successful if residents are supportive [7, 9].

Tourism becomes the most industries and has been growing rapidly in many developing countries. The development of tourism along with its residents' support in sustainable tourism has generated diverse literature in recent years by many experts [10-12]. Furthermore, several studies put their focus on residents' support for tourism development. Tourism as a union of activities, services, and industries offers an unforgettable experience by combining accommodation, transportation, attraction, vending, and destination marketing. These activities require goods and services which in exchange do and can provide economic benefits for not only businesses involved therein but also for destinations such as Molucca, and Ambon in particular. The marine environment is still attractive for tourists and goes beyond just ordinary mass tourism with its sea-sand-sun type of tourism. The marine environment is a complex system that becomes more noticeable as an open space for adventure tourism, which provides tourists with the feeling of accomplishing the challenges. This marine-based adventure tourism is perfectly harmonious with the geomorphological characteristics of Ambon where tourists can experience a challenging different type of activities.

Ineffective tourism planning, the residents' awareness, and involvement are required as the experts and practitioners recommend. In return for mitigating impacts and clarifying benefits, tourism planners can earn residents' support for tourism initiatives and create a favorable attitude [13]. Besides that, the residents' attitudes are important for their support for tourism in the destination. It is difficult to develop tourism sustainability in the destination without the participation and support of residents [14, 15]. Despite the importance of residents' awareness in dealing with sustainability challenges, further research is still required in understanding their autonomy in taking the environmental problems in the form of waste as the results of their socioeconomic daily activities.

A various range of studies on the impacts of tourism development on local communities has been conducted over the last decade [16, 17]. The destination’s attractions and other supporting factors within the communities determine the success of local tourism. Another significant factor is also the efficient local management, whether it is management to reduce the negative impacts or the costs of development, or its beneficial management so these benefits can be allocated appropriately and just among residents. Sustainable development of tourism will be achieved by applying proper management of such impacts. Not only can the impacts affect residents’ but also they can directly influence the support for tourism development within the community [17, 18]. The strength of its internal environment of sustainable marine-based adventure tourism development in Ambon. While the vulnerability factors of overcoming the aquatic pollution need to be fully considered, the residents also need to be educated to achieve sustainable marine-based adventure tourism.

Tourism especially marine and coastal tourism has become one of the most important economic industries in the world. Yet despite increased awareness of the economic and environmental significance of tourism, it is only in recent years, scientific research has emerged [19]. Coastal-marine environments are some of the most naturally various areas on earth, sheltering many of the world's plant and animal species. They are also home to hundreds of millions of people who live near the coastal-marine areas along with their diverse activities for life, including tourism. Therefore, there is intense pressure to develop these areas, particularly in developing countries in terms of the attractiveness of the growing nature-based tourism sector. On the other hand, when the plans of these coastal-marine environments are poorly implemented, there will be a significant negative impact. The operational and managerial decisions of the residents in coastal-marine areas will have an important effect on whether tourism can
be a sustainable form of economic development in these ecosystems.

4. Results and discussion
Ambon island is a strategic area in terms of the environmental aspect. Some parts of the island, such as Ambon Bay has coral reefs as the conserved natural resources. However, the existence of natural resources is in danger as pollution becomes higher over time. The typical reason for this pollution is solid waste found in many parts of the island. The increasing household population on the coastal areas around Ambon Island means that the number of solid waste also gets higher. Unfortunately, the improper management of those solid wastes enters the streams, then the currents make those solid wastes either sinking in the bottom of the marine area or floating on the marine water, which ultimately ends up in the coastal area such as presented in figure 2.

From the field survey which can be observed from figure 2 where Tulehu Beach is one of the diving departure point, the main origin of those solid waste come from the household activities as a result of a densely populated coastal area in Ambon Island. However, because Tulehu Beach is also part of a marine-based adventure tourism destination for tourists of non-local residents, solid waste is also generated from these tourism activities. Furthermore, the production of solid waste caused by marine-based adventure tourism such as diving and sea kayaking was also found on the island where no household activities occur. In figure 3 presented below, the solid waste was collected from Pombo Island, a small island that only functions as a marine-based adventure tourist destination.

![Figure 2](image1.png)

Figure 2. An example of a public dumpsite of solid waste at Tulehu Beach as one of the diving departure points. The currents from the marine brought the waste from the sea to the shore.

![Figure 3](image2.png)

Figure 3. A solid waste sample was collected at Pombo Beach.

As with many other aspects of tourism, concerns over the impacts of tourism on the physical environment and related dimensions of sustainable development have become substantial interests influencing research on ocean and marine tourism [5, 20, 21]. Significant improvements in technology, such as transportation and internet network, have also made the oceans more accessible to tourists than ever before. It also brings opportunities for the residents in Ambon to develop marine-based adventure tourism, such as sea kayak and diving. In doing so, about using tourism as a tool for economic development, there have been always trade-offs between the economic beneficial use of marine as the base for adventure tourism development and the importance of its protection. Dixon et al. [22] argued that in the case of the Bonaire Marine Park in the Netherlands, results indicated that proper management can yield both protection and development benefits although it was noted that questions of ecosystem carrying capacity and retention of the economic benefits of tourism within the country did raise important issues for longer-term sustainability of the marine-based tourism product. Issues surrounding the impacts of tourism on island microstates, whose territories are dominated by their maritime areas
[23]. Nonetheless, the extent to which tourism has been a contributing factor to environmental, economic, and social change in coastal areas and, in turn affected by such factors remains one of the central issues of research on coastal and ocean tourism. However, while the concept of sustainability has been one of the major factors influencing tourism research [24], concentration on the environmental dimensions of tourism in coastal and marine areas has been the main foci of tourism research.

Marine-based adventure tourism is all activities undertaken to create fun, challenges, new experiences, health can only be done in the territorial waters. Marine-based adventure tourism is not alone—the eyes of obtaining entertainment of various treats attractions and treats natural coastal and marine environment but also the expected visitors can participate directly to develop. The marine environment is vital for Ambon's tourism sector, yet local community and stakeholder partnerships to conserve it are very limited. An aquatic environment such as seawater is the essential factor for all living organisms, therefore, the maintenance of water quality is important for the sustainability of life [25].

Based on the analysis from the field survey and the literature review, a comprehensive and purposeful waste management system is essential to solve the sustainability challenges caused by solid waste in the marine-based adventure tourism spots in Ambon Island. Although the local government has already carried out a waste management system based on the existing standards and regulations, some improvements are required. One of them is the education for the residents who live and develop the marine-based adventure tourism spots which aiming at raising awareness and how to handle the solid waste produced both by their households and also the tourism sector. When the residents take action, then the sustainability challenges can be overcome.

5. Conclusion
From the literature survey, the authors try to conclude that the residents' optimal involvement in overcoming the sustainability challenges is essential in developing marine-based adventure tourism on Ambon Island. Although the authors’ area of study is restricted by marine-based adventure tourism destinations of Ambon Island, yet the findings can be generalized to the whole Maluku Province considering that residents' culture, socioeconomic factors, and the environment issues show similarities elsewhere. Other stakeholders, such as local government, need to be involved in preserving the marine ecosystem so that the exploitation of the marine as a public dumpsite can be avoided. It is expected that the residents and the other stakeholders design immediate strategies in solving the sustainability problems which have become challenges over the years.

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References
[1] Adventure Travel Trade Association 2015 Adventure Tourism Development Index 2015 Seattle, WA Badan Pusat Statistik 2014 Indonesia dalam angka Jakarta: BPS
[2] Baiquini M, Damanik J and Rindrasih E (Eds) Ecotourism Destinations In Archipelago: Countries Yogyakarta: GMUP (2014)
[3] Marjuka M Y 2007 Economic valuation with the travel cost method on small island ecotourism objects (Case of the Thousand Island Region) Bina Ekonomi Scientific Magazine, Faculty of Economics Unpar 11(2): 80-100
[4] Aris M and Marfai 2014 Quaest. Geogr. 33(1): 107-114
[5] Orams M 1999 Marine tourism: Development, Impacts, and Management (London: Routledge)
[6] Khalil S and Kakar M K 2007 Role of tourism in economic growth: Empirical evidence from Pakistan economy Pak. Dev. Rev. 46: 985-995
[7] Laws E 1995 Tourist Destination Management: Issues, Analysis and Policies, Routlege Topics for Tourism New York
[8] Cole S 1997 Anthropologists, local communities and sustainable tourism development, in M.J.
Stabler, ed., Tourism and sustainability: Principles to practice, CAB International, Wallingford, UK

[9] Ogonowska, Małgorzata, Torre and Dominique 2013 Sustainable tourism and the emergence of new environmental norms European Journal of Tourism Research 6:141-153

[10] Sinclair-Maragh, Gaunette, Gursoy, Dogan, Vieregge and Michael 2015 Residents’ perceptions toward tourism development: A factor-cluster approach Journal of Destination Marketing & Management 4. 10.1016/j.jdmm.2014.10.001

[11] Choi, Hwan-Suk, Sirakaya-Turk and Erkan 2005 Measuring residents’ attitude toward sustainable tourism: Development of sustainable tourism attitude scale Journal of Travel Research 43. 380-394. 10.1177/0047287505274651

[12] Golzardi, Farid, Sarvaramini, Shabnam, Sadatasilan, Kamal, Sarvaramini and Mahsa 2012 Residents attitudes towards tourism development: A case study of niasar, Iran Research Journal of Applied Sciences, Engineering and Technology 4: 863-868

[13] Wang Y A and Pfitser R E 2008 Residents’ attitudes toward tourism and perceived personal benefits in a rural community Journal of Travel Research 47(1): 84-93

[14] Gursoy, Dogan, Rutherford and Denney 2004 Host attitudes toward tourism: An Improved Structural Model Annals of Tourism Research 31. 495-516. 10.1016/j.annals.2003.08.008

[15] Rasoolimanesh S, Mostafa, Jaafar and Mastura 2016 Sustainable tourism development and residents’ perceptions in world heritage site destinations Asia Pacific Journal of Tourism Research 22. 10.1080/10941665.2016.1175491

[16] García A, Fernando, Balbuena, Antonia, Macias and Rafael 2015 Resident's attitudes towards the impacts of tourism Tourism Management Perspectives 13. 10.1016

[17] Gursoy, Dogan, Chi, Christina, Dyer and Pam 2010 Locals’ attitudes toward mass and alternative tourism: The case of Sunshine Coast, Australia Journal of Travel Research 49. 381-394. 10.1177/0047287509346853

[18] Ko, Dong-Wan, Stewart and William 2002 A structural equation model of residents' attitudes for tourism development Tourism Management 23. 521-530. 10.1016/S0261-5177(02)00006-7

[19] Hall and Colin 2001 Trends in ocean and coastal tourism: The end of the last frontier? Ocean & Coastal Management 44. 601-618. 10.1016/S0964-5691(01)00071-0

[20] Tisdale C A ed. 1988 Marine Pollution and Tourism: Studies of the ASEAN/North Australian Situation and Relevant Economic Issues Newcastle: University of Newcastle

[21] Hall C M and Lew A ed. 1998 Sustainable Tourism Development: Geographical Perspectives London: Addison-Wesley, Longman

[22] Dixon J A, Scura L F and Hof T 1993 Ecology and Microeconomics as “Joint Products”: The Bonaire Marine Park in the Caribbean Washington, DC: World Bank

[23] Hall C M and Pasge S (eds) (1996) Tourism in the Pacifisc Issues and Cases (London: Routledge)

[24] Hall, Colin, Lew and Alan 2009 Understanding and Managing Tourism Impacts: An Integrated Approach (London: Routledge)

[25] Hall C M (2001) Trends in oceans and coastal tourism: The end of the last frontier? Ocean & Coastal Management 44, pp. 601-618