Seagrass meadow and green turtle in Cambodia

PICH SEREYWATH and HEP SOKHANNARO
Department of Fisheries,# 186 Norodom Blvd, P.O.Box 582, Phnom Penh, Cambodia.
Tel: (855) 12 303 255/11 957 884, Fax: (855) 23 219 256
Email: maric@online.com.kh
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ABSTRACT
Green turtle (*Chelonia mydas*) have been reported as an abundant species among five species of sea turtles in Cambodia's sea. Green turtle have been known as plant eaters. Mainly a few species of seagrass In Cambodia, four large seagrass meadows have been selected as demonstration sites in two provinces and one municipality. KKSG1 and KKSG2 were selected in Koh Kong province, KAMPSG1 in Kampot Province, and KEPSG1 in Kep Municipality. So far, there is no confident information that have been mentioned about seagrass species and specific seagrass species which are the most favored species for green turtle even some survey had been conducted. Becase the process of the survey did not continue, feeding ground zoning for sea turtles have not been set up yet. To address this issue, survey on seagrass species conducted in 2002 in KAMPSG1 and KEPSG1 by using three methods are 1. to interview with local people who are living around seagrass area, 2. seagrass net, and 3. mapping seagrass areas, in order to find out seagrass species and feeding ground for green turtle. As a result, eight species of seagrass found in the area, in which two of them are dominated species, are *Enhalus acoroides* and *Thalassia hemprichii*. Whereas from interview indicated that green turtle mostly found in Kep municipality and Kampot province, particularly in areas that is reach of *T. hemprichii*. Although, there is no quantities information on feeding ground and specific seagrass species for green turtle are strongly aware yet. However, future plan has been made to conduct more survey in other zones in order to get fully satisfied information on favored seagrass species and their location for green turtle. It is expected that, clear result from the future activities will be useful to set up feeding ground for sea turtle, particularly green turtle. Therefore, many activities need to be done in the coming future for the sack of protecting and conserving sea turtle population as well as their feeding ground in Cambodia Water and also in the Southeast Asia. But fund for activities is seeking from concerned agencies and NGOs.

KEYWORDS: seagrass meadow, green turtle,

INTRODUCTION

The Kingdom of Cambodia has 435 Km coastline, locates in the Gulf of Thailand, and extends between the Thai's border in the West and the Vietnam's border in the South. The Exclusive Economic Zone (EEZ) of the country is the area from the shore 200 nautical miles off shore covering 55,660 Km^2 (Smith. J, 2001).

Along the coastline, there are many natural resources such as beaches, mangrove forest, coral reef and seagrass beds which served as feeding grounds, spawning ground and habitats for marine lives.

Among these, seagrass beds are one of the main sources that play very important role in ensuring sustainability coastal resources and other endangered marine animals, particularly sea turtle population, moreover, also provides feeding ground and nutrient-rich habitat for divers and range of fauna and flora (Mckenzie, L. J. & Campbell, S. J. 2002).

According to Try (2002), it has been reported that there are five species of marine turtle in Cambodian sea, in which green turtle is the abundant species mostly encountered in seagrass areas and often accidentally caught by fishermen with the stingray hook line, surrounding net, trawling net and scomberomorus gill net (Try et al., 2002).

However, there has no the report that significantly indicated about information on relating to preferred /dominant of seagrass species in specific areas as a major feeding ground for sea turtles, particularly green turtle.

But, based on the report of research by DOF (2002), which indicates that there are four sites of seagrass beds, namely KKSG1, KKSG2, KAMPSG1 and KEPSG1. They are the biggest meadow in the Cambodia waters. The first two sites (KKSG1 and KKSG2) are located in Koh Kong province, and the second one (KAMPSG1) in Kampot province and the third site in

Kep Municipality.

In terms of preserving, knowing the crucial potentials of these existing seagrass bed as well as managing and conserving program in Cambodia on endangered species, especially sea turtles, two of four seagrass sites (KAMPSG1 and KEPSG1) selected to conduct a survey and research in 2002.

Respectively, clearer data and information related to the specific feeding ground or preferred species of seagrass of green turtle and other potentials of seagrass will be completely gathered in two more sites in Koh Kong province, provided that there will be any financial support funded to DOF under good joint collaborations with outsiders.

SURVEY ON FEEDING GROUND OF GREEN TURTLE

The initiative concept on sea turtle research and conservation just restarted in the past few years after the civil war in the country. Up to now, there hasn't been any quantitative information on the specific feeding ground of green turtle along the coastline of Cambodia. Fishermen living along the coastal area, particularly in Kampot province and Kep Municipality mentioned that basically, sea turtles have been seen in different habitats based on locations where they were accidentally caught. Of which, green turtle mainly caught in Kep City and Kampot province.

Therefore, in order to get advantages during the research program on seagrass meadow of coral-seagrass Component, the Sea Turtle Team requested coral-seagrass Team to conduct the survey and research together. Then, this suggestion was agreed by the Director of the Department of Fisheries and coral-seagrass team. This cooperative group was separated into two groups, in which one group is for the inland survey and the other is for the underwater research. Clearly, all activities and result mentioned in following procedures.

METHOD

Three methods were used to conduct the survey / research :

1. Use questionnaires and note taking to interview with local people who are resident around the seagrass sites.
2. Use GPS to record position to zoning and mapping.
3. Use Seagrass net method to determine species composition and percentage cover of seagrass by species.

RESULTS OF SURVEY RESEARCH

4.1. Area found species for green turtle (*Thalassia hemprichii*)

Based on the survey/research on land and underwater about seagrass composition and specific feeding ground and preferred species for green turtle in Kampot province and Kep Municipality, there are six seagrass areas, namely in Preak Tnaot, Preak Ampil, Preak Kdat, Preak Koh Touch, Roluos and Phnom Dong in KAMPSG1 and there are two seagrass areas, namely Koh Tonsay and Koh Tbal in KEPSG1.

Eight seagrass species found in those areas such as *Enhalus acoroides, Cymodocea rotundata, Halodule pinifolia, Halodule uninervis, Halophila deciens, Halophila ovalis, Syringodium isoetifolium and Thalassia hemprichii,* in which Enhalus acoroides and Thalassia hemprichii are dominant species.

Generally, seagrass meadows are mainly growing inshore in sediment on the sea floor with clear shallow water. These meadows may be mono-specific or may consist of multi-species communities, and the other species were found in small amounts. At Preak Thnoat, Km12, Phnom Dong village in Kampot Province, around Koh Tonsay in Kep Municipality. Information on seagrass composition and seagrass abundance species within the two areas are still not reliable. According to this survey/ research, many green turtles have been caught and found in these two zones.

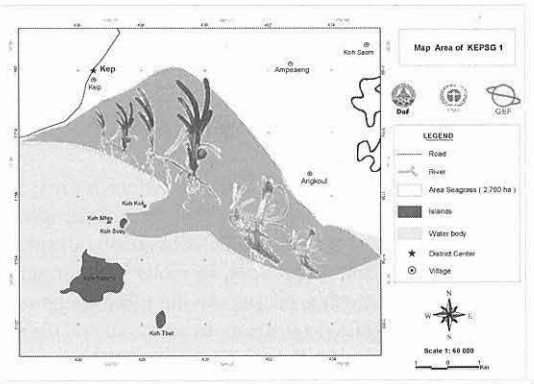

Figure 1. Seagrass area in Kep Municipality

4.2. AREA RICH IN *Thalassia hemprichii and Enhalus acoroides*

According to the data and information obtained from the underwater research shown that the areas where cover by *T.hemprichii* are Phnom Dong, Kilodabpi and Rolous in Kampot province, and group of Koh Tonsay islands at earthen part of KohTonsay and Koh Tbal in Kep Municipality.

4.3. AREA FOUND GREEN TURTLES *(Chelonia mydas)*

Referred to the on-land interview with residents around the selected site indicates that green turtle is a well-known species and can be found year round in their area. Also green turtle have been considered as abundant species in the sea. On the other hand, green turtles have been found broad expanses of shallow, sandy flats covered with seagrass or near seagrass beds in Phnom Dong, Rolous and Angkoul area, which are reported that the largest area

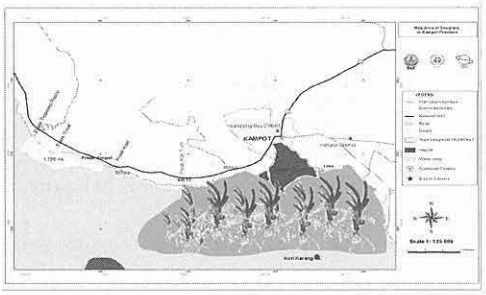

Figure 2. Seagrass area in Kanpot province

among all of areas where the underwater research has been conducted. However, information related to the specific feeding ground and specific species of seagrass for green turtle has not been completely obtained yet because local people have not known clearly about individual name of those seagrass even in Khmer. Clearly, many kind species of seagrasses were called the same name in Khmer as Smao Samut.

Even though, at least two more areas (Preak Ampil and Preak Kdat) were reported wheregreen turtle encountered as well.

4. 3. IMPACT TO SEAGRASS BED AND GREEEN TURTLE

From the survey result, there are several factors that may be causing negative impacts on seagrass beds by anthropogenic influences such as mangrove deforestation, stingray hook line, and fishing practices, in which only engine-pushed net and trawling fishing are the most dangerous activities on seagrass destruction. In addition, this illegal is not only caused degradation of diversity in the seagrass area, also reduced sea turtle population, particularly green turtle during their migration for feeding ground. Fishermen added that they found many green turtles in the past but now its number has been decreased after trawling fishing have been operated in these seagrass areas.

DISCUSSION

According to the survey/research in KAMPSG1 and KEPSG1 on percentage cover of seagrass composition and its relation to green turtle, even the study was randomly conducted in accordance with real situation at the survey/research sites, the result shows that eight species of seagrass beds have been found, of which two species are dominant species and many green turtle have been generally occurred in these two sites, especially in Phnom Dong, Preak Ampil and Preak Kdat areas.

Furthermore, it is expected that there are more than ten species of seagrasses have been presenting along the coastal area in Cambodia Water if other two (KKSG1 and KKSG2) in Koh Kong province will be completely conducted survey/research in the future. Clearly, based on Nelson (1999), it is mentioned that there are nine species of seagrass that have been found along coastline. With this regards, there is also a hope that more number of feeding ground and preferred species of seagrass for green turtle as well as other sea turtles will be found in Koh Kong water.

Thus, we hope that some of seagrass areas in this research site and others resulting from future research will be proposed to be protecting site, in order to ensure sustainability of marine fisheries resources, as specific feeding ground for sea turtles, particularly green turtle.

CONCLUSION

The research on seagrass beds in Cambodia might be able to say that this is a good initiative to set up any plan for future to prevent these seagrass beds from such crucial destruction through more closed collaboration with local communities and other government agencies even some cooperation have been done.

With this regards, such idea will also contribute indirectly to manage and conserve green turtle as well as other turtle species, because of seagrass beds are the main habitat for marine animals and other endangered sepecies, particularly feeding ground for green turtle. So, if these activities still continuously will be operated in the seagrass sites, the number of green turtle will be declined in the Cambodia waters.

Hopefully, this information from this seagrass beds survey/research will be useful for local or regional management and conservation program on sea turtles, other seegrass medow and marine endangered species as well.

RECOMMENDATION AND SUGGESTION

To ensure sustainability of our sea turtles, other marine natural resources as well as their natural habitat and feeding ground, emergent co-management and cooperation need to be implemented with friendly thinking in order to solve this matter, especially cooperatively eliminate any illegal action that may be caused danger seagrass beds and green turtle. Furthermore, public awareness campaigns and extension programs on the importance of our existing resources should be immediately disseminated to all levels.

In this connection, more research is needed on the feeding ground or areas which could be suitable for setting up to be protected zones for protecting and conserving sea turtles and their habitat in the future.

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