

Scope and Constraint of Beekeeping in Satjalia Island within Indian Sundarban Delta

Shruti Thakur¹, Subhajit Ghosh² and Dr. Tuhin Ghosh³

^{1,2}Junior Research Scholar, School of Oceanographic Studies, Jadavpur University, Kolkata 700032, India

³Joint Director, School of Oceanographic Studies, Jadavpur University, Kolkata 700032, India

Abstract— The Indian Sundarban on northern Bay of Bengal is the largest contiguous mangrove forest on earth, is a highly productive and diverse ecosystem (ES) with an aerial coverage of 9629 Sq Km. This ecosystem is also providing a wide range of direct or indirect ecosystem services (ES) and livelihood opportunities for the society. The extent of aerial coverage of the forest has not changed much in the last decade, but the health of the forest degraded along with their ecosystem services, as found from several studies. Traditionally, people of this region are dependent on farm based economy, else on the forest resources. Collection of natural honey from the forest is one such traditional practice while apiary beekeeping (Apiculture) started in the last decade only. This study is an attempt to understand the existing status of apiary beekeeping (Apiculture), their potential and constraints within the Satjalia Island, in the context of alternate livelihood option, either full time or as a seasonal profession.

Keywords — Satjalia Island, Indian Sundarban, Beekeeping (Apiculture), Alternate livelihood.

I. INTRODUCTION

Sundarban has a unique history, nature and landscape, the only mangrove tiger land on the earth. It is also facing multifaceted threats of cyclone, tidal surge, erosion and sea level rise, along with scarcity of freshwater, and existence of tigers, crocodiles and poisonous snakes. Agriculture is the major occupation, besides which a large number of people are also involved in fishing, collection of crab and honey from the forest. The common observation is that due to insufficient and gradual decrease in income from the major occupation, people of this region prefer to involve in seasonal livelihood options for secondary source of income. Honey and crab collection, along with fishing are such secondary profession, as these are confined for only few months in a year.

Increased interest in beekeeping through apiary installation has found in the last decade within the Indian Sundarban. Satjalia Island is not an exception, with the existing practice in its southern and eastern parts. A negligible percentage of the islander have accepted that beekeeping is an opportunity for alternate income generation.

Apis Dorsata is the dominant species of Indian Sundarban, commonly found in the entire district of South 24 Parganas as well as different parts of West Bengal. Himalayan ranges restrict its natural occurrence towards north though its presence has been found up to east Bali. The summer month of March to July is the flowering season in the Indian Sundarban when the dominance of this species observed (Chowdhury et al. 2008).

A different species *Apis Mellifera* are in use for this Apiculture practice for commercial honey production in this region, which also indigenous to other parts of Asia, Africa, Europe and Latin America. Locally it is called as 'European Bee'. In India, the initial success was achieved in 1960s and during the next two decades beekeeping using the European bee gained popularity in Jammu & Kashmir, Punjab, Himachal Pradesh, Uttar Pradesh, Bihar, and other parts of West Bengal (Report on 'Diagnostic Study Beekeeping and Honey Processing Cluster Old Malda Development Block'). This species is comparatively smaller in size, but stronger than *Apise Dorsata*. It prefers enclosed nesting with a single colony strength varies from 30000 to 100000 number of honey bees (Bradbear et al. 2009).

II. METHODOLOGY

Satjalia Island of the Sundarban Tiger Reserve has been selected for this study for its forest affinity and dependency of forest resources of the local people. Primary data was collected through household survey with structured and open-ended questionnaires targeted to the people involved in full-time or part-time with beekeeping within this island. Stratified random sampling technique was applied to select several respondents from different categories of honey cultivator, land lease process and trained beekeepers of different income groups. The secondary data were consulted from the Govt. or NGO reports, census data and academic publications.

III. STUDY AREA

The Indian part of Sundarban lies between 21°30' N and 22°40'48" N latitude and 88°1'48"E and 89°04'48" E longitude. It is delimited in the north by the famous 'Dampier-Hodges line' demarcating the northern extension of the intertidal zone marked by mangrove forests of 1830 (Hazra et al. 2002).

As a case study area the location of the Satjalia Island (under the jurisdiction of Gosaba Block, South 24 Parganas, West Bengal) is the last inhabited island of Indian Sundarban. Satjalia Island (22°7'40"N, 88°52'06"E) has 51.66 Sq Km. areal coverage with a population of 40189 distributed in 9883 households having a density of 778 persons/Sq km.(Census; 2011) (Fig. 1).

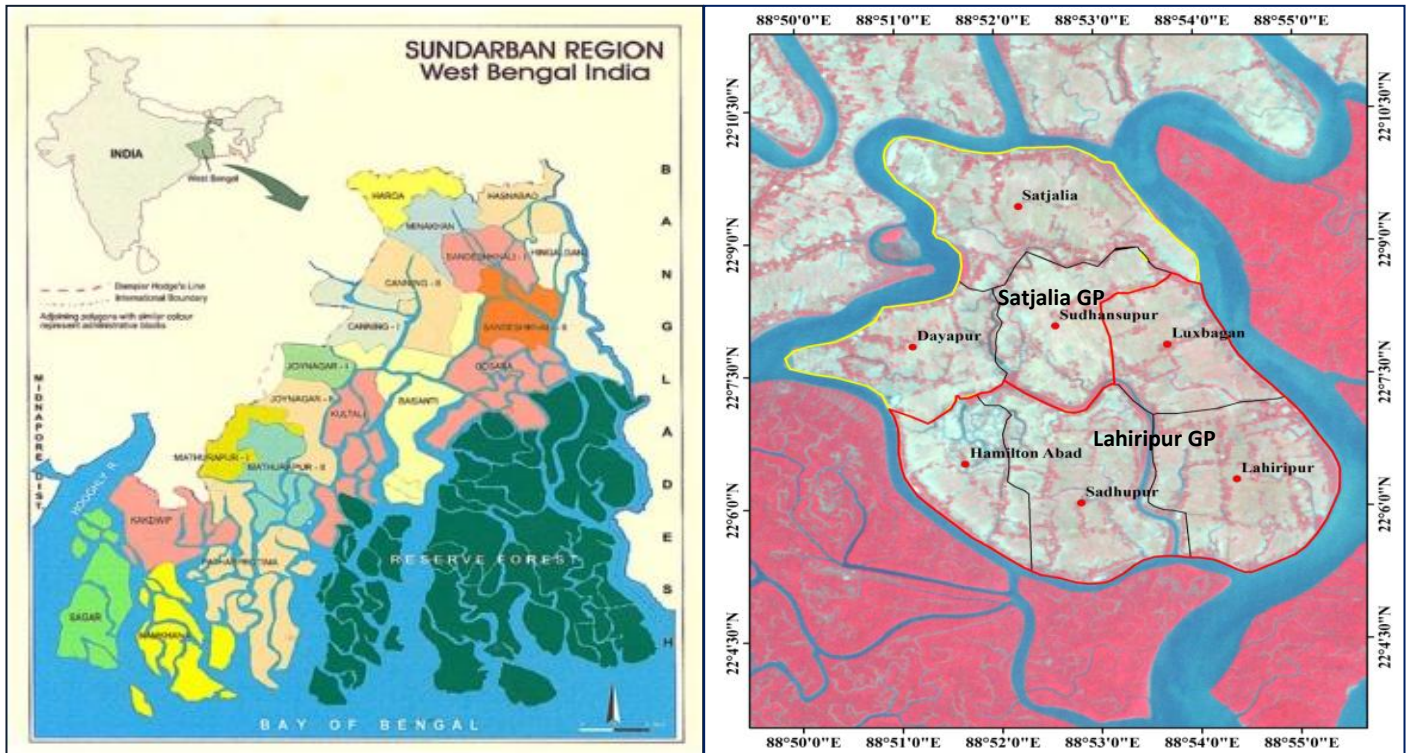


FIG. 1: THE CASE STUDY ISLAND – SATJALIA WITHIN INDIAN SUNDARBAN

Satjalia Island is comprised of two Gram Panchayat, (GP, village administrative boundary) and seven mouzas or villages. Satjalia GP consists of three mouzas, namely Dayapur, Satjalia, and Sudhansapur, while Lahiripur GP consists of four mouzas, namely Hamilton Abad, Sadhupur, Lahiripur, and Luxbagan. It is bounded by Gomdi River, Rangabelia and Kumirmari Islands in the north and Sajnekhali Wildlife Sanctuary in the West, Garal River and Jhilla Reserve Forest in the east, while Duttar Gang a distributaries' of River Gosaba delimits its southern boundary (Kar et al. 2014).

IV. RESULT AND DISCUSSION

Since the year 2000 the beekeepers have been visiting Satjalia Island to set up apiary, which increased in recent past, though this practice is still considered as seasonal practice. The season is between the end of Feb to end of May. Process of beekeeping has been initiated by the people from outside the island from different parts of the West Bengal such as Bagjola, Jaleswar, Bongaon, Baruipur, Nadia etc. presently larger portion of the community are restricted only to lease out their household premises to install beekeeping boxes, along with the support to the beekeepers. This considered as a short time easy income for the people of this Island. Income has been estimated from Rs. 2000 to 4000 for providing place for 150 to 200 boxes, depending on the space availability. Some scope for excess income has been observed through making provision food and shelter to the distant beekeepers. Also, they used to act as labour for those beekeepers for additional income (Ghosh et al. 2014).

The local information is that the practice of beekeeping was introduced almost 15 years back at Lahiripur by an outsider. Since then beekeepers are regularly visiting Satjalia Island to set up apiary. The practice of beekeeping is limited to the specific zones of Satjalia Island due to available forest within flying zones of the bee. The typical range of 1.5 to 2 km has

been considered ideal for success from past experiences (Fig.2). The villages Hamilton Abad, Sudhansupur and Lahiripur are eventually the ideal places for beekeeping, due to the presence of forest just after a narrow river. There are reports of failures on the other places within the island such as Satjalia and Dayapur mouza, due to lack of optimized location advantage (ZSI in ‘Times of India’ reporting, 25 July, 2015).

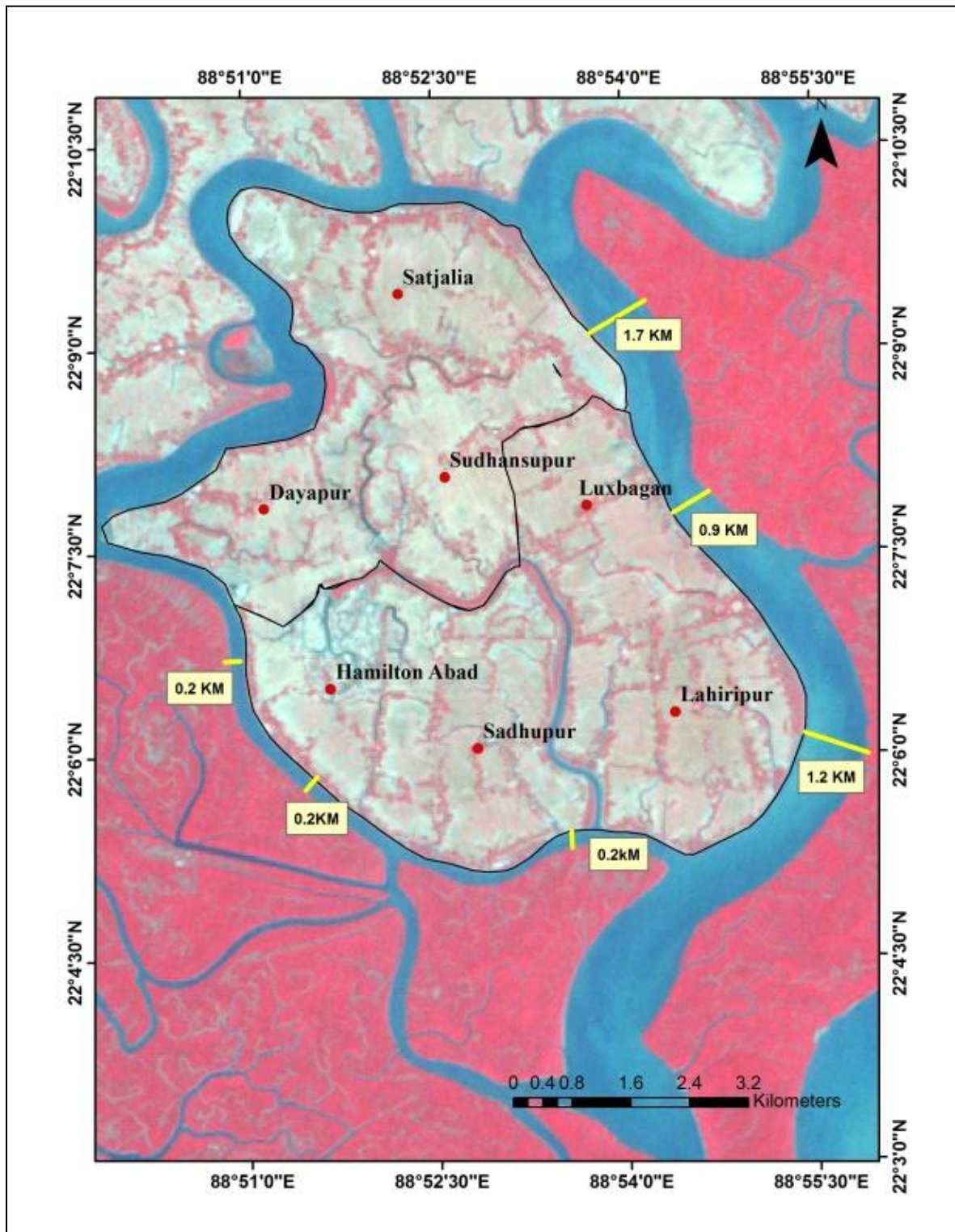


FIG. 2: THE DISPOSITION OF VILLAGES AND THEIR DISTANCE FROM THE FOREST (RIVER WIDTH)

Usually beekeepers are visiting the island to collect honey from the boxes in every 15-20 days interval. According to the beekeepers, the volume of available honey is mainly dependent on the weather condition, as storm or rain resists the bees flying distance and collect honey.

Beekeepers are not eligible to sell the honey directly to the company and have to depend on the agents for their business. There are several association like West Bengal Bee Keepers Association, Baruipur Apiculture Industrial Cooperative Society, 24 Parganas Bee Keepers Cooperative Society Ltd., Gramin Bharat Udyog and Herbal and Ma Mansa Enterprise, which send their agents in Sundarban for setting up Apiary boxes in the villages but land provider beekeepers get low price (Singh et al. 2010). Usually honey has been purchased by the agents of different private companies at a rate of Rs.100 to 140 per Kg. A full time beekeeper can collect 70 Kg. honey and a seasonal beekeeper can collect 35 Kg. from each bee box with a favored weather condition.

Forest honey collection process is more laborious and risky than cultured honey production. But the quality of forest honey is supported to be better than the cultured honey. Thus, the price of buying and selling of both type of honey in the market is showing a major difference, as shown in Table 1.

TABLE 1

THE COMPARISON OF PRICE OF NATURAL AND CULTURED HONEY TO DIFFERENT CATEGORIES OF BUYER

Traders	Natural Honey Per Kg.		Cultured Honey Per Kg.	
	Buying Price	Market Selling Price	Buying Price	Market Selling Price
Forest Department	135-140 /-	264 /-	-	-
Private Traders	140-150 /-	200-220 /-	135-140 /-	200/-
Agents	-	-	100-130 /-	-
Packed Filtered Honey	-	-	-	200-400 /-

In recent past, only few people from the local community have become directly involved in this process and successfully pursuing the seasonal business. Remunerative and continuing bee keeping in different places of West Bengal throughout the year is being practiced by negligible number of people. There are constraints in the preliminary investment by the poor people. As an alternate livelihood if a new beekeeper wants to start this business, there are the components of preliminary investment along with the other expenditure as shown in Table 2.

TABLE 2

LIST OF ITEMS FOR INITIAL INVESTMENT WITH 50 BEE BOXES BY A NEW BEEKEEPER

S. No	Particulars	Year-long Beekeeping (INR)	Seasonal Beekeeping (INR)
1	Cost of frame box with bee	175000	175000
2	Transportation with labour cost	4500	4500
3	Cost for permit in Sundarban	300	300
4	Honey extractor machine	3000	3000
5	Medicine essential for beekeeping	1000	1000
6	Labour cost in Sundarban	7500	7500
7	Rent for place in Sundarban	2500	2500
8	Sugar and molasses for off seasons	25000	NR
9	Personal travel expenditure for rest of the year	5000	NR
10	Box transportation cost	80000	NR
11	Rent for place to setup boxes outside the Sundarban	25000	NR
12	Food and lodging cost outside the Sundarban	25000	NR
	Total Expenditure	353800	193800

*NR – Not required

From the Table 2, the first seven items are common for seasonal and year-long business. Table 3 is showing a list of estimated expenditure and income for continuous year one and two for both the seasonal and year-long practice.

TABLE 3
THE CALCULATED AMOUNT OF INVESTMENT/EXPENDITURE AND INCOME FOR YEAR ONE & TWO (YEAR-LONG OR SEASONAL) OF 50 BEE BOXES

Duration in Years	Investment / Expenditure		Total income		Profit		% of Profit	
	Year-long Beekeeping (INR)	Seasonal Beekeeping (INR)	Year-long Beekeeping (INR)	Seasonal Beekeeping (INR)	Year-long Beekeeping (INR)	Seasonal Beekeeping (INR)	Year-long Beekeeping (INR)	Seasonal Beekeeping (INR)
First year	353800	193800	490000	245000	136200	51200	38	26
Second year	175800	128800	490000	245000	314200	116200	178	110
Total continuous 2 year beekeeping	529600	322600	980000	490000	450400	167400	85	52

It is evident from the Table 3 that in ideal condition a year-long beekeeping is more profitable than seasonal beekeeping. If a new beekeeper start the practice with 50 bee boxes (as a hypothetical condition) then the expenditure in first year would be Rs. 1,93,800 and can get a return of Rs. 2,45,000. So, the profit margin is not a lucrative one. But if the practice is continued in the second year, with a minimum investment, can produce higher level of profit. On the other hand, a year-long beekeeper makes an expenditure of Rs. 3,53,800 which is higher than a seasonal beekeeper while his income also high (Rs. 4,90,000) and the profit will become more than double in the second year. Fig 3 is showing that calculated fact.

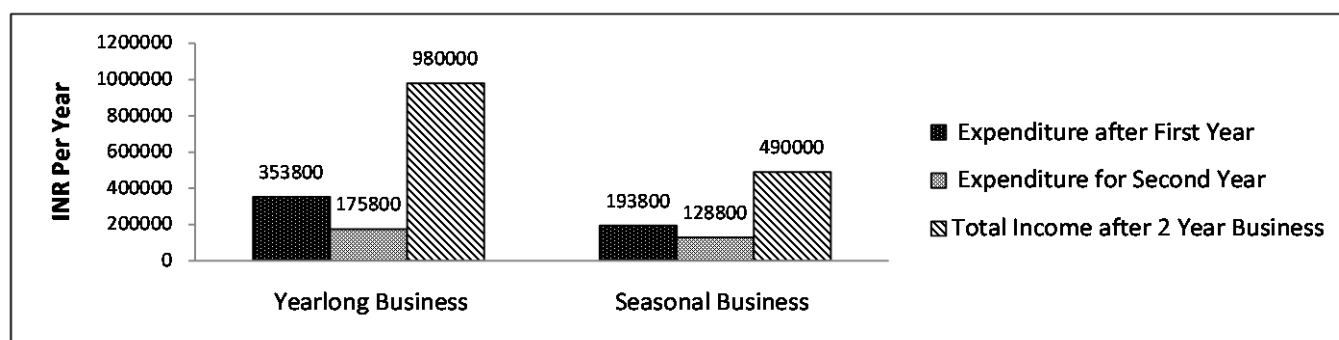


FIG. 3: COMPARISON OF EXPENDITURE AND INCOME BETWEEN YEAR-LONG AND SEASONAL BEEKEEPING

In the process of profit calculation, the profit in the first year is 38% for yearlong business and 26% for the seasonal beekeeping business. If the year-long beekeeper continues the business in the second year then the profit might become around 85%. The diagram (Fig. 4) is showing the similar fact.

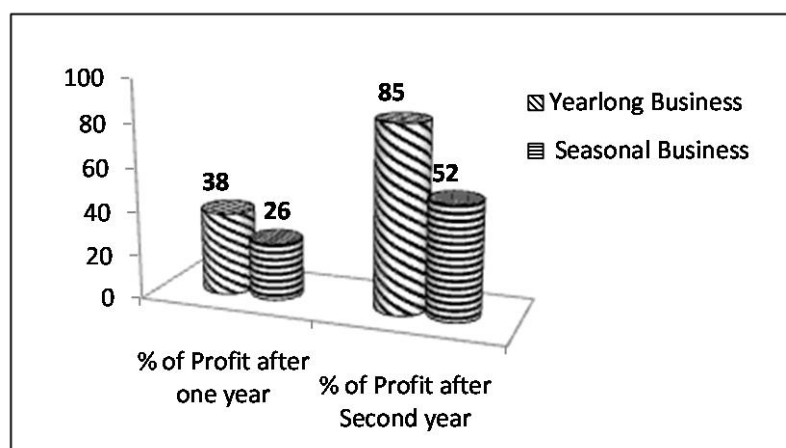


FIG. 4: COMPARISON OF PROFIT PERCENTAGE BETWEEN YEAR-LONG AND SEASONAL BEEKEEPING AFTER FIRST AND SECOND YEAR

V. CONCLUSION AND RECOMMENDATIONS

Beekeeping process is always a very eco-friendly practice in Indian Sundarban. In comparison to other business, production cost is low and demands remain always high. It is very safe compared to the traditional honey collection, entering into forest and likely to pray for the man-eater Royal Bengal Tiger. With all scope, still this is not a popular livelihood option for the local community due to several constraints. A higher initial investment is always a challenge for economically challenging people of this island. Also, there are no such governments schemes with technical training, financial support, subsidy or loan facility which appears to be the main constraints for accepting this profession. Lack of technical knowledge on scientific beekeeping procedure and inability to combat bee diseases may decrease production and reduce profit. Unable to avoid the intermediate agents the beekeepers are not getting lucrative price for their production in the commercial market and sell product on lower prices with minimal profit, which reduces enthusiasm towards this particular business. Availability of adequate equipment for bee cultivation in local area is also one of the major challenges, which increases expenditure for initial setups.

Despite of various disadvantages this area has tremendous potential for earning through beekeeping due to its geographical advantage. Proper policy for training support from government and NGOs can change the scenario.

REFERENCES

- [1] Bradbear, N., 2009. Bees and their role in forest livelihoods, A guide to the services provided by bees and the sustainable harvesting, processing and marketing of their products. Food and Agriculture Organization of the United Nations, Rome. 194 pp.
- [2] Chowdhury, A.N., Mondal, R., Brahma, A. and Biswas, M. 2008. Eco-psychiatry and Environmental Conservation. Study from Sundarban Delta, India. Environmental Health Insights. 2: (61-76). 19pp.
- [3] Ghosh, P., 2014. Subsistence and Biodiversity Conservation in The Sundarban Biosphere Reserve, West Bengal, India. Theses and Dissertations--Geography. Paper 26. University of Kentucky, UKnowledge. 335 pp.
- [4] Hazra, S., Ghosh, T., DasGupta, R. and Sen, G. 2002. Sea Level and associated changes in the Sundarbans. Science and Culture, 68 (9-12), 309-321pp.
- [5] Kar, N.S., 2014. Tropical Cyclone Aila (2009): Disaster Consequences and Disaster Response In Satjelia Island, Indian Sundarban. Asian Journal of Environment and Disaster Management. 6 (1), 15pp.
- [6] Roy, T.K., Basu, T. (Report on 'Diagnostic Study Bee- Keeping and Honey Processing Cluster Old Malda Development Block, District -Malda, West Bengal. Prepared Under Small Industries Cluster Development Programme District Industries Centre, Malda'. (Diagnostic study - Foundation for MSME Clusters (FMC) msmefoundation.org/folder/Diagnostic/59.doc)
- [7] Singh, A., Bhattacharya, P., Vyas, P. and Roy, S., 2010. Contribution of NTFPs in the Livelihood of Mangrove Forest Dwellers of Sundarban., Journal of Human Ecology 29 (3).191-200 pp.
- [8] The Times of India, Dated - 25 July 2015. Visited on 27/07/2015. Buzz over Sunderbans bee study (<http://timesofindia.indiatimes.com/city/kolkata/Buzz-over-Sunderbans-beestudy/articleshow/48208979.cms>)