

Original Research Paper

Socio-Economic Aspect of African Manatee (*Trichechus Senegalensis*) Hunting and Capturing in Parts of Ogun and Ondo State, Southwest Nigeria

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Abstract: This research was carried out to understand the emerging practice of hunting, capturing and trading of African manatee (*Trichechus senegalensis*) by fishermen and hunters in Iwopin lagoon area of Ogun State and some parts of Ondo State, Southwest Nigeria. The African Manatee has been declared an endangered species under IUCN red list. This research was conducted over one year to understand the period and factors influencing fishermen to hunt, capture and culture the animals in fish pond enclosure. The study deploys and employed immersion survey approach with enumerators staying with the fishermen in the survey communities. Analysis of the survey indicated that 70% of manatee hunters are adults in the age range of 31-60.55% of respondents use traditional traps to capture manatee and 43% uses drag fishing net (Ifatiko). The study further reveals that while 30% of the hunters captures manatee and keep it alive in fish ponds to sell it alive to buyers, 28% do so to sought for parts of its body particularly the oil and bones for medicinal purposes. Of the total 100 respondents, 21% opined that training fishing group on alternative livelihoods will help to promote conservation of the endangered sea creature, 20% suggested liaising with conservation agents on the need to train fishermen on how to rear manatee in its natural habitat. Alternative livelihood strategies and community conservation practices is recommended for the fishermen/hunters in order to prevent the practice of illegal capture and trade of Manatee.

Keywords: *Trichechus Senegalensis*, Fishermen, Rearing, Hunting, Conservation, Illegal Wildlife Trade

Introduction

Manatees are large aquatic mammal with an egg-shaped head, flippers and a flat tail. They are aquatic mammals belonging to the Order Sirenia and Family Trichechidae. (Jefferson *et al.*, 1993; Mayaka *et al.* 2013; Bradford 2017). Manatees are also known as sea cows because of their large stature. They have slow, lolling nature; and have propensity to be eaten by other animals. Manatees range in size from 2.4 to 4 m and can weigh 200 to 590 kilograms. They have large, strong tails that power their swimming and usually swim about 8 km/h, but they can swim up to 24 km/h in short bursts when they feel a need for speed (Bello, 2016).

Typically, manatees stay in rivers, seas and oceans along the coast of several countries.

Shirihai *et al.* (2006) and Reynolds *et al.* (2009) reported that there are three species of manatee: The Amazonian manatee (*Trichechus inunguis*); the West Indian manatee, or the American manatee (*Trichechus manatus*); and the African manatee (*Trichechus senegalensis*). Their names indicate the regions in which they live. The African manatee lives along the coast and in the rivers of western Africa. The Amazon manatee lives in the Amazon River's drainage, from the headwaters in Colombia, Peru and Ecuador to the mouth of the Amazon in Brazil. Their range is estimated to be around 2.7 million square miles (7 million square kilometers),

according to the International Union for Conservation of Nature (IUCN). The West Indian manatee lives in the southern and eastern United States, although a few "vagrants" have been known to reach the Bahamas, according to the IUCN. Manatees often swim alone or in pairs. They are not territorial, so they have no need for a leader or followers.

Habitats, Diets and Habits

West and Central Africa contain a variety of suitable habitats for Manatees ranging from large and small rivers, coastal estuaries, freshwater and saltwater lagoons, shallow quiet coastal bays, lakes and reservoirs. They are found in Angola, Benin, Cameroon, Chad, Republic of the Congo, Democratic Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo (Grigione, 1996; Powell, 1996; Perrin, 2001; Dodman *et al.*, 2008). In Nigeria, Manatees occurs in major rivers and their tributaries such as Benue, Niger and Cross while they are also found in major lagoons such as Badagry lagoon, Yewa lagoon, Lagos lagoon and Lekki lagoon (Powell, 1996; Awobamise, 2008).

Manatees are primarily herbivores. They feed on a wide variety of submerged, emergent, floating and shoreline vegetation. At sea, they tend to prefer sea grasses, in rivers, they consume freshwater vegetation and algae. A manatee can eat a tenth of its own weight in 24 h. That can equal up to 59 kg. African Manatees feed primarily on vegetation and over 70 species of plants have been documented to date as Manatee food throughout their range (Bessac and Villiers, 1948; Powell, 1996; Reeves *et al.*, 1988; Akoi, 2004; Keith Diagne, 2015).

When manatees are seen in a group, it is either a mating herd or an informal meeting of the species simply sharing a warm area that has a large food supply. A group of manatees is called an aggregation. An aggregation usually never grows larger than about six individuals (Bradford, 2017).

During mating, a female manatee, which is called a cow, will be followed around by a dozen or more males, which are called bulls. The group of bulls is called a mating herd. Once the male has mated, though, he takes no part in the raising of the young. A female manatee is pregnant for about 12 months and the calf, or baby manatee, is born underwater. The mother helps the calf get to the water's surface for air and within the first hour of life, the calf will be able to swim on its own. In five years, the young manatee will be sexually mature and ready to have its own young. Manatees usually live about 40 to 60 years.

Conservation Status

The International Union of Conservation of Nature (IUCN)'s Red List of Threatened Animals is internationally recognized as the list that categorizes the status of globally threatened animal species. It provides taxonomic, conservation status and distribution information on species that have been evaluated using the IUCN Red List categories. This system is designed to determine relative risk of extinction and the main purpose of the Red List is to catalogue the species that are regarded as threatened at global level, i.e., at risk of overall extinction SANBI (2010).

The IUCN's Red List of Threatened Species lists all manatees as vulnerable or endangered and facing a high risk of extinction. The African Manatee is one of the least understood marine mammals in the world and has recently been shown to be the least studied large mammal in Africa (Trimble and Van Aarde, 2010). To this extent, they are often referred to as the "forgotten sirenian" and the exact number of African manatees is unknown. However, the IUCN estimates there are fewer than 10,000 manatees in West Africa.

The African Manatee is at the greatest risk of extinction due to the high levels of human poverty within its range of distribution (Marsh *et al.*, 2012). In 2013 the IUCN SSC Sirenian Specialist Group created an African Manatee Subgroup to focus conservation efforts for the species. Though African Manatees are protected throughout their range, enforcement and control of hunting appears negligible. Hunting is largely local and sometimes ritualized and the meat is usually consumed locally. In some regions, hunting is primarily opportunistic and meat and products are traded locally and across borders. (The IUCN Red list of threatened species 2018-1)

Populations of the African manatee are expected to decline by as much as 30% over the next 20 years. This has been largely attributed to hunting and incidental capture in fishing nets (Cadenat, 1957; Dodman *et al.*, 2008). Although Manatees are most often exploited for their meat, however, in certain countries such as Nigeria, Togo and Côte d'Ivoire they are also hunted for their skin, bones and oil for traditional medicines and rituals. They are hunted by various methods including nets, weirs, large box traps, drop traps using harpoons and snag lines and hand-thrown harpoons (Reeves *et al.*, 1988; Roth and Waitkuwait, 1986; Akoi, 1992; Powell, 1996).

Habitat loss from waterfront development, damming of rivers, cutting of mangrove for firewood and destruction of wetlands for agricultural purposes all impacts their survival. Manatees are also known for their very slow reproductive nature as the time between generations is about 20 years.

Materials and Methods

The study was carried out in Oni, Orubu, Origbe, Iwopin, Imeki, Olojumeta and Makun-Omi in Ogun Waterside local government area of Ogun State and Atijere in Ilaje local government area of Ondo State Southwest Nigeria (Fig. 1). Ogun waterside has an area of 1,000 km² and an estimated population of 103,200 (NPC, 2016). It is bordered by Ijebu East local government to the Northwest, Odigbo, Okitipupa and Ilaje local government areas of Ondo state to the Northeast, East and Southeast respectively, Epe local government of Lagos state to the West and the Atlantic Ocean to the South.

The people of the study areas are Yorubas from three major lineages of Ijebu, Ikale and Ilaje, who largely observe similar customs and uphold the same traditions as other Yorubas, but shaped by their amphibious environment among swamps, large water bodies such as creeks, rivers and lagoons as well as forests. Because of the nature of their environment, majority of the inhabitants are hunters and fishermen who work for different groups and engage in different kind of fishing. While some are at the sea to catch

other fish apart from manatee, some are there to capture manatee either to rear or sell.

Research Methods

Quantitative and qualitative research approaches were employed for the one-year study. A peculiar part of this study was the immersion approach which allows researchers to stay in the communities. Data collection tools employed includes Focus Group Discussions, Semi-structured interviews, structured observation and questionnaires.

Household questionnaires were administered to one hundred (100) different respondents in Oni (10), Orubu (10), Origbe (10), Iwopin (25), Imeki (10), Olojumetta(10), Makun-Omi (10) of Ogun State and Atijere (15) areas of Ondo State.

The essence of administering the questionnaire is to ascertain ways by which fishermen captures manatee, why they sell them, how they can be reared, how to put an end to the killings of manatee and how to help improve fishermen's life so that they learn to rear than kill them for financial gains and to avoid extinction of this great but threatened species.

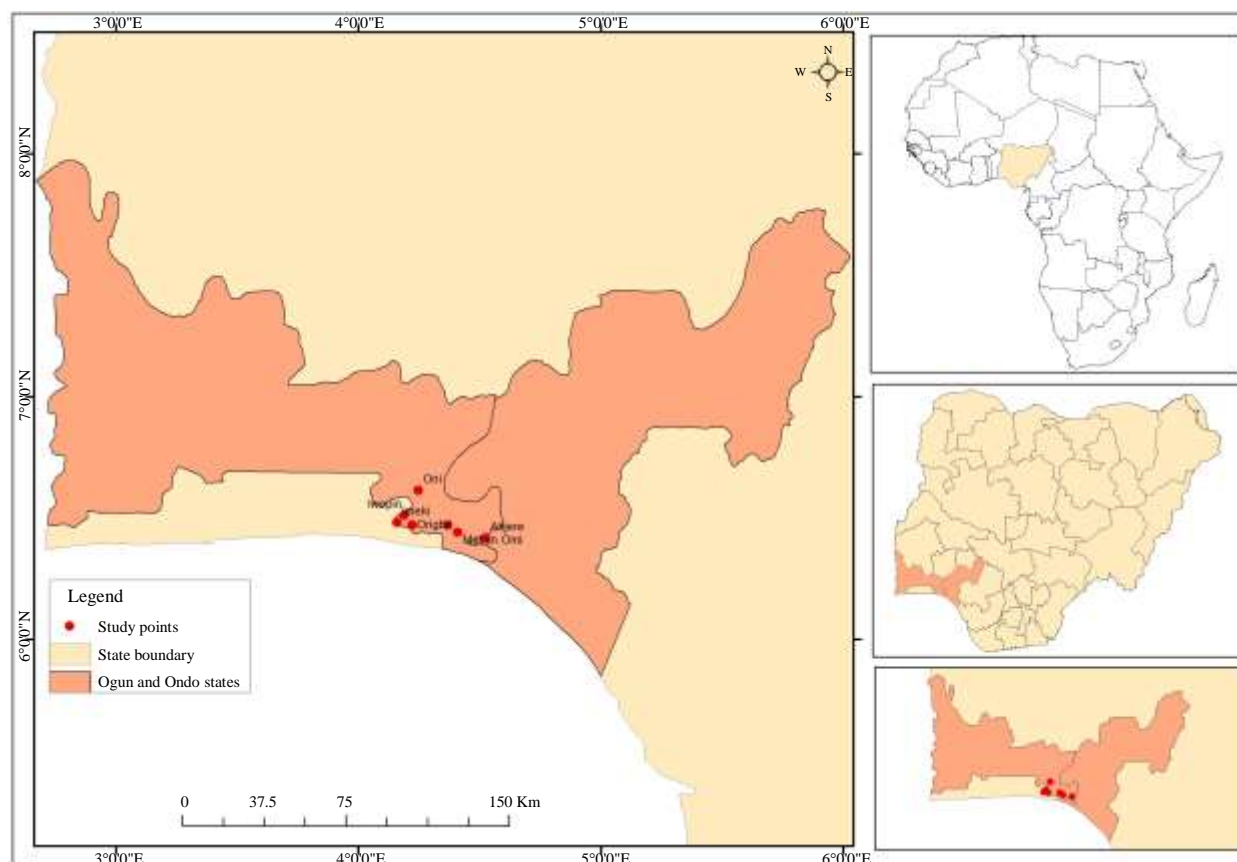


Fig. 1: Map of the study area showing study locations

The study also focused on how manatees can be captured, what kind of instruments are used in capturing them, rearing of manatee in ponds and how well can they survive under this present climate conditions. Visual and audio-visual means were equally employed in data gathering for evidence generation and archiving and to provide background information for further researches on the biology and conservation activities of manatee.

The attitude and practices of the fishermen at the shore side, fish pond side and when manatee is captured were also documented.

The following responses were extracted from the questionnaire that was administered during this survey and they are as follows:

- The reasons why people hunt Manatee
- Prevention of manatee exploitation
- Making Manatee conservation or rearing more effective in the communities
- Problems associated with weather changes and how it has affected fishing and other activities in the communities
- Beliefs associated with manatee capture
- Most prevalent period for capturing manatee
- Category of people who buys or trade in Manatee
- Types of gears used in capturing Manatee

Results and Discussion

From the Fig. 2, 72% and 28% male and female respondents participated in the survey respectively. This is because more men are naturally engaged in fishing than women.

From the Fig. 3, 28% of the respondents had both primary and secondary education while 44% had post-

secondary education. This shows that a larger percentage of the respondent who work as fishermen are mostly educated haven gone through tertiary form of education and have acquired the National Certificate in Education or First Degree.

Figure 4 shows the main type of occupation of the respondents.

Although all respondents are fishermen, they also engage in manatee business. According to them, manatee provides a supplementary income for them particularly when fishing is no longer as lucrative because of dwindling fresh water fisheries resources. From the analysis, 19% belongs to the Fish Aggregating Device-IKEN fishing group, 19% percent also belongs to the IFATIKO fishing group, 19.15% works in the farm and are into poultry. 42.5% belongs to the other jobs such as shoe making, that were not listed in the questionnaire but refer to as others.

The Fig. 5 considered the wealth level of respondents in terms of housing characteristics and assets ownership. While 100% of the respondents have, their houses build with sandcrete blocks, aluminum roof and cement floorings, 85.7% owns the house, 28.56%, 42.85%, 57.14% and 14.28% has a fridge, household radio set, household television set and multiple mobile phone set respectively. Compared to the overall wealth status of the study area, the fishermen and hunters of manatee are not the poorest due to the type of asset they own. Majority of them (more than 90%) have canoes, outboard engines and fishing nets.

From Fig. 6, the estimated average monthly income of respondents in Nigerian Naira shows that 14.28% has a monthly income of 30, 000-60, 000, 14.28% has a monthly income of 60, 000-90, 000 and 71.44 has a monthly income above 90, 000. This is not only based on the fishing job alone but in any other job they venture into which can provide means for them to cater for the family.

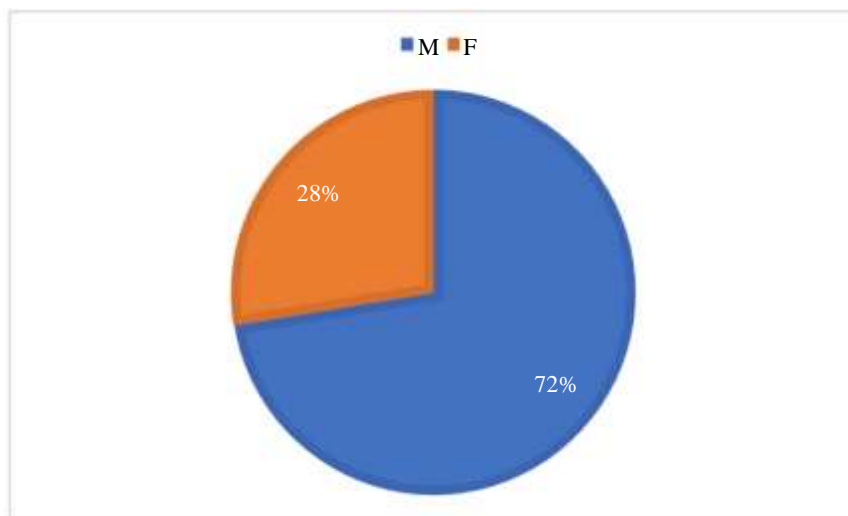


Fig. 2: Category of respondents by sex

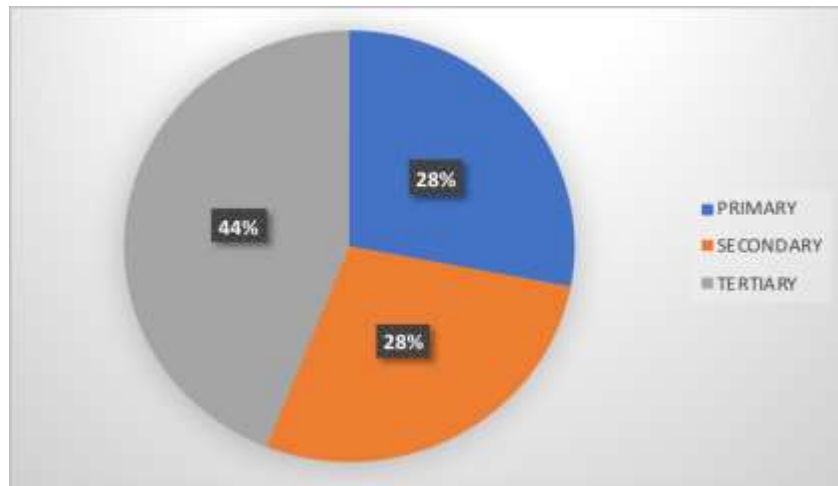


Fig. 3: Level of education of respondents

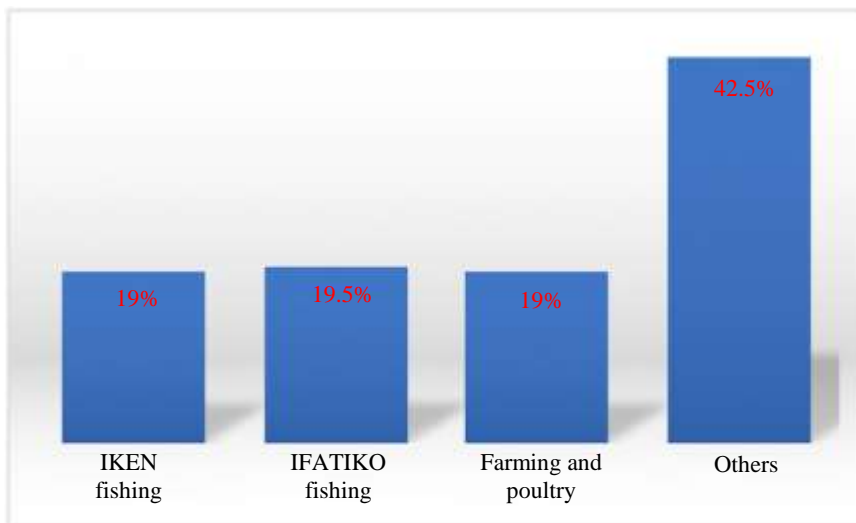


Fig. 4: Main type of occupation

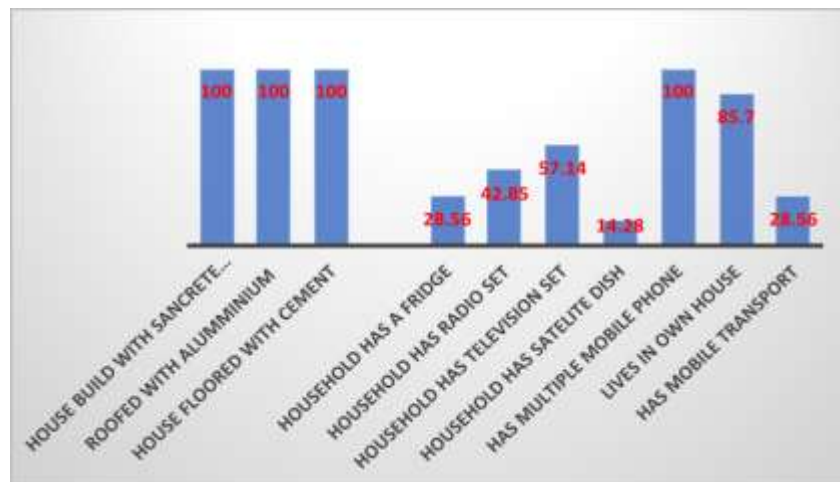


Fig. 5: Housing characteristics and asset ownership

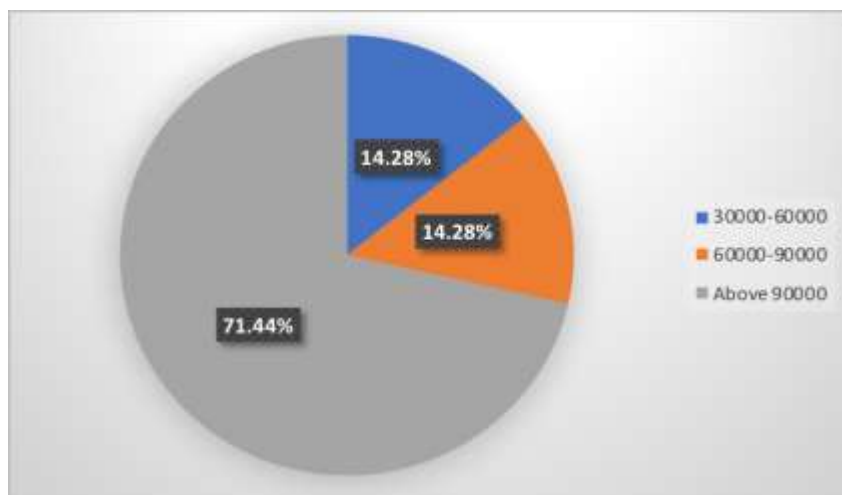


Fig. 6: Estimated average monthly income

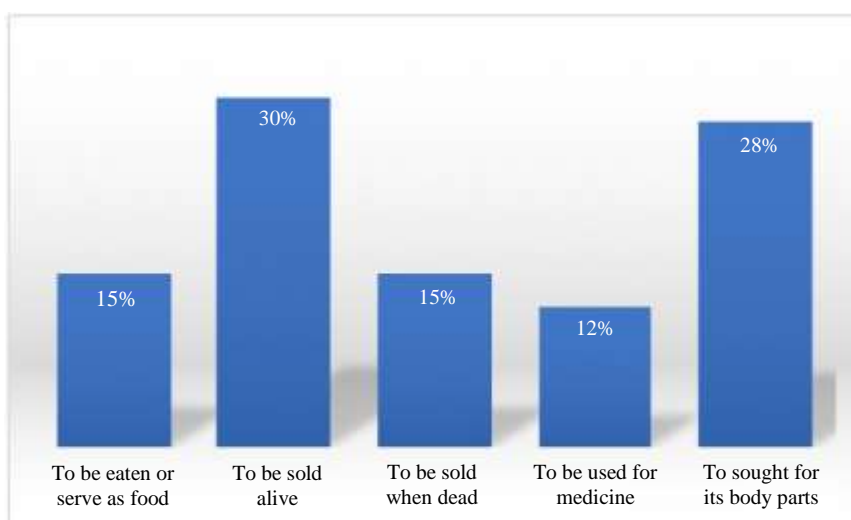


Fig. 7: Purpose of hunting/capturing Manatee

Socio-Economic Factor for Hunting/Capturing Manatee

It can be inferred from the Fig. 7 that 15% of the respondents capture Manatee for consumption, 30% sold it alive, 15% sold it when it is dead, 12% sold it to be used for medicine and 28% sold it to those who sought for parts of its body. It was gathered from fishermen at Olojumeta that the major reason why manatee is captured in the community by most people is primarily for consumption. However, most people who trade in Manatee do so because of its medicinal value as it has been found out to be effective in curing some diseases (sexual enhancement and aphrodisiac).

The Fig. 8 reveals the number of times respondents have seen or heard of manatee capture. While 3%

have only seen it once, 7% have seen it more than twice, 25% for more than six times and 65% for more than ten times. With the above analysis, majority of the respondents have seen this specie for more than ten times which shows that manatee is common in the study area. Further analysis reveals that 100% saw it in the last two weeks before the survey, 57.14% saw it a month before the survey, 14.28% saw it 2 months before the survey, a year before the survey and two years before the survey respectively.

The category of fishermen that engage in hunting and capturing of manatee was based on age range and is presented in the Fig. 9. From the Fig. 9, 25% of younger fishermen between the age of 15-30 years participate in the capturing of manatee, 70% from the ages of 31-60 years and 5% age 61 years and above.

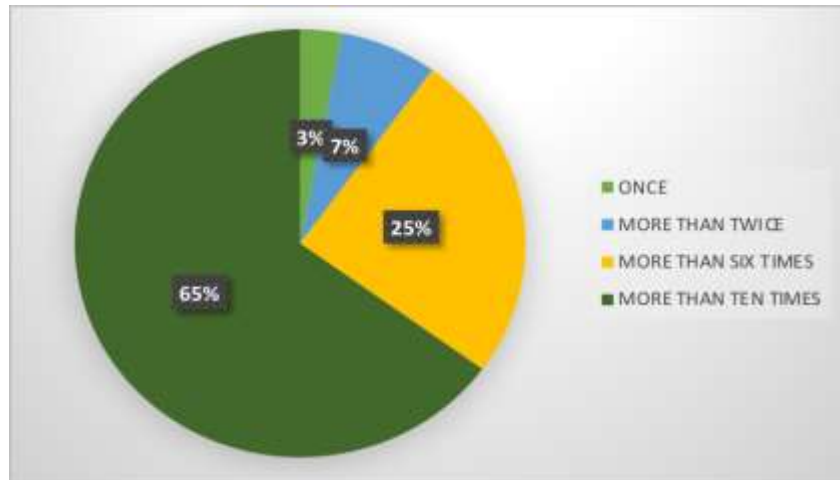


Fig. 8: Number of times seen/heard of Manatee capture

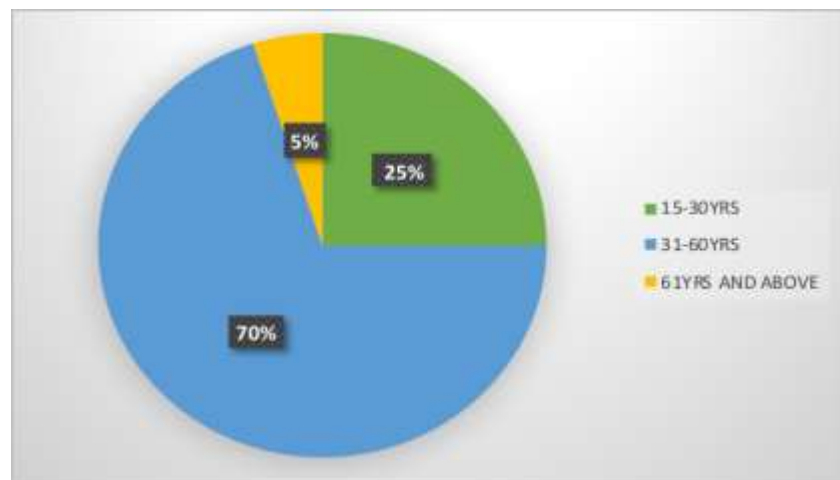


Fig. 9: Category of people that capture manatee

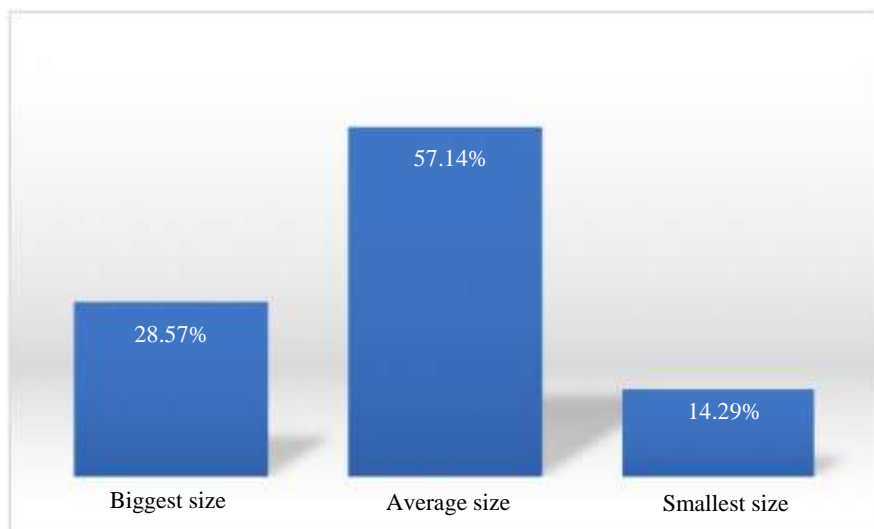


Fig. 10: Size of Manatee caught

To capture, there must be up to 10 to 15 able men and any age below or above the ones sighted cannot participate in Manatee capture.

In a Focused Group Discussion (FGD) at Iwopin water front, a respondent affirmed to have been in the business of manatee for over 30 years as his main work as a fisherman and the purpose is to capture and sell manatee either alive or dead.

Analysis of the size of manatee that was caught last in the community by respondents as presented in the Fig. 10 reveals that 28.57% are categorized as biggest size, 57.14% are average size and 14.29% are the smallest size. The size of manatee also determines the price. For example, a young manatee with an average size of 80 kg can be sold for one hundred and fifty thousand naira (#150,000.00).

How Manatee is Captured in this Community

This question was asked to obtain information on the types of gears used for capturing Manatee. From the response, 55% of fishermen uses traditional traps, 43% uses drag fishing net *ifatiko* while other uses bows and arrows.

The trading of manatee in the communities visited is a well-organized business and the outcome of the response of the category of people that engage in this trade is presented in the Fig. 11. Our enumerators observed negotiation process in three of those communities. The process started with telephone conversation between the buyers and the hunters to determine the location, size, cost and the mode of

transportation. According to our respondents, 20% of the buyers are the local fishermen who act as middlemen to resell to others, 55% are local businessmen from the Northern part of Nigeria, 22% are foreigners or external businessmen and 3% others.

In an FGD at Iwopin water front, one of the major traders in manatee confirmed that being in the business for over fifty years and that his sons are into the same business of hunting, capturing and selling of manatee.

Results of focus group discussions carried out in the study locations as indicated in the Fig. 12 explains that the most prevalent period when Manatees are captured is in the rainy season. Analysis of the responses showed that April to July is the most prevalent period at 64%. This is because of the rise in the sea level because of intense and continuous precipitation resulting to flooding and rise in water level.

Figure 13 explains where manatee can be seen or caught in the waters and what kind of water. While 55% of the respondents indicated that Manatee can be captured in deep waters, 28% indicated it can be seen or caught in shallow water. Furthermore, while 3% said it can be seen or caught in the shore, 12% said in the tall Fish Aggregating Device (*iken grass*) and 2% said in the short Fish Aggregating Device (*mese grass*).

As seen in the Fig. 14, some of the fishermen engage in the culturing of Manatee by raising them in conducive conditions such as in ponds until they are ready for sale during the off-peak season. As some of the respondents reiterated, the reason giving for the culturing of Manatee in ponds is basically to have them around when needed either for consumption or for sale.

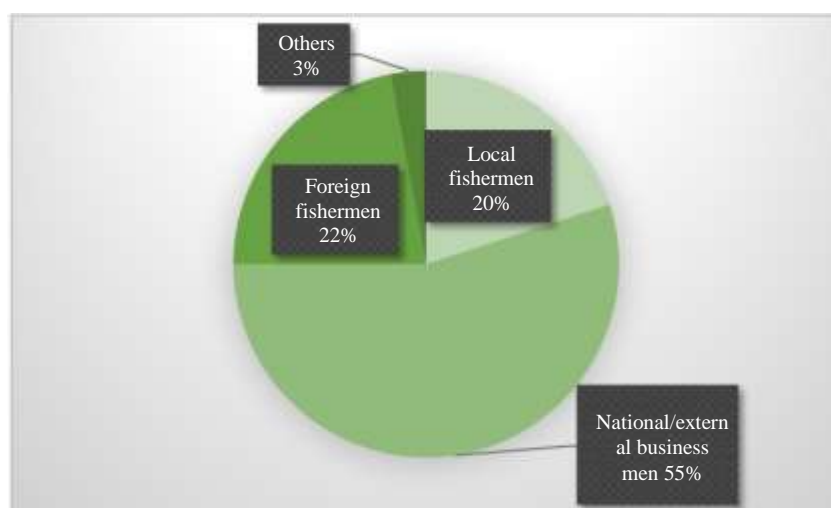


Fig. 11: Who buys or trade in Manatee

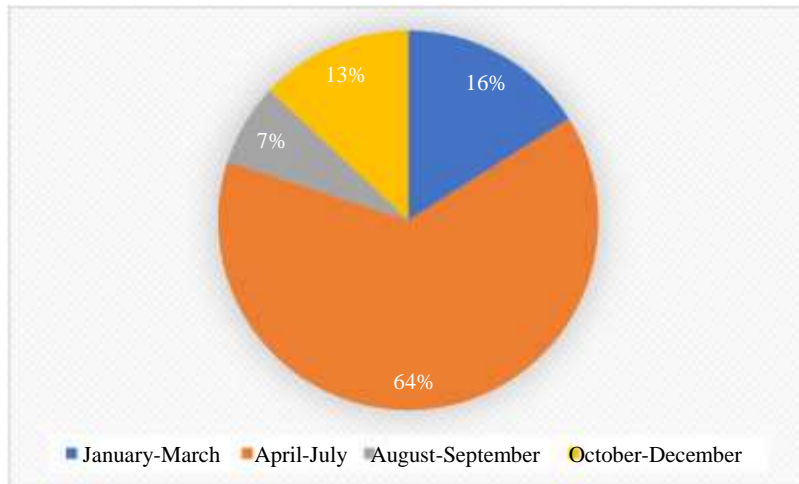


Fig. 12: The most prevalent time to capture Manatee

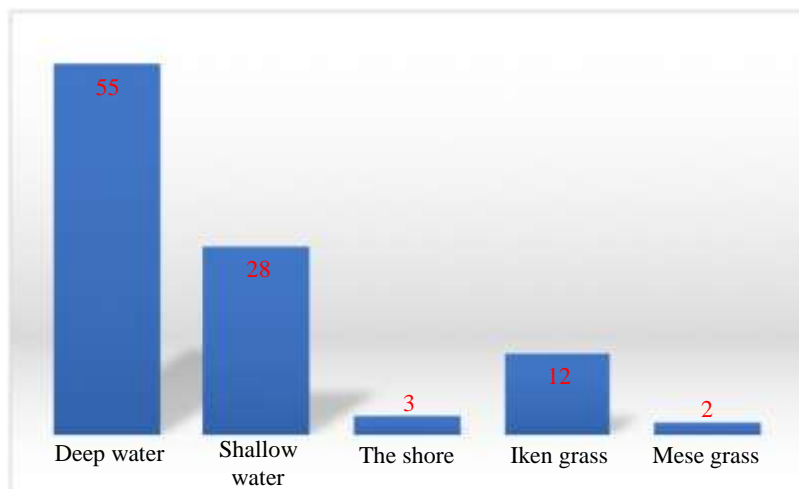


Fig. 13: Best location where Manatee can be seen or caught



Fig. 14: Culturing of Captured Manatee in Iwopin

Conclusion

It is evident from the results of the survey that the hunting, capturing and rearing of Manatee among communities in parts of Ogun and Ondo States, Southwest Nigeria has become a means of livelihood both for the fishermen and the middlemen who trade in it. While some hunt the mammals for its medicinal value, some do so for consumption purposes. Manatee if properly maintained or reared can bring about an improved socio-economic development of coastal communities in parts of Ogun and Ondo States, Southwest Nigeria. The current rearing of manatee by some fishermen in captivity can provide further information for researcher and conservation experts. Rather than continuing in the Illegal Wildlife Trade (IWT) of killing or capturing these great species which are at the brink of extinction, if they can live peacefully in their natural habitat, they will be preserved and generations yet unborn will benefit a great deal from this aspect of biodiversity.

Acknowledgement

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Author's Contributions

Kabiru O. Abass: Led the design of the research, plan and organized the study, coordinated the field study for data collection, contribute in drafting the article and reviewing it for significant intellectual content.

Abiodun. K. Seriki: Participated in the design of the research plan, led the field study for data collection, participated in the data-analysis and interpretation, contributed to the writing of the manuscript.

Emmanuel O. Orebiyi: Participated in the design of the research plan, participated in the field study for data collection, coordinated the data-analysis and interpretation, contribute in drafting the article and critically review the article for significant intellectual content.

Olayinka Ewuyemi and Olayinka Adeseja: Participated in the design of the research plan, participated in the field study for data collection, contributed to the writing of the manuscript.

Ethics

All respondents were fully informed about the purpose and nature of the research. All respondents freely consented to participate in the research without

any incentives. The authors affirm that there is no breach of confidentiality and privacy of respondents.

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