Other Fish in the Sea

A report on the perception of fisher communities on Income Generation Options and management of marine resources in the Gahirmatha area

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Executive Summary

In 2010, the central and the state governments unveiled the Integrated Coastal Zone Management Program (ICZMP) in Gujarat, West Bengal and Orissa. In Orissa, one component of this program aims to address the issue of income generation for fishermen living in 60 fishing

villages as a pilot project. Thirty of these villages are situated on the periphery of Chilika Lake, and the remaining 30 around the Gahirmatha Wildlife Sanctuary.

This study was undertaken against the background of two underlying realities

One is the dichotomy between fisher livelihoods and marine conservation measures which has existed since the Gahirmatha Marine Sanctuary was enforced in 1998 due to the ban on fishing which affects traditional fisher folk in the area. Various civil society organisations and fisher unions have repeatedly asked for alternative or supplementary means of income through livelihood schemes or provision of compensation to address this loss of income.

The history of similar interventions in the past has not been a tale of success. Most such schemes suffer from a lack of understanding of local conditions, a lack of prior consultation and feedback from the local community, and a lack of consistent training and follow up on the part of the implementing agencies. It is important that this fate not befall the pilot project that is soon to be underway in Orissa.

Against this background, United Artists Association (UAA) and Greenpeace India undertook a social survey in the Gahirmatha region to understand, examine and document perceptions among fisher communities on supplementary income generation schemes as well as their attitudes relating to fisheries management and marine conservation measures.

The recommendations of this study were arrived at through the results of the survey conducted in 15 sample villages in the Gahirmatha region, as well as through Focussed Group Discussions (FGDs) and two public hearings involving the key stakeholders (implementing agencies and communities). Further, a thorough investigation in the form of case studies of supplementary – alternative livelihood options currently prevalent within fisher communities were explored and documented.

This report documents overwhelming support of fisher communities in the region to consider alternative or supplementary livelihood options provided such options reflect the requirements and needs of the community and are economically sustainable. Additionally, in spite of the conflicting history in relation to the Gahirmatha marine sanctuary and its impacts on traditional fisher livelihoods, there continues to be high level of support and indeed recognition in the role played by the sanctuary in the management of fisheries.

This survey and resulting recommendations are completely independently undertaken by Greenpeace India and UAA for the purpose of informing the livelihoods program under the ICZMP to reflect the needs, requirements and sanction of the local fisher communities while being ecologically and economically sustainable. The report also highlights management and conservation options on the basis of perceptions and attitudes of fishermen, the consideration of which would go a long way towards facilitating management and conservation objectives while recognising and protecting the occupational interests of local fishermen.

Background

The coast of Orissa forms a highly complex yet dynamic ecosystem, comprising of wetlands, deltas, mangroves and mudflats. Orissa is home to a high diversity of marine and aquatic life, with estuarine crocodiles, fresh and brackish water terrapins, dolphins, porpoises and the

endangered sea turtles. Orissa's marine and coastal ecosystems also support and sustain the livelihoods of thousands of fishing families.

Orissa's 480 km coastline spreads across six districts – Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri and Ganjam. While Orissa remains one of the major fishing centres of the country, the poorer fishing communities particularly from the traditional sector, are experiencing a decline in their catch mainly due to over-harvesting of marine resources and destructive practices such as trawling.

Orissa supports three of the world's most important mass nesting beaches for the Olive Ridley sea turtles. Almost half a million turtles nest here annually, between January and March, at the Gahirmatha and Rushikulya beaches. The Devi river mouth region is a former mass nesting site which still witnesses significant turtle congregations and sporadic nesting of high densities.

The Gahirmatha (Marine) Wildlife Sanctuary was declared in 1997 to facilitate objectives relating to ecological conservation, with particular emphasis on the Olive Ridley turtles, and fisheries. The sanctuary extends 20 km into the territorial waters and comprises 1,408 sq km of water and 27 sq km of land. The responsibility for management of the sanctuary lies with the Department of Forests, Government of Orissa.

However, despite the presence of the sanctuary, over the last decade, more than 100,000 turtles off Orissa's coast have been a victim to illegal and unregulated mechanised fishing, in particular trawling. It is widely believed that the turtle mortality has been the highest in the Gahirmatha region, and is significantly higher than official government figures.

The sanctuary covers an area that also provides livelihoods to thousands of fishermen, whose access to the area has been restricted since the declaration of the sanctuary. It is estimated that around 12,000 active fishermen are affected by the fishing ban in the sanctuary. In 2007, Greenpeace India estimates computed an allocation of Rs. 4.23 Crores on an annually recurring basis, as a supplementary compensation specifically for traditional fishermen impacted by the fishing ban in the Gahirmatha region (Mahakalpada and Rajnagar blocks)[1].

The dichotomy between fisher livelihoods and marine conservation measures has existed since the sanctuary was enforced and various civil society organisations and fisher unions have repeatedly asked for alternative or supplementary means of income through livelihood scheme or providing compensation to address this loss of income.

In 2010, the central and the state governments unveiled the Integrated Coastal Zone Management Program (ICZMP) in Gujarat, West Bengal and Orissa. One component of this program aims to address the issue of income generation options for fishing families. In Orissa, this component of the project aims to provide income generation options to fishermen living in 60 fishing villages, as a pilot project 30 of these villages are situated on the periphery of Chilika Lake, and the remaining 30 around the Gahirmatha Wildlife Sanctuary.

The income generation project seeks to fulfill three objectives - provide some economic relief to impacted fishermen, reduce fishing pressure and protect the spawning grounds of important fish species and facilitate more effective marine and, in particular, sea turtle conservation measures.

[1] Refer to http://www.greenpeace.org/india/press/reports/orissa-turtle-package

The history of similar interventions in the past has not been a tale of success. Most such schemes suffer from a lack of understanding of local conditions, a lack of prior consultation and feedback from the local community, and a lack of consistent training and follow up on the part of the implementing agencies. It is important that this fate not befall the pilot project that is soon to be underway in Orissa.

Against this background, United Artists Association (UAA) and Greenpeace India undertook a social survey in the Gahirmatha region to understand, examine and document perceptions and thoughts of fisher communities on supplementary income generation schemes, and their opinions on what would be required for such schemes to be successful. The survey and resulting recommendations are aimed at informing the livelihoods program under the ICZMP to reflect the needs, requirements and sanction of the local fisher communities, while being ecologically and economically sustainable.

Focus of the survey

The present survey was undertaken to investigate the levels of awareness among fisher folk in the Gahirmatha region on the proposed ICZMP alternative livelihoods program and to gauge their preferences for these alternative options.

The recommendations of this study were arrived at through the results of the survey conducted in fifteen sample villages in the Gahirmatha region, as well as through Focussed Group Discussions (FGDs) and two public hearings involving the key stakeholders (implementing agencies and communities).

Methodology

The survey was carried out in fifteen villages of the Mahakalpada and Rajnagar blocks around the Gahirmatha marine sanctuary (refer to Appendix 1) between March 2011 and June 2011. A total of 3806 households were surveyed in these fifteen villages with the average household size of 5.5 and male to female ratio of 1000: 993.

The villages covered during the course of data collection include Kharinasi, Batighara, Badakolikhala, Badatubi, Devendranarayanpur, Gupti, Satavaya, Dighi, Dangamal, Talchua, Rajendranagar, Rangani, Bhekta, Keruanpal and Suniti, selected from the list of beneficiary villages included in the ICZMP using stratified random sampling. A set of questionnaires were prepared for the household level survey and open ended question were prepared for focussed group discussions (FGDs).

Research Methodology

This report contains the findings through a study between March 2011 and June 2011, using the following research methodologies

Survey Questionnaire

The main research tool to investigate community attitudes and perceptions on alternative livelihood options and income generation opportunities was a survey questionnaire (refer to

Appendix II).The key issues examined and information gathered from the household survey through questionnaires include

1. **Socio economic parameters**: This included the occupation of respondents and occupational multiplicity of households, the cumulative income and income specifically from fishing

2. **Awareness on the program**: Awareness in terms of the proposed ICZMP alternative livelihood process, the options proposed in terms of livelihoods, and the perceptions and attitudes of fishermen relating to livelihood options and the inclusion of stakeholders, in particular beneficiaries in the development of proposed alternative or supplementary income generation options.

3. **Awareness and perceptions on marine conservation and management:** These examined issues related to perceptions of fishing communities in relation to the Gahirmatha Marine sanctuary - the success and failures of management initiatives, implementation of co-management and perceived level of participation in management decisions.

Focus Group Discussions

Focus group interviews with open-ended questions with groups of 15-30 participants were conducted in each of the 15 villages on their perception and attitudes towards livelihood options and income generation opportunities, interconnected issues related to perceptions of the fishing communities in relation to the Gahirmatha Marine sanctuary, the success and failures of management initiatives, perceived level of participation in management decisions, the perceptions and positions of communities on livelihood options, the perception and prevalence of occupational multiplicity etc.

Compilation of case studies

Through a combination of field observations and through key informants (community leaders / people involved with operational alternative / supplementary income generation livelihood options), case studies of successes and failures in various alternative livelihood options were collated and compiled, with a view of making the proposed ICZMP livelihood options effective, through experiential data (Refer to Appendix I).

Public Hearings

The survey results were compiled and presented to the people of surveyed villages and representatives of other villages in the Gahirmatha regions through two public hearings organised at Kharinasi and Gupti.

Both public hearings saw the active involvement of representatives of the implementing agencies, the directorate of fisheries and the department of forests – wildlife and representation of Member of legislative assembly, representatives from the media and over 600 fisher people from the surveyed villages.

The panel comprised of fisher leaders from the Orissa Traditional Fishworkers Union, National Fishworkers forum, intellectuals, media representatives, local village and block level leaders. People complained of implementation issues and corruption in availing connections.

Following the sharing of survey results, officials of the ICZMP shared details of the project and the proposed livelihood options, followed by observations of the fisheries and forest department.

This was followed by observations and perceptions of the fisher representatives reflecting on the results of the survey and proposals of the ICZMP officials and observations of the fisheries and forest department.

Key findings and discussion

This report provides an indication of how local fisher communities perceive natural marine resources and allied livelihood opportunities, while recognising that communities may not have a single perception and socioeconomic factors will influence how individuals within a community perceive their resources. Perceptions vary according to the specific usage of the resource.

While almost all households surveyed are engaged in fishing activities either as a primary or secondary income, the type of fishing activity may also dictate the attitude and perception of the resource.

The results presented in this study compared villages as a whole and does not distinguish responses by demographics such as primary and secondary occupations. Similarly, gender as a distinguishing factor determining attitudes and perceptions has not been addressed.

And finally, this study recognises that proximity to a particular resource or habitat, as well as the usage of this resource will determine a respondent's attitude to, and value attached to the resource.

Summary of findings

The table below reflects the 15 villages which were surveyed. The survey was organised across 15 villages covering a total population of close to 21,000 people representing 3,806 households.

Village	No of Households	Male	Female	Below 18	Fishing as primary occupation (Households)	Non-fishing Primary Occupation (Households)	Access to Sea (direct or indirect)
Bhekta	235	655	622	397	70	165	Indirect access through the creek to the sea
Suniti	611	1573	1491	976	135	476	Indirect access through creek to the sea
Rajendranagar	91	195	295	67	69	22	Indirect access through the

							creek to the sea
Devendranarayanpur	225	648	647	423	6	219	Indirect access through the creek to the sea
Satavaya	97	379	329	247	3	94	Direct access through sea
Gupti	210	617	619	371	10	200	Indirect access through river to sea
Rangani	98	168	266	118	35	63	Indirect access through river to sea
Badatubi	143	377	467	304	13	130	Indirect access through river to sea
Dighi	227	554	517	238	38	189	Indirect access through river to sea
Keruanpal	138	409	407	246	23	115	Indirect access through the creek to the sea
Dangamal	77	182	263	80	30	47	Indirect access through the creek to the sea
Batighar	175	495	448	267	85	90	Indirect access through the creek to sea
Badakoli Khola	545	1420	1414	833	241	304	Indirect access through the creek to sea
Kharinasi	789	2411	2259	1399	325	464	Indirect access through river to the sea
Talchua	145	428	399	264	63	82	

Total	3806	10511	10443	6230	1146	2660

The table reveals that a majority of the respondents, in terms of occupation, rely on marine fishing as a secondary occupation. The variances on this are high, with Satavaya, Gupti and Rangani having those with marine fishing as their primary occupation as low as 3%, 3% and 5% respectively and Rajendranagar having those primarily occupied by marine fishing as high as 76%. The mean composition of households whose primary occupation is marine fishing across villages collectively is around 29%.

Occupation

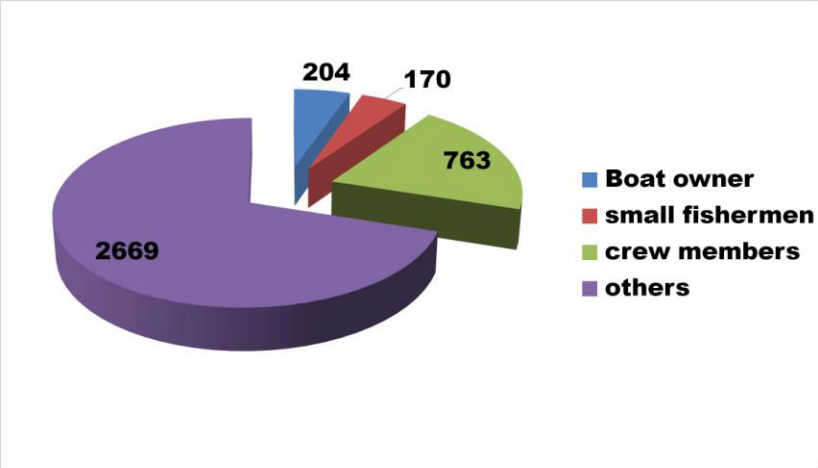
There have been examples of successful transitions to alternative livelihoods for traditional fishermen mostly to compensate for the loss of income from conservation measures. A shift to other income generations options has also been prompted so as to reduce fishing efforts, thereby aiding marine management and conservation.

The prevalence of occupational multiplicity, wherein households have an additional occupation besides fishing, was found to be common over the course of this study.

Out of the total households surveyed across the 15 villages, it was observed that the very few were owners of vessels (5.25%); a majority of fishermen are employed as crew members on boats.

While some of them were owners earlier, they currently do not own boats. The reasons for this vary from fishing ban and the resultant loss of livelihoods to huge loans and selling of the vessels in order to repay the loan.

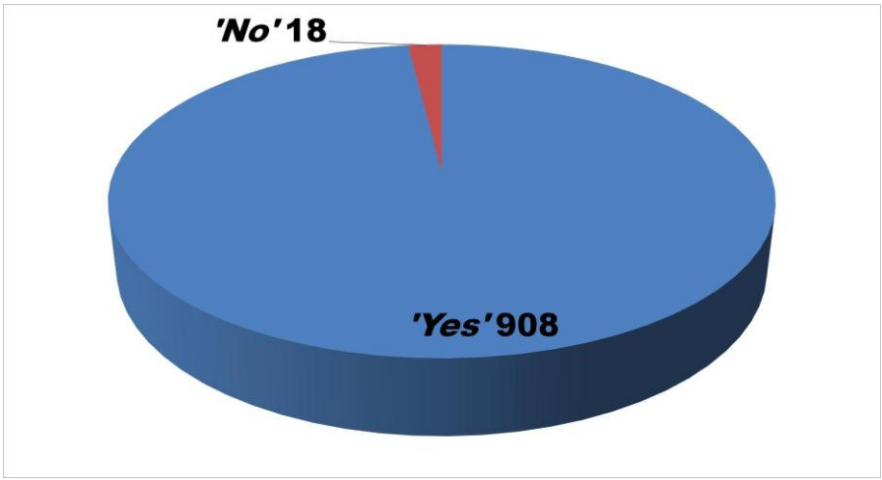
Figure 1 – Occupation



In addition to fishing (riverine and marine), agriculture is also a major source of livelihood in the villages surveyed. Agriculture is essentially limited to one crop, i.e. rice during the monsoons.

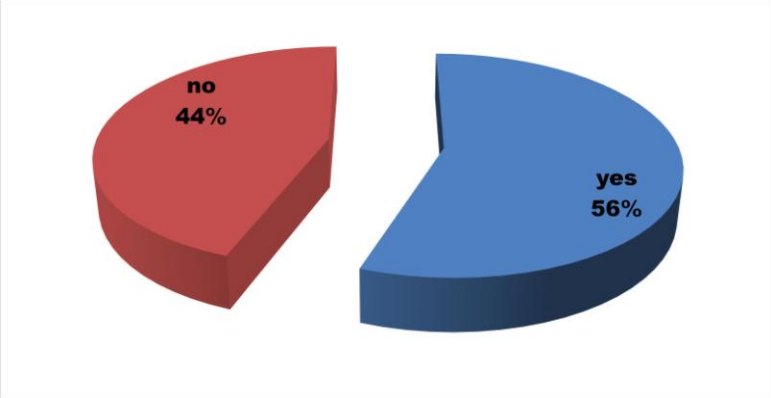
A majority of respondents have indicated a strong inclination to consider other livelihood options on a seasonal basis and in some cases as a permanent option. A marginal proportion of fishermen have, however, indicated their preference to continue fishing as their main livelihood choice.

Figure 2 – Position on Alternative Livelihoods



Amongst this marginal proportion of fishermen who were not in favour, around 50% of them are open to considering an alternative option if the proposed alternative is economically sustainable and aligned with their requirements.

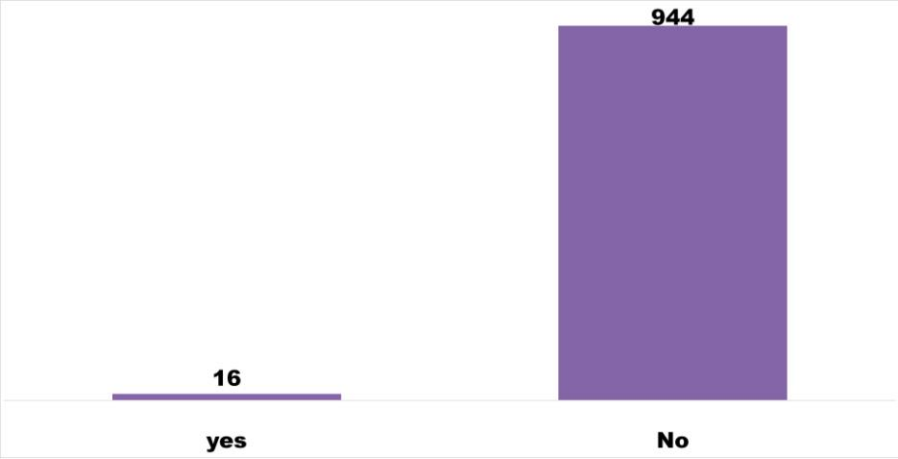
Figure 3 – Interest on viable alternative livelihood options



In reflecting on the formal ICZMP proposal, an overwhelming proportion of fishermen have strongly expressed their lack of awareness and the lack of any initiative to involve them in any consultative process towards scoping alternative or supplementary income generation options.

Amongst the marginal proportion of fishermen who had heard or were aware of the proposed program, they had learnt about it through the medium of mass broadcasting mechanisms as opposed to through any consultative process.

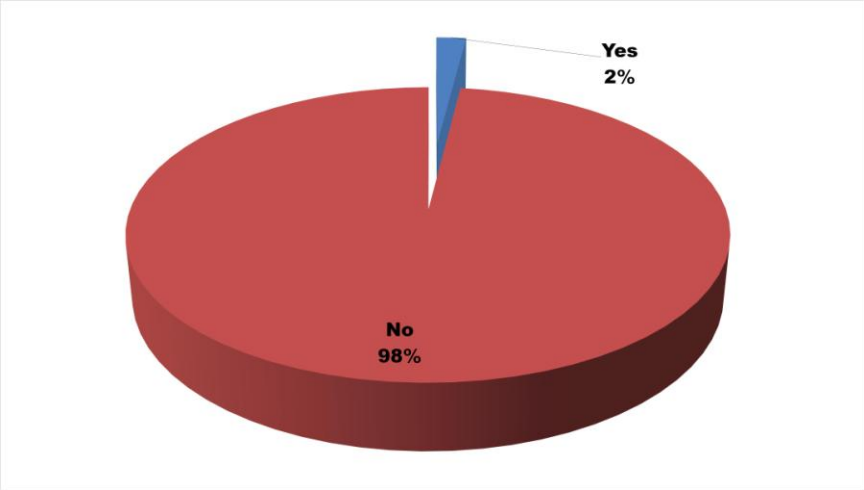
Figure 4 – Status of consultations regarding alternative livelihood schemes



Similarly, very few fishermen were aware of the various components of the proposed alternative livelihood program.

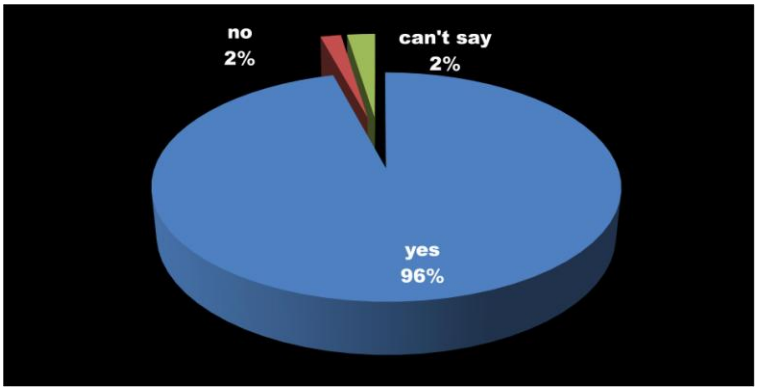
Figure 5 – Awareness on components of the alternative livelihoods

scheme



In responding to questions about knowledge of details about the various components of the proposed alternative livelihood scheme, an overwhelming majority were of the view that the proposed program could provide relief. This proportion of fishermen also emphasised the need for the development of market linkages and the requirement of technical support from the government and the implementing agencies in particular for any income generating scheme to be successful.

Figure 6 – Acceptability of alternative livelihoods as an option



However, this overwhelming support could also be attributed to the fact that the levels of awareness and understanding of the proposed alternative livelihoods options among most of the fishermen interviewed is negligible. A cumulative minority were vocally either uncertain or unconvinced that such an alternative model will work.

The observations of fishermen topically, in response to specific proposed livelihood options under the project, as part of the study, are encapsulated as below

Proposed activity	Suggestion
Fresh water fish farming	▪ Provision of good quality seed ▪ Emphasis on production of yearling in the village itself – in perennial ponds ▪ Emphasis on yearling stocking in the ponds for better result
Fresh water fish culture with prawn culture	▪ No natural seed collection of fresh water prawn ▪ Backward linkages with hatcheries to provide good quality seed. ▪ Farmers need to be capacitated on the technical knowhow.
Fresh water prawn culture	▪ It can be cultured in the fresh water and also in low saline

(mono culture)	ponds (less than 5 PPT) ▪ Good quality seed need to be ensured ▪ The feed required for the farming needs to be provided to the farmers. ▪ Technical knowhow needs to be provided to the farmer ▪ No natural seed to be stocked in the pond
Bhekti (sea bass) culture	▪ Naturally saline ponds can be promoted ▪ Bhekti has high economic value with good market demand. **Precaution** ➢ No intake of saline water regularly to pond by pumping ➢ No natural seed collection, the seed should be provided by the government. from the hatcheries ➢ Tilapia should not be transferred from the pond to other area (if proposed as feed). The inlets and outlets of the ponds should be closed by nets, which will prevent the entry and exit of fish seeds.
Crab fattening / crab culture	▪ Crab culture should be promoted only in naturally saline ponds. ▪ Crab fattening is not possible in this area but crab culture is possible if appropriate technology is provided. ▪ Not a single case of Crab culture was found during the discussion **Precautions:** ▪ Seed should be provided by the government. ▪ No natural seed collection should be promoted. ▪ No intake of saline water by pumps regularly It is important to follow these precautionary measures for this particular farming system.
Integrated aquaculture with Poultry	▪ Veterinary service is very poor as was highlighted in many of the discussions with the community. ▪ Alternative mechanisms need to be developed for the same like barefoot veterinary training. . ▪ They should have a basic idea about the common diseases ▪ Poultry farming was one of the most preferred choices expressed by the fishermen.
Integrated Aquaculture with Duck Rearing	**Precaution** ▪ The pond should be stocked with advanced fingerling or yearling. ▪ The need for good veterinary service was highlighted again. An alternative mechanism need to be developed.
Integrated Aquaculture with Dairy	▪ Dairy farming needs to be approached with a fair amount of caution. As per discussions with the fishermen the high mulching variety will not withstand this region. ▪ Numbers of failure cases were recorded by the fishermen who have tried dairy farming. .However local varieties are a viable option and can be promoted
Brackish water Shrimp Farming	It should not be promoted, as we know the negative environmental consequences of this culture practice. Profits are unpredictable and disease (such as white spot syndrome virus) is widespread which can

	wash out the entire yield. This can mean disastrous losses for the fishermen.
Dry fish & Value Addition	▪ Except Talchua, in other places it was not found suitable, as Talchua fishermen may get the raw material from Dhamra. ▪ The major problem for other places around Gahirmatha is the non- availability of raw material for dry fish production and other value addition of fish products. ▪ Before promoting dry fish production and value addition in coastal villages, the issues of availability of raw material and the market linkages need to be addressed.
Horticulture plants	▪ Drum stick and Papaya variety which will bear fruits within 6 months/ one year can be promoted ▪ Every three years or so, the garden needs to be replaced with new plants. ▪ Poi, Brinjal, tomato other vegetables can be grown in the kitchen garden
Tree Plantation	Plantation of some trees like – Chakunda, Acacia, Eucalyptus can be helpful to the fishermen in long run. They will fulfil fire wood requirement and also the value of wood will provide the fishermen with some extra money.
Goat Rearing	▪ Successful case studies were found in almost all villages about goat rearing. ▪ Limited cases of goat rearing may be promoted in the villages for the interested fishers since there is a market demand for it and it is profitable.
Other Income generation Activities	▪ Mobile repairing ▪ Vehicle repairing / engine repairing ▪ Petty business
Eco tourism	▪ Villagers should be trained in the different aspects of tourism. ▪ The minimum requirement of tourist guide and tourist friendly environment needs to be developed. ▪ Fishermen are well suited to act as guides. ▪ If this option is found to be profitable, some of the boats may be modified into tourist boats with facilities required for tourists, on a pilot or experimental basis.
Irrigation	Demand for provision of water for irrigation was common to all villages. This needs to be studied by the Water Resource Department as they are also part of ICZMP, in a consultative manner with the villagers.
Pollution	Impact of air pollution is clearly visible in Badatubi village. Pollution is a concern in many of the other villages as well. This should be addressed through the Pollution Control Board as they are also a part of ICZMP.

Case Studies

Furthermore, as part of the study, in relation to specific livelihood options, a series of case studies were compiled on the basis of existing alternative-supplementary livelihood options that have been undertaken by fisher communities in the region. The summary of some of these case studies, segregated on the basis of villages, are presented in Appendix I.

Public Hearings
Over the course of the two public hearings organised at Kharinasi and Gupti, topics ranging from awareness building about the income generation scheme to the problems present in the implementation strategy were discussed and some changes were agreed upon. One of the key discussions centred on the number of members in a Self help group (SHG) and the implementation of the program through SHGs.

The ICZMP livelihoods project aims at forming groups based on activities. Practically, fishermen overwhelmingly at these hearings where of the opinion that it may be difficult to find 15 people who have ponds and are interested in fish farming where as the chances of getting 5 people who have ponds and are also interested in pursuing fish farming are much higher. Further, it was stressed that the cohesiveness among a small group is always better than the larger group. In this regard, it was strongly recommended that the SHGs should comprise of a group of 5-7 beneficiaries as opposed to the currently proposed 15.

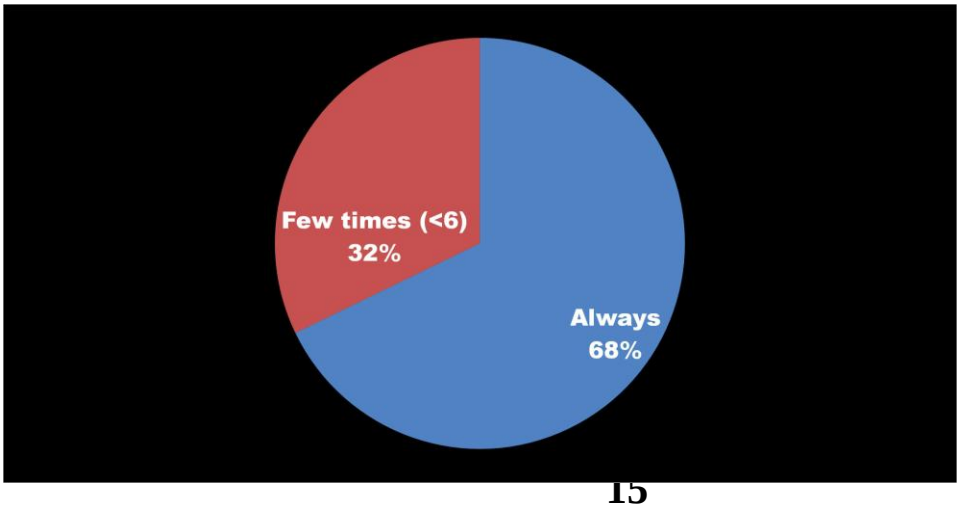
Simultaneously, it was stressed that the project should not rely on just the SHG mode of operation, but other user groups such as the primary fishermen cooperative societies should be brought under the purview of the project.

Some of the other key recommendations to emerge from the public hearings have been included in the overall conclusions and recommendations section.

Marine Fisheries and the community
As part of this study, several aspects in relation to fishermen in the region, and their perceptions and attitudes on reliance and dependency on the marine ecosystem and the Gahirmatha Marine Sanctuary in particular, were sought. The key areas are as follows

Frequency of fishing
Information collated from the respondents suggests that the frequency of fishing in the Gahirmatha region (specifically in the villages surveyed) varies from two to ten months. Those employed as crew on trawlers, fish throughout the year, while a majority fish for around four to five months.

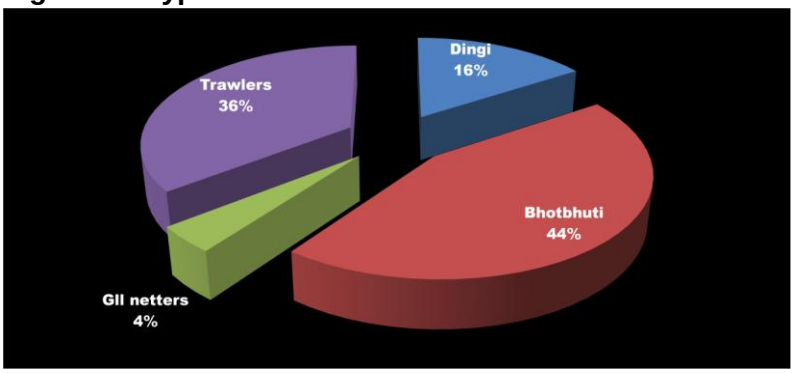
Figure 7 – Frequency of fishing



While the fishermen realise the importance of the ban on fishing coinciding with the turtle season and the merit of closed areas, almost all of them continue to fish illegally within the sanctuary, given their economic compulsions,

especially in the absence of other income generation options.

Figure 8 - Type of vessels



Around 60% of the people (men) surveyed are dependent on traditional boats like the Bhotbhuti or Dingi, while some are employed as crew on trawlers and gillnetters from fishing bases like Paradip, Dhamra and Kasafala.

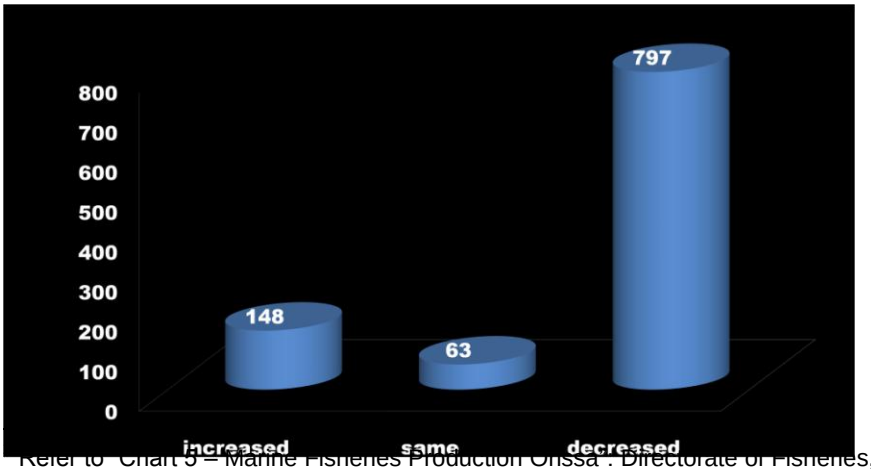
Fishing in the future

The survey clearly highlights that marine fishery as a livelihood choice is declining amongst the younger population. The fishing ban in combination with perceived opportunities in larger towns and cities have catalysed this shift. During the Focussed Group Discussions it was highlighted that many migrate to other towns in search of employment opportunities.

Income from Fishing

In general, marine fisheries in Orissa have reached a stage of stagnation and possible decline[2]. Studies[3] reveal the decline or total disappearance of some species that were once widely prevalent. While some of these changes are specific to particular locations, there are a number of species that appear to have declined uniformly across the state. That the declining species are often from commercially important categories indicates that overfishing and poor enforcement of the Orissa Marine Fisheries Regulation Act is prime contributing factors[4].

Figure 9 – Income from fishing



This is further validated through extensive anecdotal evidence collected across coastal marine fishing communities. Specific to the study area, information obtained through the survey, focussed group discussions and individual interactions indicates a decline in income from fishing. While

[2] Refer to "Chart 5 – Marine Fisheries Production Orissa". Directorate of Fisheries, Government of Orissa.

[3] Mishra (1998: 81), BOBP (1994: 164) and Parasuraman and Unnikrishnan (2000: 184) and "Trends in Poverty and Livelihoods in coastal fishing communities of Orissa State, India" – FAO Fisheries Technical Paper.

[4] Mishra (1998: 81), BOBP (1994: 164) and Parasuraman and Unnikrishnan (2000: 184) and "Trends in Poverty and Livelihoods in coastal fishing communities of Orissa State, India" – FAO Fisheries Technical Paper.

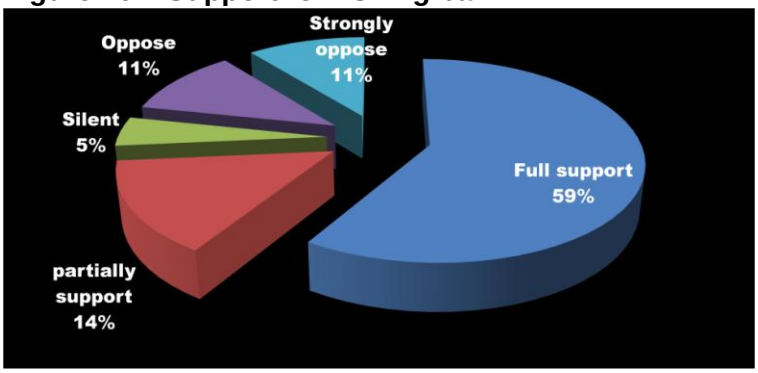
the price of certain species of fish and hence commercial returns have increased, the fish catch per vessel and earnings per individual and per vessel have decreased. The substantial increase in the number of vessels, increased intensity and pressure on fish stocks, and the significant increase in expenses incurred in fishing, besides the loss of purchasing power, have been attributed by respondents as the key driver for this trend.

Perception of fishermen on health of fish stocks in relation to the Gahirmatha Marine Sanctuary

The survey also gauged the perception of respondents on the role of the sanctuary in the replenishment of fish stocks, in addition to the better known objective of sea turtle conservation.

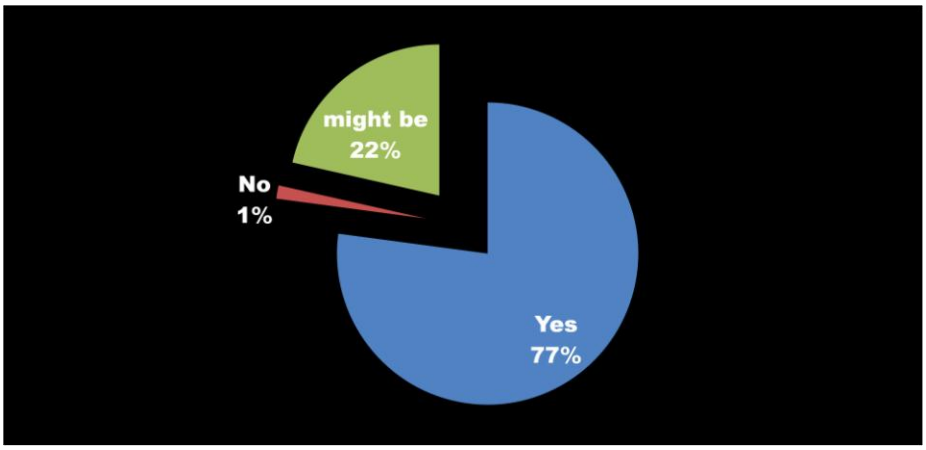
As per the design of the questionnaire, prior to raising this issue, general information about respondents' households was obtained like family structure, occupation, monthly income and other such details.

Figure 10 – Support for fishing ban



Questions concerning the proportion of catch from the sanctuary, perceptions on whether areas such as Gahirmatha contributed to the objectives of maintaining and replenishing fish stocks, support for the concept of closure policies of no fishing areas were discussed and feedback and perspectives from respondents was captured.

Figure 11 – Has Gahirmatha Marine Sanctuary helped fish-stock growth

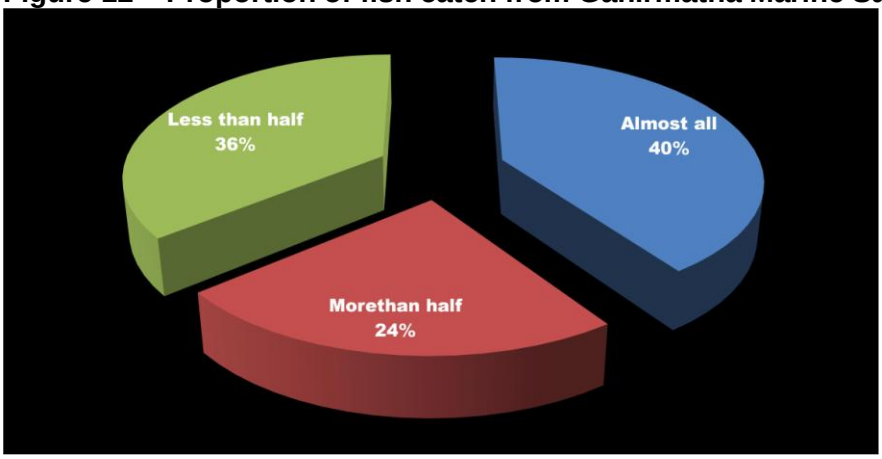


In response to whether the sanctuary has resulted in improving fish stocks in the region, over 75% of the surveyed respondents believed that stocks had improved as a result of the ban on fishing in the sanctuary. This percentage was also supportive of marine and specifically sea turtle conservation needs.

However, around 40% of these respondents also expressed the need for a reduction on the duration of the ban for certain types of gears, for instance monofilament nets. They strongly expressed the possibility of resolving the current conflict of conservation versus livelihoods

through outcome oriented consultations with the implementing agencies, so as to serve the purpose of turtle conservation while ameliorating some of the worst livelihood impacts.

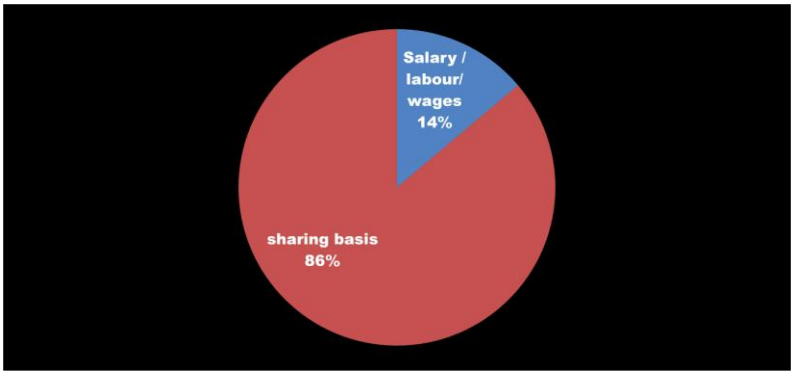
Figure 12 – Proportion of fish catch from Gahirmatha Marine Sanctuary



As a corollary, on the issue of reliance on the Gahirmatha Marine sanctuary for fish resources, over 40% of the households surveyed across fifteen villages continue to depend totally on the Gahirmatha Marine Sanctuary as a source of their livelihood. Around 24% of the respondents are partially (50%) dependent on the sanctuary while the proportion of fish catch from the Gahirmatha Marine Sanctuary of around 36% of the households is less than 50%.

Most income for fishers is on a sharing basis – wherein the fish caught during one fishing trip is distributed on a pre-agreed basis amongst the owner and crew of the vessel. This basis of sharing necessitates increasing the fish catch per trip which in turn incentivises or forces fishers to illegally fish within the sanctuary. This factor assumes significance considering that only around 14% of fishermen in the surveyed areas is employed on a salaried basis.

Figure 13 – Income type



The variance on income is significant across fishermen – dependent on the type and size of the boat, the ability to have a longer or shorter trip and amount of investment. The monthly income therefore varies drastically from Rs. 1500 to around Rs 10,000 per month.

Conclusions and Recommendations

Generating Livelihood opportunities

Specific to the enhancement of livelihood opportunities, the following emerged as key recommendations from respondents through the various tools employed in this study – questionnaires, focussed group discussions, the collation of case studies and the public hearings organised subsequently.

- The proposed income generation intervention should be extended to function all year round.

- Considering the current reliance of the ICZMP livelihoods project on self help groups, and this being a new concept, especially amongst fishermen, there needs to be sufficient investment in training and capacity building, especially relating to areas like maintenance of books and accounts and expenses, and enabling collective decision making processes.

- Ideally, the first year of the income generation project should be considered as a pilot phase and provisions made to incorporate learning's in subsequent years.

- Fishermen should be allowed to choose the options that they feel are the most feasible for them and this requires some flexibility in the program. The project should make provisions to ensure that these options are exercised, provided they are ecologically sustainable.

- There is a clear need to make sub-components of the ICZMP livelihoods project and the basic requirements around legalities of ownership of land / ponds clearer, to facilitate the accessing of funds available under the project. There is a need, therefore, for making these mechanisms simpler and more accessible.

- Considering that ownership of land / property in these communities is not necessarily determined by the possession of legal documents, attestation of the same from panchayat members should be considered as adequate evidence for the purpose of processing.

- More emphasis should be stressed on livelihood options that involve entrepreneurship and business through the community.

- Information, education and communication materials for new technology should be made available to the fishermen in a simple language and possibly a pictorial format for easy understanding.

- Capacity building and training programmes should be provided to the fishermen on various farming and horticulture techniques.

- SHGs should comprise of a group of 5-7 beneficiaries as opposed to the currently proposed 15.

- Simultaneously, the project should not rely on just the SHG mode of operation, but other user groups such as the primary fishermen cooperative societies should be brought under the purview of the project.

- Specific to the nature and type of livelihood opportunities, the following arose as key recommendations from the community
    - The lack of adequate information regarding horticulture as an option should be addressed by the ICZMP officials immediately.

    - Integrated pisci-culture should be promoted to get maximum benefits out of the resources available. This model would involve fish cum poultry cum plantation cum horticulture. This would also be a holistic approach to meet the daily requirements of a household.

    - Fishermen should be allowed and encouraged to develop their own household pond for practicing integrated models.

    - The leasing of new land should not be promoted for the fishermen who have their own pond. This will only lead to a paucity of resources for those who are landless or possess less land.

    - The landless fishermen should be given priority for goat rearing/poultry or petty business depending on the resources available and skill-sets and experience of the concerned individual.

    - Synergistic opportunities should be explored for linkages between the ICZMP livelihoods project and the National rural employment generation scheme, especially regarding the excavation or renovation of ponds.

    - The collection of prawn seedlings or other fish seed from the wild should be banned. Prior to the promotion of Bhekti, fresh water prawn and crab culture, the availability of seeds needs to be checked with different hatcheries.

    - In terms of dairy farming, local varieties should be considered.

    - The promotion of dry fish and value addition services should be done considered after a thorough analysis of the availability of raw material and the establishment of market linkages.

    - Attempt to reduce the migration of local people from the region to other areas for employment by making these locals the primary beneficiaries of the project.

    - Eco-tourism as an option should only be considered if the proposed model of tourism does not impact the local ecological stability and the involvement and enhancement of local capacity is addressed, to ensure that this actually provides benefits to the community.

- Additionally, in terms of developmental aspects, some of the key areas highlighted were
    a. The issue of pollution in the vicinity of many of these villages should be strictly addressed through effective enforcement by the state pollution control board.

    b. Similarly, issues relating to irrigation and future possibilities should be studied and thoroughly investigated by the Water Resource Department in consultation with villagers.

    c. Accessibility in terms of road networks as well electricity is major issues for most of the coastal villages surveyed and should be addressed by the concerned departments on an urgent basis.

In light of the above recommendations and as measure towards facilitating the conservation and management measures of the Gahirmatha region, this report recommends supplemental livelihood options as opposed to mandatory alternative livelihoods, as this as this would provide for economic diversification from different livelihood opportunities, while reducing household dependence on fishing, even while acknowledging and indeed recognising the right to fish.

Management and conservation measures

It is quite clear that there is a significant amount of resentment and antagonism among the surrounding villages towards the Gahirmatha Sanctuary. This has led to a situation of frequent violation of the sanctuary's fishing restrictions, and, by transference, some amount of apathy, or even antagonism, to the larger goals of marine conservation and turtle protection.

If local communities remain unsatisfied with any aspect of management and are excluded from the decisions, they are more likely to break rules and jeopardise the sustainability of the marine resources. In this case, unless livelihood strategies are considered in combination with conservation and management strategies that address the open access nature of coastal fisheries, any progress towards enabling Gahirmatha marine sanctuary to serve its purpose of conservation of sea turtles, fisheries and the local ecosystem, will remain ineffectual.

With a view to building greater community support for the Gahirmatha Marine Sanctuary, the following recommendations are proposed, based on the perceptions, attitudes and inputs of fishermen in the Gahirmatha region:

Their implementation will go a long way towards facilitating management and conservation objectives, while recognising and protecting the occupational interests of local fishermen.

- Immediately activate the provision of innocent passage of vessels of local fishermen within the sanctuary limits, and ensure that harassment of innocent fishing vessels by forest department personnel is not tolerated
- Consider the possibilities of implementing through co-management modules, which involves and includes local fisher communities, including actively encouraging and facilitating their involvement in decision making processes in regulating the sanctuary.
- Complement the above with effective implementation of the Orissa Marine Fisheries regulation act, in the periphery of the sanctuary, towards an approach to sustainable management of marine fisheries.

- Recognise the need for protection of occupational interests of local fishermen

- Consider the possibilities of access to sanctuary for certain types of vessels and gear. This could be developed on the basis of scientific processes and public consultation with both external experts and local fishing communities – conventional and traditional knowledge systems.

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Appendix I

Case studies across villages surveyed

Person	Livelihood Option	Investment	Village - Suniti Information / Feedback	Income	Key learning's / suggestions
Sankar Gochhayat, Male, 49	Bhekti - sea bass culture	INR 300 on purchase of Bhekti seeds.	* Lack of knowledge in the village and region on sea bass culture. * Practiced culture through traditional methods * Could not identify the reasons for the slow growth and high mortalities. * No understanding of feeding patterns to ensure growth of fish * Utilised seeds collected from creeks, while recognising that this could have detrimental effects on the local ecosystem.	Negligible as mortality rates were as high as 90%	* Lack of technical knowledge and capacity required to build and sustain this livelihood option. * Training programmes to build technical know-how and capacity is critical
Uttam Mandal, Male, 35	Fresh water fish culture	INR 3000 – approximate investments in fish-framing in a household pond	* Stocks fish seeds after the monsoons and before winter in the pond. * The fish is reared for approximately 8 to 10 months. * The water is retained in the pond during summer d Most people have limited to no knowledge on precautions to be taken to control disease. * People have no knowledge of scientific methods and rely largely on traditional ways, improvised on the basis of experiences.	Over the first time he harvested around three quintal of fish from the pond after 8 months and earned Rs 20,000 and now makes a profit of around Rs 17,000 on an average / annually	* Growth is higher during summer * Rearing good quality seeds and stocking at the right time is critical

Sambhu Ram Gochhayat, Male, 30	Fresh water prawn culture	INR Rs. 7,500 annually – INR 5000 on seeds and INR 2500 on feed	* Seeds purchased from local vendors * Grows them for nine months in a year (May-January) * Not aware of scientific methods of culturing	Profit of around INR 17,500 every year.	*Exclude / segregate unhealthy prawns from the rest of the stock and seek support from local experts. * Good quality seeds need to be stocked in the pond c Avoid wild-collection of seeds

Village - Barkolikhala					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's/ suggestions**
Sudhir Ranjan Pal, Male	Poultry Farming	INR. 4,000 – chickens and feed	*Started in the year 2003 * Developed understanding on an experiential basis (his and others) * Purchased from local vendors c Initially they were provided with small feeds and later fed with paddy, rice etc. * Completion of a cycle is around four months * Currently possesses 60 birds * Confining birds in a small structure (small hut etc) especially during roosting and disinfect on a regular basis is important	INR 8,000 to 10,000 in each cycle and between INR 22,000 to 27,000 annually	*Important to know of and recognise common diseases that occur amongst poultry and those which recur across seasons. * Important to seek training on the treatment of common diseases and the other technical aspects

Niranjan Maitey, Male, 38	Bhekti Culture	INR 3000 – approximate investments in fish-framing in a household pond	*Excavated an area of 0.4 acre and prepared a pond for Bhekti cultivation, considering the high demmand for Bhekti in the market. * Can be cultured in fresh as well as brackish water * Did not make profits in the first year and subsequently stocked Bhekti and tilapia seeds together (Bhekti feed on tilapia), thereby reducing feeding costs to almost nil	INR 20,000 from Bhekti cultivation.	* Ensure that you use good seeds * Acquire training on the best ways of cultivating Bhekti * Avoid collection or purchase of seeds collected from the wild.
Rajendra Kumar Das,	Poultry Farming	INR Rs. 2,000 to purchase 60 birds.	* Started in 2006 * Secondary occupation which provides supplementary income * Prior to two months chickens should provided with small portions of a ready-made feed, following which they can be fed rice bran, paddy etc * Expectations include the provision of improved veterinary services and exposure and training on technical aspects to facilitate the possibility of local people acting as barefoot vets.	INR 5,000	*Disinfect, the area of roosting in particular, on a regular basis * Learn / seek training to recognize common diseases and treatment for the same.

Kalipada Pradhan, Male, 52	Bhekti fish farming	INR 2500 – Bhekti and tilapia seeds thereby excluding feeding costs.	* Started the culture of fish initially through the collection of seeds from the wild in his pond, with marginal profits. * Subsequently purchased the seeds from local vendors and stocked them in his pond * Practices precautions like the covering of pond with bamboo branches or plants to ensure stocks are not stolen. * Expectations include technical and scientific training and learning on fish farming by the Government and also expects more financial support from the government * Also involved in poultry farming and composite fish farming in another pond.	Around INR 15,000/- per year	

Village - Kharinasi					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**
Ramkrushan Pradhan, Male, 41	Goat rearing		* Started with two livestock initially, doubling within a two year time-frame. * Started making profits from the third year * Advises many others who are considering goat rearing as an option as he has built his understanding of this occupation, especially relating to recognising and the treatment of common diseases.	Earning over INR 15,000 annually through this option.	Critical need for better veterinary services in the area.

Baisakhi Jena, Female, 42	Composite fish farming	INR 2000	*Started fish farming to meet her household requirements. * Initially faced losses as a result of a very limited understanding of the technicalities involved. * Built her understanding on basis of experiences of friends and neighbours and through technical knowledge acquired from books on the issue.	INR 10, 000 to 12,000 annually	

Village - Satavaya					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**
Madhu Muduli, Male, 40	Composite fish farming	Rs. 10,000 and received technical and financial support from the government	*Has been practicing composite fish farming over the last 20 years. * Profit realization was after the completion of a year in the initial stage * Dykes on his pond need to be repaired currently and expects support from the Government for the same.	Rs. 5,000	

Village - Gupti					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**

Narasingha Mallick, Male, 46	Shrimp culture	Rs 60,000 for pond excavation and seed input.	*Started in 2006 * Developed an understanding through a friend who is a specialist in prawn culture. * Purchased seeds from local vendor and stocked them in the pond. * Changed some portion of water in the pond on a weekly basis as part of its maintenance. * Over the last 3 years he has suffered major losses as a result of outbreak of diseases, requiring him to mortgage his land to recover money * Currently he has stopped practicing this culture	He used to earn a profit of Rs. 30,000 after each cycle which lasted for 4 to 4.5 months.	*Strongly advocates that shrimp culture not be adopted, especially as part of any formal government scheme.
Sridhar Mallick, Male, 38	Poultry farming	Initially invested Rs. 625 for 25 chickens	*Has been poultry farming over the last 7-8 years. * Technical and other knowledge acquired through experience. * Acquiring poultry of good quality is critical, even if more expensive. * Developing an understanding of common diseases and treatment for the same is important, especially as veterinary services available in the area are inadequate.	Profit of Rs. 1000 generated in the first year and currently makes a profit of Rs. 3,000 to Rs. 4,000.	*Veterinary services should be improved if poultry farming is promoted as a formal livelihood option * Similarly, capacity building and training is critical for fishermen in the region exploring poultry as an alternative / supplementary income generation option.

Keshaba Chandra Mallick, Male, 35	Fresh water fish farming		*Has been farming freshwater fish as an additional livelihood option, along with crop cultivation. * Purchased seeds from local vendors. * Estimates that fish reach their maximum profit potential over a period of 2 years (around 2 Kilos). * Did not add any feed to the pond in the first year of operation and the pond productivity was much higher. * Over the last 3 years, productivity has however dropped drastically. * Unsure of the exact reasons to the same, but believes it could be as a result of no formal training that he has received, and has essentially adopted ways on the basis of his and other experiences.		*Technical and financial support from the Government should be mandatory.

Village - Bhekta					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**

Madhava Nayak, Male, 49	Fresh water fish-farming	He invested around 20,000 rupees initially for pond construction, fish seed, feed etc.	*Started fish farming since 1980. * Developed an understanding of the basics of this livelihood option through others. * Cultured the seeds on the first attempt over 8 months prior to selling them in the market. * The prevalence of disease amongst fish was negligible earlier but is rampant now. * Used to disinfect the pond regularly through the application of lime * Earlier fish growth and resultant profits were consistently good but it is not the case anymore.	In the first year he made a total profit of rupees 10,000.	Technical support from the Government will make a difference in optimizing generation of profits
S.K.Ramzan, Male, 65	Poultry farming	Rs 15, 000 on the birds and their feed annually	*Practicing poultry farming over the past 10 years. *Prior to the fishing ban, he used to fish through the year * With the imposition of the ban, he opted to source income through other livelihood options * Over the course of a year, the birds go through 3 cycles of reproduction.	Profits of Rs 26,000 on an annual basis	Acquire a good understanding of recognising and treatment of common diseases, prior to engaging in this business.

Aravinda Das, Male, 52	Fish farming		*Practicing fish farming over the last 20 years and owns a pond (0.3 Acres in size), which he disinfects and fertilises on a regular basis using lime and cow dung * Initially practiced fresh water fish farming but over the last 5 years, he is engaged with Bhekti culture in his pond, which he feeds with small fish caught from creeks. * The work is largely handled by female members of his family and additionally, the advantages of fish farming are that it can be practiced throughout the year.	Currently earns Rs. 15,000 from Bhekti culture alone.	Feeding is critical in Bhekti culture and if feeds are not adequate or regularly monitored, it is likely to result in losses, due to slow and stunted growth of fish.
Farookh S, Male, 40	Integrated fish-farming	Rs. 1,000 on seeds.	*Excavated a pond in the backyard of his house. * Fish produced are usually used for household consumption, with the leftover fish sold in the market. * Using bigger size seeds results in better growth and higher productivity * Ensures that ponds are protected with bamboo branches to prevent poaching * Feed comprising of leftover cooked rice with rice bran is sufficient * Understanding the basics of the culture practice and technical know-how prior to engaging in this livelihood option is better to ensure better returns * Also practices poultry farming and farming of horticultural plants and believes that such an integrated model buffers the risk of failure of production in one of the livelihood	Profits of around Rs. 5,000, specifically from fish-farming	

			options in a year.		

Village - Rajendranagar					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**

Banamali Mahalik, Male, 48	Dry fish production		*Started dry fish making and its allied marketing by investing money in fish, salt, gunny bags, weighing machine and a cycle. * Developed an understanding on the basis of experiences of others * Understanding market demands and linkages prior to commencement is key * Purchase of raw fish when fish prices are low is ideal * Proper drying, at the right time and for an optimal period is important * Typically, the dry fish products are given to marketing agencies on loan and the amount due is collected after a certain period of time.	Rs. 40,000 annually.	

Village - Dighi					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**

Nilambar Jena, Male, 47	Fish cum fresh water prawn culture	Rs. 90,000	* Acquired a thorough understanding of this business on the basis of experiences of friends and subsequently, his own learning's * Seeds purchased from local vendors are stocked in the pond * Initially, cultured the seeds for close to 2 years, after which they were harvested * Over the winter season, pond maintenance assumes critical importance * Improved water quality through the application of lime to the pond on a regular basis * Understand the technicalities involved from a qualified fisheries expert, especially at the starting stage * Access to good quality seeds at required time and at reasonable prices are critical to ensure generation of profits	Rs. 1,00,000 annually	
Alekha Samal, Male, 36	Poultry farming	Rs. 40,000 in the start-up period	Engaged in thoroughly consulting others involved with poultry farming, and local veterinary officials, prior to commencing. Since then, also consults with experienced and other successful poultry farmers, on problems encountered.	Over Rs. 50,000 annually	Availability of and access to technical knowledge is important

Village - Rangani					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**

Chatrubhuja Mandal, Male, 52	Fish farming	Rs. 1,00,000	*Spent around Rs.1, 00,000 for excavation of pond and construction of shed for poultry farming right above the pond. * Wastes from birds are utilised as a fertiliser and assist in fish growth * Poultry shed is constructed in a manner to ensure that droppings directly fall into the pond. * Initiated this option on the basis of integrated models of fish and poultry farming prevalent in Andhra Pradesh * Actively consults with the local fisheries and veterinary officials, as per requirements. Additionally, in resolving problems encountered, he also consults veterinary experts located in Cuttack	Over Rs. 35, 000 annually	* Beneficial to establish a new integrated farming business based on the inputs of experienced farmers and technical people to ensure success. * Initial investment in business and technology is critical for long-term profitability

Village - Keruanpal					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**

Jhadeswar Mandal, Male, 45	Integrated fish farming		*Jhadeswar is employed as crew member on a fishing boat and relies on fish-farming in his backyard pond for a supplementary source of income. * Also practices poultry farming specifically for domestic consumption * Fish produced from the pond basically fulfills his family needs and the balance is sold in the market. * Initially, relied on seed collected from the wild, with a low production * Over the last few years, he stocks seeds with fingerlings of Indian major carps * Cooked rice and leftover-food is used as feed	Rs 5,000 – 7,000 (specifically from fish farming)	Advocates for any formal program to integrate horticulture with poultry and fish farming, as it delivers on the household requirements.
Subrat Kumar Pradhan, Male, 28	Goat rearing		* Started with 2 goats and currently owns 25 goats * Goats are allowed to graze in the wild, by way of cutting on input / feeding costs * Technical know-how and knowledge of treatment of common diseases and an understanding of precautionary measures to be taken, are key to succeed in this business * Stocking of common medicines for future requirements is useful, considering that veterinary services in the area are poor. * Also practices poultry farming to sustain household consumption requirements	Earns over Rs. 10,000 from goat rearing	

Village - Talchua					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**
Gurupada Giri, Male, 28	Poultry farming	Rs. 40,000	*Started poultry in the year 2007 * Developed the required understanding for poultry farming from friends and from frequent interactions with local veterinary officials. * Overall support on veterinary services is poor. * Over the course of a year, atleast 2 cycles of marketable poultry production takes place. * In the initial period, faced many problems like slow growth and prevalence of different diseases in the birds, resulting in loss of profits * Maintenance of a clean environment allied with proper ventilation and lighting, and the knowledge to recognise common diseases and administer treatment at the right time are key to make profits.	Atleast Rs. 40,000 annually (Rs. 20,000 per cycle of production)	

Village - Batighara					
Person	**Livelihood Option**	**Investment**	**Information / Feedback**	**Income**	**Key learning's / suggestions**

Srinivas Mandal, Male, 49	Goat rearing	INR 4000 – purchased four goats in the first year	*Started to rear goats in 2001 as an occupation through the year * Clean platform housing them on a daily basis to ensure their environment is healthy and to avoid the spread of infections * Gathered the required working knowledge for this occupation from the experience of relatives and friends from neighbouring villages. * Require better veterinary services or barefoot veterinary training to take care of our livestock.	Currently profits between INR 15,000 and 17,000 (with profits starting from the second year)	* Knowledge of the common diseases and their treatment and stocking of medicines considering that the veterinary assistance in the area is inadequate
Kalpana Pandit, Female, 40	Composite fish culture		*Practicing integrated fish farming (fish cum poultry) in her backyard ponds over the last 15 years * Composite fish farming has to be done thorough out the year. * The seeds need to be stocked in the rainy season * Knowledge on the common technical aspects on integrated fish farming is critical * Considering further excavation and renovation of the pond for better culture practice.	Profits range from INR 14,000 to 18,000 annually.	The generation of profits follows only after completion of the first year and so financial and technical support from the Government would be helpful in increasing profits.

Bijan Barik, Male, 28	Poultry	INR 6, 000 initially	*Started doing poultry in 1996. * Acquired an understanding from the experiences of others, including recognising common diseases and their treatment, the medicines required etc. * Critical to maintain a clean and healthy environment in the storage facilities, and disinfect the premises on a regular basis. He also built a shed with better light and ventilation.	Over INR 20,000 annually.	
Dhaneswar Behera, Male, 60	Fresh water fish farming		*Fish-farming over the last 10 years. Initiated with wild seed but then shifted to Bhekti culture with seeds purchased from local vendors five years ago * Combining Bhekti culture along with Tilapia. * Poaching is one of the significant problems and precautionary measures need to be taken on an ongoing basis to reduce poaching. * While the minimum weight of Bhekti is around 700 grams, it can reach upto one kilo in a year. * Household with occupational multiciplity with fish-farming as one of the options	Around 10,000 annually	

Appendix II

Survey Questionnaire

Sl. no of HH:

1. Name:
2. Total members:
3. Male: female : below 18 yrs :
4. Caste: SC =1/ ST =2 /OBC =3/ Gen =4
5. Occupation (Please Tick) : Boat Owner / crew member / fish collectors / any other
   1 2 3 4
6. Fishing activity: full time -1 / occasional - 2
7. If occasional (2) please specify average duration (months?) of being occupied as traditional fishermen over a year –
8. What type of boat? : Dingi -1/ Tapa -2/ Bhoot bhuti -3/ gill netter -4 / trawler -5
9. Length of boat :
10. Horse power/ engine power:
11. Total boat nos:
12. Type & no of net owned:
    a. Type:
    b. Nos:
13. . How long have you been involved with marine fisheries? (yrs)
14. Where do you do most of your fishing? Within 5 km of shore, within 5-10km.more than 10 km? 1/2/3
15. In your view, has the income (per month, in the year/ weekly/ per trip - need to quantify it that way too for clarity?) from fishing increased / stayed the same in the last decade or so/ decreased? (1/2/3)
    Reason: What was the income ten years earlier, and what is it now? If increased or decreased, explain briefly as to what has influenced this change?
16. How much of your fish catch comes from within the Gahirmatha Sanctuary? (Most/half/less than half/ not at all) (1/2/3/4)
17. How many crew do you have in your boat (if owner)?
18. What percentage of the year is the crew employed (if owner)?
    Occupation: fishing / non fishing (in months)
19. On what basis are earnings shared between the owner and crew members (on the basis of catch or a regular salary or other arrangement):

Your Views:

20. Do you believe closed “no fishing areas” such as Gahirmatha will help replenish fish stocks (Yes / No / Maybe) (1/2/3)? If no, explain briefly as to why you think so. If yes, explain why.
    Reason:
21. On a scale of 1-5 (1: Strongly oppose, 2: Oppose 3: Neutral, 4-Support 5: Strongly support), to what extent do you support the closure policy of “no fishing areas”?
    If 4-5, please suggest how this measure should be popularized amongst the traditional fisher community?
    If 1-3, please suggest alternative measures which will be largely adopted by traditional community, to conserve and manage fisheries better.

Alternative Livelihoods

22. Would you consider a substitute livelihood option during turtle season? Yes / no (1/2)
23. If viable alternatives are available, would you commit to not fish during the turtle season? Yes / no (1/2)
24. Were you consulted for the implementation of alternative livelihood program that the government is proposing? Yes / no (1/2)
    If yes, then how was the consultation?
25. Have you any idea what are the proposed intervention in the alternative livelihood? yes / no
    If yes, what are the interventions?
26. . Do you think the alternatives proposed by the state fisheries department are acceptable? Yes / no
    If no, why not?
    If yes, how?
27. Given a chance what would you like to do except fishing for your livelihood
28. In your opinion what are the alternative / supplementary livelihood option available in your area

What other alternatives do you think will work?