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The Best Strategy for Ensuring Sustainability of Bunaken National Park, North Sulawesi Indonesia

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Bunaken National Park (BNP) is one of the most beautiful ecotourism destinations in Indonesia, especially for diving. There is biodiversity, especially coral reefs, pelagic fish and turtles. Due to increased tourist arrivals, there has been damage of coral reefs and sea water pollution, so sustainability of BNP as a tourist destination is threatened. This study aims to choose the best strategy to ensure sustainability of BNP. The result of the study showed that the best suitable strategy to ensure the sustainability of BNP is to make BNP as a limited tourism by setting the visitors and increasing the entrance fee at least twice of current one.

Keywords: BNP, ecotourism, sustainability, limited tourists, system

Introduction

Bunaken Marine Park is one of the most popular underwater tourism locations in Indonesia. The area of Bunaken National Park (BNP) is 89,065 hectare, which has fairly high biodiversity. Several types of flora that live among others: mangrove, seagrass and seaweed. There are 70 types of mangrove such as Rhizora sp, Avicennia sp and Sonneratio sp. Several types of seagrass found are: Halophyla ovalis; Cymodocea rotundata; Cymodocea serrulata; Syringodium isoetifolium; Thalassodendron sp.; Thalassia hemprichii and Enhalus acoroides, as for seaweed is from the type of Eucheuma spp (Merrol & Davie, 1996; as cited in Hakim, Soemarno, & Hong, 2012). Fauna, among others: the coral reefs, fish, mollusks, reptiles and marine mammals. It is estimated that there are 390 types of very beautiful coral reefs, 2,000 species of fish, and various types of turtles that live in the Bunaken Marine Park (Hakim et al., 2012). Due to many species of fish that live in the sea, BNP has become one of the parks with the highest biodiversity in the world (Hakim et al., 2012).

Coral reef and various fish species are the main attractions of Bunaken marine tourism. The beauty of coral reef and underwater paradise in Bunaken Manado is a comparative advantage most alluring for tourists spot dives from anywhere. BNP has 29 very interesting dive spots with a depth of 5 and 40 meters (Anonymous, 2008).

Bunaken is a diving spot which has many advantages. It is surrounded by tropical seas containing the most interesting marine species in the world. Formation and the structural variation of flora and marine life make it very popular and have earned an international reputation for world-class diving. Water clarity and warm temperatures make the location of this maritime region ready to be dived anytime, not depending on the season.

Coral reef ecosystems, mainly composed of various types of coral (hermatipik), and a variety of colorful ornamental fish occupy Stylophora coral colonies, and the marine life is most unique in the world. In addition

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to unique coral reefs, also live different kinds of fish, such as soldierfish and cardinalfish, clown fish, butterfly fish, and turtles, which can be seen by divers.

Local government efforts to develop the park as a leading tourist area for local economic development have prompted an increase in the number of tourists from year to year (Supit, 2007), the increase in the number of tourists about 10%/year, with the number of visits in 2015 around 19,000 tourists (Sangkaeng, Manan, & Oroh, 2015), whereas the maximum capacity is from 13,000 to 15,000, causing damage of most beautiful coral reefs (Kholil & Tangian, 2012). Besides, travelers passing freighter also cause water pollution, thus causing the death of fish and other marine animals (Tangian, Djokosetiyanto, Kholil, & Munandar, 2015). Destruction of coral reefs, the death of fish species and other endemic animals will make the sustainability of the park as a leading tourist area threatened. Therefore, a proper strategy is needed to manage the sea park as sustainable ecotourism.

This study aims to design a proper strategy to ensure the sustainability of Bunaken Marine Park as featured ecotourism area of North Sulawesi province, using a systems approach.

Literature Review

Ecotourism is a responsible travel, for the conservation of the environment by taking into account local values. Ecotourism is tourism concept which is becoming famous and begins to be adopted by the government or the manager of a tourist attraction in providing image on its tourist objects. Ecotourism is also a concept that sees tourism as part of a system, and there is interaction of economic, social, and environmental (Mendoza-Ramos & Prideaux, 2007). So the development of ecotourism has to consider the achievement of ecological, improved quality of life and economic sustainability (Bater et al., 2001). According to The International Ecotourism Society (TIES, 1990; as cited in Drumm & Moore, 2002), ecotourism is responsible travel to natural areas that conserves the environment and improves the well-being of local people. The basic principal of ecotourism is the concern and responsibility to the environment, in accordance with the rules of ecological and agreement of local communities (Mowforth & Munt, 2009; Purnobasuki, 2012).

Nugroho and Suryono (2013) expressed that in the globalization era, traveller trip leads to environmental and ecological preservation, which is called as ecotourism. Ecotourism will be an attractive option for travelers who already saturated in cultural interest and artificial. According to Achmad, Ngakan Umar, and Asrianny (2012) and Putra, Anggoro, and Kismartini (2015), development of ecotourism must have some criteria, among others: (1) should be environmentally friendly, economically sustainable and in harmony with social and cultural conditions of the ecotourism destination area; and (2) ensure that the nature conservation and biodiversity as the main resource of tourism. According to Butler (1980), there are six stages in development of tourist area, as described in Figure 1.

Figure 1. Cycle of tourism development (Butler, 1980).

Sustainability has a meaning that natural resource's management should have the same benefit of the present and future. Sustainability for coastal areas has physical, chemical/biological, and social parameters. Physical parameters are related to the area, and the physical condition of coastal areas, the chemistry/biology parameter is related to water quality, the amount of oxygen, the number of species, marine life and vegetation. While social indicator is related to the density of the area, public access to the beach, existing infrastructure, and public participation (Organisation for Economic Co-operation and Development [OECD], 1993). There are three main indicators to measure the level of sustainability of coastal fisheries resources management, which are ecology, economic and social (Dahuri, 2003), institutional strengthening is the most important factor for BNP to ensure sustainability of ecology, economic and social (Kholil & Tangian, 2012). For more complete analysis of sustainability, it is important to analyze the indicator of institutional and infrastructure (Directorate General of Capture Fisheries, 2011; Kholil & Puspadewi, 2014). The problems encountered in the management of coastal fisheries resources are the low awareness of the stakeholders of the importance of sustainability and the existence of contestation in the utilization that tends to over fishing (Dahuri, Rais, Ginting, & Sitepu, 1996; Cicin-Sain & Knecht, 1998). Sustainability of ecotourism is a complex problem, because it involves technical and non-technical issues, requiring a holistic approach (Kholil, Sukamdani, & Soecahyadi, 2017). The systems approach is an integrative approach, which is characterized in cybernetics, holistic, and effective (Eriyatno, 2013). Through a systems approach, various aspects related will be identified and influence each other, so that recommendations can be taken in accordance with the objective conditions (Kholil, Kumala, & Listyarini, 2014).

Methodology

Bunaken Park management is a dynamic and complex problem, so the method used is system approach which enables the analysis to be done holistically. It is complex because it involves a wide range of stakeholders from government, business, academia, and society (Speakman & Garay, 2016). It is also dynamic because there are changes along with changes in time.

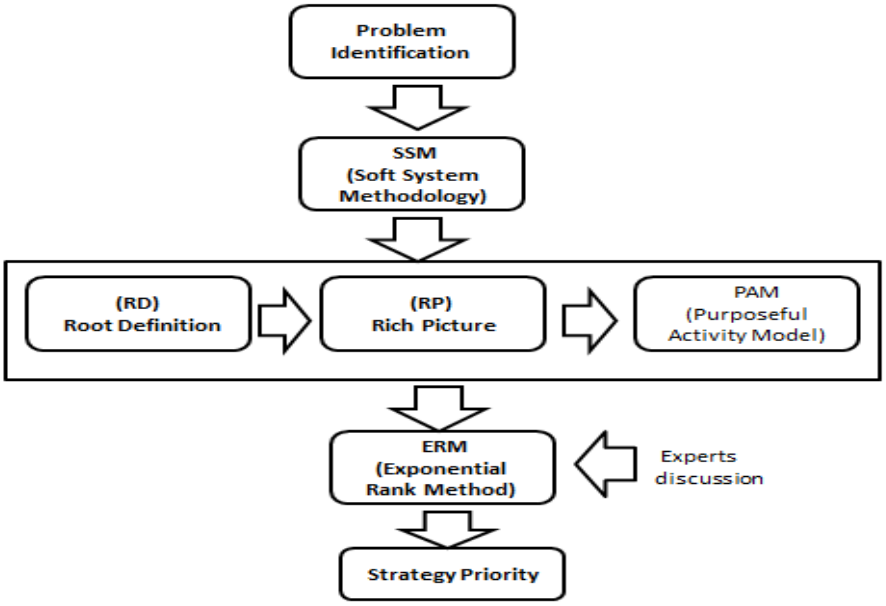

Figure 2. Steps and method of study.

System approach is selected using Soft System Methodology (SSM) developed by Checkland and Scholes (1990), which begins with the formulation of rich picture (RP), root definition (RD) and ended with the formulation of purposeful activity model (PAM). While deductive begins with the institutional analysis based on theories of organization. In general, methodology of studies is shown in Figure 2 above.

Exponential Rank Method (ERM) is chosen to determine the best option based on ecotourism development criteria, using the formula:

$$TNi = \sum_{k=1}^{n} RKij^{TKKj}$$

where:

TNi: Total value element to *i*;

RKij: Degree of relative importance criteria to-*j* at decision option to *i*;

TKKj: Degree of decision improtance criteria to-*j*; *TKK* > 0;

n: Number of selection decisions;

j: Number of criteria decisions.

Data were collected through questionnaires given to expert respondents. There are five expert respondents selected in this study: the policy makers represented by the Head of Regional Development Planning Agency, academics, practitioners, community leaders and business actors.

Result and Discussion

Inductive analysis results show that in the last three years (2013-2015), tourist arrivals are likely to decline, as shown in Table 1.

Table 1

The Number of Tourist Arrivals (2013-2015) and the Decline of Coral Reefs

Year	Foreign tourists	Domestic tourists	Total	Coral reef (hectares)
2013	5,720	12,189	17,909	2,925.00
2014	7,342	10,264	17,606	2,693.00
2015	10,000	3,000	13,000	2,478.00

Note. Source: Tourism Agency of North Sulawesi (2016).

One of the factors causing the declining area of the coral reef is the activity of tourists. Based on the data of travellers (2012-2016), most of them dive into the coral reef. The average of tourist diving is 10,000-12,000/year, while the maximum capacity is only 8,000-9,000 (Supit, 2007). This means that the tourist activity has exceeded the environmental carrying capacity.

By using the concept of CATWOE developed by Checkland and Scholes (1990), the “root definition” of BNP can be defined as: “Marine tourism center as a major attraction for tourists, professionally managed with the involvement of relevant stakeholders to ensure environmental sustainability and economic benefits for the surrounding communities”.

Based on the results of stakeholder analysis and discussion from experts, the RP can be described as shown in Figure 3.

Figure 3 shows that the management of BNP should involve various parties with different interests. In general, there are several key stakeholders, namely, local government, the central government (Ministry of Tourism), the agency of National Bunaken Park, business travel (hotels, restaurants and travel agents), as well as research institutes/colleges. Each stakeholder should coordinate with the governing body. Without proper coordination would avoid overlap and inefficiency, since each has a different vision and mission.

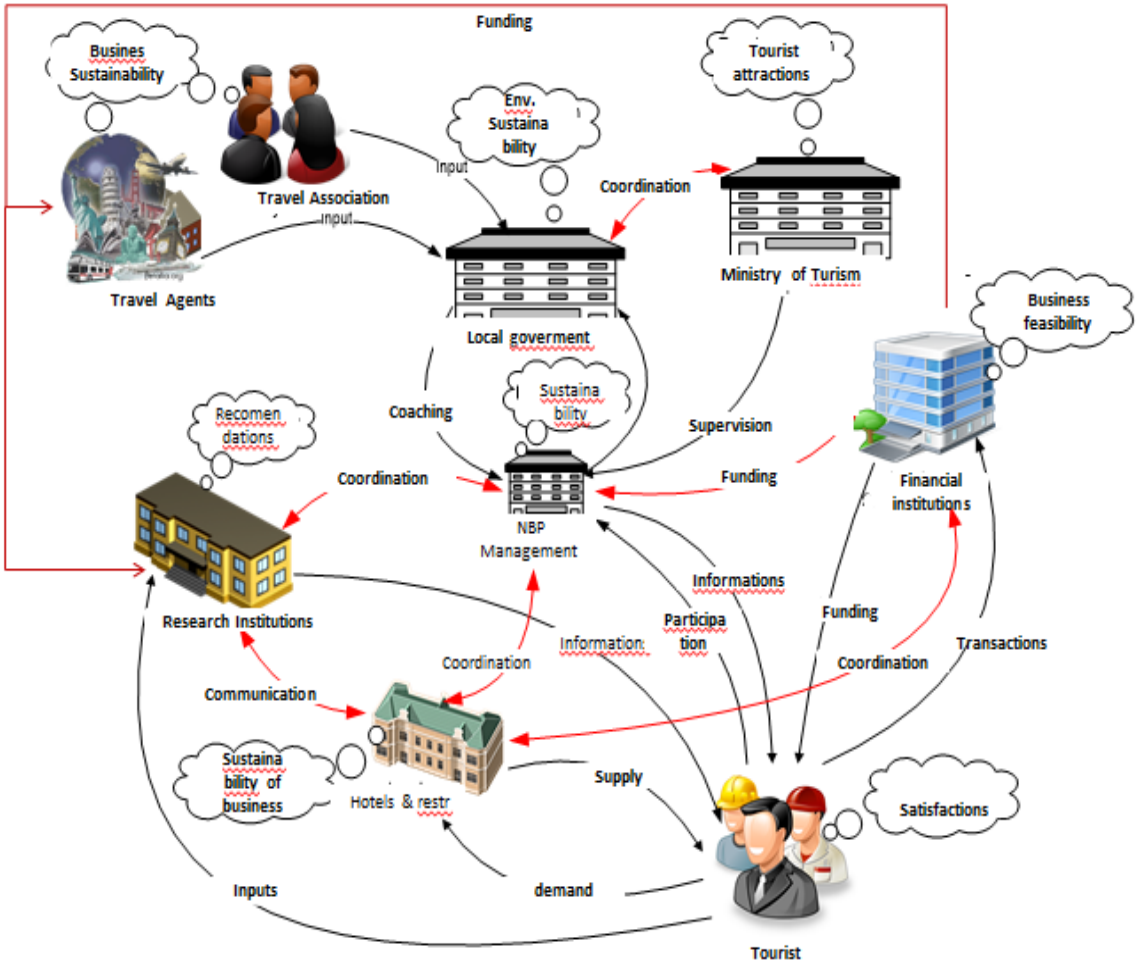

Figure 3. Rich Picture of Bunaken National Park.

The final step of the inductive process of SSM (Checkland & Scholes, 1990) is the development of PAM. From various sources (regulations, experts, and discussion with entrepreneurs in the field) can be developed PAM as follows (see Figure 4).

Some of the activities in the development of the BNP as a featured ecotourism (1-8) represent a set of activities by involving various stakeholders, visitor restriction, involvement of tourists, financial institutions and local community as the main stakeholders. Visitor restriction will affect the reduction of ship-owners income. Therefore, it may be rejected by the ship owners, but restriction of visitors will ensure the sustainability of their business. So, involvement and awareness of local people (Kholil, Susanty, & Soecahyadi, 2016) especially ship owners is very important.

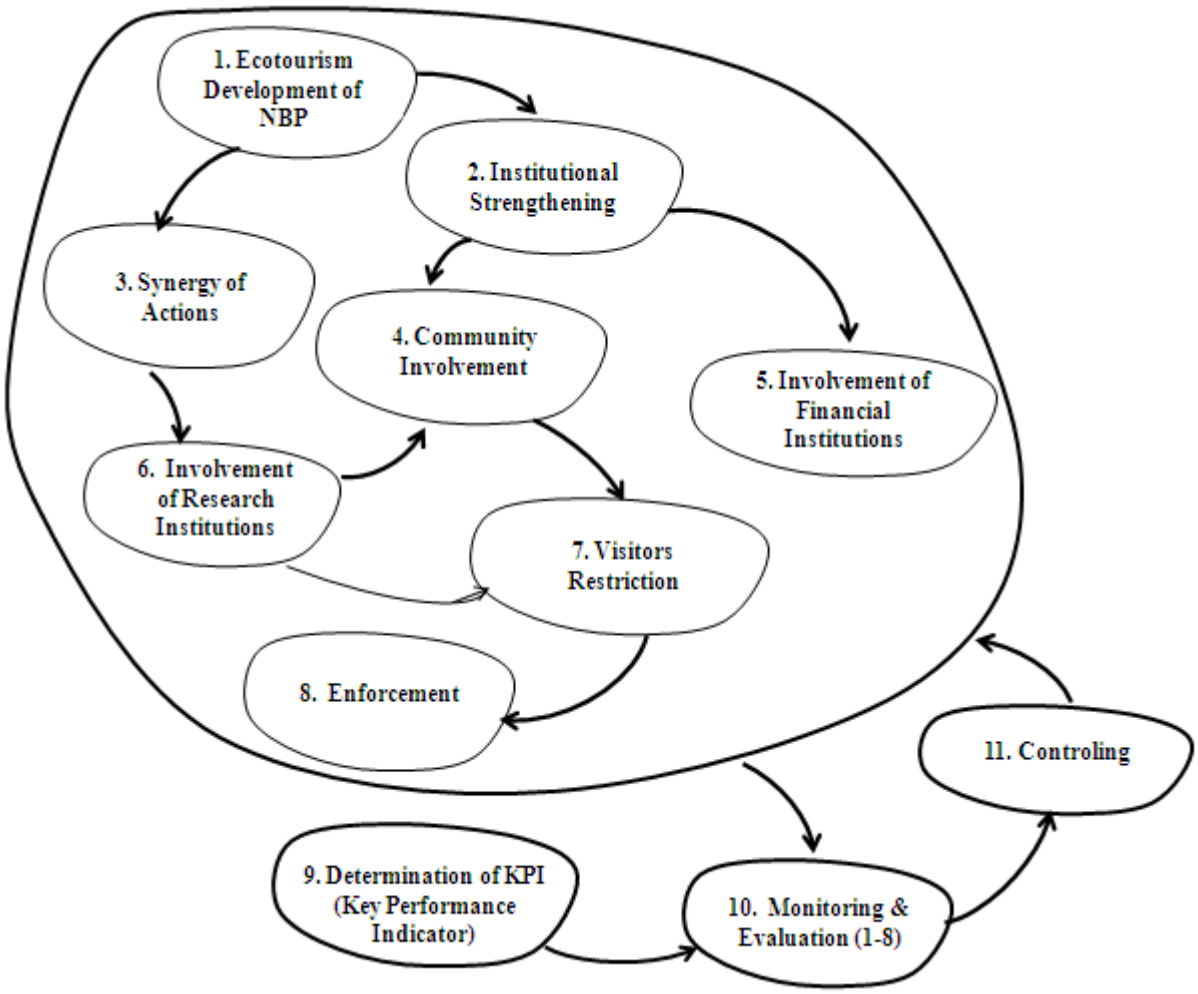

Figure 4. PAM development of TNB as ecotourism.

Based on the above PAM, using ERM, through expert discussion, we obtained the first priority strategies to ensure the sustainability of BNP is "visitor restriction", as shown in Table 2. Tourist restrictions are made through setting time of visit for tourists adjusted to a maximum capacity of 9,000 people.

Table 2

Priority of Strategy to Ensure Sustainability of BNP

No.	Criteria	Level of criticality (1-5)	Alternative of strategy				
			Monitoring and enforcement	Institutional strengthening	Public participation	Visitor restriction	Restriction of tourist activities
1	Sustainability	5	2.2	2.0	2.2	3.0	2.7
2	People welfare	3	3.0	2.9	3.0	3.9	2.9
3	Local government income	4	3.2	3.2	3.9	3.1	3.1
4	Employment	5	2.1	3.1	3.1	3.8	3.2
5	Business opportunities	3	2.0	2.2	2.0	2.2	2.1
	Value of ERM		83	86	125	129	87
	Rank		5	4	2	1	3

Restrictions on visitors is a top priority followed by the involvement of the local community, both strategies are strongly associated. Empirically, the more visitors will be even greater economic benefits for the surrounding communities. But an increase in the number of visitors that exceeds the maximum capacity will have a negative impact on the sustainability of coral reef. Visitor restriction strategy can be done by raising the price of admission at least two times from now. By paying only Rp 50,000 as an entrance ticket and Rp 250,000 for rental boats (motor boat), the number of visitors continues to increase, thus reaching 15,000-20,000 people/year, far above the maximum capacity of 8,000-9,000/year. Total revenue will be IDR 750,000,000 for ticket and IDR 3,750,000,000 for all boat owners. By doubled of entry fee and rental boat and assumed visitors to be 9,000, total revenue will be higher at IDR 900,000,000 for ticket and IDR 4,500,000,000 for boat owners. By raising the price of admission will reduce the number of visitors, so the pressure on the park declined.

Strategies to raising entry fee will cause reduction in the number of tourists, but the aggregate revenue did not decline and may actually increase. Thus, the risk of the destruction of coral reefs and the death of other marine biota will be reduced, so that sustainability can be assured.

Conclusion

The number of visitors exceeded the carrying capacity, which will negatively impact on the sustainability of the park as featured ecotourism in North Sulawesi. The right strategy to ensure sustainability is to establish the park as limited tourism instead of mass tourism by limiting visitors (by raising the admission fee) at least two times and the involvement of surrounding communities.

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