

## Livelihood Developmental Interventions for Fishers' in Indian Sundarbans: A Descriptive Study

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### ABSTRACT

Tagore Society for Rural Development (TSRD), Socio-Economic and Ecological Development (SEED), Sabuj Sangha, Paribesh Unnayan Parishad (PUPA), Vivekananda Institute of Biotechnology (VIBT), Sundarban Dream, Nature Environment and Wildlife Society (NEWS) intensely worked on the fishers' livelihood in Sundarbans under different Fishery, Agricultural and Rural Development programmes. Whereas, Department of Fisheries (DoF), Sundarbans Development Board, Govt. of West Bengal (W.B.) and Kakdwip Research Centre of Central Institute of Brackish Water Aquaculture (KRC of ICAR-CIBA), Govt. of India intervened in fishers' livelihood development and climate change adaptations. Thus, these seven Non-Governmental Organizations (NGOs) and three Governmental Organizations (GOs) were considered to study the details of interventions for fishers' livelihood development during 2013-14 to 2014-15 and funding status in a more comprehensive manner. Results showed that the maximum numbers of beneficiaries (fishers) of NGOs were covered under Greening programme (31.20%), followed by Health camps (20.75%) and providing Credit facilities (14.58%). Top five figures of beneficiaries of GOs were benefitted under Biometric card distribution (29.73%), followed by Capacity Building Programmes related to Agriculture/Fishery (24.56%), Fish Feed Distribution (10%), Distribution of Fertilizers (9.98%) and Fish Seed Distribution (7.23%) respectively. Out of all selected NGOs, VIBT spent the maximum amount of total allotted fund (33.14% *i.e.* ₹ 9,23,56,000/-) for carrying out different developmental interventions in Sundarbans region and from GOs, Sundarban Development Board had the maximum share (74.07%, *i.e.* ₹ 299,66,26,000/-). The present study suggests that there is a need of focussing more on exclusively fisheries components as part of livelihood developmental programmes with more budgetary allocations especially, for NGOs.

**Key words:** Development, fisher, government, livelihood, NGO, sundarbans.

### INTRODUCTION

Sundarbans, a Biosphere Reserve, World Heritage site and the largest mangrove vegetation in the world, represents a richest and most unique ecosystem. Being the largest delta in the world, it consists of 14,300 sq. km of mangrove forest, spread over two adjoining countries namely, India and Bangladesh, in which, area under Indian territory is 4267 sq. km. Another 5400 sq. km. of non-forest-inhabited region in India, along the north and north-western fringe of mangrove forest, is also known as Sundarbans region, encompassing 13 adjacent blocks of 24 Parganas (South) 6 blocks of 24 Parganas (North) districts in West Bengal (W.B.) (Department of Sundarban Affairs, 2016; UNESCO, 2016; and WWF-India, 2016). Sundarbans plays a significant role for

supporting wide range of floral and faunal biodiversity and ecosystem services that support livelihoods of local communities and therefore contributes to sustainable development and poverty reduction (Mulongoy and Gidda, 2008).

Considering the facts of ecological importance, enormous potentialities in fisheries sector and socio-economic backwardness of Sundarbans region, many Governmental Organizations (GOs) and Non-Governmental Organizations (NGOs) have been intervening in different areas of livelihood development through inputs distribution, infrastructure development, capacity building, sanitation facilities, afforestation programmes, climate change initiatives *etc.*, especially, for the fishing communities in Sundarbans. Gradually,

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Sundarbans became a place of works for different NGOs with international and national repute along with GOs like Department of Fisheries (DoF), Sundarban Development Board (SDB), Department of Sundarban Affairs, Govt. of West Bengal (W.B.) and Indian Council of Agricultural Research (ICAR), Govt. of India (Ghosh, 2017).

The livelihoods of coastal communities in Sundarbans region are being improved through the fisheries and agricultural activities, generation of new afforestation-based livelihoods and promotion of small-scale tourism and ecotourism activities. Eco-sensitive tourism infrastructure is being developed, including at Ganga Sagar, an important pilgrimage site at the confluence of the river Ganga and the sea (DISHA, 2009).

As far as the major funding agencies are concerned for sponsoring different GOs and NGOs in carrying out developmental programmes in Sundarbans region, World Bank had been a leading source of funding under Integrated Coastal Zone Management Project (ICZMP).

However, the details of target group specific livelihood developmental interventions especially, for the fishers in the Sundarbans region, were not found to be reported through any direct researches. Thus, the present study was undertaken with the objective to make an inventory and perform appropriate analyses of interventions with funds undertaken by different Governmental and Non-Governmental Organizations for fishers' livelihood development in the Sundarbans, West Bengal for having a comprehensive view of these interventions which would enable the development actors, policy makers and other agencies to design future development programmes more effective in Sundarbans region.

### METHODOLOGY

A list of NGOs working in agri-allied activities for livelihood development was collected from Sundarbans district administrative offices. It was found that there were 111 such NGOs. Further information was collected from officials and key informants to know which NGOs were working on fishers' livelihood in Sundarbans region. Such NGOs were 7.

Thus, these 7 NGOs were selected for this study. Apart from these NGOs, 3 GOs were found to be engaged in fishers' livelihood development thus, included in the present study. The details of the selected GOs and NGOs are presented in table 1.

**Table 1: Selected NGOs and GOs working on livelihood interventions in Sundarbans**

Name of the Organizations	Key Areas of Intervention	Working Areas/Blocks
Tagore Society for Rural Development (TSRD)	<ul style="list-style-type: none"> <li>Health, Capacity building, Sustainable livelihood development through fishery and agriculture, Sanitation, Installation of Submersible pumps, Kiosk and street lights, Rain water harvesting, Soil testing, Disaster management, Greening, Plantation and Bio Diversity conservation, Cultural programmes etc.</li> </ul>	Sagar, Rangabelia, Basanti, Gosaba, Hingalganj
Socio-Economic and Ecological Development (SEED)	<ul style="list-style-type: none"> <li>Adult education programme, Capacity Building, Climate Adaptive Agriculture and Aquaculture, Disaster Preparedness Programme, Health Awareness Camps, Comprehensive LODHA development programme etc.</li> </ul>	Sagar, Patharpratima, Gosaba
Sabuj Sangha	<ul style="list-style-type: none"> <li>Health and Nutrition, Water Sanitation and Hygiene, Education and Child Protection, Livelihood development and Women's Empowerment, Natural resource management through Pond Based Integrated Farming System, Poultry farming, Small business like Fishery, Agriculture, Environment and Disaster Responses etc.</li> </ul>	Sagar, Patharpratima, Raidighi
Paribesh Unnayan Parishad (PUPA)	<ul style="list-style-type: none"> <li>Socio-economic upliftment of Scheduled Caste (SC) Community through skill enhancement and livelihood intervention, Livelihood Development for the Disadvantaged Sections, Development of Biodiversity Conservation Park, Fish farming and inputs distribution, Nutritional kitchen gardening etc.</li> </ul>	Sagar
Vivekananda Institute of Biotechnology (VIBT)	<ul style="list-style-type: none"> <li>Multi Skilled Technology Packages/Skill development in emerging technologies, Accelerated development of Minor irrigation project, Financial Services to Un-Banked areas, Science and Technology Entrepreneurship Development, Livelihood development through fishery and agriculture, Organization of Community Science Centres through Participatory Approaches, Establishment of Seed Processing Units, Organizational Attachment programme, Development of Training Packages and imparting Skill based training, Business Plans Development, Biodiversity and conservation etc.</li> </ul>	Sagar
Sundarban Dream	<ul style="list-style-type: none"> <li>Women's Empowerment, Capacity building, Sustainable livelihood development through fishery and agriculture, Tree plantation, Formation and functioning of Farmers' Producer Company (FPC) and Farmers' Interest groups (FIG) etc.</li> </ul>	Gosaba
Nature Environment and Wildlife Society (NEWS)	<ul style="list-style-type: none"> <li>Mangrove Afforestation, Reforestation and Restoration, Facilitation for livelihood development through capacity building programmes on fishery and agriculture, Cyclone Shelter development, Assessing the impacts of Climate Change in Sunderbans, Socio-economic development through seaweed culture, Disaster preparedness etc.</li> </ul>	Sagar, Patharpratima, Gosaba, Kultali, Basanti
Department of Fisheries (DoF), Govt. of W.B.	<ul style="list-style-type: none"> <li>Freshwater carp culture, Distribution of Fishery Inputs, Recurrent remuneration for the members of Khuti Samity (a form of cooperative society), Old-age pension, Development of Infrastructure facilities, Pond excavation, Housing, Capacity building programmes, Distribution of biometric card and Registration of Boats, Saving Cum-Relief Scheme/Group Accidental Insurance etc.</li> </ul>	All the blocks of Sundarbans
Sundarban Development Board, Govt. of W.B.	<ul style="list-style-type: none"> <li>Civil Works Programmes, Agricultural and Fishery based Programmes etc.</li> </ul>	All block of Sundarbans
Kakdwip Research Centre of Central Institute of Brackish Water Aquaculture (KRC, ICAR-CIBA)	<ul style="list-style-type: none"> <li>Fish Feed preparation, Technology development and refinement for Brackish water aquaculture, Enhancing livelihood security of farming communities through sustainable management of degraded coastal land, Improvement of Livelihood of Tribal Farmers of Sundarbans</li> </ul>	Namkhana and Kakdwip

Secondary data related to details of activities with corresponding funding statements of these selected organizations were collected from their official records/reports. From the available contents, a set of interventions (table 2) was listed, consisting of units of observations for quantification of data. Precisely, it is a set of parameters with quantification units, extracted from the detailed interventions of selected GOs and NGOs. Interventions of these organizations were collected during 2012-13 to 2014-15 as the World Bank Funded Integrated Coastal Zone Management Programme (ICZMP), the prime source of funding for many organizations on livelihood development in Sundarbans, was functional during that period. Due to contrariety between Govt. of India and Govt. Of W.B., fund was not disbursed during post 2015 period. Many organizations reported that, they did not even receive the fund which they actually spent for interventions even after making intense persuasion to Departments/Governments.

**Table 2: List of interventions of selected GOs and NGOs**

Basic areas of Interventions	Units for Quantification
Seed	Numbers of beneficiaries received
Feed	Numbers of beneficiaries received
Fertilizer	Numbers of beneficiaries received
Equipment	Numbers of beneficiaries received
Insulated Box	Numbers of beneficiaries received
Matsyajaj	Numbers of beneficiaries received
Pond excavation	Numbers of beneficiaries benefitted
Laboratory and testing facilities	Numbers of beneficiaries benefitted
Housing	Numbers of beneficiaries received
Roads	Kms. of Roads Constructed
Development of SHGs	Numbers of members benefitted
Culvert	Numbers of culverts constructed
Bridge/Jetty	Numbers of bridges/jetties constructed
Tube well	Numbers of tube wells installed
Sanitation facilities	Numbers of beneficiaries benefitted
Capacity Building Programmes (Agriculture/Fishery/Animal Husbandry/Others)	Numbers of beneficiaries attended
Awareness programmes	Numbers of beneficiaries benefitted
Health camps	Numbers of beneficiaries benefitted
Credit facilities	Numbers of beneficiaries benefitted
Incentives/Subsidies	Numbers of beneficiaries benefitted
Old-age pension	Numbers of beneficiaries benefitted
Greening programmes	Numbers of beneficiaries afforested
Education	Numbers of beneficiaries benefitted
Disaster management	Numbers of beneficiaries benefitted
Licensing	Numbers of licenses distributed
Bio-metric Card	Numbers of Bio-metric Cards distributed

The present study, appropriate analyses and statistical tests were done to study the details of interventions for fishers' livelihood development and funding status with sources of funding in a more comprehensive manner.

Units of quantification *viz.* numbers of beneficiaries were figured out from every intervention undertaken by selected GOs and NGOs for fishers' livelihood development in Sundarbans. In those interventions,

where, different groups, units, entities were benefitted, average numbers of members per group or equivalent were considered for deriving total number of beneficiaries benefitted through those interventions.

After proper quantification of data, performances of selected GOs and NGOs with reference to fishers' livelihood developmental interventions in Sundarbans were compared. By enumerating the numbers of beneficiaries covered under different interventions of each of these organizations during 2012-13 to 2014-15, a comparison among GOs and NGOs was made to understand the pace and priorities of performance in fishers' livelihood development. Funding status elaborates the source, foreign/non-foreign share and amount of funds spent for respective intervention by respective GO and NGO.

## RESULTS AND DISCUSSIONS

An inventory of different livelihood developmental interventions of selected GOs and NGOs was made to gain a clear insight about details of interventions and making a comparison among organizations in terms of achievements (no. of units benefitted). Results of appropriate analyses of these interventions are presented in the following tables-

### Interventions of Non-Governmental Organizations for fisher's livelihood development

As seen from the table 3, out of total numbers of beneficiaries benefitted under different livelihood developmental programmes through the selected NGOs, maximum numbers were under Greening programme (31.20%), followed by Health camps (20.75%) and providing Credit facilities (14.58%). Whereas, the percentage shares for exclusive fisheries components like providing fish seeds, feed, fertilizer, equipments and pond excavation were less than 1% and laboratory cum testing facilities and fisheries related training programmes constituted only 1.45% and 1.19% respectively. It is also clear from the same table that in interventions of providing Fish Seed, Feed, Fertilizer, Equipment, Pond excavation, Laboratory cum testing facilities and Capacity Development programmes on Fisheries, NGOs, namely, VIBT (613 Beneficiaries), SEED (360 Beneficiaries), PUPA (365 Beneficiaries), TSRD-Rangabelia (4371 Beneficiaries for Equipments and 20291 for laboratory and testing facilities) and TSRD-Sagar (2100 Beneficiaries for Pond excavation and 7681 for Capacity Building programmes on fisheries) recorded the highest achievements in terms of numbers of beneficiaries benefitted.

**Table 3: Analyses of Interventions undertaken by different Non-Governmental Organizations for fishers' livelihood development in Sundarbans**

Name of NGOs	Seed	Feed	Fertilizer	Equipment	Pond excavation	Laboratory and testing facilities	Development of SHGs	Tube well (Nos.)	Sanitation facilities	Capacity Building Programmes									
										Fishery	Agriculture	Livestock	Others	Awareness programmes	Health camps	Credit facilities	Greening programmes	Education	Disaster management
TSRD-Sagar	0	0	0	0	2100	0	24210	0	15504	7681	4461	1949	0	10319	10227	0	0	0	0
TSRD-Hingalgunj	55	0	0	55	162	0	0	26	27	0	825	560	25	0	1265	0	0	600	0
TSRD-Rangabelia	440	0	0	4371	414	20291	0	0	40712	2004	715	744	1455	59036	30674	0	1974	110376	0
Sabuj Sangha	246	246	246	246	752	0	2250	20	81904	780	2134	654	592	0	247051	216	0	5578	0
VIBT	613	0	339	0	129	0	2680	0	0	1006	2005	0	5258	175	0	189000	0	4	0
PUPA	167	0	365	0	0	0	3798	16	24	266	747	103	596	150	0	0	0	135	0
Sundarban Dream	0	0	0	0	0	0	6725	0	0	3750	0	0	975	4750	0	0	950	0	0
SEED	360	360	360	360	100	0	1150	0	264	1020	1180	510	425	256	1200	0	0	231	1500
NEWS	0	0	0	0	8	0	18450	0	180	175	182	63	177	1740	180	15000	434000	0	0
Total units	1881	606	1310	5032	3665	20291	59263	62	138615	16682	12249	4583	9503	76426	290597	204216	436924	116924	1500
% Share*	0.13	0.04	0.09	0.36	0.26	1.45	4.23	-	9.90	1.19	0.87	0.33	0.68	5.46	20.75	14.58	31.20	8.35	0.11

(Source: Annual Reports/Official records of selected NGOs)

\*Percentages have been figured out from numbers of units benefitted under each parameter (i.e. beneficiaries)

### Interventions of Governmental Organizations for fisher's livelihood development

It is evident from Table 4 that the top five figures of beneficiaries of GOs were benefitted under Biometric card distribution (29.73%), followed by Capacity Building Programmes related to Agriculture (24.56%), Fish Feed Distribution (10%), Distribution of Fertilizers (9.98%) and Fish Seed Distribution (7.23%) respectively. In a study, Slathia *et al.* (2009) stated that Capacity building programmes have the prime importance in strengthening sustainable livelihoods. A total of 6.98 per cent of beneficiaries were benefitted under licensing of boats. Whereas, the percentage shares for programmes like distribution of equipment for fish farming, pond excavation, sanitation facilities, training programmes on livestock and providing incentives/subsidies were less than 1%. Insulated box distribution, laboratory cum

testing facilities and fisheries training programmes were constituted only 1-5 per cent respectively. It is also clear from said table that Department of Fisheries, Govt. of West Bengal took a prime role in providing fishery inputs, whereas, Sundarban Development Board showed good achievements in Infrastructure development and Kakdwip Research Centre played a crucial role in organizing Awareness Programmes of different issues of brackish water aquaculture in Sundarbans region. Further investigation revealed that generally, NGOs give more focus on Capacity building programmes whereas, GOs have to carry out diversified activities like infrastructure development, fishery/agri inputs distribution, integrated rural developmental activities etc., in some cases, those may be need based/region specific interventions. Precisely, both GOs and NGOs are mandated to do exclusive fisheries programmes in Sundarbans region.

**Table 4: Analyses of interventions undertaken by different Governmental Organizations for fishers' livelihood development in Sundarbans**

Name of GOs	Seed	Feed	Fertilizer	Equipment	Insulated Box	Matsyajan	Pond excavation	Laboratory and testing facilities	Housing (in nos.)	Roads (in Km.)	Culvert (in nos.)	Tube well (in nos.)	Bridge/Jetty (in nos.)	Sanitation facilities	Capacity Building Programmes							Biometric Card
															Fishery	Agriculture	Livestock	Awareness programmes	Incentives /Subsidies	Old-age pension	Licensing	
Department of Fisheries Sundarbans	18622	18622	18622	517	4500	750	630	9500	2261	14.00	0	56	0	2400	2862	0	0	44	44	810	25748	109723
Development Board	8000	18200	18200	0	0	0	0	0	0	873.42	10	0	85	0	3525	88700	0	0	0	0	0	0

Kakdwip Research Centre, CIBA	78	78	0	0	0	0	6	0	0	0	0	0	0	0	1853	1974	2109	13005	0	0	0	0
Total	26700	36900	36822	517	4500	750	636	9500	2261	887.42	10	56	85	2400	8240	90674	2109	13049	44	810	25748	109723
% Share**	7.23	10.00	9.98	0.14	1.22	0.20	0.17	2.57	-	-	-	-	-	0.65	2.23	24.56	0.57	3.54	0.01	0.22	6.98	29.73

(Source: Annual Reports/Official records of selected NGOs)

\*Percentages have been figured out from numbers of units benefitted under each parameter (i.e. beneficiaries)

**Table 5: Funding Status of Selected Non-Governmental Organizations for different developmental interventions**

Name of NGOs	Funds Allotted (in ₹) and Percentage Share				Total	% Share
	Foreign	% Share	Non-Foreign	% Share		
VIBT	47353000	29.93	45003000	37.35	92356000	33.14
TSRD-Rangabelia	55083500	34.81	24381476	20.23	79464976	28.51
NEWS	34452562	21.77	6885000	5.71	41337562	14.83
TSRD-Hingalgunj	2550000	1.61	22479000	18.65	25029000	8.98
Sabuj Sangha	5248665	3.32	18730090	15.54	23978755	8.60
PUPA	7000000	4.42	2444247	2.03	9444247	3.39
SEED	5530000	3.50	174000	0.14	5704000	2.05
TSRD-Sagar	1003955	0.63	230000	0.19	1233955	0.44
Sundarban Dream	0	0.00	172200	0.12	172200	0.06
Total	158221682	100	120499013	100	278720695	100

(Source: Annual Reports/Official records of selected NGOs)

**Table 6: Funding Status of Selected Non-Governmental Organizations for different developmental interventions**

Name of GOs	Funds Allotted (in ₹) and Percentage Share				Total	% Share
	Foreign	% Share	Non-Foreign	% Share		
Sundarbans Development Board	0	0	2996626000	74.11	2996626000	74.07
Department of Fisheries	0	0	987400400	24.42	987400400	24.41
Kakdwip Research Centre, CIBA	2019000	100	59496000	1.47	61515000	1.52
Total	2019000	100	4043522400	100	4045541400	100

Source: Annual Reports/Official records of selected GOs

The Table 5 and Table 6, out of all selected NGOs, VIBT had the maximum amount of total allotted fund (₹ 92.356 lakh) and from GOs, Sundarban Development Board had the maximum share (74.07%) in total allotted fund for carrying out different developmental interventions in Sundarbans region. It is also evident from said tables that all GOs and NGOs received foreign (other than India sources) and non-foreign (Indian Sources) fund except Sundarban Dream from NGOs and Department of fisheries and Sundarban Development Board from GOs had not been received any foreign fund for undertaking their interventions.

## CONCLUSION

Sundarbans became a place of work for many Governmental Organizations (GO) and Non-

Governmental Organizations (NGO) for its' ecological importance and poverty. Most of the communities in buffer zone of Sundarbans were highly depended on resources of Sundarbans for their livelihoods and a major share of the household's income was generated from forest resources (Islam, 2011) but due to adverse climatic conditions and impenetrable locations, inhabitants face complexities in accessing all the possible means of livelihood generations. DeviNongmaithem and Ngangbam (2014) reported that fishery management policies, effective input supply, technical and social support might improve the livelihood of the fishers which would ultimately increase the overall fisheries productivity of India. Contextually, an inventory of different livelihood developmental interventions being implemented by different Governmental and Non-Governmental Organizations in Sundarbans would be useful for identifying key areas of interventions and priorities by any organization working in the similar areas. From the findings of this study, it is suggested that NGOs should give more focus on inputs distribution related to fish farming and GOs should give emphasis on capacity building programmes on fisheries so as to ensure good impacts through different developmental interventions in Sundarbans region with more budgetary allocations. As the present study limited to a span of three years for considering interventions of selected GOs and NGOs, future research with a duration of last 10 years can be considered for documentation of interventions of different GOs and NGOs and an in-depth trend analysis of activities can be studied.

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