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A STUDY ON THE COMPARISON OF INCOME BETWEEN FISHING ACTIVITY AND ALTERNATIVE LIVELIHOOD OF RUSHIKULYA FISHERS, ODISHA

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ABSTRACT : Livelihood assessment of fishers of three villages *viz.* Purunabandha, Kantiagada and Gokhurkuda around Rushikulya Sea Turtle (Olive Ridley) rookery in Ganjam district, Odisha have been undertaken. Due to conservation efforts towards these turtles, fishing ban is imposed for a period of seven months (November-May), which adversely affects the livelihood of fishers with respect to their primary occupation. Hence, this study was conducted to compare between the income from fishing and alternative livelihood activities and also suggest strategies to improve their social and economic wellbeing. The results showed that the average income from alternative livelihood activities is significantly lower than the fishing activities (P<0.05). The primary income of Gokhurkuda village showed significantly higher than other villages (P<0.05). Meanwhile, no significant difference was found in alternative income among the villages (P>0.05). However, the primary and alternative income within the villages showed significant difference between them (P<0.05). The findings suggested that new policies need to be framed to improve the economic and livelihood conditions of the fishers as an alternative option during the banned periods. It is also needed to implement community-based management programmes to give indirect subsistence options to the fishers of these villages.

Key words : Alternative livelihood, fishing, Rushikulya rookery, income.

INTRODUCTION

Fishing is the oldest and important livelihood option for the inhabitants of the coastline of the country from time immemorial. This natural resource along with the marine environment provides livelihood and employment opportunities for the coastal people and others by way of indirect employment for the coastal population. In India, marine fisheries sector plays an important role in the socio-economic development. It is the principal source of livelihood for umpteen coastal fishers. Marine fisheries also contribute to food security and provide direct employment to over 1.5 million fishers besides others indirectly dependent on the sector (CMFRI, 2010).

Odisha is a coastal state located in the east-coast of India with a coastline of 480 km which is almost 8% of the coastline of India and it has occupied one of the most dynamic coastal environments due to its location and physical factors (Lakshman *et al*, 2012). Among the six coastal districts, Ganjam is represented as the least populous district among all the maritime districts with an area of 8206 sq.kms. In Ganjam district, more than 95% of the fishers belong to Nolia caste from Andhra Pradesh, who are settled permanently for generations and accepted as local fishers of that area. It is the one among the world's largest rookery site for sea turtle. The population of sea turtles in Orissa represents about 80% of Indian sea turtles and about 50% of world population of the species (Behera, 2010). The Rushikulya sea turtle (Olive ridley) rookery in Ganjam district was discovered in 1994 and is approximately 5 km beach located immediately north of Rushikulya river mouth from Purunabandha to Kantiagada village (Patro, 2016). Most of the coastal villagers adjacent to the Rushikulya rookery are well aware of the "*Arribada* (Olive Ridley mass nesting ground)" at the Rushikulya rookery from early childhood. Five coastal villages *viz.* Kantiagada, Gokhurkuda, Purunabandha, Nuagaon, and Arjipalli adjacent to the sea turtle (Olive ridley) congregation site at Rushikulya rookery depend on traditional fishing. About 95% of the population are employed in fishing, while rest of them are involved in daily wage labour, private jobs, small trade etc (Sridhar, 2005).

The villages surrounding the rookery get highly affected because of the conservation practices for sea turtle. The Government of Orissa (under the Union Government of India) has banned all kinds of gill nets operating in the near shore waters of Rushikulya coincides with the breeding season of Olive ridley turtles i.e. from 1st November to 31st May, without providing any alternative livelihood options to the fisherfolk (Panda *et al*, 2014). Due to enforcement of ban period, fishermen of that area are affected and excluded from their primary occupation of fishing. The fishermen from three villages viz. Kantiagarha, Gokhurkuda, and Purunabandha, do their fishing activities from this coastal beach and are highly affected in terms of loss of income, living standards, loss of traditional livelihood, etc. They also spend a maximum of their time on the sea shore for several activities such as repairing of their boat, mending of nets etc. Getting alternative livelihood to maintain their living standards is very difficult and they migrate outside of the state boundaries in search of a job. Hence in the present study, an attempt has been made to compare between the income from fishing and alternative livelihood activities of fishers near Rushikulya rookery in Ganjam district of Odisha.

MATERIALS AND METHODS

The present study was conducted in three selected marine village's *viz*. Kantiagarha, Gokhurkuda and Purunabandha of Ganjam district of Odisha, which is located immediate north of the Rushikulya river mouth and fully depends on the sea for their livelihoods, income and living standards. These villages together contribute about 35% of Ganjam block marine landings (DoF, Odisha). These districts are selected based on the problem associated with the ban period implementation for sea turtle conservation measures, which in turn causes loss of livelihood of the fishers due to restricting from fishing activities (DoF, Odisha).

Out of the total 1266 fishers' household, 180 sample sizes were selected using stratified two-stage purposive sampling method. Initially, three villages were selected and proportionally 15% household samples from these villages were selected for the purpose of collection of data. A structured interview schedule was developed including all relevant queries needed to accomplish the objectives of the study. The collected primary data were from the fishers through personal interviews and the responses were recorded.

Primary data were analyzed by one-way analysis of variance (ANOVA) and the significant difference among the treatments was determined by Turkey's Multiple Range Test (Duncan1955) using SPSS (Version 16.0, IBM, Chicago, Illinois, USA). 5% level of probability ($P < 0.05$) was chosen to determine the statistically significant difference among the treatments means.

RESULTS AND DISCUSSION

Average household income

The incomes from the fishing and alternative livelihood activities were taken. The average incomes of respondent from fishing and alternative livelihood activities were found to be Rs. 12569.54 and Rs. 9569.54, respectively. It was observed that the income from alternative livelihood activities is significantly lower than the fishing activities ($P<0.05$). This reveals that the fishers are struggling for a job during ban period particularly from 1st November to 31st May, migration to other states and also seeking help from the government to supports their livelihood. As a result of which fishermen are affected as they are excluded from their primary livelihood of fishing in the area and searching for a new job which resulted in decrease their alternative livelihood activities (Sridhar, 2005; Panda *et al*, 2014).

Primary income

The primary incomes of villages in Rushikulya rookery coast, Odisha, India are presented in Table 1. The primary income from all three villages showed significant difference among them ($P>0.05$). The Gokhurkuda village showed significantly higher primary income of fishers than other villages. This might be due the more involvement of fishers in fishing activities along with the use of different types of fishing gear, drift/gill nets and crafts for fishing in off shore-sea compared to other villages. The lower primary income in Kantiagada and Purunabandha villages might be due to the fact that majority are artisanal fishermen engaged in near shore or estuarine fishing.

Alternative livelihood income

The data on alternative livelihood income of the villages in Rushikulya rookery coast, Odisha, India are given in Table 2. The result showed that there is no significant difference was found in alternative income of the villages in Rushikulya rookery coast ($P>0.05$). This study reveals that there are only few alternative options available to the fishers during the restricted period mostly from 1st November to 31st May (Panda *et al*, 2014). Most of the fishers of these villages are spend their maximum of their leisure time on the sea shore for several activities other than their primary fishing activities such as repairing of their boat, mending of nets etc.

The comparison between the primary and alternative

Table 1 : Primary income of the villages in Rushikulya rookery coast, Odisha, India.

Villages	Primary income	p-value
Gokhurkuda	16159.09±8358.61[a]	0.008
Kantiagada	11607.14±5945.75[b]	
Purunabandha	12226.03±4903.26[b]	

Table 2 : Alternative income of the villages in Rushikulya rookery coast, Odisha, India.

Villages	Alternative income	p-value
Gokhurkuda	10522.72±7264.52	0.540
Kantiagada	9089.28±5891.52	
Purunabandha	9650.68±3678.65	

Table 3 : Comparison between the primary income and alternative income within the villages in Rushikulya rookery coast, Odisha, India.

Village name	Primary income	Alternative income	P-value
Gokhurkuda	16159.09±8358.61	10522.73±7264.52	0.002
Kantiagada	11607.14±5945.75	9089.29±5891.52	0.000
Purunabandha	13166.67±4510.67	8685.18±2572.59	0.000

income within the villages are shown in Table 3. The study depicts that the primary and alternative income within the villages showed significant difference between them ($P<0.05$). This might be due to banning of all kinds of nets operating in the near shore waters of Rushikulya during the mass nesting season without providing any alternative livelihood options to the fisherfolks. This resulted in diverting them from their traditional activities and subsequently, reduced alternative incomes over the primary incomes.

Suitable strategies for implementation

Fishing is an important economic activity of the coastal communities and the preceding analysis shows that over the years the social and economic status of the fishery has improved a lot because of the government policies and subsidies for the backward communities of the country. The study also showed that the lack of awareness among the fishers about the schemes provided by the government for the betterment of the fishers' community. The government has launched the Matshyajibi Unnayana Yojana (MUY) in 2011, which contains a welfare package especially for the welfare of the fisherfolks (DoF, Odisha). Moreover, alternative livelihood options like ornamental fish farming, seaweed farming and dry fish marketing can be suggested and implemented by the state or central government to overcome the low socio-economic status of fishers and to bring up livelihood income during ban season. The developing of infrastructure facilities for dry fish processing, marketing and transportation will help the growth of fisheries sector in Ganjam district and avoid migration of fishers during these periods.

Community-based management should be improved by giving an opportunity for fishers to involve them in eco-tourism. Monetary support from the government to compensate for the ban period imposed for turtle conservation; in turn, the fisher can be involved in governance in conservation measure. Fishery department or state government involvement is necessary/ needed for the improvement of inland fish cultures activity by involving fishers by giving an opportunity for their livelihood. Since the traditional fishing community is being called upon to regulate itself, the question of alternative sources of livelihood may be looked into urgently. Ecotourism and tourism involving sea turtles and involving fishers should be promoted by the government. The respective department must involve the traditional fishing community in conservation efforts highlighting at the same time that certain restrictions will ensure their long-term livelihood security.

CONCLUSION

From the ongoing study, it concluded that the fishers of theses villages are keenly indulged in fishing as their primary occupation for generating income to sustain their livelihood. Due to the enforcement of ban for a period of seven month, this in turn deteriorates the standard of living. There is required a helping hand from the government and non-government organisation to developed a growth oriented policy for the Rushikulya rookery fishers by providing suitable alternative livelihood during the off season.

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