



## REPORT

# COMMUNITY PERCEPTION ABOUT DUGONG AND SEAGRASS CONSERVATION

KOTAWARINGIN BARAT DISTRICT, CENTRAL KALIMANTAN

This Project is executed by the Mohamed bin Zayed Species Conservation Fund, with financing from the GEF, implementation support by UNEP and technical support from the CMS Dugong MoU Secretariat.



## FOREWORD

Praise the Lord for all of His grace this report about Community Perception About Dugong and Seagrass Conservation In Kotawaringin Barat could be finalized. We also want to say much thanks for helps from many parties who have contributed in this, from obtaining data, analyze data, until making the report.

This report is actually part of reporting series from Dugong and Seagrass Conservation activity in Kotawaringin Barat. This report is expected to be useful and beneficial, especially in dugong and seagrass conservation in Indonesia. We do hope it could give an overview of fishermen condition in Kotawaringin Barat, especially in four villages: Kubu, Sungai Bakau, Teluk Bogam, and Keraya.

Apart from that, we fully realized that there still might be some shortcomings in this report. We ask for your critics and recommendation for the completeness of this report.

Kotawaringin Barat, December 2017

Author

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# INTRODUCTION

## 1. Background

Dugong (*Dugong dugon*) is one of sea mammals which spends its life in the sea. Population growth of this species is very low, and pressure towards this species is so huge, causing dugong population in threat. According to IUCN criteria, dugong is classified as vulnerable to extinction. Meanwhile, based on CITES, dugong is classified as Appendix 1 which means it could not be traded. In Indonesia itself, dugong is one of protected animals, according to PP No. 7 year 1999.

In attempts of dugong and its habitat conservation in Indonesia, Ministry of Marine Affairs and Fishery collaborated with Indonesian Institute of Sciences, Bogor Agricultural University, and WWF Indonesia which was supported by United Nation Environment Programme-Conservation Migratory Species (UNEP-CMS) and Muhammed bin Zayed Conservation (MbZ), joined in Dugong and Seagrass Conservation Project (DSCP) Indonesia since 2016, and was planned to finish at the end of 2018, with three main activities, they are:

1. Proposal 1 (ID1) *Strengthen and Operationalize National Policy Strategy and Action Plan for Dugongs and Seagrass Conservation,*
2. Proposal 2 (ID2) *Improving National Awareness and Research of Dugong and Seagrass in Indonesia,* and
3. Proposal 3 (ID3) *Community Based Conservation and Management of Dugong and Seagrass Habitat in Bintan, Kotawaringin Barat, Alor and Tolitoli.*

There has been not much information about dugong status in Indonesia, so the effort is still very limited for its conservation. At October 10th- 16th 2016, there has been a pre-survei conducted to monitor dugong and seagrass in Kotawaringin Barat to find out its presence and its general locations for dugong sighting, reviewing community awareness of preserving dugong and seagrass habitat. However, questionnaire survey which was based on UNEP-CMS survey standards, the survei should be done in a representative number of the community in one region.

Through collaboration with Antakusuma University (UNTAMA) and WWF Indonesia, community participative survei program by UNEP-CMS questionnaire method would be conducted in November 2017. This survei would only be conducted at targeted regions from DSCP Indonesia program in Kotawaringin Barat District. The other targeted regions are four coastal villages in Kumai Sub-District, they are Kubu, Sungai Bakau, Teluk Bogam, and Keraya.

## 2. Objective

The objective of this survey is to give a representative idea to locate general spots where dugongs are often seen, and review community awareness of dugong and seagrass habitat preservation.

## 3. Time and Location

UNEP- CMS questionnaire survey would be conducted on November 2017, at four coastal villages Kumai Sub-District, they are Desa Kubu, Sungai Bakau, Teluk Bogam, dan Keraya.

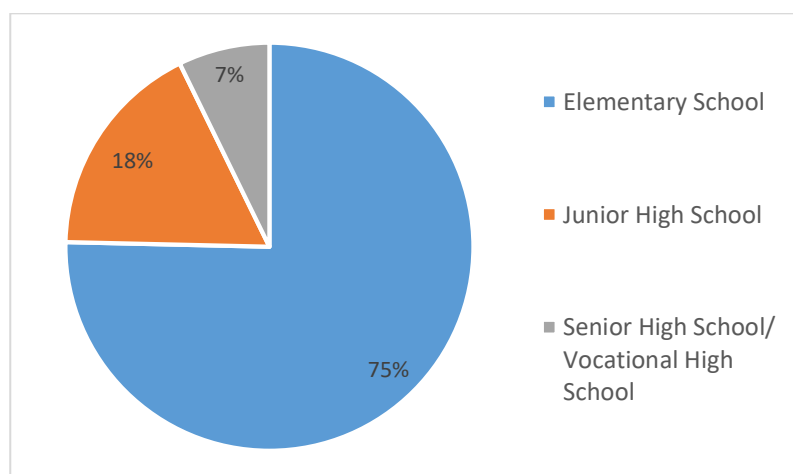
## 4. Survey Method

Data taking is done by interviewing the interviewee. Interviewees are targeted to be fishermen near the research location, and with numbers 10% from its whole per region (Gay, 1992). The interview would be based on questionnaire about dugong presence and people perception related to dugong and seagrass habitat in Bahasa Indonesia which was developed and adopted based on questionnaire from CMS (<http://www.cms.int/en/project/cms-unesco-dugong-questionnaire-survey>). List of questions would be entered into Akvo Flow, so the data input process would be done using android smartphone or android tablet. The data that has been entered could be downloaded at <http://wwwfid.akvoflow.org/>.

# RESULT AND DISCUSSION

## 1. Interviewee Characteristics

Interviewee targets on this research are fishermen that are assumed having data resource which could give maximum result. The numbers of fishermen based on data from each village office shows various number on each village. Total interviewees that were obtained were 138 people, 27 people from Kubu Village, 54 people from Sungai Bakau Village, 42 people from Teluk Bogam Village, and 15 people from Keraya Village (Appendix 1). Most of them were elementary school graduated, there were 75% of them. The rest were junior high school graduated (18%) and senior high school/ vocational high school graduated (7%) (Figure 1).



**Figure 1.** The interviewees' education background

From all of the interviewees, 10% of them said they had been interviewed before, and 7% of them said the interview was about fishery topic. The interview related to dugong and seagrass have not been done in these villages. There were three of them who had been on the same interview (preliminary survei data on 2016), two of them said they have not been interviewed before. There rest, for 90% said they have never interviewed before.

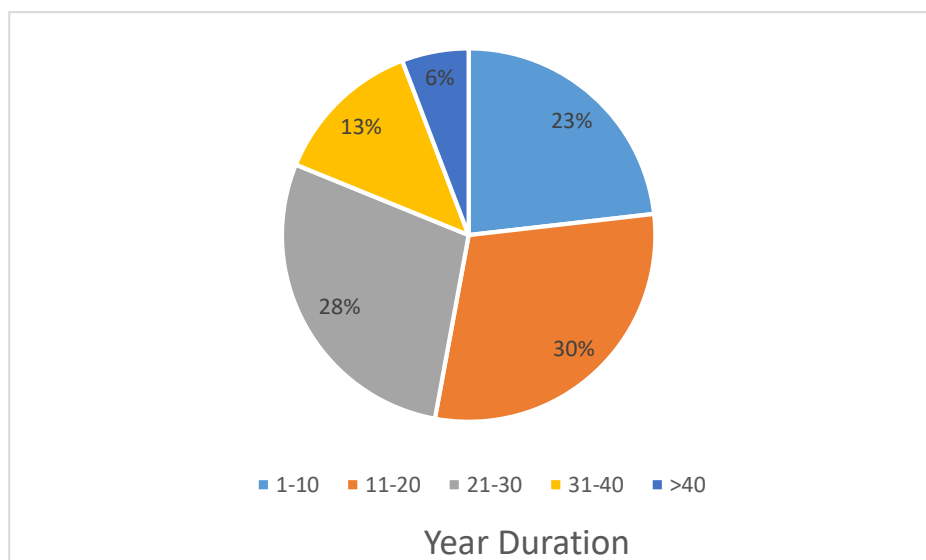
Most of the interviewees (83%) have never got any training/ informal education/ skill enhancement activity. The rest (17%) told they have ever got training/ informal education/ skill enhancement activity related to fishery, fishing gears, "rumpon" usage, sea navigation, seagrass and dugong, turtle hatchery, seaweed cultivation, extinguish land/ forest fire, agriculture, brick makings, and clean water. These activities were held by Kobar District Fishery Agency, Central Kalimantan Provincial Marine and Fishery Agency, Regional Water Supply Company (PDAM), Firefighters Company (DAMKAR), Department of Forestry, Department of Agriculture and Livestock, Youth Organizations, and WWF Indonesia.

Media of information that they used to obtain informations were television (45%), 6% of them told another source like internet, newspaper, village information board, and sayings

from acquaintances. Even though access of information has been sufficient, and interaction within the world is so open nowadays, still the interviewees (49%) admitted they have not got any informations.

The majority of interviewees (97%) are capturing fishermen, and the rest are aquaculture fishermen. The interviewees (97%) told that being fishermen is their main job, the rest are having side job like farming, construction worker, transportation service, palm oil plantation worker, gardening, security worker, tanjung keluang conservation, and groceries store. Most of the interviewees (90%) had parents who worked as fishermen, and 89% of it are having grandfathers who were fishermen too. This shows that the interviewees were having background and strong dependency on the sea and its resources.

The interviewees showed that 30% of them had become fishermen for 11-20 years. The ones who had become fishermen for 40 years or above were only 6% or only 8 people. The ones who had become fishermen for 21-30 years were 28%. This shows that most of the interviewees had much experience within the sea, so the information about fishery that was obtained must be accurate (Figure 2).

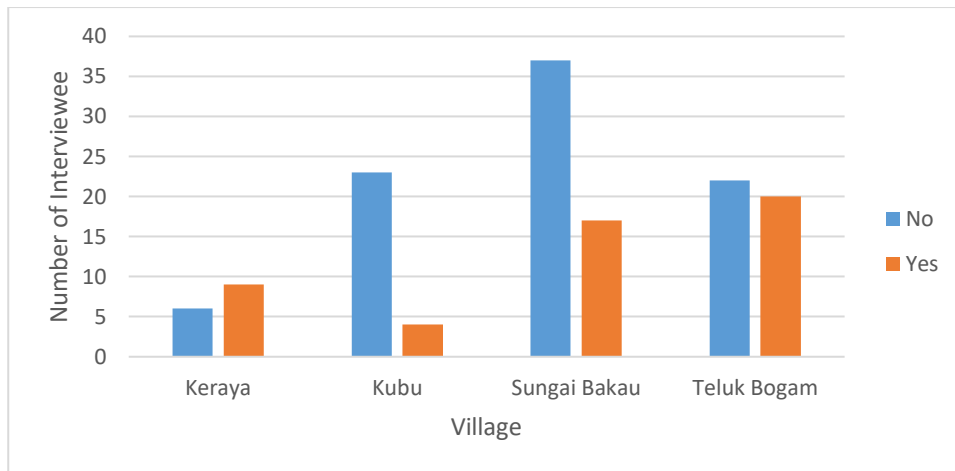


**Figure 2.** The duration of how long the interviewees had become fishermen

## 2. Dugong

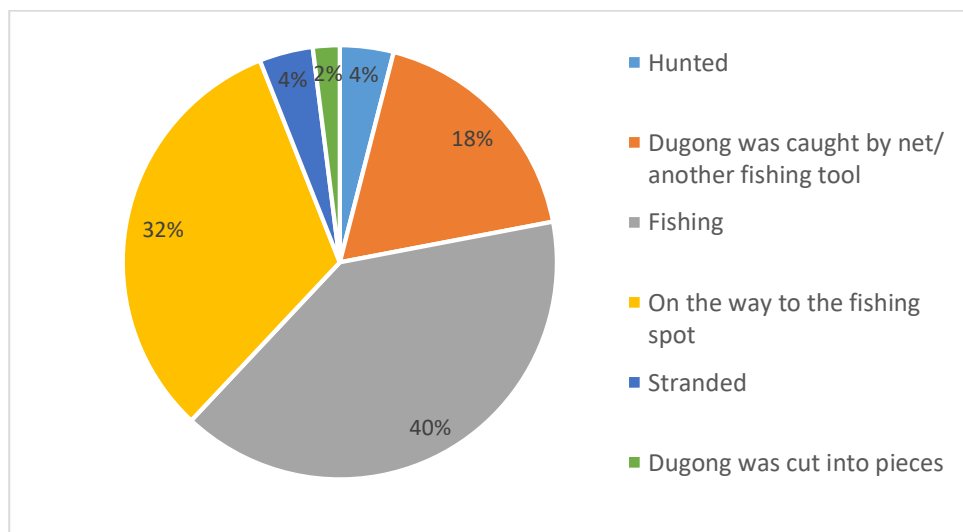
From 138 interviewees, the majority of them (64%) have not ever seen dugong and only 36% of them have ever seen dugong. The result of the interview showed that people who have ever seen dugong are from Teluk Bogam (14%), followed by Sungai Bakau (12%) (Figure 3). And only few of them (30%) admitted they could differ dugong from dolphins. Then only few of them too (16%) who said that dugong lifespan is the same as human, within 5-50 years, even some are reaching more than a hundred.





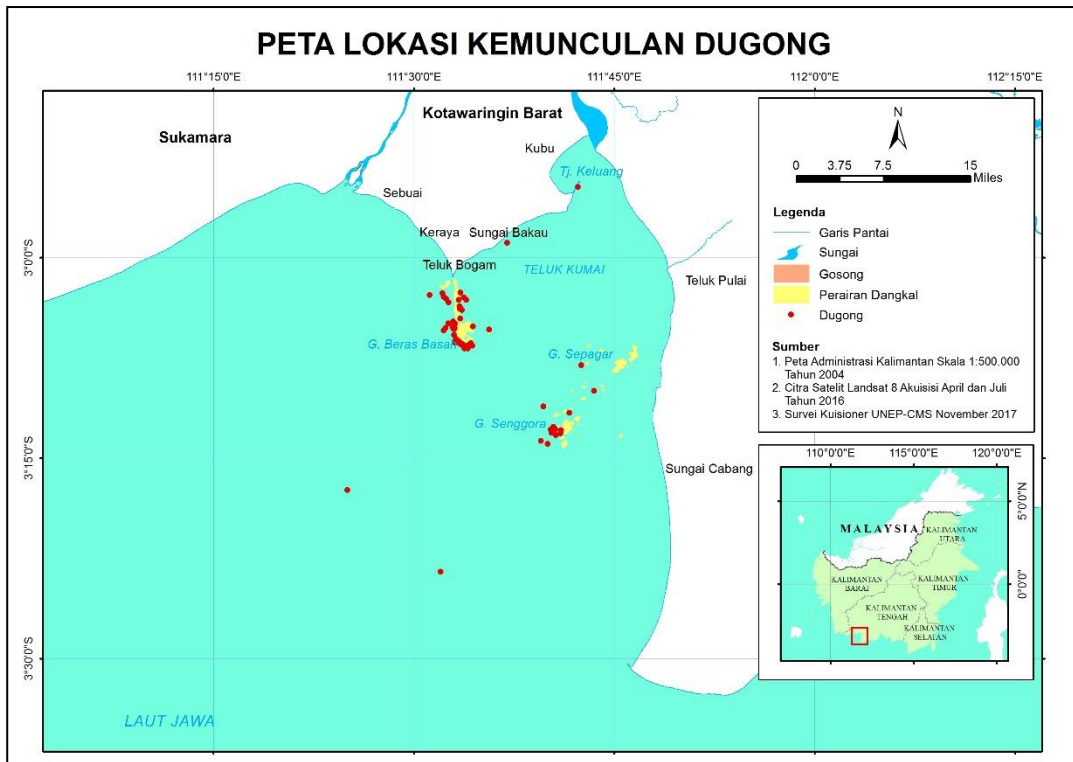
**Figure 3.** The interviewees from every village who have ever seen dugong

The majority of interviewees who have ever seen dugong (40%) was when they were fishing. The rest (32%) saw dugong when they were on their ways to fish. When dugong was accidentally caught by their net of another fishing gears (18%). The rest of 4% admitted they saw dugong when it was haunted and stranded. And 2% of them saw dugong when it was butchered (Figure 4).



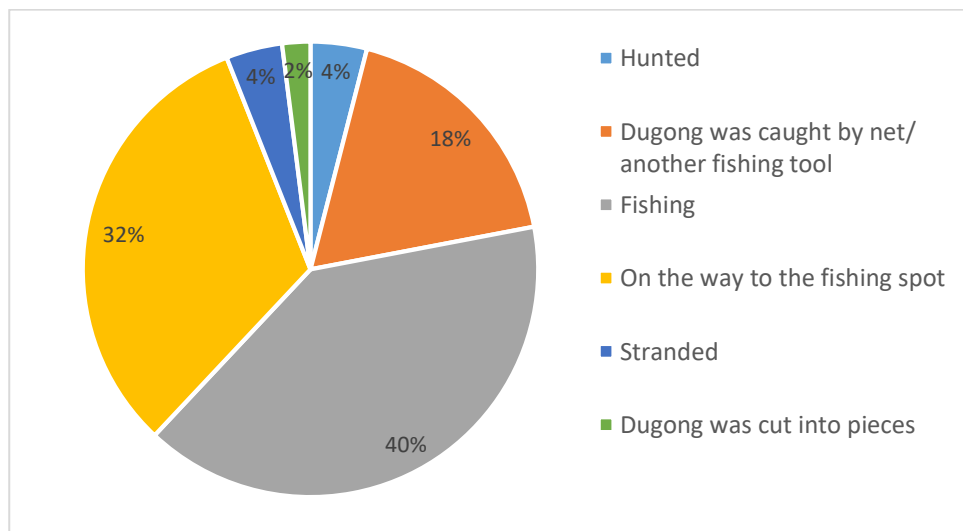
**Figure 4.** Dugong condition seen by interviewees

The information of dugong's appearance from the interviews obtained is that the distribution location where dugong often seen is near Gosong Beras Basah, and then near Gosong Senggora (Figure 5). The year which dugong is often seen is in 2017, although some said it's 1967. It's because the recent sighting is the easiest to be remembered by them. The month which dugong often seen is on June and November, based on the ones who have ever seen dugong. On the average, the dugong they saw was only one, and the most numbers of dugong they have ever seen was three. Some interviewees said the least common location, like the coastal of Sungai Bakau Village, Tanjung Keluang, and in the Southwest of Gosong Beras Basah. Most of the interviewees (63%) said that the appearance of dugong was changing from timely. The rest (37%) told that they had no idea about that.



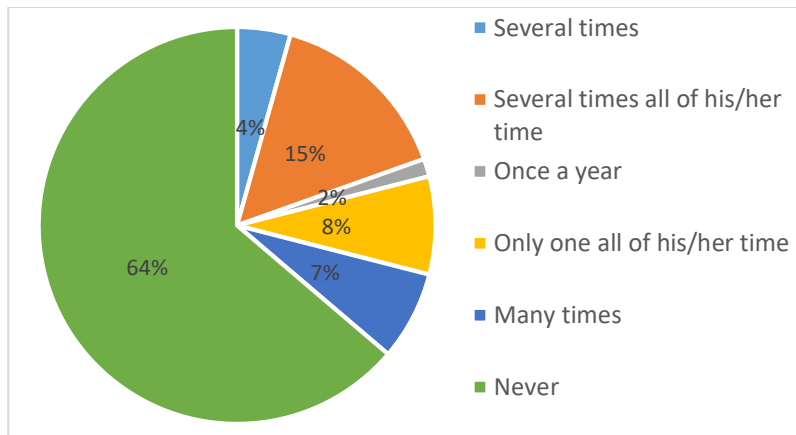
**Figure 5.** Map of Dugong Sighting Distribution

Figure 6 shows that most fishermen saw dugong while fishing were 22% from Teluk Bogam, and most fishermen from Sungai Bakau (18%) saw dugong while on their ways to fish. Most fishermen from Keraya (8%) saw dugong when it was accidentally caught. Most fishermen from Kubu (4%) saw dugong while fishing. And only in Teluk Bogam (2%) which fishermen saw dugong when it was butchered.



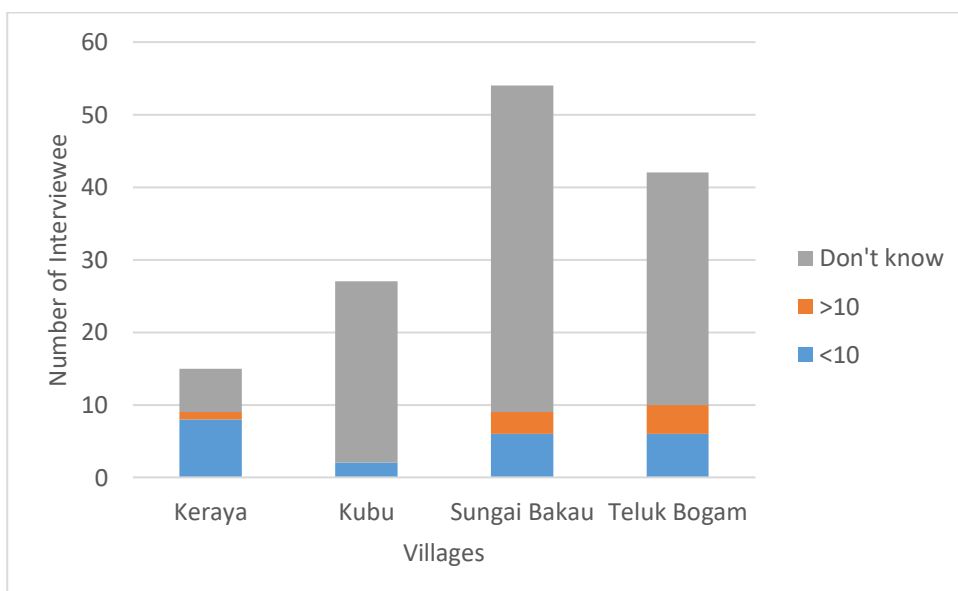
**Figure 6.** Dugong Condition Seen by Interviewees per Village

Only a few of the interviewees who have ever seen dugong several times (15%). Then, 8% of the interviewees said they saw dugong only once. And 7% of them said they often see dugong, 4% of them said only a few times, 2% of them saw dugong once in a year.



**Figure 7.** Interviewees' intensity of seeing dugong appearance

A little of the interviewees (16%) said that their estimation of dugong population in Kotawaringin Barat is less than 10 dugongs. Only few (6%) who said that the estimation of dugong population is more than 10 dugongs. Meanwhile the rest of it (78%) are the ones who never saw dugong said that they had no idea of dugong population.



**Figure 8.** Interviewees' estimation of dugong population

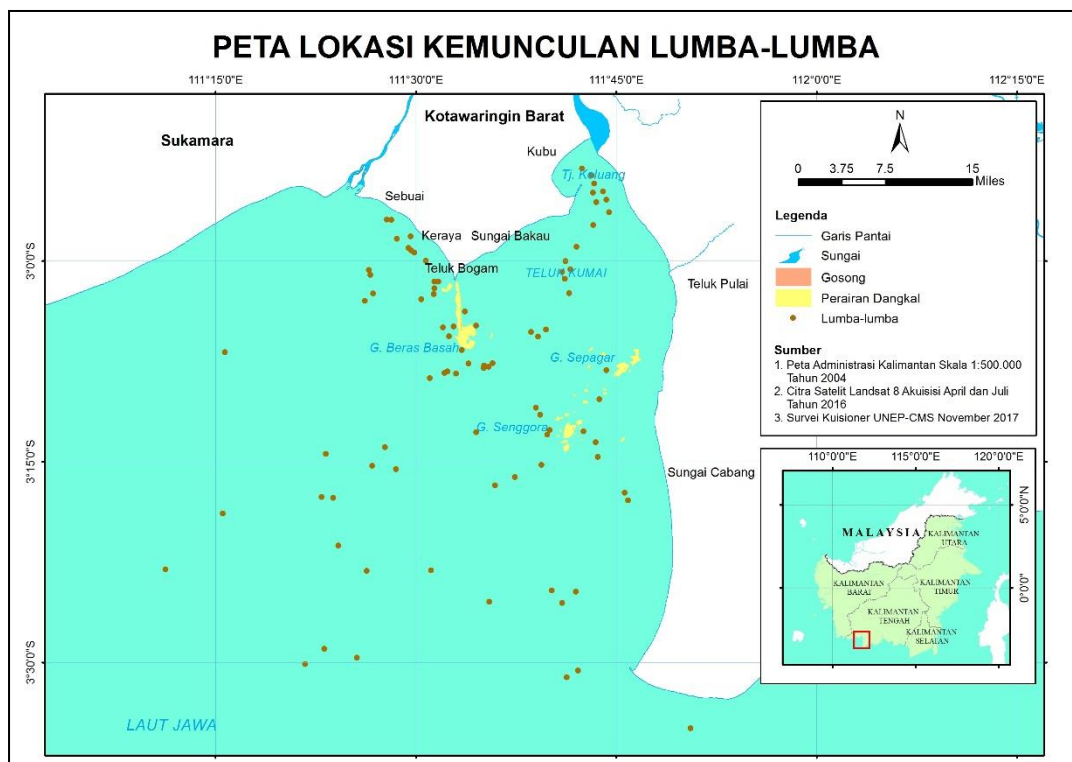
Less than half of people who have ever seen dugong (30%) said they ever saw juvenile dugong in 1967, 1990, and 2002. According to interviewee from Sungai Bakau, they saw its juvenile last 2010 and 2015. Meanwhile interviewee from Teluk Bogam said they saw its juvenile 40 years ago in Batu Ajir, some said saw it on 2002, on October 2015, some even said they saw it on November 2017 in Gosong Beras Basah. The rest (70%) said they never saw any of its juvenile.

Only a little of the interviewees (5%) knew that there were people who caught dugong, and most of them said the hunting happened in Teluk Bogam, only one person said it was on Keraya. The interviewees said that about 1 to 20 people from Teluk Bogam ever caught dugong, and only 2 people were from Keraya. The dugong was caught unplanned (bycatch).

From all of the interviewees, only 2 of them said that on their villages there were fishermen who have specialty on catching dugong, the fishermen were from Teluk Bogam. They said that about 2 to 5 people were deliberately hunting dugong. The history of dugong hunting in Teluk Bogam started from 1946 until 2015. Fishing gears that they used were spear and a particular net that can catch 3 to 7 dugongs at once.

All of the interviewees said they never deliberately or accidentally caught dugong. Even though at some different times, some interviewees admitted they ever hunted dugong deliberately. A few months ago, in June, a dugong was caught accidentally in a fishermen's net in Keraya Village, which was set near Gosong Beras Basah. Confession from fishermen said that dugong has dead and was brought to the land to be eaten and sold. The interviewee also ever saw a dugong was stranded in 1987 in Teluk Pulai beach.

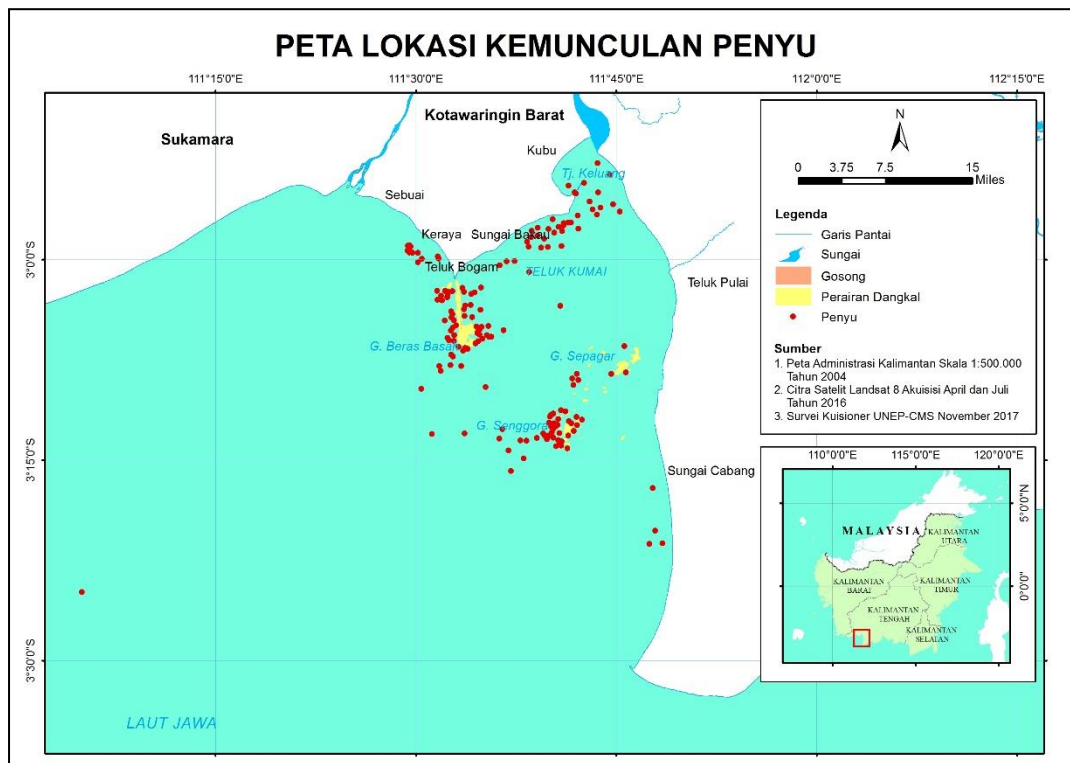
Recent years, in the coastal of Sungai Bakau in 2014 has ever found a dead dugong stranded. The same occasion also happened on part of Gosong Beras Basah, which a dugong was dead because it was caught accidentally and was decomposed in 2014. There was also a dugong found in the coastal of Sungai Bakau, which the dugong was still little in 2015. One of the threat that cause its death was caught by the fishermen's net. And the dugong that was caught accidentally was eaten, even sold.



**Figure 9.** Distribution of dolphin's appearance

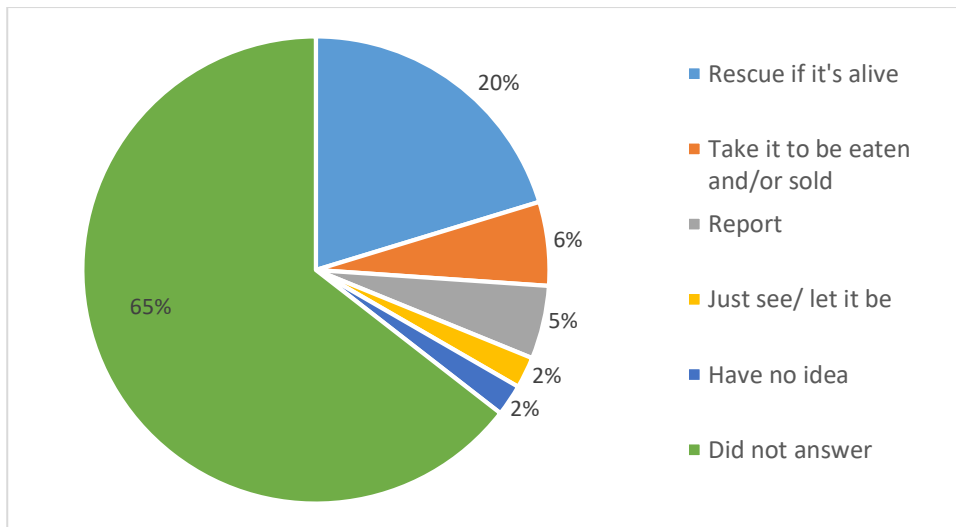
Species that common to be found is dolphins which distributed evenly near Gosong Senggora, Beras Basah, Tanjung Keluang, Tanjung Puting, coastal of Keraya, until Jawa Sea (Figure 9). Turtles are often be found too almost in Gosong Beras Basah, Gosong Senggora, coastal of Sungai Bakau, coastal of Keraya, and coastal of Teluk Pulai because in that location,

turtles often do hatchery (Figure 10). Besides, occasionally there is Irrawaddy dolphin near Teluk Kumai, south of Gosong Senggora, and near Tanjung Puting, in south of Gosong Senggora is often found whale too (Figure 12).



**Figure 10 .** Distribution map of turtle appearance

The result of the interview shows that only a little (20%) of the interviewees who would save a stranded dugong. There are still 6% of the interviewees who admitted they would take the dugong and then eat and sell it, then there are 5% of them who are ready to report a stranded dugong. And each 2% of the interviewees who just see or let it be and don't know what to do. Most of the interviewees (65%) did not give answer for this question (Figure 11).

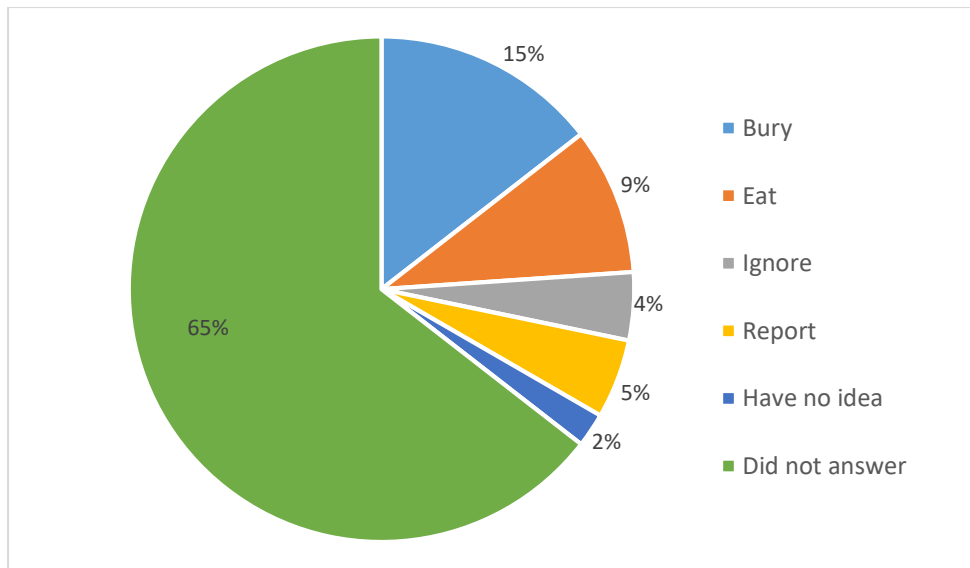


**Figure 11.** What would the interviewees do when they see alive dugongs



**Figure 12.** Map of distribution of Irrawaddy dolphin and whale appearance

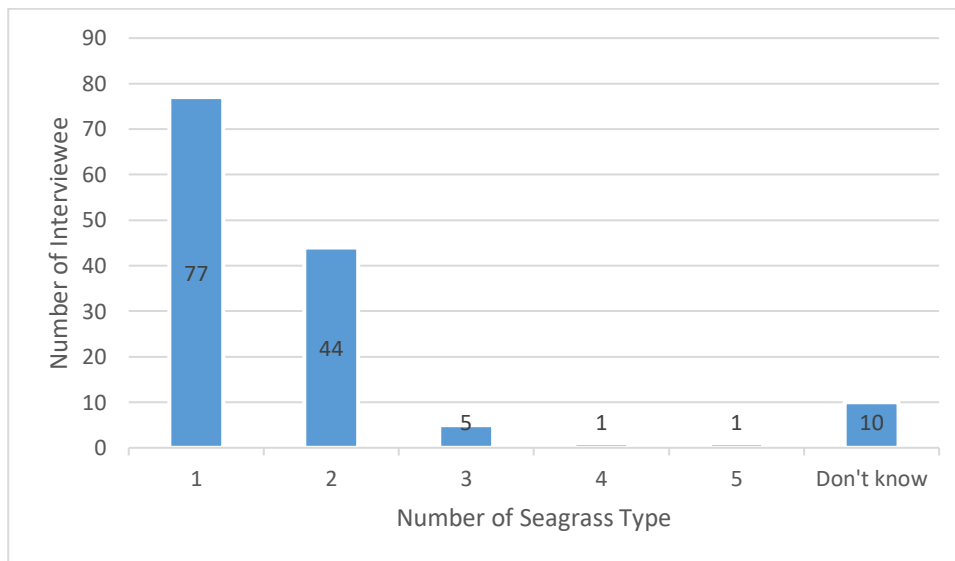
Meanwhile, there are so little of the interviewees (15%) who are ready to bury dugong if they find a stranded one. Even 9% of them would harness it to eat or sell it if it found dead. At least 4% of the interviewees who let it just stranded and then die. Only 5% of them who are ready to report a death dugong. Only 2% of them don't know what to do and most of them (65%) did not give answer for this question (Figure 13).



**Figure 13.** What would the interviewees do when see alive dugong stranded

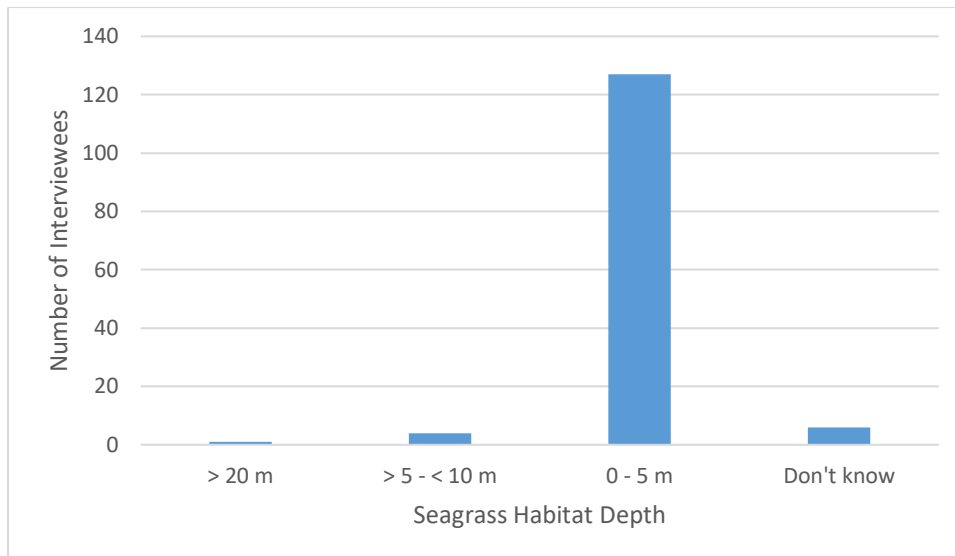
### 3. Seagrass habitat

Almost all of the interviewees have seen seagrass, and only two people who said they have not. The most common or seen seagrass is the one with long leaf (*Enhalus acoroides*), the number of species they have seen are between 1 to 5 species (Figure 14).



**Figure 14.** Estimation of seagrass species that the interviewees have ever seen

The majority of the interviewees (92%) said that if seagrass is often found at 0-5 meters depth. Only 3% of the interviewees who often found seagrass at >5 meters to <10 meters depth. And only 1% who said that seagrass could be found at >20 meters depth, the rest 6% did not know which depth where the seagrass is often found (Figure 15).



**Figure 15.** The water depth of seagrass habitat



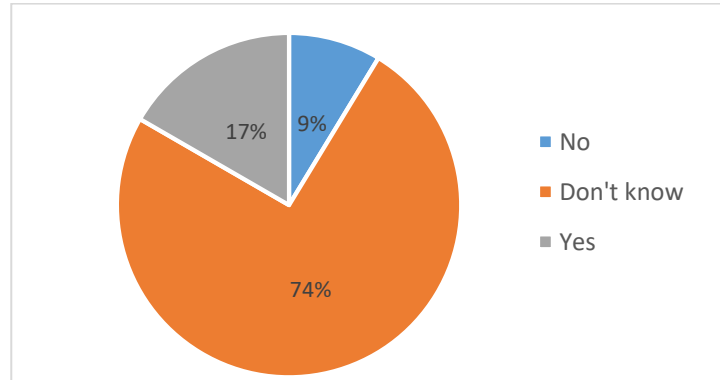
**Figure 16.** Map distribution of seagrass habitat (according to the interviewees)

As you can see at Figure 16, according to the interviewees, seagrass is distributed in all of the coastal area and in all of Gosong area in Kotawaringin Barat district. The most abundant seagrass is located in Gosong Beras Basah near coastal of Teluk Bogam. The condition of seagrass in Gosong Senggora and Sepagar is always changing seasonally.



#### 4. Community Perceptions

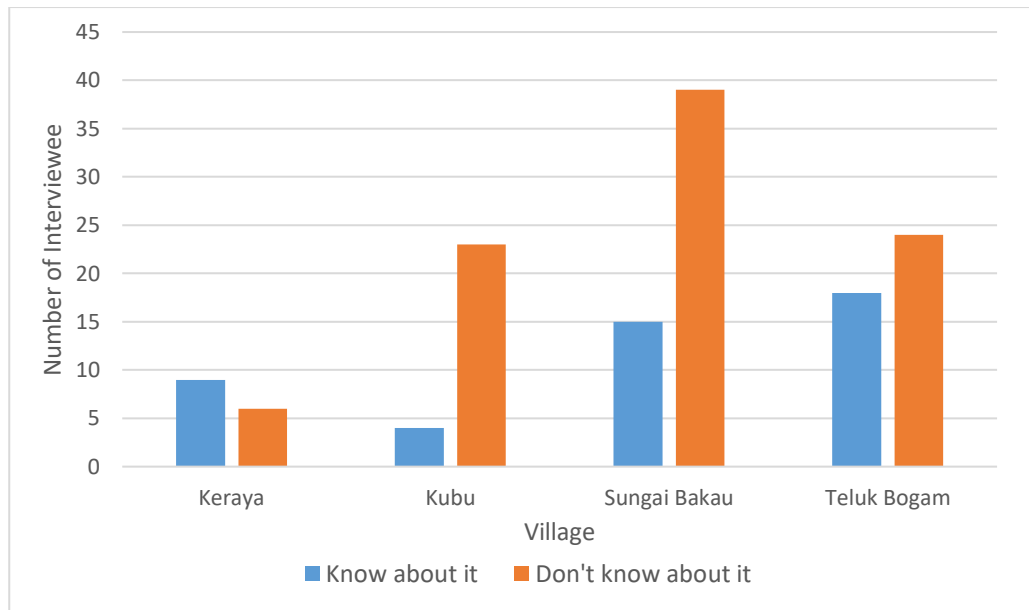
The majority of the respondents (74%) stated that they didn't know the presence of dugong is very important. Only few of them (17%) stated that the presence of dugong is important, and the rest (12%) said that the presence of dugong is unimportant (Figure 17).



**Figure 17.** Community perception about the importance of dugong's presence

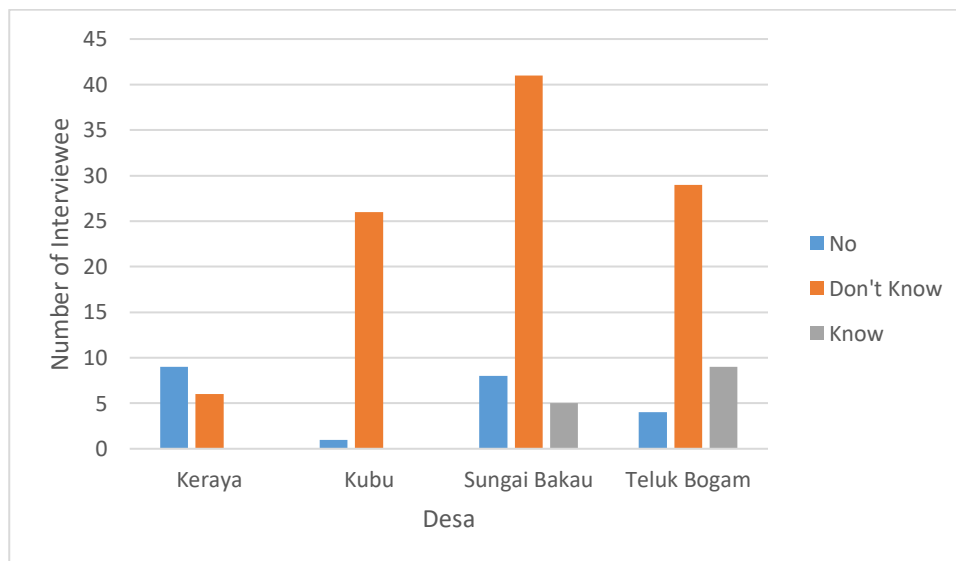
The reasons why they said dugong's presence is important are vary, from positive ones like dugong is a protected animal, its vulnerability, as a tourism object, it enriches seagrass, and its presence is followed by fishes, but there are some who stated negative reasons, like its price is expensive if it is sold, mainly its fangs and tears, and if not prohibited, it could be eaten. The price for its meat could range from IDR 70.000,-/ kg, even some are willing to pay IDR 100.000,-/ kg.

Less than half of the interviewees (33%) stated they have known the law status of dugong, that if they catch it deliberately, they violated the law. Most of the interviewees (67%) said they had no idea of dugong's law status. It could be seen from Figure 18, that in Keraya Village there are more than 9 people who know about it compared to 6 people who don't know. In teluk Bogam, it's almost the same between the one who do know (18 people) and the one who don't know (24 people). The imbalance is seen in Kubu Village, which the ones who do know are only 4 people, meanwhile the ones who don't are 23 people. It's the same in Sungai Bakau that less than half of the interviewees (15 people) do know, meanwhile there are 39 people who don't. This is influenced by their lack access of information, because their sailing schedule which is weekly or monthly. It's different than fishermen in Keraya and Teluk Bogam who sail daily, so we got so much time in the land to obtain information from them.



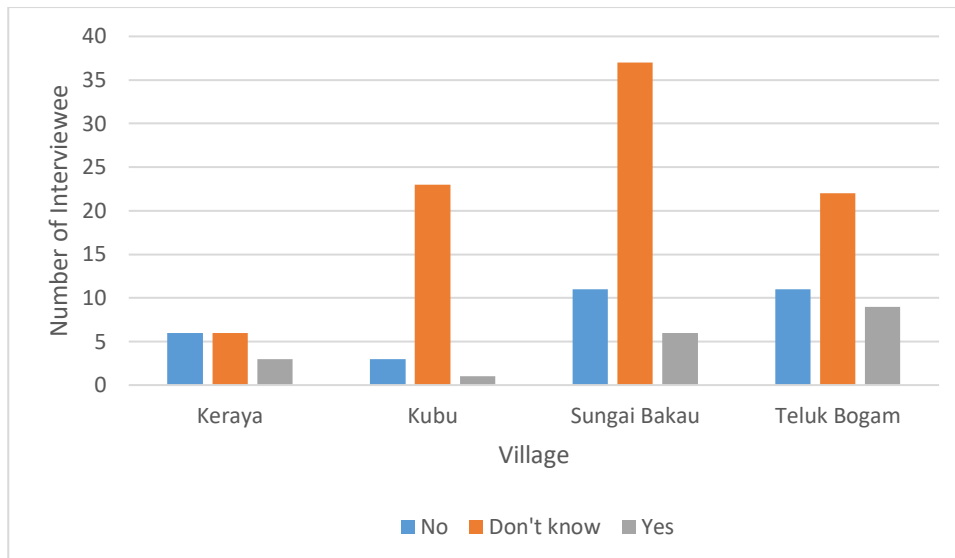
**Figure 18.** Community perception about law status of catching dugong

When they were asked about law status of dugong which is caught accidentally, only few of them (10%) who do know that it is against the law. The majority of the interviewees (74%) stated they don't know that catching dugong accidentally is also against the law, and the rest (22%) said that it is not against the law for catching dugong accidentally.



**Figure 19.** Community perception about law status of dugong that is caught accidentally (by-catch)

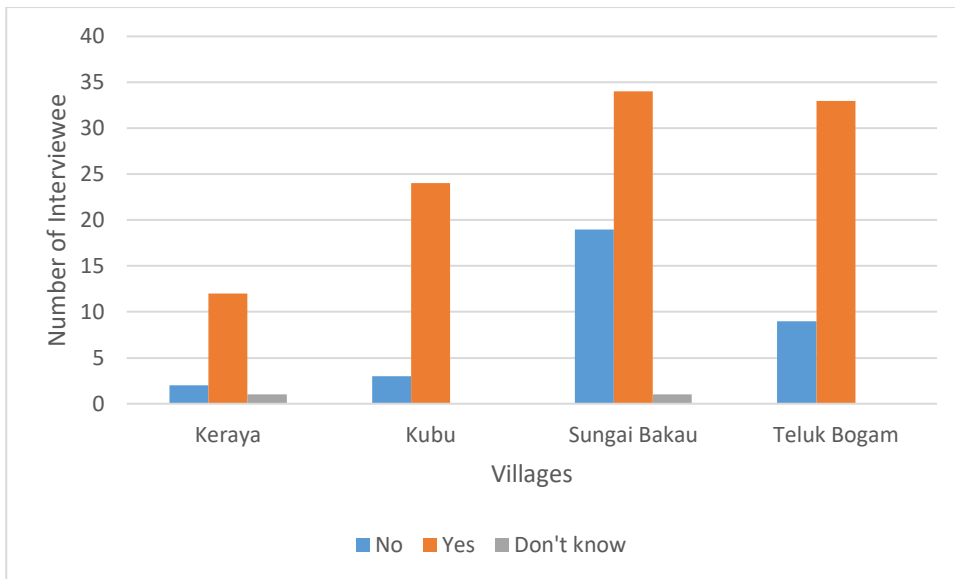
At Figure 19, it can be seen that people in Keraya and Kubu don't know if catching dugong accidentally is against the law. Even in Keraya Village, 9 people stated that it is not against the law, and 6 people said they don't know about it. In Kubu Village, 1 person stated it is not against the law, and 26 people don't know about it. In Sungai Bakau, there are only 5 people who said it is against the law, 8 people said it is not against the law, and 41 people stated they don't know. In Teluk Bogam, only 9 people who said that it is against the law, 4 people said it is not against the law, and 29 people don't know about it.



**Figure 20.** Community perception about their availability to report dugong which is caught accidentally to local officials

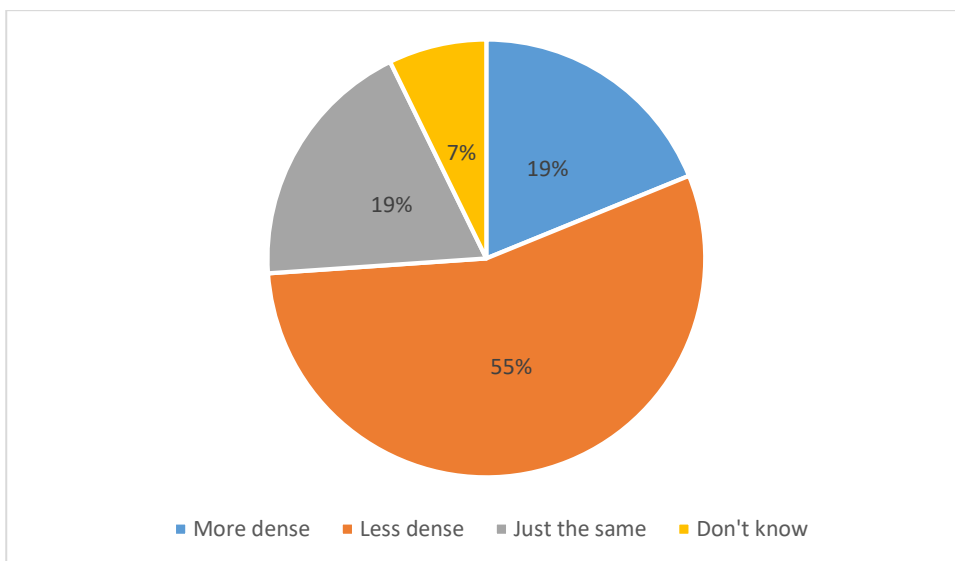
Based on the result of the interview, only few of the interviewees (14%) who are ready to report if they found dugong that is caught accidentally, majority of the interviewees would not report that, and the rest 22% don't know what they should do. Based on Figure 20, 9 people in Teluk Bogam are ready to report, it's the most number from the other three villages. In Sungai Bakau, there are only 6 people who are ready to report, in Keraya there are only 3 people, and in Kubu there is only 1 person who ready to report if they found dugong that is caught accidentally. The interviewees who are ready to report said that they (131 people) would report to the leader of its village, 2 people are ready to report to neighborhood (RT), the rest (each one person) would report to the local officials, community surveillance group, natural resource conservation agency, and conservation officers.

The majority of the respondents (75%) said that the presence of seagrass is important to them. A few of them (24%) said that seagrass is not important to them, the rest (1%) don't know whether seagrass is important to them or not. It can be seen at Figure 21, respondents from Sungai Bakau, 34 people said that seagrass is important, followed by Teluk Bogam, 33 people said it is important, in Kubu there are 24 people, and in Keraya there are 12 people who said seagrass is important. Based on that result, people know the relation between seagrass presence and fishery source in their own areas.



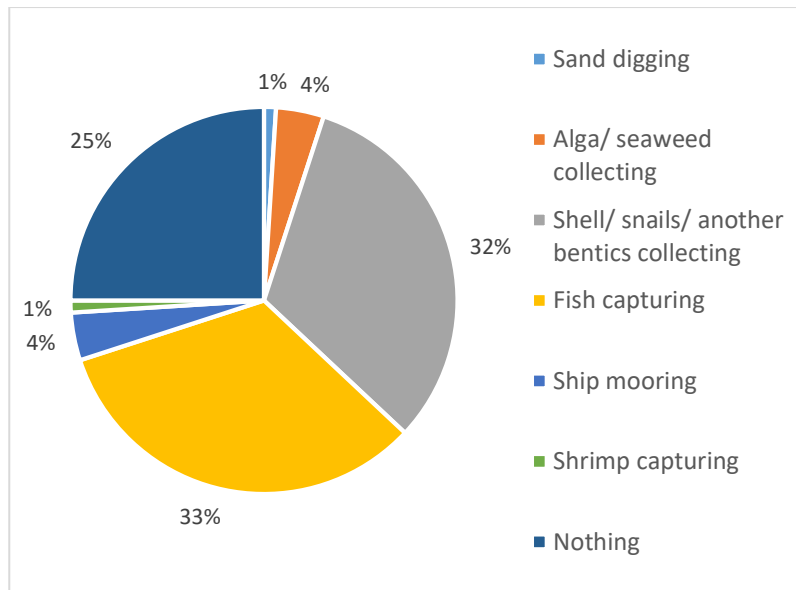
**Figure 21.** Community perception about the importance of seagrass' presence

As much as 19% of the interviewees said that seagrass condition is more dense and also 19% of them said its condition is just the same, the rest 7% said they don't know about the seagrass condition then and now (Figure 22). More than half of the interviewees (55%) said that seagrass condition is less than the years before.



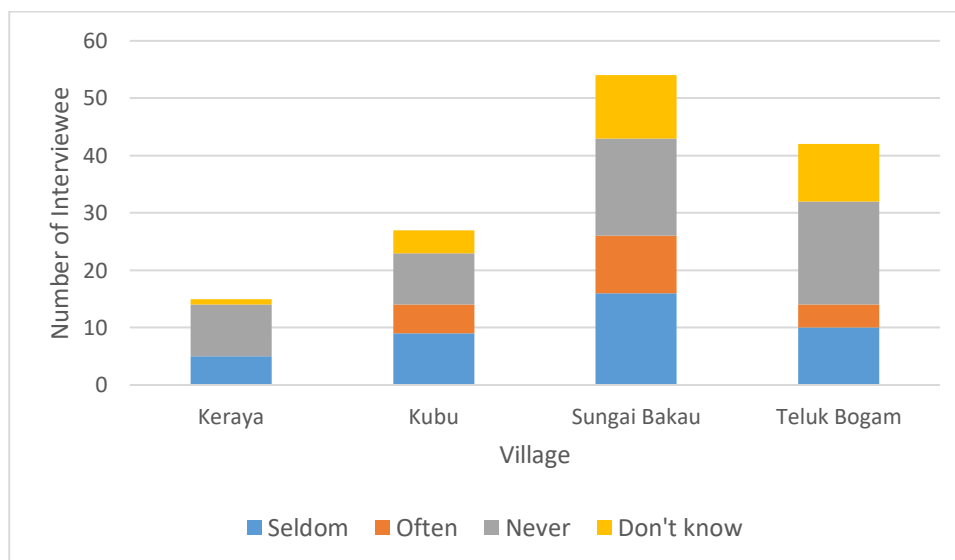
**Figure 22.** Comparison of seagrass condition then and now

Majority of the interviewees (70%) stated that they do not fish in seagrass area, and the rest 30% stated they do fish in seagrass area. In harnessing the seagrass, according to the interviewees, most of them said that it's for fishing area, then 32% of them said it's an area to collect shells/ snails/ another bentic animals. And very little of them (25%) said that seagrass has no benefits. At least each 4% said that seagrass has function as algae/ seaweed collector and for ship mooring, the rest each 1% stated that seagrass is for collecting shrimp and for digging sand (Figure 23).



**Figure 23.** Community perception of seagrass functions

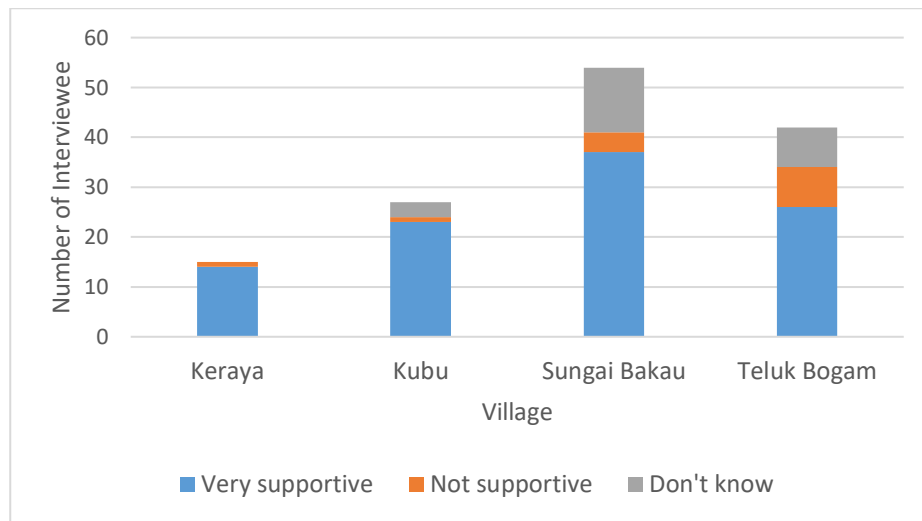
Less than half of the respondents (38%) stated that there has not ever been a patrol in their water area. At least 29% respondents said that a patrol is done rarely, and a few of them (14%) said that the patrol is done often, and the rest 19% said they don't know if there is a patrol (14%). The interviewees said that the ones who patrol are from Water and Air Police, Navy Seals, Tanjung Keluang Resort Team, Fishery Agency, and Community Surveillance Group. The objectives to patrol (according to the interviewees) are to supervise fishermen activities in Kumai waters, looking for smuggling, keeping dugong and seagrass habitat.



**Figure 24.** Community perception about patrol activity/ supervision

Story/ legend that evolves within Kotawaringin Barat, especially in Kumai Sub-District about dugong and seagrass is there was a wife who craved for seagrass fruit and then took it herself, so she turned into a mermaid. Besides, to call a mermaid back then was done by

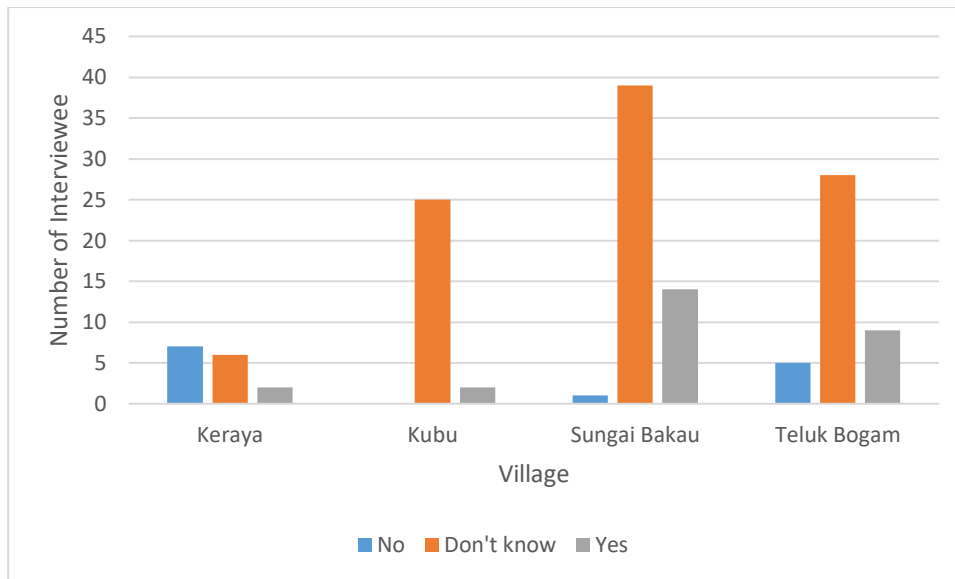
whistling. There were habits that often done after spearing dugong, there would be sound from shells. The presence of the dugong back then was interpreted as change of season.



**Figure 25.** Community perception about government roles, community leaders, community organization, and/or private sectors in coastal area preservation (especially dugong and seagrass)

Majority of respondents (72%) said that government, community leaders, community organization, and/ or private sectors are really supporting coastal area preservation, especially for seagrass and dugong (Figure 25). Supports from many parties is actually a chance to make dugong and seagrass conservation in Kotawaringin Barat a success.

A few of respondents (10%) said that there has been conservation attempts for dugong and seagrass in their areas, majority of respondents (97%) said that they don't know if there's any dugong and seagrass conservation program, and the rest (20%) said there is no any dugong and seagrass conservation program. Efforts for dugong and seagrass conservation have been done in their areas in sort of seminar or socialization to the community, group forming, and some interviews. However, only little of the respondents (20%) who are ready to involve in dugong and seagrass conservation. Majority of respondents (71%) said they don't know whether they will involve or not, meanwhile the other 9% said they don't want to involve in dugong and seagrass conservation. In Sungai Bakau, there are 14 people who ready to involved, in Teluk Bogam, there are 9 people, in Kubu there are 2 people, and in Keraya there are 2 people also. The reasons for the ones who don't want to involve are they would not have much time to sail, it does not give any profit, they don't want to get involved with law, age issues, and they are also worry they could not do the tasks well, and the task is heavy for them (Figure 26)



**Figure 26.** Interviewees who are ready to involve in dugong and seagrass conservation

The next is interviewee's response about some things that affect dugong and seagrass habitat conservation. First is related to the population growth (Figure 27a), almost balanced between the interviewees who said it would affect the conservation process (44%) and who said it would not affect (43%). This shows that population growth still could affect dugong and seagrass preservation because there would likely more be chances of dugong's habitat destruction.

The interviewee's response toward the impacts of the construction of tourism facility/ tourism activity it's almost balance between the interviewees who said it would affect the conservation (47%) and the interviewees who said it would not affect the conservation (45%) (Figure 27b). This is because the tourism that is conducted in Kubu Village was only beach tourism, like in Kubu Tourism Beach and Tanjung Keluang Tourism Park. Meanwhile in Teluk Bogam, beach tourism activity is still not maximum because the land has been owned by foreigner, so the tourism development is targeting Gosong Beras Basah.

Majority of respondents (56%) said that industry/ mining activity would impact the dugong and seagrass conservation, 28% of them said it would impact nothing (Figure 27c). The impacts from industry/ mining activity would destruct the environment which would affect the seagrass growth as dugong's main diet, which would force dugong to move to another location.

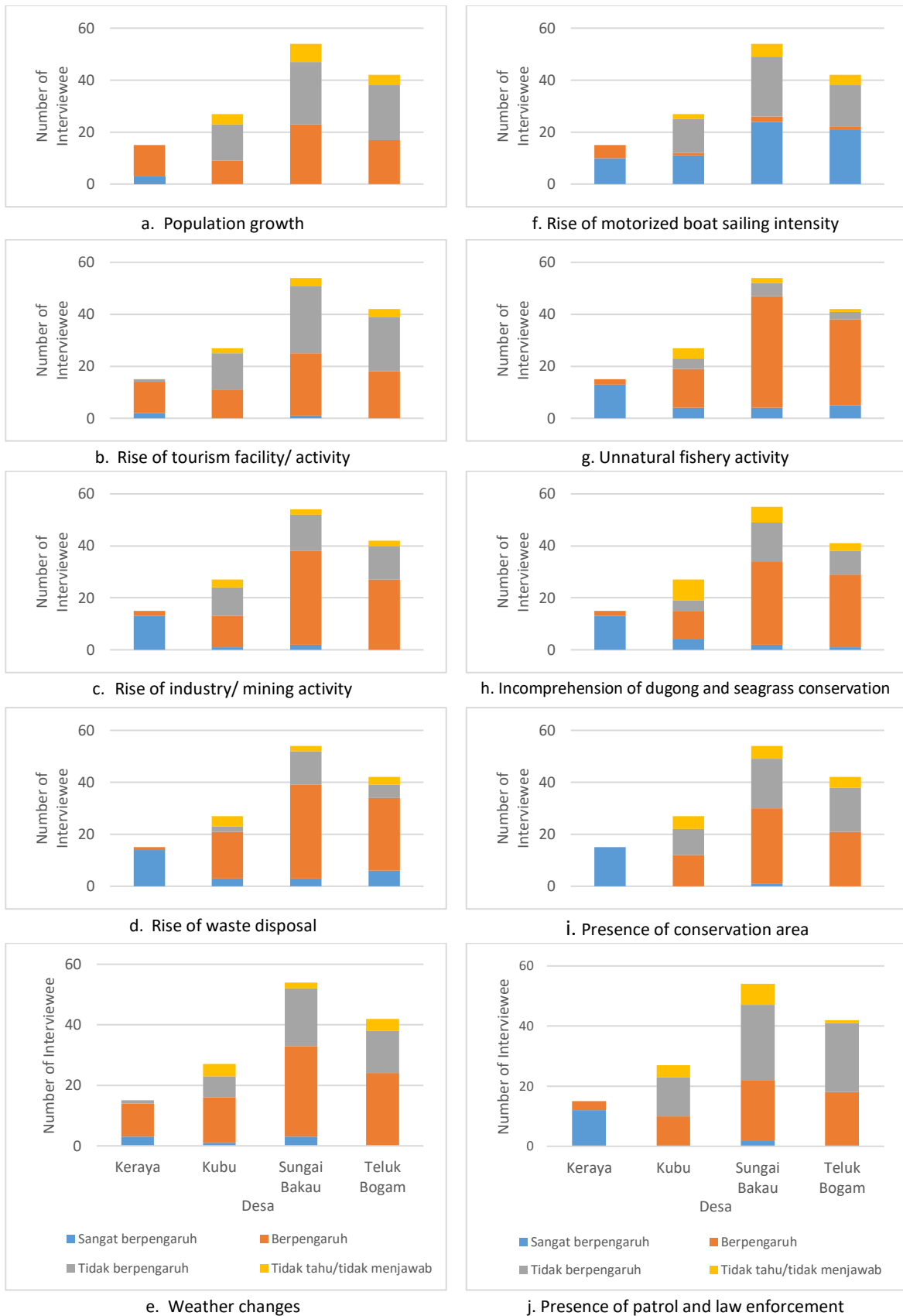
Majority of interviewees (60%) said that waste disposal or the absence of program/ facility for waste management would affect dugong and seagrass conservation. Very few said it would deeply affect, and only 14% said it would not affect anything (Figure 27d). Majority of the interviewees (58%) said that climate/ weather change would affect dugong and seagrass habitat, less than half (30%) said it would not (Figure 27e). Because in every month there would be a fishermen who confess dugong's sighting.

Interviewees' response shows almost half of them (48%) said that motorized boats affect dugong, and 7% of them said it affects so much. Meanwhile, 38% of the respondents said it would not affect dugong (Figure 27f). Some fishermen who saw dugong while on their ways to their fishery spots said that they often saw dugong went along with boats, this could be a threat for dugongs because they could hit the propeller. Majority of interviewees (67%) also said that capturing fish in an unnatural and destructive would affect dugong and seagrass preservation. At least 19% said it would affect so much, and so little (9%) said it would not affect any of dugong and seagrass preservation (Figure 27g). The non-destructive activity is much rejected by fishermen from Teluk Bogam, like the using of trawl. This could destruct seagrass habitat that it passes, so it would reduce the seagrass amount, which could cause dugong to move its feeding location.

More than half of the interviewees (53%) said that community's incomprehension would affect dugong and seagrass habitat. Only 20% who said it would affect nothing (Figure 27h). Socialization intensity toward community is needed to raise their awareness of dugong and seagrass habitat conservation.

Almost half of the interviewees (45%) said that the determination of the region affects dugong and seagrass habitat preservation, and a few of them (12%) said that it affects very much, only 33% of the interviewees who said that conservation area does not affect dugong and seagrass (Figure 27i). Almost half of them (44%) said that patrol activity does not affect dugong and seagrass preservation, only 37% of them said that patrol does affect dugong and seagrass (Figure 27j). This is affected by fishery violation that has never been dealt firmly by the officers.





**Figure 27.** Community perception towards several factors that affect dugong and seagrass conservation

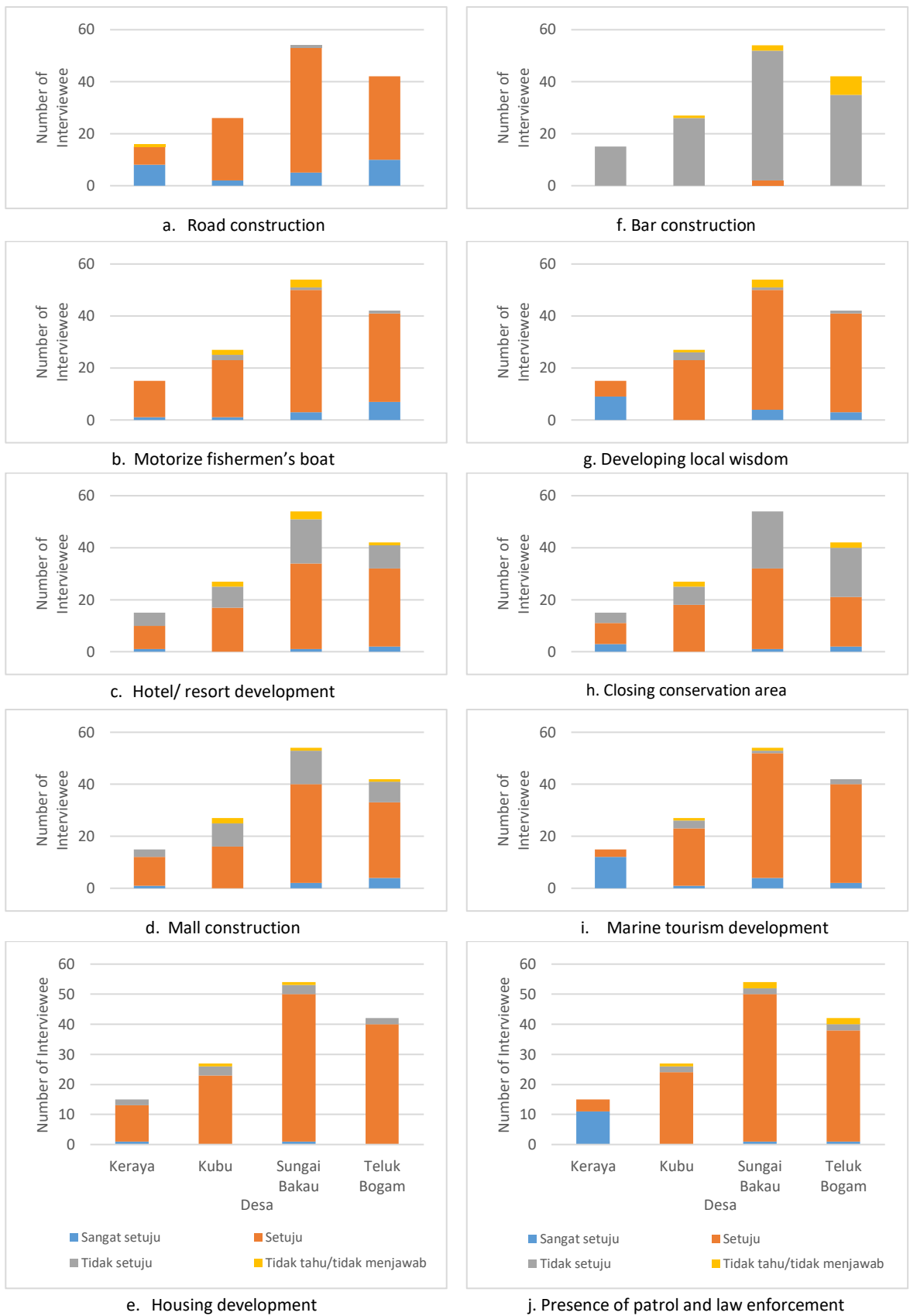
Figure 28 shows community perception towards expectation of regional development, in terms of infrastructure and enterprises. For road construction, majority of the interviewees agreed of that idea (80%), at least 18% said they were strongly agree, and the rest 1% did not agree and the other 1% did not answer (Figure 28a). Road conditions in four villages are already adequate, until the road connector between villages are very good, so people could travel conveniently.

Majority of the interviewees (85%) said they were agree to motorize fishermen's boat and 9% of them were strongly agree (Figure 28b). Those were said because the fishermen's condition still fishing using traditional fishing gear. For hotel/ resort building (Figure 28c), majority of the interviewees did agree. This shows that they are open about tourism development in their location. For mall construction (Figure 28d), majority of the interviewees (68%) did agree on that idea.

For housing development (28e), majority of the interviewees (90%) said they were agree of that idea. Meanwhile, for bar construction (Figure 28f), almost all of the interviewees (91%) were not agree of that idea. That was because they did not want bad things to enter and destruct their generations. This is also matching with local wisdom development top reserve their culture and traditions (Figure 28g), majority of the interviewees did agree (82%) and (12%) even did strongly agree.

Closing the whole/ partly conservation area (Figure 28h), more than half of the interviewees (55%) did agree on that idea to recover seagrass habitat and fishery resources. Even though there are still 38% of them who did not agree about closing conservation area. This because only a little of the fishermen who fish in seagrass area.

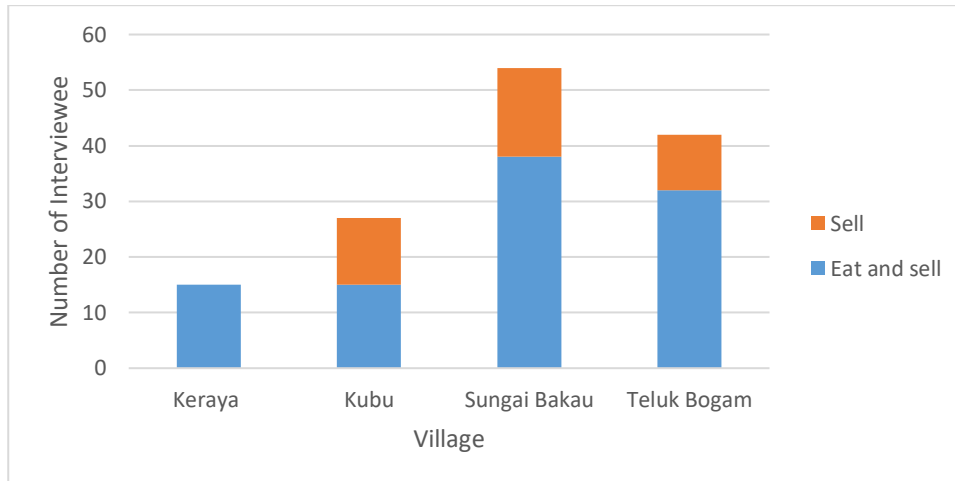
Majority of the interviewees (80%) said they were agree about marine tourism development, even there are 14% of them who said they were strongly agree, so almost all of them agreed to develop marine tourism (Figure 28i). This is similar to their thoughts about hotel/ resort development. Supports of tourism development in their locations are also shown by interviewee's perception about homemade industry. Majority of the interviewees (83%) did agree about that idea to support tourism activity (Figure 28j). This is because so that the tourism activity in their locations also could bring benefits to the locals.



**Figure 28.** Community perception about regional development plan in their regions

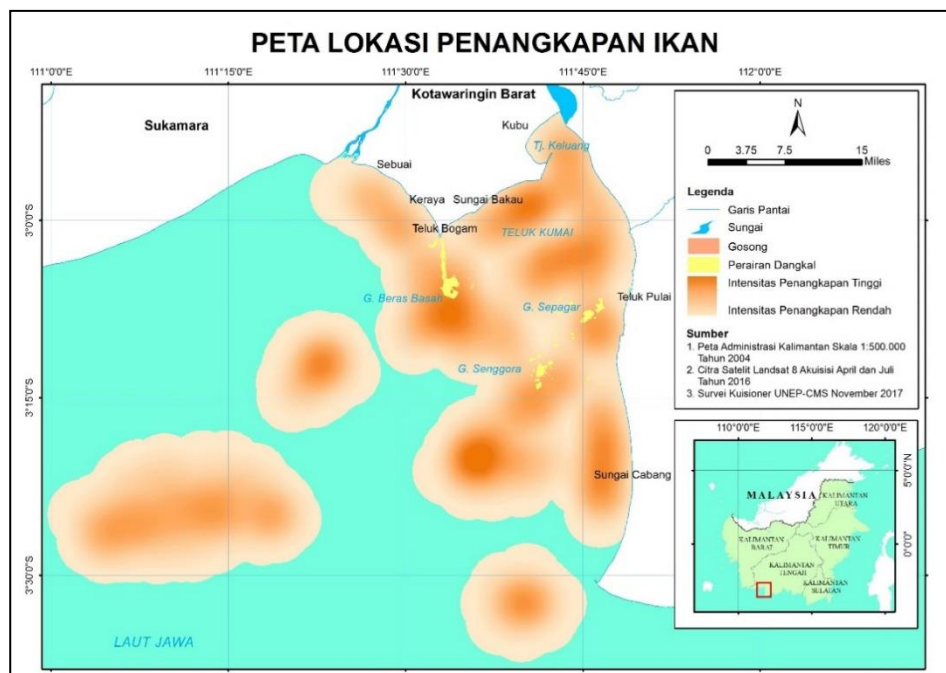
## 5. Fishery Information

Majority of the interviewees (72%) said about their fishery capture, beside they sell it, they also consume it themselves, at least 28% of them said all of their capture are sold (Figure 29). In Keraya, all of the interviewees said they sell and also consume their capture. This because they still look for nutritional value in fish.



**Figure 29.** Following up fishery capture

On Figure 30 it also can be seen the distribution location where the fishermen from all of villages fish. These locations are also differed based on the targeted species, like in coastal area, the people would crave more crabs, and people in Kumai Estuary River and people in Southwest Gosong Senggora targeted shrimps, and another locations only targeted various fishes.



**Figure 30.** Map location of Fishing Area

Using various fishing gears is being adjusted with targeted species. Even though the gears is vary, majority of the interviewees (78%) use trammel net, and only 17% of the interviewees who do not use that.

The targeted species of this gear is very vary, fishes itself could be very vary from *bawal*, *bandeng*, *belanak*, *senangin*, *otek*, *mayung*, *telang*, *pari*, *kakap*, *pesikur*, *tenggiri*, and shark, also it could catch crabs, squids, and shrimps, depend on its mesh size. This tool is being used by partly of the interviewees (33%), it is used in all seasons, and only a few (24%) use in only in west, and the rest said various seasons like west, transition, southeast, and east.

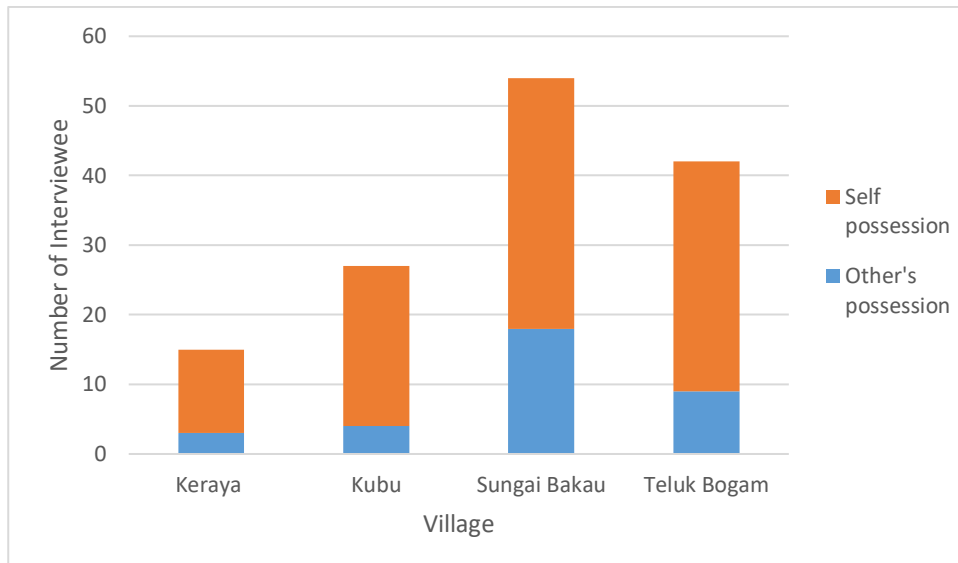
For longline and basic longline, only a few who use that tool. For longline, only 4% of them who use it, and at least 7% use it occassionally. The targeted species of this tool usually only *otek*, ray, and big fishes. It is usually used in west, east, and southeast season only. And for basic longline, only 1 person who use it as his main tool, and at least 4% use it occassionally. The targeted fish are *mayung*, *pari*, and *remang*. It is usually used in west and east season only. Not far from fishing tool, only 2 people who use it as their main fishing tool, at least 8% said they use it occassionally. The targeted species are usually ray and snapper, but fishing tool could be used in all season.

Purse sein tool is only used by fishermen from Keraya who use it as their main fishing tool, at least 16% use it occasionally. It could catch crabs, and being used only in southeast season. Meanwhile seine nets is only used by fishermen from Kubu, at least 2% said it is their main fishing tool, and at least 6% said they use it occasionally. The main target using this tool is shrimp, and it is only used in west season only. And for trawl, there is only 1 person from Teluk Bogam who use it at his main fishing tool, at least 4% said most of them use another fishing tools, and at least 5% said they use it occassionally. The targeted species are shrimp, small fishes, and it's only used in west season only.

For small trap fishing tool, also called *bubu*, only a few of them who use it. At least 4% interviewees from Teluk Bogam and Sungai Bakau use it as their main fishing tool, and at least 7% use it occasionally. The targeted species of this tool is crab, and this tool could also be used in west and southeast season, some even say this could be used in all season. For another trap tool called *kelong*, at least 2% of the interviewees use it as their main fishing tool, and at least 3% use that occasionally. The targeted species of this tool is crab, and could be used in all season, even though some say it only could be used in west season only. And for *rempa pantai* fishing tool, only 1% who use it, the targeted species is usually coastal fishes and could be used in transition season. For *sungkur* fishing tool, at least 5% of them use it, the main target is shrimp and it is used in east, southeast, and transition season.

Majority of the interviewees said that they use their personal boat to fish, and the other 25% said they use people' boat (Figure 31). The ones who don't have any boat usually follow the ones who have boat, or family's boat, or use another one's boat. This is comparable with

their money resource when they go sail, some said they got it from their own (86%), and at least 14% said they got a loan to sail, from their boss, family, bank, or even loan sharks.



**Figure 31.** Boat's ownership

## CONCLUSION

A few of the interviewees have seen dugong and could differ it from dolphin. The most common sighting is in Gosong Besar Basah. All of the interviewees claimed they have never hunted dugong or even caught it accidentally (bycatch). However, if they found a dead dugong, a little of the interviewees said they would harness it, by eating or selling it. Fishermen in Teluk Bogam and Sungai Bakau are often see dugong because their fishing areas are near dugong and seagrass habitat. Even though the majority of the interviewees did not answer about dugong because most of their time they use to sail, but most of them know and have seen dugong are having awareness to protect and treat specially if they find a dead dugong.

The development in tourism is accepted greatly by most of the interviewees, and they also agreed on preserve dugong and seagrass habitat by one of conservation area determination program. Gosong Senggora and Gosong Sepagar has been decided to become its place by Marine and Fishery Agency at the beginning of 2017 by decree from the governor.

## RECOMMENDATION

- There has to be control over unnatural and destructive fishing gears, like trawl.
- The conservation area determination should be done quicker, so the border of the area could be decided so it would avoid the dugong bycatch.
- Gosong Beras Basah is being pushed to become National Water Conservation Area so the Regional Technical Unit could focus on one of the coastal village.
- Optimizing information by using information board in every village.

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