

Ecotourism Development-based on Local Wisdom of Coastal Community in Biak Numfor Regency Papua Province

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Abstract. Biak Numfor is an island district located in the Saireri region of Papua Province which has abundant natural resources and a strong local culture as a potential for coastal tourism that can be developed to improve the economy of the local community. Thus, this study aims to provide an overview of ecotourism potential and the formulation ecotourism development concept based on local wisdom as a recommendation for local governments in making tourism development policies. The development of local wisdom-based ecotourism in Biak Numfor Regency is based on the principle of sustainable development. This study uses a quantitative descriptive approach with primary data sources in the form of observations and in-depth interviews as well as secondary data from various publications in 2012-2018. The results of this study indicate that Biak Numfor Regency has a variety of tourist objects consisting of nature tourism, beach tourism, marine tourism and historical tourism as well as cultural tourism "*Munara Wampasi*" which is annually conducted, in which the management requires the equalization of concepts and synergy between local governments and local communities to optimize ecotourism which will have a direct impact on improving the community's economic condition.

Keywords: Ecotourism; Local Wisdom; Coastal Community.

1 Introduction

Biak Numfor is one of the island districts located in the coast of the Saireri customary region of Papua Province. The development of coastal tourism is focused on the landscape or natural beauty, Characteristics of the ecosystem, the peculiarities of art and culture and the characteristics of the local community as the basic strength possessed by each region [1]. Biak Numfor has the potential of Its uniqueness and natural beauty, customs and culture of a strong local community that can become an attraction having a positive impact on improving the regional economy and the people's welfare.

Regarding the characteristics of the coastal region, the development of Biak Numfor tourism is directed to the development of sustainable ecotourism based on the local wisdom. In its implementation, Ecotourism integrates various elements such as trips to a tourism spots (for example: natural forests, caves, beaches, underwater life, the life of indigenous peoples, etc.), learning activities, in order to increase knowledge and tourist experience, promoting

natural resources conservation efforts (flora and fauna), culture, and increase the awareness and capacity of local communities [2].

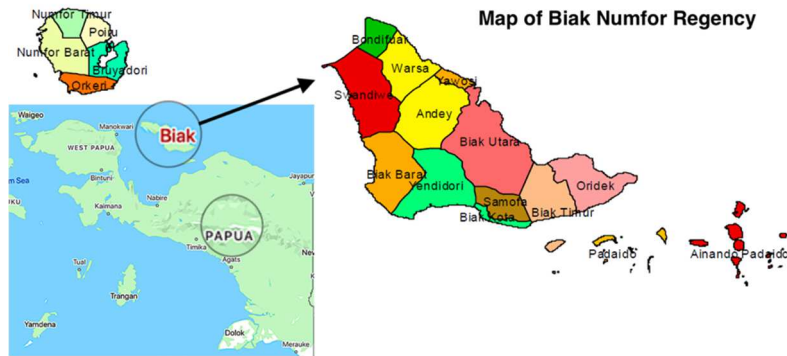


Fig. 1. Map of Biak Numfor Regency, google map processed.

Community-based ecotourism emphasizes the active role of local communities so that the involvement of local communities is absolute. This ecotourism pattern recognizes the rights of local communities to manage tourism activities in areas owned both traditionally and as managers [3]. Knowledge of the local community about the natural environment, as well as the customs and culture they have, will influence the development of ecotourism in the area.

Ecotourism is a reflection of the lives of local people who are involved in the development and improvement of the regional economy. Through participatory development patterns, local communities are given the opportunities and are encouraged to improve their ability to develop ecotourism in the area. Fotiou *et al*, asserts that the role of local community participation is very important, especially in remote areas and islands, because ecotourism destinations are generally located in the vulnerable areas and scattered in remote areas [2]. Furthermore, the success of local community participation depends on the goals and ideology of each stakeholder in the development of ecotourism itself [4].

The ecotourism policies and planning are to provide benefits to the local communities and the environment, such as having new occupation and additional income, opening markets for local products, improving infrastructure, providing community facilities and services, new technologies and expertise, increasing cultural awareness and environment, protection and conservation, and improvement of land use patterns [4]. The involvement of local communities in ecotourism has a positive impact on the community it self as shown in table 1.

Table 1. Potential Impacts of Tourism in Communities [5]

No	POSITIVE (with community participation)		NEGATIVE (without community participation)	
	For communities	For protected areas	For communities	For protected areas
1	Sustainable income	Reduced threats and compatible economic development (CED)	Erosion of natural resource base	Incompatible economic development
2	Improved services	Reduced threats and CED	Growing economic inequity	Poaching, overuse of natural resources
3	Cultural empowerment	Reduced threats and CED	Cultural erosion	Alienation from traditional sustainable use

Sustainable tourism development means building a community economy based on the potential of local communities as shown in figure 2. Related to the development of sustainable tourism, ecotourism based on local communities must meet 3 basic conditions namely: first, the opportunity to get economic benefits must be formed in a culturally acceptable ways, so that it can be accessed by the community; Second, ecotourism must support tenure security, and local communities have the ability to decide on land use; and Third, ecotourism must encourage more tangible social and political justice [6]. Ecotourism as the core of sustainable tourism, is also understood as a form of deep and cautious regional management paradigm (especially towards local residents, culture, and nature), according to Machnik [2].

In developing ecotourism, Ojong *et al*, emphasized three important things to be considered: first, local communities in the ecotourism area should receive correct information about the potential and impacts of ecotourism; second, industrial stakeholders or tourism businesses must provide a conducive environment to encourage the participation of local communities; and third, the lack of public knowledge and concern for ecotourism can be increased through community education [2].

The development of various tourism places in the framework of ecotourism based on local wisdom in Biak Numfor district will be a special attraction both for domestic and foreign tourists, so that it can increase the intensity of tourist visits. Direct involvement of local communities will effect on the growth of various economic activities in the community, thus it will increase communities incomes and encourage welfare. The growth of various economic activities as a result of ecotourism activities particularly effect on the increasing of tourism sector and the regional economy incomes generally.

Along with the importance of developing sustainable tourism in the coastal region, this study is carried out to provide an overview of the tourism potential in Biak Numfor district, as well as to analyze the development of the number of tourists visiting, tourism sector revenue growth and its contribution to the regional economy as well as formulating development concepts of ecotourism based on the local wisdom with the principle of sustainable development as a recommendation for local governments in making tourism development policies in Biak Numfor district.

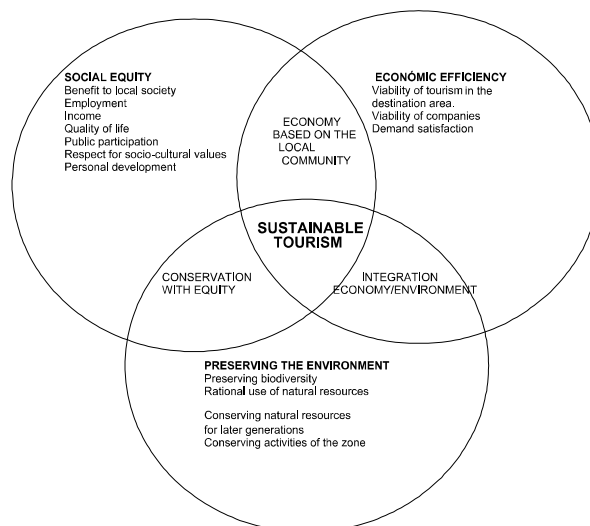


Fig. 2. Model of sustainable tourism development [7].

2 Research Method

This study applied quantitative descriptive approach using primary and secondary data for the period of 2012-2018. A quantitative descriptive approach is used to explain the results of field research obtained [8] with numeric and graphics statistical methods to recognize patterns of a number of data, summarize the information contained in the data and present it as required [4].

Primary data is data obtained from field surveys directly from the first sources using original data collection methods [4] such as the observation method and in-depth interview. Observations are carried out by being directly involved in the field being observed to obtain and collect data that will be processed based on the research purposes. In-depth interviews were conducted to key informants related to research conducted such as local government, village officials, local communities, and tourists.

Secondary data is data or a collection of data obtained, covered and collected from various reports that have been published by an institution beforehand to the data user community [4]. The data in this study were published by the Central Statistics Agency (BPS) of Biak Numfor Regency, where the data were in the form of numbers, types and locations of the tourism places, number of lodgings, number of tourists/ visitors, tourism sector GRDP and total GRDP of Biak Numfor Regency. Secondary data collection is done by using documentation and literature study methods.

Documentation is a way to collect data obtained from existing documents or records that are stored either in the form of transcript notes, books, newspapers, magazines, inscriptions, minutes, agendas related to research problems. Meanwhile, the literature study was conducted to obtain a number of secondary data and various empirical studies related to research problems, which were conducted by studying various literature and periodic reports (monthly/annually) available on the research object. Then, to analyze the growth of tourists visiting, tourism sector revenue growth and its contribution to the economic growth of the Biak Numfor district, the following general formula of growth and contribution modification is used:

$$G_{it} = \frac{PRDB_{it} - PDRB_{it-1}}{PDRB_{it-1}} \times 100\%. \quad [9]$$

Where, G_{it} is the growth of the tourism sector, $PDRB_{it}$ is the revenue of the tourism sector and t shows the year.

$$S_{it} = \frac{PDRB_{it}}{Total\ PDRB_t} \times 100\%. \quad [9]$$

Where, S_{it} is the contribution of the tourism sector to the regional economy, $PDRB_{it}$ is the income of the tourism sector, $Total\ PDRB_t$ is the total income of the regional economic sectors, and t shows the year.

3 Results and Discussion

3.1 Tourism Potential of Biak Numfor Regency

Biak Numfor which is in the Saireri customary area is the regency that has the second most tourist attraction among other regencies / cities in Papua province after Nabire Regency in the Meepago customary area. Biak Numfor and 4 other districts are regencies with the

highest number of tourist objects representing each customary area¹ in the Papua province as shown in Table 2.

Table 2. Most Tourism Objects in each Indigenous Territory in Papua Province [10][11][12][13][14]

No	Regency	Indigenous Territory	Number of Tourism Objects
1	Nabire	Meepago	51 objects
2	Biak Numfor	Saireri	44 objects
3	Jayapura	Mamta	40 objects
4	Merauke	Anim Ha	34 objects
5	Jayawijaya	Lapago	16 objects

Various natural tourism objects such as beach and forest tourism, historical tourism and artificial tourism are spread in 14 sub-districts of 19 districts in the district as shown in table 3. Table 3 shows that the most tourist objects are scattered in Biak Kota sub-district with 8 tourist objects and followed by the East Biak sub-district, and Oridek sub-district, each of which has 6 attractions, and the Warsa sub-district with 5 attractions. The 29 coastal tourism objects are the most tourism objects owned by Biak Numfor district. Furthermore, there are 11 historical attractions, 1 artificial tourist attraction and 3 other natural attractions (Batu Merah, Gaharu Forest, Sombundi Protection Forest).

Although it has many beach tourisms, the most popular one is the Bosnik Beach in East Biak, Wari Beach in North Biak, and Water basis Beach in Kota Biak. It is due to the fact that these tourist objects are located near Kota Biak, which means they are easy to reach.

Table 3. The Name, types, and location of Tourism in Biak Numfor regency [15][16][10]

Districts	Tourism Objects	
	Name	Types
Biak Timur (East Biak)	Marau Beach, Saba Beach, Owi Island, Segara Indah Beach, Lima Kamar Cave, Taman Burung (the Birds Park)	Nature, historical, and artificial tourism
Oridek	Anggaduber Beach, Mnurwar Beach, Barari Cape, Sawadori Beach, Sauri Beach, Makmakerbo Cave	Nature and historical tourism
Samofa	Goa Jepang, Pepera Monument	Historical Tourism
Biak Kota (Biak City)	Yensumber Beach, Paray Beach, Kolam Biru Paray, Water Basis Beach, World War II Paray Monument, KLM Monument, Mac Arthur Monument	Nature and historical tourism
Yendidori	Impendi Beach, Urfu Beach, Samber Beach, Tua Padwa Cemetery	Nature and historical tourism
Padaido	Auki Island, Wundi Island	Nature tourism
Biak Utara (North Biak)	Korem, Yobdi, Wari, Tugu Tsunami	Nature and historical tourism
Andei	Wouna cultural side	Historical Tourism
Yawosi	Saruri Cape	Nature tourism
Warsa	Sawai dan Aman Beach, Komboy Beach, Batu Merah, Wafsarak Waterfall, Gaharu forest	Nature tourism
Bondifuar	Sansundi Beach, Sombundi forest	Nature tourism
Biak Barat (West Biak)	Wapsdori waterfall, Tua Sopen Village	Nature and historical tourism
Swandiwe	Mardori Beach	Nature tourism
Poiru	Asaibori Beach	Nature tourism

¹ There are 5 Customary Regions in Papua Province namely Mamta, Saireri, Meepago, Lapago and Anim Ha.

In addition to the above various tourism objects, there are also new tourism objects that are starting to be visited by tourists, both local, domestic and foreign tourists. These attractions include Anggopi Beach, *Telaga Biru Samares*, *Telaga Hijau Kampung Mambesak*, Raja Tiga Adoki, Samber-Binyeri Minapolitan Village, Samberpasi Islands marine tourism, and Yensama Tourism Hab. Among these new tourist attractions, there are four leading tourism places in Biak Numfor Regency in 2019, namely the marine tourism Samberpasi Islands, Auki Island, *Telaga Biru Samares*, Samber-Binyeri Minapolitan Village and Yensama Tourism Hab.

In increasing tourist attraction, Biak Namfor does not only rely on various tourist objects owned but, it holds annual tourism events under the name "*Biak Munara Wampasi Festival*", and in 2019 this event has been held for the seventh time. In this festival various attractions originating from Biak cultural traditions such as *Snap Mor* (the tradition of catching fish in low tide), *Apen Beyeran* (walking on hot rocks), Wairon Boat Paddle (commercial boat as well as war boat) and *Perahu Mansusu* (boat with two front-back bow that has multi-functions), Wor Dance typical of Biak culture, craft exhibition of local people, trips to various tourist objects (including snorkeling on the beach), photography competition and other typical Biak cultural arts performances.

Although it has a lot of tourist objects, the lodging facilities available are only 16 hotels in the Biak Kota sub-district and 1 hotel in the Samofa sub-district. Of the 17 hotels, there are no five-star and four-star hotels, but there is only one three-star hotel, the Asana Hotel, one two-star hotel, the Nirmala Beach Hotel, and 15 other hotels belonging to the jasmine hotel category. Up to now there are no homestay available in each location of the tourist attraction. Meanwhile the accommodation system used in ecotourism is Homestay. A homestay is a simple lodging accommodation owned and managed directly by each family in the local community (both in the form of a special house prepared and a family home that is used as lodging). The homestay system as an ecotourism product, has a high value because it can provide direct economic benefits for the local community as the owner, and it also provides benefits for tourists because they get the opportunity to learn about the surrounding natural wealth, customs and culture of the local community in daily life.

In addition to the unavailability of homestay facilities, there are also other limited facilities, such as limited parking lots, trash bins, showers or changing rooms and public toilets, swimming equipment rental, diving and snorkeling, outboard motorboat or speedboat rentals. The tourism management is still done individually in traditional ways, for example there is no standard imposition of vehicle parking fees, entrance fees, and rental rates for Para-Para (seats by the beach), so that the fees are based on "willingness" of tourists who visited.

3.2 Tourist Development, Tourism Sector Revenue Growth and Its Contribution to the Regional Economy of Biak Numfor Regency

Referring to the number of tourists visiting, both foreign and domestic tourists as shown in table 4, it is known that the interest of domestic tourists is very large compared to foreign tourists. The number of domestic tourists reaches tens of thousands each year, while the number of foreign tourists only reaches thousands and even declined to hundreds in the last two years.

Table 4. Tourists Visits in Biak Numfor [15][16][10]

Years	Tourists		Total
	Foreign	Domestic	
2011	1442	47130	48572

2012	1330	52775	53905
2013	2075	40400	42475
2014	1771	42366	44137
2015	3405	42780	46185
2016	1314	56557	57871
2017	973	55272	56248
2018*	371	38621	38992

*) Excluding tourists staying at the Asana Hotel²

Regarding its growth as shown in figure 3, the growth rate of foreign and domestic tourists visiting the regency of Biak Numfor tends to be fluctuating with declining numbers and even experiencing negative growth. The number of foreign tourists experienced more negative growth, and it was the opposite for the growth of domestic tourists. Positive growth rates for foreign tourists only occurred in 2013 and 2015 with growth number of 56.02 percent and 92.26 percent respectively, which is also the highest compared to the growth of domestic tourists. Domestic tourist growth due to the highest domestic tourist growth rate achieved in 2016 with a figure of 32.20 percent, an increase from the previous year which only experienced growth below 1 percent. The tendency of a decrease in the number of tourists, especially foreign tourists visiting Biak Numfor, generally occurs due to security factors that are less conducive in the Papua as a whole. Various shocks that occur in other regency areas, will indirectly also affect the Biak Numfor district. It is due the lack of knowledge about the geographical location of the Papua region and the lack of complete information about the mobility of travel to reach tourist destinations (Biak Numfor). The high cost of travel (especially flight ticket prices) is also a factor in the decline of tourist visits to the region. In addition, the lack of promotion causes various tourist objects in Biak Numfor district to be unknown by the public at large both domestically and abroad.

The Revenue (GRDP) of Biak Numfor tourism sector showed fluctuated positive growth, but it declined even experienced a very small growth of under 1 percent declined to reach the lowest growth below 1 percent that occurred in 2015 (by 0.19 percent), 2017 (by 0.11 percent) and 2018 (0.79 percent). Tourism sector revenue growth tends to decrease in line with the decreasing number of tourists visiting Biak Numfor district.as shown in figure 3. The highest growth rate occurred only in the early years of the study period in which the tourism sector GRDP grew by 8.13 percent, then declined to reach the lowest growth below 1 percent that occurred in 2015 (by 0.19 percent), 2017 (by 0.11 percent) and 2018 (0.79 percent). Tourism sector revenue growth tends to decrease in line with the decreasing number of tourists visiting Biak Numfor district.

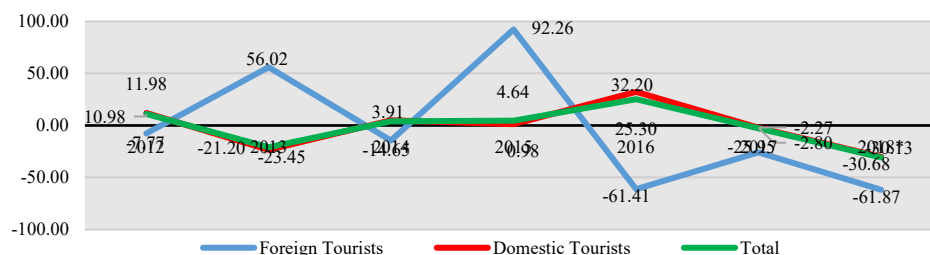


Fig. 3. Tourist Growth in Biak Numfor Regency, [15][16][10] processed.

² The data comes from the Central Statistics Agency of Biak Numfor Regency, where Asana Hotel data is not yet available.

The contribution of the tourism sector to the Biak Numfor GRDP is very small at under 1 percent per year. During 2012-2018 the tourism sector's contribution only ranged from 0.75 percent to 0.86 percent. It illustrates that although the Biak Numfor district has the most tourist attractions in Papua, the tourism sector has not been able to contribute significantly to the regional economy. It proves that the tourism management of Biak Numfor district has not been effectively carried out. Local people have not played an active role in the management of existing tourist objects, thus the tourism activities have not been able to improve the economy of the local community specifically and the regional economy in general. Tourism management, especially community-based ecotourism development, must be carried out by the regional government by involving related parties that work together. By utilizing a variety of existing tourism potentials, the development of ecotourism in the Biak Numfor district in the future is expected to become a leading sector of the region that contributes significantly to the regional economy and improving the community welfare. It is in line with the statement stating that ecotourism is able to provide working opportunities, business opportunities, and improve the development of business skills, thus it is beneficial in improving the economic life of local communities [17].

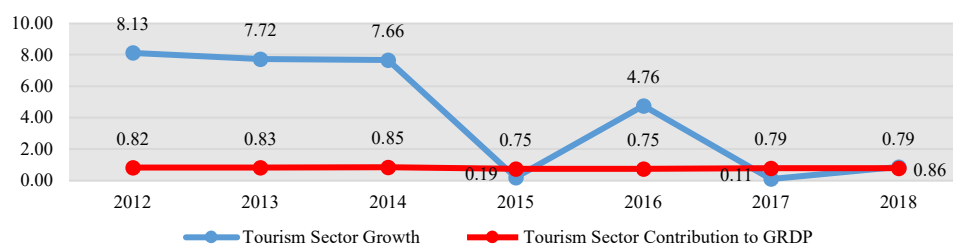


Fig. 4. Growth of the Tourism Sector and Its Contribution to the Biak Numfor GRDP, [18][19] processed.

3.3 Ecotourism Development Based on Local Community Wisdom in Biak Numfor Regency

The ecotourism development in Biak Numfor regency is carried out accordingly with the national tourism development plan where tourism development is carried out by considering various important aspects such as diversity, uniqueness, and cultural and natural characteristics, as well as human needs to travel³.

The ecotourism development can improve the economy of the local community. The development can be done by building strategic partnerships between local governments, tourism businesses (the private sector, such as business owners and travel companies), local communities, even tourists and other relevant parties. It supports the previous researchers [5] who stated that to achieve ecotourism success, there needs to be a partnership between the government, the tourism industry, local communities, funders, Non-Government Organizations (NGOs), and also the tourists.

Furthermore, this partnership pattern may be realized in several ways such as:

- a) Educating the local community through socialization starting from the Village Head, Village Apparatus, Traditional Elders and the village community or indigenous people to be directly involved in tourism business activities on existing tourist objects which are

³ The Ministry of Tourism's Strategic Plan for 2015-2019.

located in almost every village in Biak Numfor. Thus the village community or indigenous people can play a role as a tour guide who can educate tourists about local customs or culture, historical values of attractions and efforts to preserve the natural resources they have. To further facilitate the educational effort, a tourist guide pocket book can be made which contains the ethics of traveling in accordance with the culture of the local community and still maintaining the preservation of natural resources in each tourist attraction.

- b) To Establish Village-Owned Enterprises (*BUMKamp* or known as *BUMDes* for other regions in Indonesia) that are engaged in tourism businesses such as providing tourist facilities. Various tourist facilities that can be provided include homestays (It can also be provided by each family), Para-Para (beachside seating), parking lots, trash bins, public toilets, information boards and tourist support facilities such as outboard motorboats or speed boats to visit other islands, diving and snorkeling equipment, swimming equipment, buoys, and other supporting facilities. The establishment and strengthening of this *BUMKamp* can manage the funding from the Village Fund, where the program or activity is outlined in the RPJMK (Village Medium Term Development Plan) and budgeted in the APBK (Village Budget and Revenue).
- c) Conducting Tourism Object Management Training for local communities such as English language training or courses, management of tourism object management, homestay management training including hospitality (service quality) and culinary provision (food management). Furthermore, one of the activities done by the local government is strengthening the management of tourism spots through tourism management training.
- d) Promoting tourism by involving all relevant tourism actors (stakeholders) to introduce and socialize various tourism objects and ecotourism products and services owned by the region, thus it can increase the interest of domestic and foreign tourists, which will also increase the income of the tourism sector in the region. Tourism promotion can be done in various ways such as conducting regular tourism events, and making tourism advertisements both through printed media (such as newspapers, magazines, brochures and billboards) as well as electronic media (such as television, radio, websites, and various mobile applications). The promotions that have been carried out by local governments and local communities are done through annual events namely the "*Biak Munara Wampasi*" Festival and the establishment of a tourism information center in Biak Kota. In addition, the local government of Biak Numfor district has also cooperated with Stated-Owned Enterprises i.e., PT. Angkasa Pura I Frans Kaisiepo Biak Airport and PT. Garuda Indonesia, and other elements such as tourism business service providers (including travel agents), aviation service businesses (including PT. Garuda Indonesia), professional organizations and young generation or tourism volunteers in the context of promoting various tourist destinations in Biak Numfor.
- e) Developing tourism infrastructure and improving existing infrastructure. In this regard, the local government has done the construction of a tourism information center building and supporting facilities which are located in the Biak sub-district, the capital city of Biak Numfor district. Additionally, development and improvement of infrastructure facilities in the tourism sector's main program is also done, such as marine tourism of Samberpasi Islands, Auki Island, *Telaga Biru Samares*, Samber-Binyeri Minapolitan Village and Hab Yensama Tourism.

4 Conclusion

Biak Numfor has the most tourism objects among other regencies/cities in Papua province, such as natural tourism (beach and forest tourism), historical tourism, artificial tourism and cultural tourism. However, the number of tourists visits tends to decrease every year. The decline is strongly influenced by several things including security issues, high transportation costs, and lack of promotion. It effects on tourism revenue growth which also tends to decline, and its contribution to the regional economy is still very small. Therefore, by having its potential, Biak Numfor regency is encouraged to develop coastal tourism by developing ecotourism based on the local wisdom. Ecotourism development can be done by building strategic partnerships between local governments, tourism businesses, local communities, even tourists and other related parties which are realized by educating local communities, forming village-owned business entities in the field of tourism businesses, conducting various tourist management training, tourism promotion, as well as the construction and improvement of tourism infrastructure.

The development of ecotourism based on local wisdom in the Biak Numfor district can actually be realized through the following ways:

- a) Making effective use of Village Funds to form *BUMKamp*, in which the establishment is set out in the RPJMK (Village Medium Term Development Plan) and budgeted in the APBK (Village Budget and Expenditure Budget) of each village having tourism objects, as well as providing assistance in the management of the *BUMKamp*. It can be done gradually and continuously every year.
- b) Making effective use of the Special Autonomy Fund through budget allocations in the field of social economy and affirmation to finance the construction and improvement of tourism infrastructure, tourism trainings, tourism promotions, and other tourism facilities. It can also be done gradually and continuously every year.

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