



**Regenerative Agriculture and
Sustainable
Livelihood for Vulnerable
Ecosystems
(RESOLVE)**

**Baseline Survey Report
Sirajganj, Bangladesh**

Regenerative Agriculture and Sustainable Livelihood for Vulnerable Ecosystems (RESOLVE)

Area: Sirajganj, Bangladesh

Acknowledgement

The report titled “Baseline Survey on Regenerative Agriculture and Sustainable Livelihood for Vulnerable Ecosystems (RESOLVE)” is an assessment of present situation of living condition of people of different village of Kazipur upazila. **This report is an output of RESOLVE project, implemented by GKS, GUK, SDS and Unnayan Onneshan with financial support from Oxfam Novib.** The report is prepared by Unnayan Onneshan Social policy unit with the assistance from SDS and Oxfam Novib. We further thank A. Z. M. Saleh and Shahriar Kabir of Unnayan Onneshan for editing language and formatting the report.



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1. INTRODUCTION

Climate change has increased the frequency and severity of extreme events in Bangladesh such as cyclone, floods, hailstorms, droughts and salinity intrusion that threatens various sectors of the economy. Geographically, the northern and central regions of Bangladesh are flood plain, formed through siltation carried by three mighty rivers namely Padma, Jamuna, Bramhaputra from upstream. Historically, the regions are inundated every year and local ecosystems are influenced by periodic flooding. In spite of people's sufferings due to the impact of these floods, they make the cultivable lands fertile through siltation and thereby shape the life and economy of those areas. However, climate change has modified the scenario. Different climate change impacts such as recurring but unpredictable extent of floods, increasing river bank erosion, early/late drought in dry season, increased salinity as a result of back water effect, downing ground water level have been contributing to add to the vulnerability of the people living in these regions. Despite these well observed climate change impacts, the regions continue to receive insufficient attention from the government. Contextual analysis suggests that unless urgent actions are taken, climate change will undermine efforts to ensure the food security of the regions.

Case studies across the world confirm the truth that 'business as usual' approach is not sufficient to support vulnerable rural communities in addressing unprecedented climate change related food security challenges. There is an urgent need for adopting a strategy that could mutually ensure food security while decreasing vulnerabilities to climate change impacts. The RESOLVE project is innovative in its approach by applying and demonstrating an ecosystem approach during its implementation. Other than segregating action, the project will use an integrated approach that includes field intervention, capacity building, and advocacy initiatives; with strong cross-cutting concerns for gender equity and of raising the voices of the most vulnerable households. It will improve the resilience to current climate variability and future climate change of food insecure households by developing and supporting cost-effective strategies at both household and community levels; and advocating for policies and measures at the local, national and regional levels, that will improve food security in the context of climate change.

The project, RESOLVE stands for Regenerative Agriculture and Sustainable Livelihoods for Vulnerable Ecosystems. It has been designed to achieve the goal of making communities more resilient to climate shocks while ensuring food security through a combination of intervention strategies: direct poverty reduction through practicing adaptive agriculture techniques and technologies; diversifying livelihoods (on-farm, off-farm and non-farm) of the rural poor; working with grassroots and civil society; conducting research and evidenced-based lobby and advocacy at various strategic levels (national, regional and global); managing knowledge and innovative techniques; and maintaining and/or creating linkages to foster cross learning among different stakeholders (see Figure 1 for the project's conceptual framework).

RESOLVE is aimed at implementing a pilot project in climate vulnerable and poverty stricken Sirajgonj, Gaibandha, Shariatpur and Rajshahi districts for a duration of 2 years (2011-2012), which will follow another two programme phases of 3 years each; phase 1 (2013-2015) and phase 2 (2016-2018). The model will be replicated and scaled up in different locations in the same agro ecological zones (AEZs) or districts in phase 1 and in other AEZs (districts) in phase 2. Since a graduation cycle of a household generally takes 3-5 years, therefore each new phase will start by replication and/or scaling up keeping continuation with existing beneficiaries through a phase out strategy.

The design of interventions under the project is based on a vulnerability analysis incorporating the climate change impacts, which predict how the welfare of livelihood groups may change in the future. As such, action will be localised in 'climatic hot spots' in Bangladesh where not only people's vulnerability will be compounded but also their livelihoods will be addressed which are currently being eroded due to climate change impacts. In Bangladesh, the climatic hot spots have been identified by country level research through assessing the extent to which communities will be geographically exposed to specific change (using agro-ecological zoning mapping) and their capacity to adapt to the impacts (using poverty map and analysis). Since most of the people living in climatic hot spots are dependent on agriculture, it is pertinent to set project objectives by giving priority to adaptation in agriculture that will ensure food security.

Considering experiences on local context, four Non-Government Development Organizations and one research organization grouped together to implement the project. Having long-standing experience in the selected areas, these organisations will implement proposed activities; Gana Unnayan Kendra (GUK) in Gaibandha, Gono Kalyan Sangstha (GKS) in Sirajgonj, and Shariatpur Development Society (SDS) in Shariatpur and Unnayan Onneshan will provide technical support to the implementing organizations.

A baseline survey is a prerequisite for informed decision making. Without having a clear picture of socio-ecological context the project areas, intervention strategies may not be able to produce the desired output. Moreover a measurable and verifiable system has to be developed to ensure transparency and accountability in activities so that the survey could play an important role. Through baseline survey, existing socio-economic condition of the right holders could be explored and after a project cycle these information will help to measure their progress towards moving from existing Condition A to expected Condition B; and also the effectiveness of the intervention strategies. In this sense baseline survey report is the reference point for monitoring and evaluation.

As a starting point of RESOLVE activity, a baseline survey was conducted in Goshai Upazila in Shariatpur, where SDS will implement RESOLVE activities. Overall goal of the study was to prepare a socio-economic profile of right holders based on existing situation. Moreover, another 100 households were also surveyed in order to prepare a reference point to measure the progress of the right holders compare to those who are out of RESOLVE intervention.

2. THE APPROACH AND METHODS OF THE STUDY

To conduct the baseline survey, the study followed multidisciplinary approaches. A semi structured questionnaire was developed considering socio-economic condition of the area based upon secondary literature and consultation with key stakeholders. The questionnaire then tested in the field to review its performance whether the questionnaire is comprehensive enough to collect required data or need any inclusion or exclusion. A number of observations were suggested by field data collectors from the field test and the questionnaire was finalized by taking their account into suggestion. Other than household survey, the study also used BCAS feasibility study on the RESOLVE working areas as reference point. Couple of Focus Group Discussions (FGDs) were carried to assess local people's awareness regarding climate change impacts and their attempts to confront those. The study surveyed 400 households by using the questionnaire, out of which 300 households are right holders (in RESOLVE the target group are termed as right holders based on the understanding that they are climate victim but not responsible for causing climate change. Therefore, development towards a prosperous life is their right) and rest 100 household taken from outside RESOLVE intervention.

2.1 Selection of Project area and Right Holders

Currently proposed RESOLVE project selects Khasrajbari union of Kazipur upazila, Sirajgonj to implement the activities as pilot basis as the union is more vulnerable than others due to frequency and intensity of climatic disasters. GKS has demonstrated experience to carry out project in this area, although in other aspects rather than in climate change adaptation.

Geographically, Khasrajbari union is char land with an area of 37 sq. KM. However, the area has been being squeezed day by day due to river bank erosion. Flood is considered as one of the major climatic hazards in the target area. However; river bank erosion, flood induced sediment influx; cold wave and drought etc. have pronounced effects on life and economy of the area. Land of this union is eroded every year and thus many people become landless. 31-55% households are extremely poor in this area. Three types of land use are prominent in the area, of which 40 percent is fallow land (sand bar), 30 percent is cropland and 29 percent is homestead land. Boat is the only means of intra-union transportation to connect upazila sadar as well as other villages. The major occupations of the villagers are agriculture, wage labor, fishing and small business. Most of the families are either very or moderately poor. Only 20 percent people use sanitary latrine and remaining others use either hanging latrine or open places for defecation. It is therefore pragmatic to state that poverty and recurrent exposure to climatic hazard are the main reasons behind selecting the area for pilot intervention under RESOLVE project.

Table 1: Climate change impacts and constraints of the people in Sirajgonj district

Climate variability	Problems	Perceived needs	Constraints of the target group
Temperature			
Temperature rise	Due to increased temperature, moisture in soil has been decreasing and causing problems for crop and vegetable cultivation in-time and the production has decreased.	Require information about Adaptation Technology	Adaptation information & technology is not available at community level Target group has no access to relevant service providing agency/dept. and there is no available adaptation information. Lack of available funds.
	More irrigation became a prerequisite because of the decreasing of the moisture in the soil that increased the cost of irrigation that as well increased extraction of water from the surface and ground water sources, which affected the availability of water for future consumption in agriculture as well as for other purposes.	Need appropriate adaptation technology Need to conduct field based research	
	Production of fruits especially mango, black berry, jackfruit, papaya etc. has decreased.	Need to provide livestock and aquaculture health services at community level.	
	Livestock resources like poultry, cattle and goat have been affected by various diseases like diarrhoeal diseases, dehydration, worm etc.	Need to conduct vaccination and deworming campaign.	
	Negatively impacts on egg production of poultry that decreases income of poultry rearers and therefore hampers the food security of the poultry rearing households specially women.	Boat Ambulance in chars and <i>Chalon beel</i> area.	
	Fishery resources, aquaculture and other aquatic faunal and floral resources (plants and vegetables) are badly damaged that hamper livelihoods of poor people dependent on these natural resources.	Community health clinic at remote areas.	
	Creates problem to human health by causing diseases like jaundice, fever, cold, cough, dysentery, diarrhoeal diseases, dehydration, asthma etc. gradually increases in the areas resulting into physical weakness, sometimes death and economic losses for treatment purposes		
Drought	Farmers can't cultivate the land in time that causes low production of crops	Need Improved agricultural practices	Lack of initiatives and technology. Availability of funds.
	Reduces fertility and productivity of agricultural land and causes vulnerability to the poor and marginal farmers.	Demonstration of drought tolerant variety of crops	
	Huge amount of lands remain fallow due to moisture stress that decrease the cultivable land and scope of work for the farmers and agricultural labourers.	Alternative IGAs	
	Increase the mortality rate of poultry birds and reduce production of eggs that hampers livelihood and earnings of the affected households.	Improved practices of poultry rearing activities	Lack of poultry health service providers, vaccine

	Affects the sources of drinking water by depletion of water table and drying out of ponds that often creates scarcity of water for drinking and irrigation.	Reduce dependency of ground water and create alternative water reservoir through rainwater harvest. Establish deep tube wells	and treatment Limited access/ no access to government resources. Lack of available of funds
Cold wave	Damages crops and vegetables hamper flowering, growth and production of crops and vegetables and affected farmers face economic hardship to maintain their livelihood.	Require information about Adaptation Technology	Community people are mostly poor & living in vulnerable places Inadequate knowledge and skill about new IGA.
	The labourers cannot go outside for work that hampers their livelihoods	Need appropriate adaptation technology	Limited access to government service providing agencies/departments
	Decrease scope of work in agriculture and other sectors.	Need diversified livelihood options	
	Affects aquaculture, hampers its growth and increases disease like wound and rotting that reduces the production of fishes.	Need to take precautionary measure for fish and livestock.	
	Live stock affected by different diseases like cold, <i>gala fula</i> (swelling of throat), indigestion etc.		
Dense fog	Increase different fungal diseases of crops and vegetables like potato, tomato, etc. and reduces their production.	Need to take some precaution measures.	Less access to government agriculture department
	Damages rabi crops like mustard, wheat, chilli, onion, cabbage, cauliflower etc. and rice seedlings of seedbed.	Fungicide spray	
Erratic behaviour of rainfall			
Rain in off season	Affects/Damage <i>til</i> (oil seed) and vegetables during <i>rabi</i> season.	Require information about	Lack of proper information about weather
Change of time/season	Farmers fail to plough land for cultivation of crops in time, increase diseases and pest attack and decrease its production. Poor farmers (small, marginal and sharecroppers) are the affected hugely that drags them into acute poverty.	Need appropriate adaptation technology Need diversified livelihood options	Absence of active role of agriculture department
Torrential rainfall	Affects standing crops and vegetables. Causes damage to paddy and vegetables by flooding the Aman paddy and making it <i>chitta</i> (unfilled), reduces the production of paddy and other crops and vegetables.	Need to adjust existing crop calendar.	
	The poor people; mainly the wage labourers, agricultural labourers, rickshaw/van pullers cannot work that causes perilous situations in maintaining their livelihoods.	Pond embankment raising	
	Erodes the bank of pond and wash away fishes, as a result aqua farmers lose their income.	Improving existing coping capacity.	

	Affects the livelihoods and income earnings of the agriculture & non-agriculture labourers and decreases the scope of work	Knowledge & technologies for land use change for getting alternative crops in other seasons	
Flood	Carries on sand and deposit in the agricultural land that makes the land barren and unsuitable for cultivation.	Need to remove the sand.	Weak embankment and infrastructure
	Farmers can't cultivate land timely due to late rejection of water thus, agricultural lands remain fallow.	Crop selection for sandy soil.	Availability of funds.
	Late flood damages ripen Aman paddy and affect cultivation of <i>rabi</i> crops (mustard, wheat, pulse and other vegetables)	Cultivation of late variety.	Lack of government initiatives.
	Huge numbers of poor and marginal households including farm labourers lose scope of work.	Alternative livelihood options.	Less adaptive capacity.
	Washes away fish stock from ponds and damages the banks of ponds that causes huge economic declination for the aquaculture farms	Pond re-excavation and raising embankment.	
	Damages livestock shelters and often washes away the cattle, goats and sheep and thus creates scarcity of livestock feed.	Construction of <i>kella</i> /cattle shelter.	
	Outbreak different diseases for poultry and livestock. Women, poor and marginal farming households lose their family income and that worsens their poverty.	Need to raise the homestead plinth	
	Damages living houses, mainly the weakly structured houses of the poor and makes them shelter-less. Creates problems for cooking food.	Flood water tolerant tree plantation	
	Uproots and damages trees and summer vegetables	Installation of raised tube well and latrine	
	Affect water resources in different ways including inundation of open water sources, tube wells and thus pollutes water.	Need to establish gender friendly flood shelter.	
	Women collect safe drinking water from long distance during and after the disaster period.	Crop insurance	
	Scarcity of safe drinking water leads to various waterborne diseases (diarrheal diseases, skin diseases etc.)		
	Damages latrines and causes sanitation problem. It pollutes surface water sources and causes acute scarcity of safe water.		
Women face acute difficulty in safe defecation because of lack of safer and higher places.			

River erosion	Erode homestead lands, cultivable/cultivated lands with standing crops (Amon, Boro Paddy, Jute, sugarcane, chili and vegetables).	Need emergency food support	Government recognition and initiative. Political willingness Fund availability
	Poor, marginal farmers and share croppers become more vulnerable by losing their lands and livelihood sources.	Need action to resettle them	
	Erodes houses, losses household assets, trees etc.	Cluster village to rehabilitate the victims	
Seasonal Changes	Cold loving crops and vegetables are affected due to decrease of winter season.	Adjustment of crop calendar.	Lack of proper initiative and study/research Investment
	Seasonal crops cannot grow well	Early variety cultivation	
	Production is hampered		

2.2 Secondary Data

Secondary data on population, households etc. of villages under the Gosairhat upazila have been obtained from the published documents of Bangladesh Bureau of Statistics (BBS). The census report of 1991 and 2001, the Household Expenditure Survey (2007) as well as other relevant documents have been used to gather information on physical aspects, natural resources, agriculture and livestock, economic condition etc. from the Bangladesh District Gazetteers.

2.3 RESOLVE Villages

To implement RESOLVE, different villages under Kazipur upazila of Sirajgong District have been selected purposively considering their grave vulnerability to climate change and high occurrence of poor people. Total 400 households were surveyed in the baseline study, out of which 300 households are covered under RESOLVE and rest 100 households, who are not intervened by RESOLVE and will be used as reference point to measure the progress of the right holders compare to them.

2.3.1 Geographic and demographic profile of Kazipur Upazila

Kazipur Upazila (Sirajganj district) with an area of 368.63 sq km; is bounded by Dhunat, Sariakandi and Sarishabari upazilas and the Jamuna river on the north, Sirajganj Sadar upazila on the south, Sarishabari upazila and the Jamuna river on the east and Dhunat upazila on the west. Many old inhabitation including Mallickpara, Dhulaura, Maijbari, Manik Patal, Kazipur, Meghai, Tarakandi, Tengalahata are being gradually extinct by river erosions. Jamuna-Bhramaputra Flood Protection Dam known as WAPDA Dam, built in the 1960 on the west side of the Jamuna has not been of much help neither in resisting river erosion nor in flood control. It helped much in irrigation though. Main rivers of the area are Jamuna and Ichamati. Kazipur (Town) consists of 9 wards and 9 mahallas. The area of the town is 10.84 sq km. The town has a population of 14800; male 50.01% and female 49.99%. The density of population is 1365 per sq km. Literacy rate among the town people is 27.2%. Administration Kazipur thana, now an upazila, was established in 1920. The upazila consists of one municipality, nine wards, 11 union

parishads, 114 mouzas and 182 villages. A historical event In December 1971 a battle was fought between the Pakistani army and the freedom fighters at village Baraitala of Gandhail union in which several freedom fighters were martyred. Marks of War of Liberation Mass grave 1 (Baraitala), Monument 1.

The total population of the upazila is 2,34,804 among which 50.39 percent are male and 49.61 percent are female. By religion, 96.94 percent are Muslim, 3.03 percent are Hindu and others are 0.03 percent. Average literacy rate of the area is 20.5 percent; male 26.3 percent and female 14.5 percent. Kazipur upazila has 16 colleges, 32 high schools, 15 junior high schools and seven madrasas. Noted educational institutions of the area titled Meghai High School (1920), Gandhail High School (1920), and Rani Dimoni High School (1957). The area possesses 32 cultural organizations club, one public library and 12 playgrounds.

Agriculture is the most popular occupation of the area with 54.22 percent, agricultural laborer 20 percent, wage laborer 2.11 percent, commerce 9.38 percent, service 4.24 percent and others 10.05 percent. The total area of cultivable land is 23384.06 hectares and fallow land 207.2 hectares. Single crop is cultivated on 13.43 percent land, double crop on 54.56 percent and triple crop on 32.01 percent of lands. Among the peasants 6.63 percent are landless, 17.6 percent marginal, 20.5 percent small landholders, 35.27% intermediate farmers and only 20% rich farmers with huge cultivable land. The market value of the land of the first grade is approximately Tk. 10000 per 0.01 hectare. Main crops cultivated in the area are paddy, jute, wheat, mustard seed and chilli. Extinct or nearly extinct crops are Khesari (pulse) and aus paddy. Main fruits of the upazila include mango, jackfruit, black berry, papaya, guava, litchi and banana

The area covers 19 km of concrete road and 202 km of mud road. Traditional transports of the area include palanquin, dhuli and horse carriage. These means of transport are either extinct or nearly extinct. The number of hats and bazars are 13 and most noted are Batoar Para, Sonamukhi, Panagari Hat. Locals have mainly three fairs, most noted of which is Sonamukhi Mela during the Durga Puja festival. Operational activities of important NGO of the area include BRAC, PROSHIKA, ARCHES and Darpan. The area has one Upazila health complex and nine health centres.

3. DEMOGRAPHIC FEATURES OF RESOLVE VILLAGES

Among 301 right holders 67 percent are male headed households and 32 percent are female headed households (Figure 1). On the other hand, among 100 uncontrolled households, 73 percent households are male headed and 27 percent household is female headed.

Total population size of the right holders' family is 1074; out of which male members consists of 48.41 percent and female member 51.59 percent (Table). In case of family composition, 15 percent households have one member, 14.6 percent households have two family members, 17.6 percent households have three family members, 24.9 percent households have four family members, 12 percent households have five family members, 12% households have six family members, 3.3% households have seven family members and 0.7 percent households have eight Family members. However, baseline survey revealed that a total 350 family members belong to 100 uncontrolled households, within which 8 percent household have one family member, 20

percent households have two family members, 25 percent households have three family members, 22 percent households have four family members, 15 percent household have five family members, 7 percent households have six family members, 2 percent household have seven family members and 1percent family have eight family members.

Table 2 : Family Composition of right holders and uncontrolled group

Right Holders Group	Frequency	Total	Valid Percent	Uncontrolled Group	Frequency	Total Members	Valid Percent
1	45	45	15.0	1	8	8	8.0
2	44	88	14.6	2	20	40	20.0
3	53	159	17.6	3	25	75	25.0
4	75	300	24.9	4	22	88	22.0
5	36	180	12.0	5	15	75	15.0
6	36	216	12.0	6	7	42	7.0
7	10	70	3.3	7	2	14	2.0
8	2	16	.7	8	1	8	1.0
Total	301	1074	100.0	Total	100	350	100.0

Table 3 : Distribution of family members by age and sex of the right holders

Household members by age	Households Members Compositions	Ratio of male and Female	Total number	Percentage By sex	Total percentage
Number of members between age 0-5	Number of male members between age 0-5	109	213	10.15	19.82
	Number of female members between age 0-5	104		9.67	
Number of members between age 6-14	Number of male members between age 6-14	130	260	12.10	24.20
	Number of female members between age 6-14	130		12.10	
Number of members between age 15-59	Number of male members between age 15-59	268	569	24.95	53.01
	Number of female members between age 15-59	301		28.06	
Number of members age 60+ and above	Number of male members age 60+ and above	13	32	1.21	2.97
	Number of female members age 60+ and above	19		1.76	
Total		1074	1074	100.00	100.00

In case of number of female members among right holder group, it is observed from the study that 49.8 percent households have one female member, 31.2 percent households have two female members each, 13.6 percent households have three female members, 3.3 percent households have four family members, 1 percent households have five and six female members each within 301 households there are 534 female members. On the other hands within uncontrolled group, 52 percent households have 1 female member, 30 households have 2 female members, 16 percent households have 3 female members, and 1 percent households have 4 and 6 female members each.

Table 4: Distribution of Family members by age and sex of the uncontrolled group

Household members by age	Members by sex	Ratio of male and Female	Total number	Percentage By sex	Total percentage
Number of members between age 0-5	Number of male members between age 0-5	23	42	6.57	12.00
	Number of female members between age 0-5	19		5.43	
Number of members between age 6-14	Number of male members between age 6-14	42	80	12.00	22.86
	Number of female members between age 6-14	38		10.86	
Number of members between age 15-59	Number of male members between age 15-59	98	206	28.00	58.85
	Number of female members between age 15-59	108		30.85	
Number of members age 60+ and above	Number of male members age 60+ and above	12	22	3.43	6.29
	Number of female members age 60+ and above	10		2.86	
Total		350	350	100.00	100.00

4. OCCUPATIONAL STRUCTURE

4.1 Primary Occupation

From the baseline survey it is found that 25 percent household head of right holders' primary occupation is agriculture, 62 percent are wage labourer, 0.7 percent small businessman, 0.7 percent rickshaw puller, 1.3 percent carpenter and 8 percent other within our 301 households (Table 4.1).

On the other hand, among the uncontrolled group, 4 percent household's main occupation is farming, 90 percent household's head main occupation is labour, 1 percent of household head is housewife, 4 percent household heads' main occupation is carpentry and 1 percent household head engage themselves in other occupations.

Table 5: Distribution of primary occupation of right holders and uncontrolled group

Maim occupation	Frequency	Valid Percent	Maim occupation	Frequency	Valid Percent
Farmer	78	25.9	Farmer	4	4.0
Labor	189	62.8	Labor	90	90.0
Small business	2	.7	housewife	1	1.0
fishermen	2	.7	Carpenter	4	4.0
rickshaw puller	2	.7	others	1	1.0
Carpenter	4	1.3	Total	100	100.0
others	24	8.0			
Total	301	100.0			

4.2 Secondary Occupation

Majority of the right holders are only engaged in a single occupation. However, some of the right holders do change their occupation depending on seasonality. The survey shows that 0.7 percent households' heads are engaged in agriculture as a secondary occupation, 3.3 percent is labours, 0.3 percent does small business, 1.3 percent is rickshaw puller and 2 percent households' heads are engaged in other activities as a secondary option, particularly in lean period (Table 4.2). In case of uncontrolled group, 100 percent households are found to be engaged in their primary occupation.

5. EDUCATION

Table 6 : Distribution of family members education according to age and sex within right holders group

Composition of educational qualification	Composition of educational qualification by age and sex	Percentage by Sex	Total percentage
Number of members who are illiterate, age above 15	Number of male members who are illiterate, age above 15	11.00	20.48
	Number of female members who are illiterate, age above 15	9.48	
Number of members who can only sign, age above 15	Number of male members who can only sign, age above 15	11.27	28.44
	Number of female members who can only sign, age above 15	17.17	
Number of members who can only write & read, age above 15	Number of male members who can only write & read, age above 15	8.68	14.94
	Number of female members who can only write & read, age above 15	6.26	
Number of members who have education below class 5	Number of male members who have education below class 5	11.45	22.72
	Number of female members who have education below class 5	11.27	
Number of members who have education between class 5 and class 10	Number of male members who have education between class 5 and class 10	5.27	11.53
	Number of female members who have education between class 5 and class 10	6.26	
Number of members who have education SSC and above	Number of male members who have education SSC and above	1.16	1.92
	Number of female members who have education SSC and above	0.76	
	Total	100.00	100.00

Table 7 : Distribution of family members education according to age and sex within uncontrolled Group

Composition of educational qualification	Composition of educational qualification by age and sex	Percentage By sex	Total Percentage
Number of members who are illiterate, age above 15	Number of male members who are illiterate, age above 15	9.65	18.13
	Number of female members who are illiterate, age above 15	8.48	
Number of members who can only sign, age above 15	Number of male members who can only sign, age above 15	12.20	28.50
	Number of female members who can only sign, age above 15	16.30	
Number of members who can only write & read, age above 15	Number of male members who can only write & read, age above 15	6.43	14.18
	Number of female members who can only write & read, age above 15	7.75	
Number of members who have education below class 5	Number of male members who have education below class 5	14.28	25.81
	Number of female members who have education below class 5	11.53	
Number of members who have education between class 5 and class 10	Number of male members who have education between class 5 and class 10	4.56	11.80
	Number of female members who have education between class 5 and class 10	7.24	
Number of members who have education SSC and above	Number of male members who have education SSC and above	1.34	1.88
	Number of female members who have education SSC and above	0.54	
	Total	100.00	100.00

5.1 Enrollment

Within 300 right holders' households, 414 members were found enrolled in schools and colleges out of which 57 percent are male and the rest (43 percent) are female. On the other hand, total 67 members were found enrolled in school and college of the uncontrolled group, within whom 52.24 percent are male and 47.76 percent are female.

Table 8: Enrollment status of right holders and uncontrolled Group

Current enrollment in Schools and Colleges of Right Holders	Total 414	Male =236	57%	100%
		Female=178	43%	
Current enrollment in Schools and Colleges of Uncontrolled group	Total 67	Male =35	52.24%	100%
		Female=32	47.76%	

5.2 Dropout

In right holders' household, dropout rate is 3.3 percent, which is 1 percent in case of the uncontrolled group. While identifying the reasons of dropout in the right holders' group, it is found that only 7 percent are dropped out for financial insolvency. Besides financial insolvency, assisting in households' chores (1.3 percent) and natural calamities (0.3 percent) are the two major reasons behind dropping out. On the other hand 1 percent out of 100 households is dropped out to assist in family income and other earning activities in the uncontrolled group.

5.3 Adult Education

In right holders group only 1.7 percent were found to have received adult education facilities. Alternatively, 1 percent household has received adult education in the uncontrolled group.

5.4 Female Education

Within right holders; 23.9 percent of the female members obtain primary level education, 3.7 percent obtained secondary level, 1 percent pursued above S.S.C and 8 percent households female members have no degrees at all. The rest (63.4 percent) of the households' female members are illiterate.

On the contrary; 12 percent female members obtained primary level degree, 7 percent has secondary level education, 4 percent households gained above secondary level education. In addition, 1 percent household female member do not have any degree and 76 percent households female members are illiterate. Though female illiteracy rate is higher both in right holders and uncontrolled group, but current enrollment rate is satisfactory in both cases. It seems people of RESOLVE area are well-aware about female education. However, 23 percent girl has informed that they face difficulties going to school. While girls from the uncontrolled group do not face any obstacles of financial insolvency.

Table 9: Female Education Status

Female education status of right holders group		
Degree obtained by female member	Frequency	Valid Percent
Primary level	119	39.7
Secondary level	65	21.7
S.S.C	2	.7
Above S.S.C	3	1.0
No degree	41	13.7
Illiterate	70	23.3
Total	300	100.0

Through the baseline survey we tried to investigate the mode of communication used for schooling. Within the right holders, 22.6 percent goes by different vehicles (van/rickshaw/bus),

5.3 percent uses boat and 19.6 percent of the total students reaches their respective institutions on foot. In case of uncontrolled group, 2 percent households cover the distance by foot, 41 percent households' mode of communication is van/rickshaw/bus and the other 2 percent is dependant on boat. However, the particular question, was not applicable for 52.5 percent and 55 percent households in right holders and uncontrolled group respectively as no school going children were found in those houses.

6. INCOME AND EXPENDITURE

6.1 Income

Most of the right holders are extremely poor and their annual income is below 30000 taka (USD 400). The baseline study revealed that 67.19 percent right holders' annual income is equal or below 30000 taka. However, 32.81 percent right holders are of an annual income that is more than 30000 taka (Table 6.1).

Table 10: Income Information of right holders and uncontrolled group

Estimated yearly income of right holders	Frequency	Valid Percent	Yearly Income of Uncontrolled group	Frequency	Valid Percent
Less than 10,001	59	19.67	2400 to 10000	10	10
10001 to 20000	64	20.94	10,001 to 15000	11	11
21000 to 30000	80	26.58	15,001 to 25,000	39	39
31000 to 40000	67	22.26	25,001 to 35000	16	16
42000 to 90,000	31	10.29	35001 to 45000	11	11
			45001 to 75000	13	13
Total	301	100.0	Total	100	100

On the other hand, within the uncontrolled group, 66 percent were identified as extreme poor whose income is equal or less than 30000 taka (Table 6.1).

6.2 Expenditure

There is a discrepancy between the income and expenditure in the RESOLVE area. Even though more than 65 percent right holders were found with less than an annual income of 30000 taka, 72 percent right holders' yearly expenditure is more than 30000 taka. Aids received from different government and NGO programmes are the reasons behind. However, a reverse scenario is discovered in the uncontrolled group where only 21 percent households were found with an annual expenditure which is more than 30000 taka.

6.3 Feeding Capability

Since the right holders are extremely poor, most of them cannot arrange food three times in day. The baseline data depicts that 2.3 percent of the total households' members can have a meal once each day (that is not square even), 41.5 percent households' members eat twice everyday and 56.1 percent households members eat three times each day. Feeding scenario is identical for uncontrolled group as well. Within the uncontrolled group, 82 percent of the total household members eat thrice a day and 18 percent households' family members eat two times in a day.

And, no household head is capable of feeding his/her family members three times in a day in case of the uncontrolled group.

Table 11: Households feeding capability of right holders and uncontrolled group

Members eat each day within right holders	Frequency	Valid Percent	Members eat each day within uncontrolled group	Frequency	Valid Percent
one time	7	2.3	2 time	18	18.0
Two time	125	41.5	3 time	82	82.0
Three time	169	56.1	Total	100	100.0
Total	301	100.0			

7. DESCRIPTION OF DWELLING

7.1 Ownership Pattern

Within 301 right holders, 29.6 percent owns their houses, 52.2 percent has rented house and 18.3 percent of the total households has ownership of house in other ways. 88 percent has one room, 11 percent has two rooms, 0.7 percent does have three rooms and only 0.3 percent of the total household has four rooms. On the other hand, 11 percent of uncontrolled group has their own house. 86 percent households have rented house and 3 percent households have the ownership of house in other ways. 100 percent households of the uncontrolled group live in single room house and each of them has one bed room to sleep.

Table 12: Households ownership status of right holders and uncontrolled group

Ownership of house	Frequency	Valid Percent	Ownership of house	Frequency	Valid Percent
owned	89	29.6	owned	11	11.0
rent	157	52.2	rent	86	86.0
others	55	18.3	others	3	3.0
Total	301	100.0	Total	100	100.0

7.2 House Materials

The lion's share (99 percent) of the right holders' household floor is made of mud and the rest (1 percent) is made of brick. In case of roof; 96.7 percent is covered by tin, 2.7 percent materials of roof is straw/golpata and 0.7 percent is concrete. In addition, only 0.7 percent households' wall is prepared by mud, 0.3 percent has got bamboo-made wall, 0.3 percent are of concrete, 8.3 percent is made of straw/golpata, 33.2 percent is of tin, 20.6 percent is made of wood and 36.5 percent is made of other different materials. Similarly, 100 percent household's floor of the uncontrolled group is made of mud, 7 percent households materials of wall is made by Straw/ Golpata, 82 percent household's material of wall is tin, 9 percent houses material of wall is make by wood and 2 percent houses materials of wall is made by other materials and 100 percent of this group's household roof is covered with tin.

Road communication: Most of the households (99 percent) of right holders are surrounded by mud, 7 percent is brick-made and 0.3 percent of road surrounding the house is made of concrete. While, 100 percent houses of the uncontrolled group is surrounded by mud.

7.3 Source of Light

Only 0.7 percent of household of the right holders has access to electricity. 96 percent house them depends on Kerosene and 3.3 percent uses solar energy as for a source of light. On the other hand, 100 percent household of the uncontrolled group uses kerosene.

7.4 Cooking System

Almost all the houses of both the right holders and the uncontrolled group practice their culinary in open places. Within the right holders, only 12.6 percent has separate place for cooking. The scenario is identical for the uncontrolled group as well. 100 percent house hold use leaves, straws and wood for cooking.

7.5 Fuel System

The right holders depend on nature for fuel. Only 1 percent use electricity, 99 percent of the right holders use wood, straw, leaves etc. as fuel and collect those from their surroundings. On the other hand, 100 percent households of the uncontrolled group use leaves, straw and woods as fuel. It is quite common everywhere in rural Bangladesh, where female members of the family are responsible for collecting fuel and the RESOLVE project area showed the same pattern. In case of time required for collecting fuel (in minutes) reads like this: 15.61 percent household needs less than 31 minutes, 51.73 percent household requires 31 to 60 minutes, 30.66 percent household needs to spend 61 to 120 minutes and 2 percent household spends 121 minutes and above. Within the uncontrolled group, time needed to collect fuel in minutes is: 47 percent household needs to spend 20 to 60 minutes and 53 percent household needs to spend 66 to 130 minutes.

8. WATER AND SANITATION

8.1 Drinking Water

Over the decades rural Bangladesh has been dependant on using tube well for drinking. Similarly, almost all the right holders use tube well to meet up their demand of drinking water. However, not all the tube wells are placed adjacent to the right holder's household. Rather they have to walk few minutes to collect pure drinking water. From the survey it is found that only 60.12 percent house hold has tube wells in their house premise and they collect water without spending mention-worthy time, 34.88 percent needs 15 minutes, 5 percent needs 30 minutes to collect drinking water from the source. In case of collection frequency, it is found that 0.7 percent households collect once, 17.6 percent households collect twice, 54.8 percent households collect thrice, 26.2 percent households collect four times and 0.7 percent of the total households collects five times to meet their demand of drinking water.

Alternatively, the uncontrolled group has its total (100 percent) household dependant on tube-wells for drinking water. Eighty-nine percent households need to spend 1 to 10 minutes and 11 percent household need to spend 12 to 35 minutes to collect drinking water from the source. From the baseline survey it is found that 21 percent household collect drinking water two times

in a day, it is thrice in case of 46 percent and 21 percent household collects four times a day and 12 percent household does it five times a day.

8.2 Cooking Water

For cooking; 99 percent of the right holders group collects from tube wells and the rest (1 percent) collects from ponds/wells. In case of collection time, it is found that 71.43 percent households need less than 11 minutes and 28.57 percent households need to spend 12 to 60 minutes for collect their cooking water. 2 percent of household collect water once whereas 6.7 percent household collects water three times a day. In case of the collectors, 45.2 percent is male, 51.2 percent is female. 33 percent of it is being collected by both male and female and 0.3 percent is collected by children.

Within the uncontrolled group 99 percent households collect their cooking water from tube wells and the rest (1 percent) household collects from others sources. While surveying the required time to collect cooking water, it is found that 88 percent household need to spend 1 to 10 minutes and rest 12 percent households needs to spend 12 to 35 minutes. 100 percent collectors are male here. While counting cooking water collection frequency, it is found that 3 percent household collect once a day, 21 percent household collect twice a day, 47 percent households collect thrice day, 17 percent households collect 4 times a day, 9 percent households collect 5 times a day and 3 percent households collects 10 times each day.

8.3 Availability of Water

In Sirajgong, availability of water till now is not a concerning issue as evident from right holders' response. 99 percent households do not face problems of any sort in water collection. The situation is similar in the uncontrolled group and 100 percent responses positively regarding the availability of water.

8.4 Bathing and Washing Water Source

For washing cloths and bathing purposes, majority of the right holders depend on river (70.1 percent), 0.3 percent depends on supply water and 29.5 percent depends on tube wells for. Within the uncontrolled group, 99 percent household uses river/pond for washing and bathing. Only one percent household depends on tube-well for this purpose.

8.5 Sanitation System

8.5.1 Toilet

In case of sanitation; 17.9 percent uses sanitary toilet, 80.1 percent uses hanging ones and the rest (1 percent) uses open place for defecation. In case of distance between toilet and source of drinking water, it is found that 32.46 percent households are within 11 meters, 65.22 percent are within 11 to 40 meters and rest of them (2.32 percent) has a distance of 50 to 200 meters.

On the contrary; within the uncontrolled group, 28 percent uses sanitary toilets and 72 percent uses hanging toilets. In case of use of the toilet, 97 percent uses their own toilet and 3 percent

shares toilet with others. In case of distance between toilet and source of drinking water it is found that 33 percent is within 0 to 10 meters, 63 percent is within 12 to 35 meters and 4 percent is within 40 to 100 meters.

Table 13: Types of toilet used by right holders and uncontrolled group

Type of toilet use by right holders group			Type of toilet use by Uncontrolled group	
Type of toilet	Frequency	Valid Percent		
sanitary	54	17.9		
hanging	241	80.1		
opens	3	1.0		
other	2	1.0		
Total	301	100.0		

8.6 Waste management

Waste management system is very poor in rural areas resulting from the lack of awareness and technical knowledge. From the survey it is revealed that almost all household of right holders place their waste in open places. However, good news is that 91 percent household cleans the garbage area daily, 7.3 percent cleans it once in a week and 1.7 percent does it once in a month.

The baseline survey gives an impression of the right holders' inadequacy of technical knowledge and awareness on using garbage as organic fertilizer. It is found that only 8.6 percent household use garbage as organic fertilizer and 92.4 percent household never do it and they even do not know how to convert garbage into organic fertilizer.

In case of the uncontrolled group, 76 percent is found to dump waste in open places, 2 percent household's garbage is put in dustbin, 4 percent households garbage is collected by garbage collectors and 18 percent households garbage is put in river/pond. In case of frequency of garbage cleaning, 74 percent cleans it daily; 23 percent once a week and 3 percent once a month. In case of preparing organic fertilizer from waste, it is found that one percent household use garbage as an organic fertilizer and the rest 99 percent never does it.

9. HEALTH

9.1 Disease

While considering health situation of right holders, it is found that 13 percent households members are affected by fever, 5.3 percent by cough, 10.3 percent by Diarrhea, 68.8 percent by Influenza, 0.7 percent by TB, 0.3 percent by Typhoid, 0.3 percent by Asthma and 1.3 percent has got headache. In case of method of treatment, 3.3 percent relies on homeopathy, 96 percent takes allopathic medicine and 0.7 percent goes for herbal options.

In case of the uncontrolled group, 5 percent household's family members are affected by fever, one percent family member is affected by Diarrhea and 94 percent household's member is affected by Influenza. Here two percent households use homeopathy and 98 percent households use allopathic method of treatment.

Table 14: Diseases occurrence among right holders and Uncontrolled group

Right holders group			Uncontrolled group		
Disease frequently affects	Frequency	Valid Percent	Disease frequently affects	Frequency	Valid Percent
Fever	39	13.0	Fever	5	5.0
cough	16	5.3	diarrhea	1	1.0
diarrhea	31	10.3	influenza	94	94.0
influenza	207	68.8			
TB	2	.7	Total	100	100.0
typhoid	1	.3			
Asthma	1	.3			
headache	4	1.3			
Total	301	100.0			

The scenario of access to formal medical facility is projects a worrying picture. Almost 85.7 percent household of the right holders group uses non-government or unregistered village doctors for treatment. Only 14.3 percent use government medical facility. Likewise, 99 percent of the uncontrolled group relies on non-government medical facilities for treatment and only 1 percent uses government medical facilities.

While investigating reasons for not using formal medical facilities, it is found that distance is the most significant factor for the lack of interest in formal medical facilities. From the survey it is depicted that 35.2 percent household has to travel less than a kilometer to reach formal medical facility and 42.3 percent need to travel at least a kilometer, 12.3 percent household needs to travel two kilometers, 3.7 percent needs to travel 3 kilometers and 6.6 percent are required to travel 5 kilometers to reach nearest medical center in order to avail formal medical facilities. In case of the uncontrolled group 45 percent households has to travel a kilometer. Fifty five percent households have to travel two to three kilometers to reach nearest medical center.

9.2 Immunization of Children

The rate of children immunization depicts a satisfactory picture. Within the right holders group; 68.8 percent children (below 5 years) get complete immunization and 1.6 percent children has completed partial immunization.

The uncontrolled group shows similar picture in case of immunization. 45 percent household completed immunization of their children and 3 percent household has completed it partially.

Table 15: Immunization status of children of right holders

Immunization of children	Frequency	Valid Percent
Completed	207	68.8
Partially completed	5	1.6
Not applicable	89	29.6
Total	301	100.0

9.3 Birth Control

In case of birth control, 52.5 percent reproductively active women use birth control system in right holders group. Religious restriction is the main reason behind female members' lack of interest in using birth control methods.

In regard to uncontrolled group, 53 percent reproductively active women are using birth control methods, whereas 2 percent households birth control is not preferred by parent-in-laws, 1 percent household do not receive birth control case. They are not aware about birth control methods and others do not take birth control for others reasons.

Table 16: Birth control status of Right holders and Uncontrolled group

Right holders group			Uncontrolled group		
Receive birth control	Frequency	Percentage	Receive birth control	Frequency	Percentage
Yes	158	52.5	Yes	53	53.0
No	63	20.9	No	13	13.0
Not applicable	80	26.6	Not applicable	34	34.0
Total	301	100.0	Total	100	100.0

9.4 Maternal Health Facility

Maternal health facility is inadequate in RESOLVE project area. Only 14.9 percent of the right holders have received maternal health facilities during pregnancy period and 63.5 percent relied on untrained midwife for pregnancy related matters. 26.9 percent households' female members checked up once, 2.3 percent did check up two times and 11.6 percent households checked up thrice after delivery.

The situation is slightly better in case of the uncontrolled group. Within this group, 3 percent of the total households received formal maternal health facilities during pregnancy. In case of delivery it is seen that 83 percent of the total delivery has been done by midwife, 2 percent delivery done by trained personnel within 100 households.

9.5 Vaccination During Pregnancy

Within the right holders 57.5 percent pregnant women take vaccination during pregnancy, rest of the 6.6 percent do not take any vaccination during pregnancy and 35.9 percent households are not applicable for this question.

On the other hand, 84 percent pregnant women of the uncontrolled group take vaccine during pregnancy and 1 percent household do not take any vaccine during pregnancy.

10. AGRICULTURAL AND LAND DISTRIBUTION SYSTEM

Most of the right holders are landless poor or have insufficient amount of land, which is evident from survey result as well. From survey it is found that 85 percent household do not have any agricultural land if their own. Alternatively, 98 percent household does not have any productive agriculture land within the uncontrolled group.

Table 17: Agricultural land ownership status of right holders and uncontrolled group

Right holders group			Uncontrolled group	
Ownership of agricultural land	Frequency	Valid Percent		
Yes	45	15.0		
No	256	85.0		
Total	301	100.0		

10.1 Size of Agriculture Land

As most of the right holders are landless or small holder, therefore only 10 percent households have less than 30 decimal and 5 percent households have 31 to 90 decimal agricultural lands. On the other hand, 1 percent household has 10 decimal lands and another household have 16 decimal lands for agricultural activities within the uncontrolled group.

10.2 Leased Land

Some of the farmers use leased land for agriculture production. Within the right holders 5.3 percent households have leased land and within the uncontrolled group only 8 percent use leased land for agriculture production.

10.3 Size of the Leased Land

The baseline survey revealed that 5.3 percent household use leased land for agriculture and within them 2.7 percent have less than 5 decimal and 1.3 percent have 5 to 8 decimal land. From the data it is clearly evident that most of the right holders are either landless or smallholder farmer. In case of the uncontrolled group, one percent household has 2 decimal, two percent has 16 decimal, other two percent has 33 decimal, another two percent household have 66 decimal and one percent households have 99 decimal leased land for agricultural activities.

10.4 Share Cropping

In case of share cropping; 26.3 percent household is engaged with share cropping and within the sharecropper, 20 percent households have less than 20 decimal land and 5.3 percent households have 20 to 99 decimal share cropping land within the right holders. On the other hand, within the uncontrolled group 31 percent is engaged in sharecropping. The sharecroppers within the uncontrolled group have 13 percent having 5 to 30 decimal and 18 percent has 33 to 99 decimal share cropping land for agricultural activities.

10.5 Ownership of Pond

Within the right holders, only one percent household has their own ponds and it is used for bathing and washing mostly. On the other hand, one percent has ownership of pond and most of the time the purpose is akin to the right holders' within the uncontrolled group.

10.6 Poultry

Within the right holders, 34 percent household has poultry resources that the uncontrolled households lack. In case income from poultry resources, it is found that 4.9 percent earns 100 to 1000 taka and 30 percent can make it up to 1001 to 2000 taka per month. In case of the uncontrolled group, 39 percent has poultry resources. It is seen from study that 27 percent household's income is estimated to be 100 to 400 taka and 12 percent makes an amount of 450 to 2300 taka per month.

10.7 Livestock

Livestock is considered as an important natural capital for rural people and a considerable portion of income comes from it. However, 44.9 percent of the right holders have livestock. In case of estimated amount money earned from domestic animals here is like this: 4.9 percent makes 500 to 10000 taka, 26 percent earns 10001 to 40000 taka and it is 4001 to 70000 taka per month in case of 14 percent. On the other hand, 49 percent has the ownership of domestic animals in the uncontrolled group. The estimated amount of earned money from domestic animals here ranges from 1500 to 15000 taka in case of 22 percent and 27 percent household's estimated income per month is 18000 to 60000 taka.

10.8 Agricultural Activities

In the project area, 32.2 percent is engaged in agricultural activities among the right holders and 9.6 percent harvests once a year while it is twice for another 24.6 percent. On the other hand, 42 percent households of the uncontrolled group are engaged in agriculture activities. 4 percent of them cultivate their lands once a year and 37 percent households cultivate their ones twice.

10.9 Productive Crop

Like other parts of Bangladesh, rice is a major crop for project villages. The survey revealed that among the right holders; 63.5 percent of the farmers grow rice in their fields, 0.7 percent grows wheat, 2.3 percent cultivates jute, 1 percent grows maize and 0.3 percent cultivates vegetable. Among the uncontrolled group; 23 percent produces paddy, 3 percent produces wheat, another 3 percent cultivates jute and 1 percent produces maize.

10.10 Seed Used for Crop Production

The farmers in rural Bangladesh use to grow crops from locally produced seeds. However, the trend is changing slowly and many types of hybrid seeds are replacing indigenous ones. Within the right holders; it is found that 23.9 percent households use local variety, 8.6 percent households use highly yielding variety and 0.3 percent makes use of Hybrid seeds. On the other hand, within the uncontrolled group; 26 percent uses local seeds, 15 percent households use highly yields variety seeds for production. In case of seed preservation, it is found that 2.7 percent farmers preserve seeds for future use in the right holders group, whereas this rate is 5 percent in case of the uncontrolled group.

10.11 Use of Agriculture Tools

Subsistence agriculture in rural Bangladesh is gradually shifting towards mechanized agriculture, which is manifested from the survey as well. It is found that out of 34.5 percent farmers of the right holders group, 19.6 percent uses traditional agricultural tools, 8.6 percent uses modern agricultural appliances and 6.3 percent use both the traditional and modern ones. Out of 48 percent farmers within the uncontrolled group; 35 percent uses traditional tools, 10 percent uses modern tools and 3 percent uses both.

Table 18: use of agricultural tools within right holders and uncontrolled group

Right holder group			Uncontrolled group		
Tools for agricultural activity	Frequency	Valid Percent	Tools for agricultural activity	Frequency	Valid Percent
traditional	59	19.6	traditional	35	35.0
modern	26	8.6	modern	10	10.0
Both	19	6.3	Both	3	3.0
not applicable	197	65.4	not applicable	52	52.0
Total	301	100.0	Total	100	100.0

10.12 Source of Irrigation

Irrigation is an important issue for agriculture production. More particularly, irrigation is crucial for Boro production. Within right holders group; 0.3 percent farmers use surface water, 18.3 percent uses ground water and 14.7 percent households use both as a source of irrigation. In the uncontrolled group, however, 2 percent farmers' source of irrigation is surface water and 44 percent uses ground water and 4 percent uses both for irrigation.

10.13 Main Obstacles for Agriculture Production

10.13.1 Obstacles for Agricultural Production

Agriculture is a weather sensitive sector. Even a slight change in climate eventually hampers the production. Farmers of the RESOLVE area are confronting multiple stressors. However, flood is the dominating factor that has an ambivalent affect. In one side it makes lands fertile through silt deposition; on the other hand cause destruction by inundating the whole production. Among the right holders group, it has been found that 73.1 percent considered river bank erosion as a major threat. 12.6 percent recognized flood, it is drought for another 7.3 percent and 6.6 percent faces other obstacles as hindrances for agricultural production. On the other hand; 18 percent recognized drought, 37 percent considers it to be flood and 7 percent identifies riverbank erosion as the main obstacles of agricultural production within the uncontrolled group.

Table 19: Obstacles for agricultural production within right holders and uncontrolled group

Right holders group			Uncontrolled group		
Obstacles for agricultural	Frequency	Valid Percent	Obstacles for agricultural production	Frequency	Valid Percent
Drought	22	7.3	Drought	18	18.0
flood	38	12.6	flood	37	37.0
salinity	1	.3	Riverbank	7	7.0
Riverbank	220	73.1	other	38	38.0
other	20	6.6	Total	100	100.0
Total	301	100.0	Total	100	100.0

10.13.2 Effect of Climate Change in Agriculture

Agricultural sector is very sensitive to climate change, where direct loss is incurred. Climate change posed multifaceted impacts on agriculture. In the right holders group; 81.7 percent face reduction of production, 7.3 percent face change of variety of crops and 6 percent households face change of crop calendar as the major impacts of climate change. Within the uncontrolled group, 92 percent households answer has been reduction of productivity, 2 percent speaks of change of variety of crops, 2 percent informs change of crop calendar and another 3 percent answers other reasons as the major impacts of climate change.

11. CLIMATE CHANGE AND NATURAL HAZARDS

79 households of the right holders answered that they are affected by climate change, while 35 percent answered that they had heard about it but failed to notice any effects. However, 21 percent respondents were found to be ignorant regarding climate change.

Knowledge regarding climate change among the uncontrolled group showed similar patterns that are akin to the right holders group. In this case, 85 recognized climate change as a major threat to their lives and livelihood. On the other hand, 38 percent respondents answered that they have heard about climate change but did not notice any effect of it. Regrettably, 27 respondents did not know anything about climate change.

11.1 Hazard Frequency

According to respondents among the right holders; 44.5 percent's answer is flood, 4.7 percent answers salinity, 1.7 percent recognizes river bank erosion and 47.8 percent households face other calamities and natural hazard.

On the other hand, within the uncontrolled group, 99 percent respondents identified flood to be the most frequent hazard.

Table 20: Hazard frequency according to right holders and Uncontrolled group

Right holders group			Uncontrolled group		
Calamities frequently occur	Frequency	Valid Percent	Calamities frequently occur in your locality	Frequency	Valid Percent
Flood	134	44.5	Flood	99	99.0
Salinity	14	4.7	Not applicable	1	1.0
Riverbank erosion	5	1.7	Total	100	100.0
Other	144	47.8			
Not applicable	4	1.3			
Total	301	100.0			

11.2 Relief and Recovery after Disaster

Even though Bangladesh has been cited as a model for disaster management worldwide, however the RESOLVE project area shows a disappointing scenario in case of receiving relief and recovery assistance after disaster. The survey revealed that only 40.9 percent of the households get assistance out of which 20.3 percent receives assistance from government, 43.2 percent gets

assistance from NGOs. Alternatively, 93 percent households get financial assistance and 7 percent doesn't get any. In addition, only 5 percent households get assistance from govt. and 95 percent from non-government sources after disasters.

11.3 Access to Shelter Center

The right holders are living in a fragile ecosystem and they are the most vulnerable to disasters. However, their access to flood or cyclone centre is limited. This is partly due to the distance and partly due to people's general tendency of staying in their places in order to protect livestock and other resources in times of flood or other natural hazards. The survey revealed that only 6.6 percent of the right holders go to shelter centre during flood, cyclone or other natural hazards. However, within the uncontrolled group the share of going to shelter centre is 6 percent.

11.4 Weather Forecasting System

The right holders are very vulnerable to disasters and weather forecasting is very important for securing themselves from devastation. However, about 0.7 percent households have the weather forecasting system but the other 99.3 percent do not have any. In case of the uncontrolled group, 75 percent respondents do not have access to weather forecasting system.

12. FINANCIAL SYSTEM

12.1 Savings

Since the right holders are poorest among poor, they do not have any savings. It is seen from the survey that only 4.7 percent right holder have savings among the right holders. On the other hand it is only 2 percent within the uncontrolled group.

12.2 Loan

The survey revealed that 56.5 percent households have to take loans for a number of reasons. The highest percentage (48.2 percent) is found to take loans for purchasing food, 9 percent borrows for treatment, 5.3 percent for education of children and another 5.3 percent for others reasons. On the other hand, 37 percent households of the uncontrolled group take loan in order to purchase food, 25 percent for treatment, and 6 percent for education of children.

12.3 Source of Loan

Micro credit has appeared as major source of capital for the poor people in rural Bangladesh even if there are some controversies regarding its effectiveness. Within right holders group; 2.7 percent households borrow from cooperative, 50.2 percent from money lenders, 12.3 percent from relatives, 3 percent from neighbors and the rest of them borrow for other reasons. The situation is nearly identical in case of the uncontrolled group.

12.4 Debt Situation

Since the right holders are poor, they are compelled to take loans to bear their daily expenses. The survey explored that 59 percent of the total households among right holders are in debt. Within uncontrolled group, the rate is 37 percent.

Among the right holders group; 42.29 percent households have less than 10001 taka, 13.72 percent has 10001 to 20000 taka and 3.99 percent has 22000 take and above as an amount of debt at present within the 301 households. On the other hand, 19 percent households have 2000 to 10000 taka and 17 percent has 12000 to 50000 taka as debts at present within uncontrolled group.

13. CAPACITY BUILDING TRAINING

The right holders are identified as less capacitated in case of problem reasoning as well as solving. The right holders are not only illiterate but also out of the ambit of capacity building training offered by both government and NGOs. From the survey shows that only 14 percent of the right holders receive capacity building training. It is 12 percent in case of the uncontrolled group.

14. MAJOR FINDINGS OF THE STUDY

Table 21: Major Findings of the study	
Indicators	Current situation of the Indicators
Population	Total population size of the right holders' family is 1074; with 48.41 percent male and 51.59 percent female. However, baseline survey revealed that total 350 family members belong to the 100 uncontrolled households out of which 50 percent is male members and other 50 percent are females.
Primary Occupation	From the baseline survey it is found that 25 percent household head of the right holder's primary occupation is agriculture, 62 percent are wage labourers, 0.7 percent small businessman, 0.7 percent rickshaw pullers, 1.3 percent carpenters and 8 percent is engaged in other occupations within our 301 households. Among the uncontrolled group, 4 percent main does farming, 90 percent is labor, 1 percent is housewife, 4 percent is carpenter and 1 percent household head are engaged in others associations as the primary occupation.
Secondary Occupation	Within the right holders; 0.7 percent is engaged in agriculture as a secondary occupation, 3.3 percent labour, 0.3 percent small business, 1.3 percent rickshaw puller and 2 percent households heads are engaged with other activities as their secondary occupation particularly in lean period. Among the uncontrolled group 100 percent households only engage with their primary occupation.
Enrollment	Within 301 right holders' households, 414 members were found to be enrolled in schools and colleges out of which 57 percent are male 43 percent are female. On the other hand, total 67 members were found enrolled in various schools and colleges, and 52.24 percent are male and 47.76 percent are female among the uncontrolled group.
Female Education	Within right holders; 23.9 percent of the female members obtain primary level education, 3.7 percent obtained secondary level, 1 percent persued above S.S.C and 8 percent households female members have no degrees at all. The rest (63.4 percent) of the households' female members are illiterate. On the contary; 12 percent female members obtained primary level degree, 7 percent has secondary level education, 4 percent households gained above secondary level education. In addition, 1 percent household female member do not have any degree and 76 percent households female members are illiterate.
Income	Most of the right holders are extremely poor and their annual income is below 30000 taka (USD 400). The baseline study revealed that 67.19 percent right holders' annual income is equal or below 30000 taka. However, 32.81 percent right holders are of an annual income that is more than 30000 taka. On the other hand, within the uncontrolled group, 66 percent were identified as extremely poor whose income is equal or less than 30000 taka

Expenditure	There is a huge discrepancy between the income and expenditure in the RESOLVE area. Even though more than 65 percent right holders were found with less than an annual income of 30000 taka, 72 percent right holders' yearly expenditure is more than 30000 taka. Aids received from different government and NGO programmes are the reasons behind. However, a reverse scenario is discovered in the uncontrolled group where only 21 percent households were found with an annual expenditure which is more than 30000 taka.
Feeding Capability	The baseline data depicts that 2.3 percent of the total households' members can have a meal once each day (that is not square even), 41.5 percent households' members eat twice everyday and 56.1 percent households members eat three times each day. Feeding scenario is identical for uncontrolled group as well. Within the uncontrolled group, 82 percent of the total household members eat thrice a day and 18 percent households' family members eat two times in a day.
Ownership of House	Within 301 right holders, 29.6 percent owns their houses, 52.2 percent has rented house and 18.3 percent of the total households has ownership of house in other ways. 88 percent has one room, 11 percent has two rooms, 0.7 percent does have three rooms and only 0.3 percent of the total household has four rooms. On the other hand, 11 percent of uncontrolled group has their own house. 86 percent households have rented house and 3 percent households have the ownership of house in other ways.
Source of Light	Only 0.7 percent of household of the right holders has access to electricity. 96 percent house them depends on Kerosene and 3.3 percent uses solar energy as for a source of light. On the other hand, 100 percent household of the uncontrolled group uses kerosene.
Fuel System	The right holders depend on nature for fuel. Only 1 percent use electricity, 99 percent of the right holders use wood, straw, leaves etc. as fuel and collect those from their surroundings. On the other hand, 100 percent households of the uncontrolled group use leaves, straw and woods as fuel.
Water	Almost all of the right holders and the uncontrolled group use tube well to meet up their drinking water demand. In case of cooking water, 99 percent households of the right holders and the uncontrolled group depend on tube well. Availability of water till now is not a matter of concern as evident from the right holders and the uncontrolled group's response because 99 percent of the households do not face problems of any sort while collecting water.
Sanitation systems	In case of sanitation; 17.9 percent uses sanitary toilet, 80.1 percent uses hanging ones and the rest (1 percent) uses open place for defecation. Within the uncontrolled group, 28 percent uses sanitary toilets and 72 percent uses hanging toilets. In case of use of the toilet, 97 percent uses their own toilet and 3 percent shares toilet with others.
Waste management	Waste management system is very poor in rural areas resulting from the lack of awareness and technical knowledge. From the survey it is revealed that almost all household of right holders place their waste in open places. However, good news is that 91 percent household cleans the garbage area daily, 7.3 percent cleans it once in a week and 1.7 percent does it once in a month. The baseline survey gives an

	<p>impression of the right holders' inadequacy of technical knowledge and awareness on using garbage as organic fertilizer. It is found that only 8.6 percent household use garbage as organic fertilizer and 92.4 percent household never do it and they even do not know how to convert garbage into organic fertilizer. In case of the uncontrolled group, 76 percent is found to dump waste in open places, 2 percent household's garbage is put in dustbin, 4 percent households garbage is collected by garbage collectors and 18 percent households garbage is put in river/pond. In case of frequency of garbage cleaning, 74 percent cleans it daily; 23 percent once a week and 3 percent once a month. In case of preparing organic fertilizer from waste, it is found that one percent household use garbage as an organic fertilizer and the rest 99 percent never does it.</p>
Diseases	<p>While considering health situation of right holders, it is found that 13 percent households members are affected by fever, 5.3 percent by cough, 10.3 percent by Diarrhea, 68.8 percent by Influenza, 0.7 percent by TB, 0.3 percent by Typhoid, 0.3 percent by Asthma and 1.3 percent has got headache. In case of method of treatment, 3.3 percent relies on homeopathy, 96 percent takes allopathic medicine and 0.7 percent goes for herbal options. In case of the uncontrolled group, 5 percent household's family members are affected by fever, one percent family member is affected by Diarrhea and 94 percent household's members are affected by Influenza. Here two percent households use homeopathy and 98 percent households use allopathic method of treatment.</p>
Immunization of Children	<p>The rate of children immunization depicts a satisfactory picture. Within the right holders group; 68.8 percent children (below 5 years) get complete immunization and 1.6 percent children has completed partial immunization. The uncontrolled group shows similar picture in case of immunization. 45 percent household completed immunization of their children and 3 percent household has completed it partially.</p>
Birth control	<p>In case of birth control, 52.5 percent reproductively active women use birth control system in right holders group. In regard to uncontrolled group, 53 percent reproductively active women are using birth control methods.</p>
Vaccination During Pregnancy	<p>Within the right holders 57.5 percent pregnant women take vaccination during pregnancy. On the other hand, 84 percent pregnant women of the uncontrolled group take vaccine during pregnancy.</p>
Agricultural Land Ownership	<p>From survey it is found that 85 percent household of the right holders do not have any ownership of agricultural land. Alternatively within the uncontrolled group; 98 percent households do not have any productive agriculture land.</p>
Agricultural activities	<p>In the project area among the right holders 32.2 percent households are engaged in agricultural activities. On the other hand, 42 percent households of the uncontrolled group are engaged in agriculture activities.</p>
Productive Crop	<p>Among the right holders; 63.5 percent of the farmers grow rice in their fields, 0.7 percent grows wheat, 2.3 percent cultivates jute, 1 percent grows maize and 0.3 percent cultivates vegetable. Among the uncontrolled group; 23 percent produces paddy, 3percent produces</p>

	wheat, another 3 percent cultivates jute and 1 percent produces maize.
Seed use for agricultural production	Within the right holders; it is found that 23.9 percent households use local variety, 8.6 percent households use highly yielding variety and 0.3 percent makes use of Hybrid seeds. On the other hand, within the uncontrolled group; 26 percent uses local seeds, 15 percent households use highly yields variety seeds for production. In case of seed preservation, it is found that 2.7 percent farmers preserve seeds for future use in the right holders group, whereas this rate is 5 percent in case of the uncontrolled group.
Use of agricultural tools	It is found that out of 34.5 percent farmers of the right holders group, 19.6 percent uses traditional agricultural tools, 8.6 percent uses modern agricultural appliances and 6.3 percent use both the traditional and modern ones. Out of 48 percent farmers within the uncontrolled group; 35 percent uses traditional tools, 10 percent uses modern tools and 3 percent uses both.
Obstacles of Agricultural Production	Among the right holders group, it has been found that 73.1 percent considered river bank erosion as a major threat. 12.6 percent recognized flood, it is drought for another 7.3 percent and 6.6 percent faces other obstacles as hindrances for agricultural production. On the other hand; 18 percent recognized drought, 37 percent considers it to be flood and 7 percent identifies riverbank erosion as the main obstacles of agricultural production within the uncontrolled group.
Effect of climate change on agriculture	In the right holders group; 81.7 percent face reduction of production, 7.3 percent face change of variety of crops and 6 percent households face change of crop calendar as the major impacts of climate change. Within the uncontrolled group, 92 percent households answer has been reduction of productivity, 2 percent speaks of change of variety of crops, 2 percent informs change of crop calendar and another 3 percent answers other reasons as the major impacts of climate change.
Climate change and Natural hazards	In case of climate change, 79 households of the right holders answered that they are affected by it. On the other hand, 38 percent respondents answered that they are affected by climate change and Natural hazards.



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