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Benefit sharing from whale shark tourism in Botubarani, Gorontalo and Labuhan Jambu, Teluk Saleh

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Benefit sharing from whale shark tourism in Botubarani, Gorontalo and Labuhan Jambu, Teluk Saleh

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Abstract. Whale shark tourism is a growing industry in the world. This study aimed to determine the benefits local people earn from whale shark tourism at two sites in Indonesia, Botubarani in Gorontalo Province and Labuhan Jambu, Teluk Saleh, Nusa Tenggara Barat Province. This study involved dive centres, fishermen, community tourism groups, village enterprises (BUMDES), home stay owners, car rental companies, boat owners, lift net owners, snorkelling equipment rental businesses and ecotourism operators. In Botubarani, dive centres sold whale shark watching dive trips for US$42.3/pax, and snorkelling trips for US$23/pax, of which, US$4.6 and US$2.7 went to the Pokdarwis, and US$33.5 to the dive centre. For non-divers, trips cost US$11.5, of which US$1.5 was for whale shark bait, US$1.5 went to the Pokdarwis, and US$4.6 to fishermen. Whale shark watchers in Labuhan Jambu paid US$211.5-US$270 to ecotourism operators plus US$7.7/pax to the BUMDES. From that money, US$119 was paid to lift net owners, US$42 to boat operators, and US$19.2-US$76.9 to ecotourism operators. On average, car rental companies received US$46.1, home stays received US$7.6, and US$11.5 was paid for rental equipment.

1. Introduction

Whale sharks (*Rhincodon typus*) have been called the 'Ambassador of Sharks'. Their large size, docile nature, planktivorous diet, surface feeding tendencies and slow movement make them attractive from a tourism standpoint [1,2]. Their tendency to aggregate in predictable locations has enabled many countries to establish a whale shark-watching tourism industry that is worth approximately US$66 million worldwide, the majority of which is captured by developing countries [3].

Whale shark ecotourism is an important source of sustainable revenue for developing countries, while simultaneously giving live whale sharks economic value. For example, fresh whale shark meat in the Taiwanese market retails for US$4.91–17.16 per kg or US$12,948 for 2800 kg individual [4], while a live whale shark in Belize is estimated to be worth at least US$34,906 a year or approximately US$2 million over its lifetime, assuming a minimum life expectancy of 60 years [3]. Countries with established whale shark watching industries like Australia and Belize have reported annual economic returns of US$24 million and US$1.35 million, respectively [3]. In addition, this financial incentive has helped convert several South-east Asian fishing villages targeting whale sharks as prey into community-based ecotourism ventures supporting their protection [5]. Because of their predictable patterns of feeding on food sources such as sergestids [6] and fish larvae [7], people have been able to use their presence for

marine wildlife tourism. Increasingly, the whale sharks have been supporting large tourism industries across the globe [5].

The whale shark is listed as Endangered in the IUCN Red List of Threatened Species [8] and in Indonesia this species is fully protected by the Regulation of the Minister of Marine Affairs and Fisheries Number 18 of 2013. Even so, this species faces many threats including bycatch and unregulated, unreported and illegal fishing [1,8,9].

Whale shark tourism now exists in several places across Indonesia such as in Probolinggo, Derawan, Talisayan, Botubarani, Teluk Saleh, Teluk Cenderawasih and Kaimana. In Teluk Cenderawasih, income generated from whale shark tourism to Cenderawasih Bay National Park (CBNP) is around US$ 10.54 million [10]. In addition, the contribution of foreign tourists there reached 82.4% while only 17.6% came from local people. Local tourists paid US$ 315.3 per visit while foreign tourists paid US$ 1.453.8 per visit into this area.

This study focused on two sites: Botubarani, Gorontalo and Labuhan Jambu, Teluk Saleh in Sumbawa. In Botubarani whale shark tourism was initiated in April 2016, while in Labuhan Jambu, Teluk Saleh it began in September 2018 [11]. The aim of this study was to investigate the benefits local people earn from whale shark tourism operations.

2. Materials and Methods

2.1. Study area

This study was conducted in Botubarani (Gorontalo) and Labuhan Jambu, Teluk Saleh (Sumbawa) from 18 December 2018 to 15 February 2019. The study locations are described in Djunaidi et.al (2020) [11].

2.2. Data collection

Four enumerators were trained to assist in collecting data in the study areas. In Botubarani, village representatives, dive centres, fishermen and community tourism group (*Pokdarwis*) members were interviewed, while in Labuhan Jambu, Teluk Saleh, villages enterprises (*Badan Usaha Milik Desa*, BUMDES), car rental companies, home stay owners, local *bego* boat owners, *bagan* lift net owners, snorkelling equipment rental business and ecotourism operators were interviewed. The interviews were conducted in the villages of Botubarani, Gorontalo and Labuhan Jambu, Teluk Saleh. Enumerators visited the respondents daily during the agreed data collection period. The total number of respondents was 91 people for both locations combined, comprising 2 village representatives, 2 dive centre representatives, 27 fishermen and 7 community tourism group (Pokdarwis) members in Botubarani; and 4 representatives from village enterprises (BUMDES), 2 from car rental companies, 7 home stay owners, 5 local *bego* boat owners, 30 *bagan* lift net operators, 1 person from a snorkelling equipment rental business and 3 ecotourism operators in Labuhan Jambu, Teluk Saleh.

2.3. Data analysis

The data collected were tabulated in Microsoft Excel 2010 and presented with graphics, tables and supporting visual documentation. The results were analysed descriptively with reference to the current literature and issues related to whale shark watching tourism.

3. Results and Discussion

3.1. Community groups involved

In most developed and industrialized countries, studies on community support for sustainable tourism have been conducted in many places [12], and it is widely viewed as vital to support the conservation of many marine species [13,14]. Despite a growing number of studies in developing countries [15], there is still a need for further studies on people's perceptions and ways to support local involvement in tourism development.

This study revealed that local community members who support and benefit from the whale shark tourism operations in the study areas consisted of eleven groups. These eleven groups within the community included village representatives, dive centres, fishermen, village tourism groups (Pokdarwis), villages enterprises (BUMDES), car rental companies, home stay owners, local *bego* boat owners, *bagan* lift net owners, snorkelling equipment rental businesses and ecotourism operators. The first four were found in Botubarani, Gorontalo and the rest were present in Labuhan Jambu, Teluk Saleh. Village representatives sold the tickets while dive centres provided diving and snorkelling for divers and snorkelers using their own boats, and fishermen provided canoes for non-divers. Meanwhile, the village tourism group (Pokdarwis) will give instructions to the visitors who interact with whale sharks in the interaction areas. Village enterprises (BUMDES) provided services for bagan lift net owners whenever the net was damaged due to a whale shark becoming entangled with the net. Car rental companies provided cars to the visitors who come from Sumbawa to Labuhan Jambu village and home stay owners provided accommodation for the visitors. Local *bego* boat owners brought the visitors to the *bagan* lift nets which were used as a platform for seeing the whale sharks, while snorkelling equipment rental business provided snorkelling gear and ecotourism operators sold the trips.

Similarly to Labuhan Jambu, tour operators in Ningaloo, Western Australia were involved in and arranged trips to see the whale sharks [16]; however, they used spotter planes to locate the whale sharks, and communicate the coordinates to the boats. In this case, a maximum of 10 snorkellers were then allowed to enter the water to swim with the animal. Table 1 displays the names and numbers of the community groups, their location, and a description of the services provided.

Table 1. Community groups providing whale shark tourism services in Botubarani and Labuhan Jambu.

No.	Group name/type	Location	Services provided	Number
1	Village representatives	Botubarani	Ticket sales	2
2	Dive centres	Botubarani	Diving and snorkelling	2
3	Fishermen	Botubarani	Canoes for whale shark watching	27
4	Village Tourism Group (Pokdarwis)	Botubarani	Provide permits/instructions for whale shark watching	7
5	Villages Enterprises (BUMDES)	Labuhan Jambu	Repair/maintenance services for bagan lift-nets	4
6	Car rental companies	Labuhan Jambu	Transport for tourists from Sumbawa	2
7	Home stay owners	Labuhan Jambu	Accommodation for whale shark watchers	7
8	Local *bego* boat owners	Labuhan Jambu	Transport from shore to the *bagan* lift nets	5
9	*Bagan* lift net owners	Labuhan Jambu	Use of bagan lift nets as whale watching platforms	30
10	Snorkelling equipment rental owners	Labuhan Jambu	Provide snorkelling gear	1
11	Ecotourism operators	Labuhan Jambu	Sell whale shark watching trips	3

3.2. Whale shark watching trips

Indonesia is a big country facing economic conditions that have not shown much improvement over recent decades. Fortunately, the tourism industry is growing, and many visitors come to destination areas to seek a variety of experiences, one of which is to see whale sharks. According to [17,18], one factors contributing to whale shark watching is the willingness to pay. For example, tourists can take a tour package for US$ 359 per day to see whale sharks in Teluk Cenderawasih; this includes the use of snorkelling gear, meals, snacks, accommodation in the field and return transportation from Nabire to Kwatisore [10].

There are two ways to see the whale sharks in Botubarani and Labuhan Jambu. In Botubarani, divers or snorkelers booked their trip through dive centres while non-divers or non-snorkelers booked the trip through the locket provided in the area where the whale sharks are located. Divers paid the equivalent of US$42.3 per person while snorkelers paid US$23 and non-divers paid US$11.5. From the money paid by divers and snorkelers, US$ 4.6 and US$ 2.7 respectively went to the village tourism group (Pokdarwis) and US$ 1.5 was spent on whale shark bait. Meanwhile, from the money paid by non-divers, US$ 1.5 was spent on whale shark bait, US$3.9 went to the village representatives, US$ 1.5 went to the village tourism group (Pokdarwis) and US$ 4.6 went to the fishermen. Dive centres obtained US$ 33.5 from the divers and US$ 15.4 from the snorkelers. Divers or snorkelers came to the dive centres to book their trips, either the Miguel Dive Centre located in Gorontalo City or the Salvador Dive Centre located in Botubarani. Visitors who have booked will go on the same day or the next day. Non-divers/snorkelers could come to the locket in the whale shark watching area in Botubarani whenever they wanted to, between 06.00 am and 17.00 pm every day. They would take a canoe provided by the fishermen to go to the interaction area, while divers or snorkelers would be brought to the interaction area by the dive centre in a speed boat.

Divers, snorkelers and non-divers/non-snorkelers have around 45 minutes to an hour to interact with whale sharks, after which they return to the boat or the beach. During the interaction period fishermen will give *nike* as bait to attract the whale sharks and keep them swimming near the canoe or boat. These *nike* are the larvae or post-larvae of several species of amphidromous fish, including *Awaous* sp. [19] which typically migrate from seawater to their main freshwater habitat after spending most of their larval phase in plankton-rich coastal waters. A certified diver will accompany the snorkeler or diver during the interaction with the whale shark. They will ensure a distance of about 3 to 4 is maintained between the whale shark(s) and the snorkelers or divers. This protocol must be followed otherwise they will have to terminate the dive or snorkel.

In Ningaloo, Western Australia tour operators use a spotter plane to locate the whale shark. As soon as they have located the whale shark, communication will be established with the boat and 10 snorkelers maximum will enter the water and swim with the whale shark. Snorkelers must not approach the whale shark closer than three meters and the boat must remain 30 meters away from the sharks [20]. Furthermore, a trained videographer is present to record data every trip during the whale shark season. The videographer takes images during whale shark encounters using underwater digital video or still camera and whenever possible the videographer will take images of the right and the left side of each whale shark and record the sex and estimate size [21]. Figure 1 shows divers, snorkellers and non-divers interacting with whale sharks in the interaction area in Botubarani, Gorontalo.

Similar to Botubarani, visitors to Labuhan Jambu, Teluk Saleh have to take a boat to see the whale sharks. They either take local *bego* boat or come with their own speed boat (e.g. from a liveaboard boat) to the *bagan* lift nets used as whale shark watching platforms. However, before they can visit the interaction area they have to contact the ecotourism operators for a reservation, either from Labuhan Jambu village or from a liveaboard boat. The amount they have to pay to the villages enterprises (BUMDES) varies from US$211.5 to US$270 plus US$7.7 per pax. From those prices, US$119 went to *bagan* lift net owners, US$42 went to local *bego* boat owners and between US$19.2 to US$76.9 went to ecotourism operators. At the *bagan* lift net, the owner will provide *rebon* (*Acetes* sp.), a small shrimp resembling krill which is native to the western and central Indo-Pacific including Indonesia. The *rebon* is used as bait to attract the whale sharks and keep them near the *bagan* lift net. The *bagan* owner also provides a simple breakfast to the visitors.

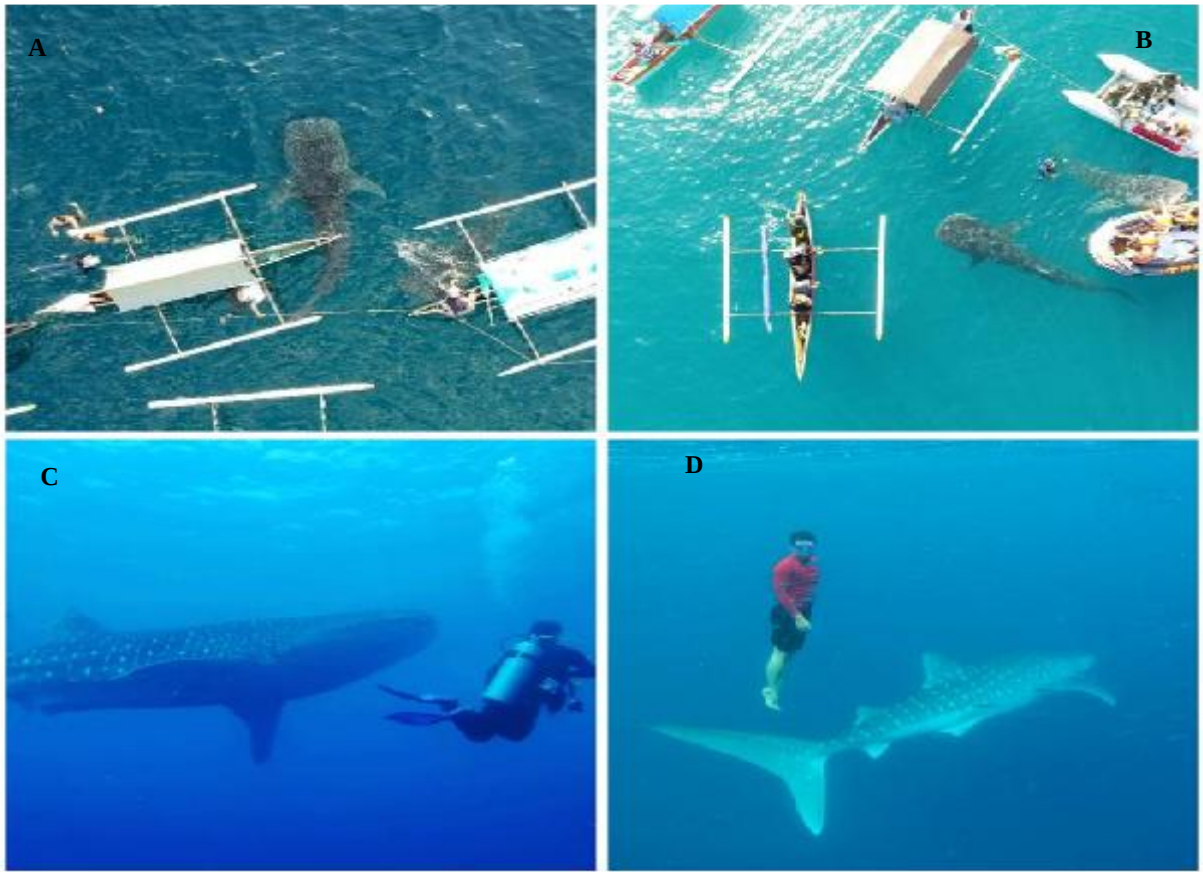

Figure 1. Divers (B, C), snorkelers (B) and non-divers (A, B, D) interact with whale sharks in Botubarani, Gorontalo. (Source: A, B: https://beritagar.id/artikel/sains-tekno/kelestarian-hiu-paus-bantu-kembangkan-ekowisata-indonesia; C, D: Salvador Dive).

From Labuhan Jambu, visitors leave with a *bego* boat before dawn at 03.00 a.m., arriving at the *bagan* lift net around 05.30 a.m. in the early morning. Visitors will have breakfast at the *bagan* lift net after watching the whale sharks either by snorkelling or diving. From liveaboard boats, visitors can come at 06.00 a.m. and they can snorkel or dive. During the snorkelling or diving period, people from the *bagan* lift net will feed the whale sharks with *rebon* to keep them nearby, as mentioned earlier. Visitors are normally accompanied by a well-trained guide during the interaction, and the distance between the whale sharks and the visitors is around 3 to 4 meters. After spending one to two hours, visitors can come back to the shore or to the liveaboard boat.

In Mozambique, especially in Tofo beach 400 km north-east of the capital city of Maputo, tourism operators offer 2-hour snorkelling trips to see whale sharks and other marine megafauna. Boats survey a 6 km of the coastline south of Tofo, between the surf-line and 1000 meters away from the beach in depths between 5-30 meters. The whale sharks are located through visual inspection and the boats then positioned themselves in relation to the whale shark's direction of travel so that visitors can enter the water to interact with the whale sharks [22]. Furthermore, upon locating the whale shark, observers entered the water alongside with the visitors and record the total number of swimmers and the environmental characteristics such as weather condition and underwater visibility [23]. Figure 2 shows snorkelers, divers and swimmers approaching whale sharks around *bagan* lift nets in Teluk Saleh.

Figure 2. Diver, snorkeler and swimmer (E, G, H) interact with whale shark while figure (F) show people in bagan, Teluk Saleh. (Source: E, F: Sumbawa Amazing; G, H: Lestari Bahari).

3.3. Benefits from whale shark tourism

In this study, the benefits were divided differently according to the location where the whale shark tourism took place. We started with Botubarani where village representative, dive centres, fishermen and villages tourism group (Pokdarwis) received the benefits. Since whale shark watching began in 2016 the four stakeholders mentioned above have consisted of 2 village representative, 2 dive centres, 27 fishermen and 7 members of the village tourism group (Pokdarwis). Village representatives are the people who sell the ticket to watch the whale sharks, dive centres were Miquel Dive Centre located in Gorontalo City and Salvador Dive Centre located in Botubarani, while the fishermen each had a boat that was registered to the village and used it to take the visitors to the interaction area. On the other hand, the village tourism group (Pokdarwis) comprised people who dedicated their time to managing the whale shark tourism in the area.

The benefits dive centres received from this tourism was divided into local and international divers and snorkelers. In 2016 Salvador Dive Centre received US$26,676 and Miquel Dive Centre received US$10,284 from local divers while from international divers Salvador Dive Centre received US$11,021 and Miquel Dive Centre US$29,245. Meanwhile, during the same year, Salvador Dive Centre received US$8,712 from local snorkelers and Miquel Dive Centre received US$2,980; from international snorkelers Salvador Dive Centre received US$3,024 and Miquel Dive Centre received US$7,416. The income remained high in 2017, 2018 and 2019 (Figure 3) but fell sharply in 2020 due to the Covid-19 pandemic which prevented both local and international tourist travel. In 2018, Miquel Dive Centre received US$32,863 from international divers, more than the Salvador Dive Centre with US$14,304,

while Salvador Dive Centre received US$8,308 from local divers, less than the Miquel Dive Centre with US$9,413.

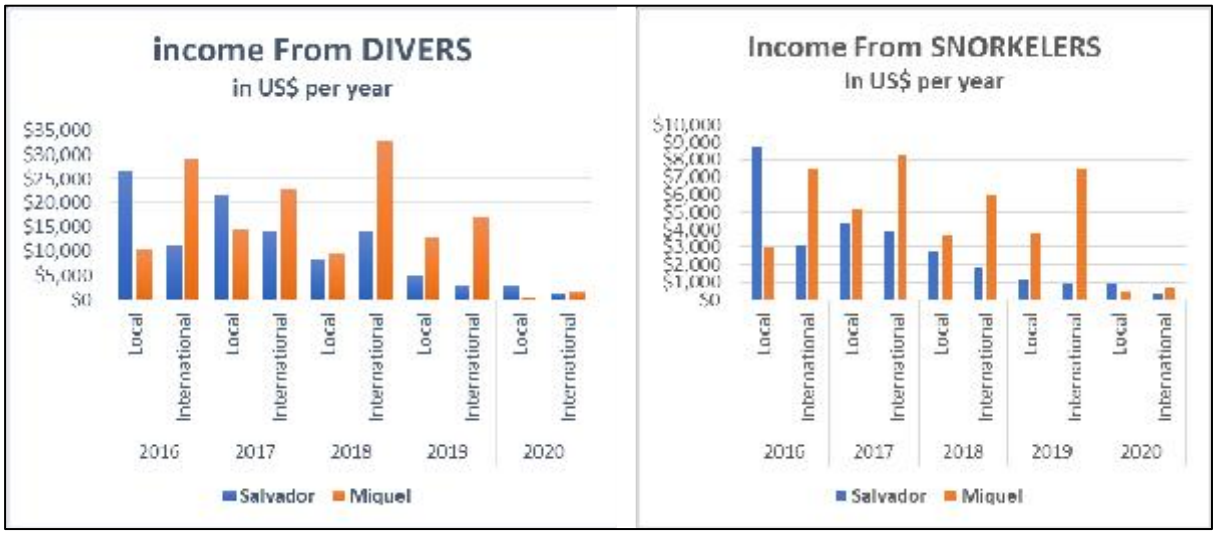

Figure 3. Showed the benefits received by Salvador Dive Centre and Miquel Dive Centre from local and international divers and snorkelers in Botubarani over the period 2016 to 2020.

Meanwhile, income generated from divers and snorkellers also provided benefits to the fishermen, village tourism group and village representative through the use of canoes, payment of the retributions and tickets (Figure 4). In 2016 the fishermen obtained US$3,532, the village tourism group received US$5,606 and village representatives received US$2,995 from divers. From snorkelers the fishermen obtained US$2,356, the village tourism group obtained US$3,378 and village representatives received US$1,997.

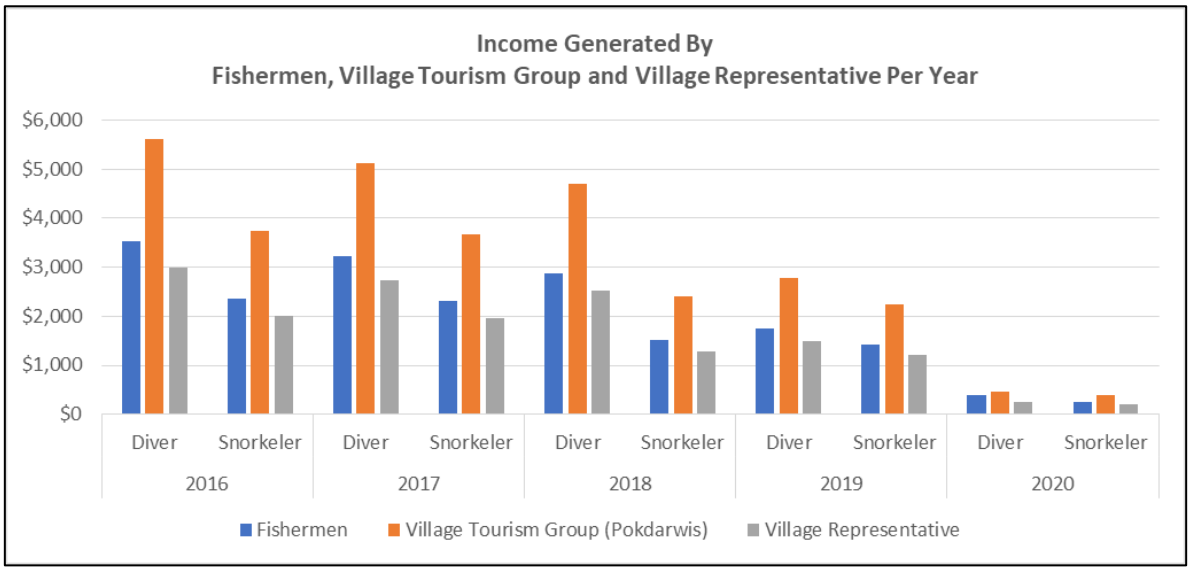

Figure 4. Whale shark watching income of fishermen, the village tourism group and village representatives combined from divers and snorkellers using canoes, paying the local retribution and purchasing tickets from 2016 to 2020.

In 2017 and 2018 the fishermen, village tourism group and village representatives received almost the same as in 2016; however in 2018 the snorkellers contributed less than in the first two years. There was a drop in income from divers and snorkelers in 2019; from divers the fishermen received US$1,748, the village tourism group received US$2,774 and the village representatives received US$1,482 while from snorkellers the fishermen received US$1,417, the village tourism group US$2,248 and the village representatives US$1,201. In 2020, due to the COVID-19 pandemic restrictions on travel, visitor numbers were very low; therefore so was income.

From visitors watching the whale sharks from canoes, we estimate that in 2016 the fishermen received US$33,580, the village tourism group obtained US$10,950 and the village representative US$28,470. From 2017 to 2019 the benefits began to decrease. The decrease was 17% in 2017, 11.5% in 2018 and 38.5% by 2019. Finally in 2020 when the COVID-19 pandemic struck, benefits decreased to almost zero. Figure 6 shows the income generated from visitors who watched the whale sharks from canoes from 2016 to 2020.

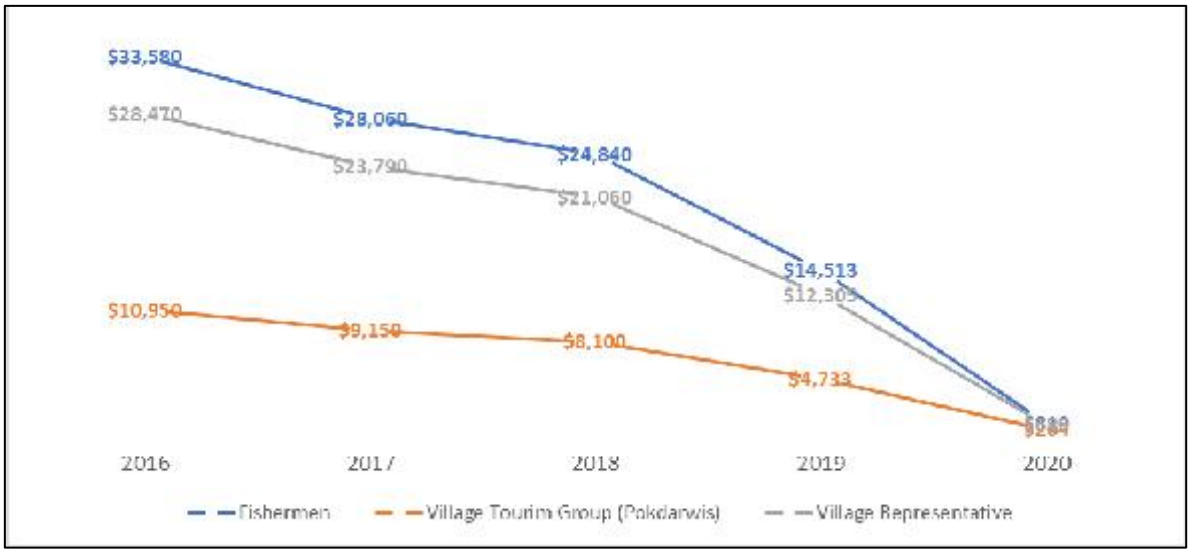

Figure 5. Income from visitors who watched whale sharks from canoes received by fishermen, the village tourism group and village representatives in Botubarani from 2016 to 2020.

Similar to Botubarani in Gorontalo Province, in Labuhan Jambu, Teluk Saleh the benefits went to several groups; however the groups involved differed. They included village enterprises (BUMDES) who provided services to bagan lift-net, including repairs whenever their net was broken by whale sharks, car rental companies that provided transportation form Sumbawa to Labuhan Jambu, home stay owners who set up accommodation to the visitors, local *bego* boat owners who take visitors to the *bagan* lift-net, the owner and operators of the *bagan* lift-nets that provided a place as a flat-form to see the whale shark, snorkelling equipment rental owners who provided snorkelling gear to the visitors and ecotourism operators who arranged the trips to see the whale sharks.

The village enterprises (BUMDES) received US$615 in 2018 and US$2,077 in 2019; in 2020 the income decreased to US$115 because visitors were not coming to the area due to COVID-19. Meanwhile, car rental companies received US$192 in 2018 and US$538 in 2019 but received no benefits (zero income) from whale shark watching in 2020. *Bagan* lift net owners and local *bego* boat owners received the highest benefits followed by ecotourism operators. The income was US$1,908 in 2018 and US$6,438 in 2019 for *bagan* lift owners while local *bego* boat owners received US$1,673 in 2018 and US$2,308 in 2019 and tourism operators received US$932 in 2018 and US$3,115 in 2019. Home stay owners and the snorkelling equipment rental owner received less because most of the trips were by tourists coming from liveaboard diving companies rather than from land-based accommodation. Home

stay owners received US$62 in 2018 and US$131 in 2019 while the snorkelling equipment rental owner received US$311 in 2018 and US$830 in 2019. Fig. 6 shows the income form whale shark tourism to stakeholders in Labuhan Jambu from 2018 to 2020.

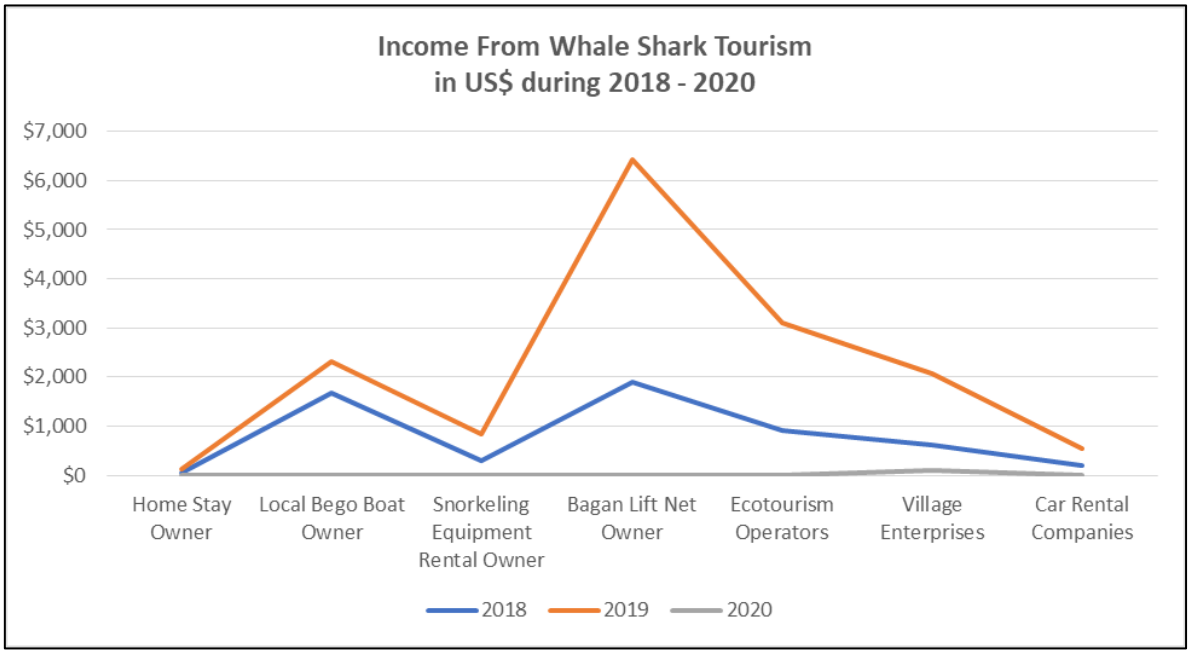

Figure 6. Income from whale shark tourism received by stakeholders in Labuhan Jambu, Teluk Saleh from 2018 to 2020.

4. Conclusion

Whale shark watching tourism benefited several local community groups at the study sites, including village representatives, dive centres, fishermen, village tourism groups (Pokdarwis), village enterprises (BUMDES), car rental companies, home stay owners, local *bego* boat owners, b*agan* lift net owners, a snorkelling equipment rental owner and ecotourism operators. These community groups each played an important role and has some responsibility for the success of whale shark tourism development at the two sites studied. Whale shark watching trips included processes enabling visitors to see the fish in the wild while swimming, snorkelling and diving with this animal. Finally, the benefits from the whale shark tourism were of value to people in the local communities. Even though the income generated from whale shark watching tourism was not the main income of the local people involved, it helped them in their daily family and community lives; for example for children's school fees, to support the local mosque and to promote tourism in the areas through building an information centre.

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