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The interplay between sea turtle population and income generation in south-west Nigeria coastal environment

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Abstract. Over exploitation of marine resources pose a threat to their population and ultimate survival. Sea turtle is one of the endangered marine species whose conservation must be taken seriously because of their economic advantages. Human interferences with sea turtle habitat and procreation process have been observed to be one of the main causes of reduction in their population. This research considers the interplay of sea turtle population and hunting for sea turtles and eggs for consumption and sales to earn a living by the coastal community dwellers in some parts of South West (SW) Nigeria. The study area is characterized by humid and hot weather, with annual temperature ranging between 26 and 34°C. More than 80 percent of the rain falls during the rainy season around (April to October). Data on field encounters with sea turtle nesting sites, hatchlings and mature adults were collected, questionnaires were administered among the coastal community dwellers. It was observed that some local community members do hunt sea turtle eggs for consumption and eating of sea turtle meat which may create reduction in sea turtle population since their process of procreation has already been tampered with. Captured sea turtles must be rescued for it to survive. More needs to be done on the levels of awareness on turtle conservation and protection. Policy monitoring and implementation on endangered species conservation must be implemented and monitored in Nigeria.

Keywords: Sea turtles, conservation, endangered, awareness creation

1. Introduction

Determining animal populations is very important but requires a great effort, it is a major component of wildlife monitoring and management. Resources are required for effective monitoring, conservation and policy formulation.

The United Nations report indicated that high percentage of coastal dwellers depend on marine and coastal biodiversity for their livelihoods. Increment in global population is one of



the reasons why pressure is being created on marine resources., Over exploitation of marine resources has made some marine species to be endangered, sea turtle is one of the endangered marine species whose population is critically being affected negatively. Human interference) with sea turtle habitat and procreation process has been noted to cause reduction in their population. Seven sea turtle species are well known in waters around the world, their populations today are dwindling. The six species found in U.S. waters (green, hawksbill, Kemp's riley, leatherback, loggerhead, and oliveridley) are all protected under the Endangered Species Act. The seventh species (flatback) is only found in Australia, but is protected under Australian law. Because they migrate long distances and are slow maturing. In addition, they use a variety of habitats throughout their life cycles [1].

Lepidochelys olivacea (Olive ridley turtle), *Caretta caretta* (Atlantic Loggerhead), *Chelonia mydas* (Atlantic Green turtle), , *Eretmochelys imbricata* (Atlantic Hawksbill turtle) and *Demochelys coriacea* (Leatherback turtle) are the common five sea turtle species common in Nigerian waters, they nest along the coastal areas[2]. All seven extant species of marine turtle are highly migratory, and considered oceanic and neritic at different life history stages.[3] opined that protection of turtles in the inter-nesting area requires adequate knowledge and information on their spatial behaviour. In addition, data on spatial behaviour during the inter-nesting period is important and required for efficient protection and conservation in addition to the understanding of their ecology.

Sea turtles lives are mostly spent in the water, where very little information could be collected on their behaviour. Observing Female adults and hatchlings that come to the coastal area to lay eggs provide much information about the sea turtle as we have it currently. Sea turtles and Salmon shares the same breeding style, like salmon, sea turtle do return to the same location of their nesting grounds at which they were born to lay eggs[4]. The behavioural responses of hawksbill turtles to thermal stress was studied by [5], the researchers found out that Temperatures outside the range of those that turtles can bear resulted in the death of the developing sea turtle embryos.[6] concluded that the global warming phenomenon has impacts on marine species survival.

The type of food eaten by sea turtles depend on the subspecies, but some common items include: sponges, shrimps, jellyfish, seaweed, crabs, snails, algae and mollusks. Each species prefers different diet for example, Olive greens eat sea grasses; leatherbacks prefer to feed on jellyfish and soft-bodied animals; heavy-shelled animals such as clams are preferred by loggerheads; hawksbills delicacies are sponges and other invertebrates [7].

The ingestion of plastic marine litter (PML) by sea turtles is common and this is also posing a threat to sea turtle survival. [8] commented that the five species that occur in the southwestern Atlantic are all vulnerable to this pollution.[9] affirmed that PML ingestion can result in sub lethal or lethal effects in animals, including sea turtles.

Species determines the number of eggs that could be laid by sea turtles, it could be between 70-190 eggs [10]

Male and juvenile sea turtles do not return to shore the moment they hatch and get to the ocean, this has made it difficult to determine precisely the population numbers. In addition, the population size assessments of marine turtles are often based on counts of nests, which are then related to abundance [11]. Also, due to low re-encounter probabilities, clutch frequency

has proven difficult to estimate reliably, especially for large populations that make a major contribution to global stock assessments [12]

Possible causes of sea turtle population reduction have been attributed to coastal erosion, destructive fishing (fishing with chemicals), pollution, real estate development around the coastal areas, consumption of turtle eggs and hunting turtle for meat, by catch by fishing trawlers, fishermen nets and other anthropogenic factors. Adults and juveniles are actively hunted and commercial fisheries catch them incidentally [1] concluded that Nesting suffers from beach development, egg poaching and the poaching of nesting females.

2. Methodology

The study involved field data collection on the nesting sites spatial location, collection of spatial locations of the hatchlings and adult sea turtles encountered using Magellan eXplorist 310 to collect the longitude and latitude data. The soil samples of the three observed nesting sites were taken for analysis together with other three randomly selected locations in the site to determine whether there is a preference for location with certain chemical constituents for eggs laying. The soil samples were soaked in distilled water for a period of three days in order to measure the PH. The PH values of the nesting sites were observed to be between 7.01 to 7.03 in values. The study also involved questionnaire distribution among the coastal community dwellers. One hundred and fifty questionnaires were distributed. One hundred and twenty were retrieved and its analysis are currently ongoing. The general study of other anthropogenic factors that may affect sea turtle nesting and population were observed like wastes and non-degradable materials around the coast and other human activities.

3. Result and Discussions

1. Though the research is still ongoing 50 hatchlings, 10 female adults with two dead adult carapaces and 3 nesting sites were encountered between July to December 2018. The field observations showed that some local community members do hunt for sea turtle eggs for consumption and eating of sea turtle meat to meet their protein needs. These acts may create reduction in sea turtle population since their process of procreation has been tampered with. During the encounters, one of the most endangered species leatherback species was caught for consumption in a marine environment in the study area, Payment for rescuing of sea turtle is another way that people are earning their living from among some community dwellers, you either pay for the sea turtle for it to be released back into the ocean or it would end up in a pot. Payments were made for some caught sea turtles to be released back to the ocean.



Fig1.The above Olive green sea turtle was rescued from the local community to prevent its sales to those that would have bought it for consumption.



Fig. 2. The above picture shows one of the hatchlings that was entangled by the unused fishing net near the nesting site. This shows that human activities around the coasts has a detrimental effects on sea turtle survival and development



Fig 3 shows a leather back sea turtle that was caught by local community while coming to the shore area to lay eggs



Fig4 shows the removal of eggs for consumption by the local community members from the leather back sea turtle



Fig5: shows the leatherback sea turtle meat sharing process by the local community members.

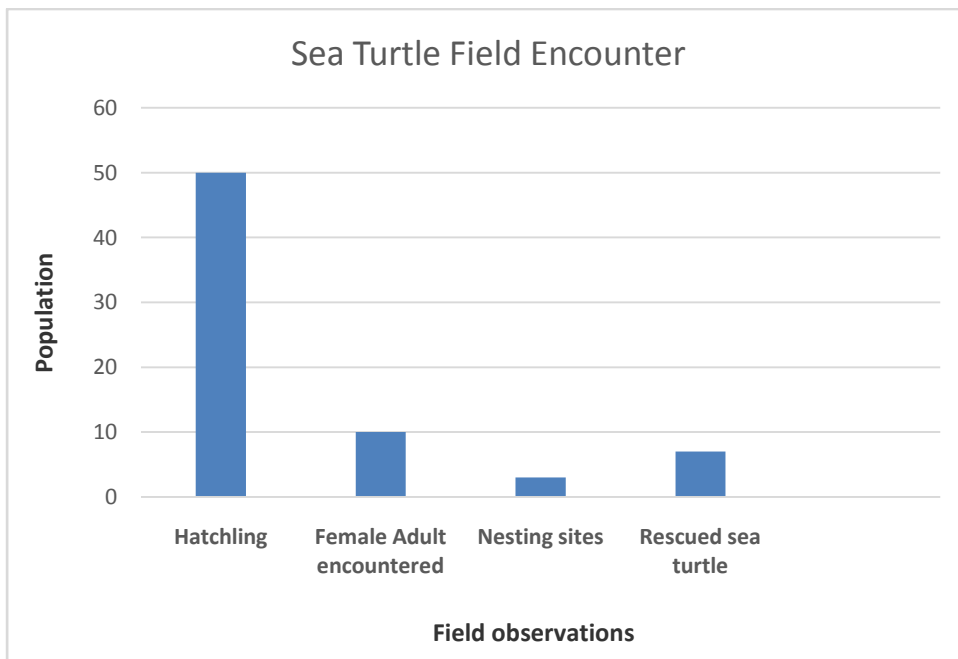


Fig.6. Field turtle encountered

4. Conclusion and recommendation

Human activities around the coast is creating significant disturbances in the procreation process of sea turtles. It equally poses a challenge towards sea turtle survival more awareness needs to be created among the coastal community dwellers on the need for endangered species conservation. Jobs should be created for the youths to reduce overdependence on

marine resources exploitation for livelihood. The people must be discouraged from turtle flesh and eggs consumption to enhance population growth of sea turtles and prevent their extinction. Policy formulation, monitoring and evaluation systems need to be active in Nigeria towards endangered species conservation. More funds should be provided for marine species research and conservation

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