

Pre-Crisis Market Mapping and Analysis (PCMMA)

Baseline Report



Photo 1: a water taxi leaves Korail after dropping passengers

Potable Water in the Urban Korail Neighborhood
and

Agricultural Labor in the Rural Sirajganj Area

Bangladesh

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Humanitarian Aid
and Civil Protection

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Section 1: Executive Summary

The PCMMA training and baseline exercise took place from December 9-16, in the Korail neighborhood of Dhaka and the Sirajganj Sadar Upazila of Bangladesh. The analysis team followed the PCMMA guidance to apply an approach similar to that of the Emergency Market Mapping and Analysis (EMMA) Toolkit in a pre-crisis context. For the purpose of this PCMMA assessment, the floods of 2014 and the annual rainy season were selected as the reference crises in Sirajganj and Korail, respectively. The team examined how the floods in the context of the lean season and rainy season impact the function of one critical market system in each area, in order to draw conclusions about the likely impact of future floods and seasonal rains on selected market systems, and to propose appropriate market-based preparedness and response interventions. This report presents the findings and recommendations for the potable water market system in Korail, and the agricultural labour market system in Sirajganj.

Water in Korail: Throughout the year, including during the rainy season, the market provides a sufficient volume of water for the target population in Korail, although there are ongoing concerns and issues with environmental contamination of water, and improper consumer practices, especially with the direct (untreated) consumption of water from unsafe sources. During emergencies, there is nearly universal local contamination of WASA (the government Water Supply and Sewerage Authority) water points, which are the main sources of drinking water. But, alternative sources of water, including the local market and water points in nearby neighborhoods can quickly scale up the supply of water during crises. The main constraint to the reliable supply of clean water is contamination via shoddy infrastructure. The low, steady price of water year-round, and the number of business, government, and non-government actors involved in water supply to Korail suggest a competitive and resilient market environment.

Korail is a very complex environment, with high population density and many NGO, CBO, government, political, and informal stakeholders. The focus of this report is preparedness and relief/recovery contexts, and no effort has been made to study long-term development considerations. Effective development practices from the relatively simple (e.g. rainwater catchment systems) to the complex (e.g. definitive legal, financial, and political settlement of the Korail land ownership) are preferable to the continued endless cycle of chronic and sudden-onset disasters faced by the inhabitants of Korail. The complexity of the environment, and the wide variety of formal and informal actors involved in Korail must be kept in mind when considering interventions of any kind in the community. It is strongly recommended that establishment of a relationship with the Korail community and those who provide services in the community be considered a prerequisite to programming anywhere along the humanitarian/development spectrum. Presupposing the necessary relationships in Korail, this report recommends the following market-sensitive programming options to meet the drinking water needs of the affected population during the rainy season, and particularly during waterlogging or flooding.

Unconditional cash, distributed in envelopes or by mobile money transfer is appropriate for relief and recovery. Market systems in and around Korail continue to operate in waterlogging scenarios, and an adequate supply of potable water is available nearby. Water costs are not a significant percentage of household expenses (less than 2% of HH expenditure in emergency context), but loss of income opportunities from movement difficulties, to places of work being closed, to illness, to lack of customers means a drop in income of nearly 20% for many vulnerable households during waterlogging times.

Install mobile water treatment plants. Water availability is not the issue-WASA pipes and water points continue to yield plentiful water during the rainy season; it is contamination of that water which is the key problem for households. Mobile water treatment plants, similar to those already deployed by the International Federation of the Red Cross in Bangladesh, can bring rapid, local access to clean water.

Distribute locally procured water. Clean water is readily available year-round at retail and wholesale prices via the market in and around Korail. Various market actors can be targeted to supply water purchased by NGOs for distribution to relief/recovery programming beneficiaries.

Agricultural Labour in Sirajganj Sadar Upazila: Sirajganj is a rural area where agriculture is the main economic activity. There is little mechanization, so commercial farms of all sizes depend heavily on cheap agricultural labor, of which there is abundance. The large majority of families relying on agricultural labor for their livelihood have no other livelihood strategies, and as such are in dire economic circumstances during the lean season from June to September, which is also when floods typically occur. A small minority of households¹ have alternative livelihoods during the lean season, such as rickshaw pulling, or fishing, which also provides a regular income throughout the year. Other households send one or more members to Dhaka to earn and remit day labourer wages during the lean season.² However, for the majority of households, there are no income opportunities during the lean/flood



Photo 2: Sirajganj women harvesting

season, and in order to meet their basic needs most are forced into a financially disastrous cycle of borrowing money. Those households that rely entirely or almost entirely on agricultural labor are the poorest and live under the Bangladesh lower poverty line.

Men and women supply agricultural labor, but the market offers wages to women that are in some cases half those offered to men. In addition to childcare and domestic jobs in the home, women also take the role of central responsibility for home gardens and animal husbandry, and with helping extended family's gardens and animals.

The agricultural labour market in Sirajganj displays little elasticity of demand or supply – labourers are not wage-setters, and there is an oversupply of labour in the market. There is a seasonality to wage rates, but rates do not shift significantly from year to year, so farmers determine their labour needs (and their ability to hire labour) based on crop acreage and effects of flooding, *inter alia*.

The focus groups and household interviews in Sirajganj yielded discrepancies: annual income was consistently reported as less than annual expenses. Despite great efforts by the field team during the fieldwork and in subsequent analysis, **the income/expenditure relationship at the household level remains unclear, and requires further study.** Despite ambiguities in the data, the information collected is strong enough to make the following key observations and recommendations:

The agricultural labour market is not able to absorb all available manpower for most of the year. More critically, demand for agricultural labour collapses during the four consecutive months of the lean season. Therefore, a key strategy to support landless labourers to cover the gap between their needs and means should focus on enhancing their ability to diversify their sources of food and income. Diversification can come via new income generating activities (IGAs), as well as strengthening some already existing secondary sources of food and income, such as homestead gardening, poultry and livestock. **Livelihoods diversification** should focus on providing new income

¹ Around 20%, according to primary data collected in the field

² Around 15%, according to primary data collected in the field

opportunities for the “no income” months of the lean/flooding season, and also during the last term of the year. **Livelihoods strengthening** should look at the already existing secondary livelihoods strategies that HHs use to complement income from agri-labour. Support should be provided to improve and expand these activities. During the emergency and early recovery phases, unconditional cash should be used to cover basic needs, conditional cash used for small-scale farmers to hire agri-labourers, and cash for work for DRR-related projects at the community level. Under disaster mitigation and climate change adaptation, vouchers for flood resistant paddy varieties should be further explored as an intervention option.

Finally, although PCMMA is not meant to recommend developmental interventions, the team considered it appropriate to include the option for the creation or support of existing agricultural associations and cooperatives. The graduation development model, used to good effect by BRAC in rural Bangladesh, is also appropriate and encouraged for Sirajganj.

1.1 Background

Under the leadership of Oxfam, the Cash Working Group³ (CWG) in Bangladesh has been encouraging the country's humanitarian community to recognize that market forces play an important role in helping people withstand and recover from shock. Many of the agencies that constitute the membership of the CWG have begun experimenting with cash-based interventions (CBI) alongside or in place of conventional relief distributions of food and non-food items, and local procurement is being encouraged wherever possible. Explicit in these activities is the acknowledgment that adequate market functionality is important for both preparedness and resilience, and for disaster-affected people to return their lives and livelihoods to normal. Understanding markets is also necessary for decision-making in designing and implementing CBI and in-kind programs across the humanitarian spectrum. As such, market analysis should be an integral part of decision-making at humanitarian agencies, to ensure that no harm is inadvertently done, and to improve the efficiency, efficacy, and impact of humanitarian programming in the preparedness, mitigation, relief, and recovery phases.

In service of better understanding markets and in the interests of furthering awareness and technical rigor of market-based programming and cash-based interventions in Bangladesh, Oxfam, with funding from ECHO, arranged a PCMMA training and baseline study in December, 2015. This baseline report is a product of that process.

A November 2014 PCMMA report from Ethiopia⁴ provides an apt description of the purpose and approach of the PCMMA process:

“The PCMMA aims at providing field practitioners with a practical step-by-step process to plan, carry out, and update pre-crisis market mapping analyses. As the name points out, the analysis is conducted before a crisis hits. Its purpose is to inform better and market-adapted contingency and preparedness programme design and implementation as well as to allow the implementation of surveillance, early warning and monitoring and evaluation systems. The PCMMA approach has the concept of rapid and realistic ‘good enough’ analysis at its core. Using tools such as seasonal calendars and market system maps, the approach combines the analysis of

³ The cash working group in Bangladesh has more than 30 members, including government agencies and private sector actors. From the CaLP website: *the Bangladesh Cash Working Group seeks to strengthen the effectiveness and efficiency of CTPs across sectors and clusters in disaster preparedness and response. Since its launch in March 2014, it has successfully coordinated the emergency CTPs by harmonising grant size and location and introduced the structural market price monitoring practice in union level.* The Cash Learning Partnership, “Bangladesh Cash Working Group”, <http://bit.ly/1TiLnBV>

⁴ DeWild, David “Pre-Crisis Market Mapping Analysis: Market systems for Sorghum, Rice, and Pasta, Siti Zone, Somali Region, Ethiopia”, *Food Economy Group, Oxfam, Save the Children, Concern Worldwide*, November 2014

people's uncovered needs (gap analysis) and the analysis of the market systems intending to cover these needs (market system analysis) to offer a systemic and comprehensive understanding of the capacity and constraints of critical market systems. Based on this analysis PCMMA offers response recommendations that detail how far the critical market systems analysed can help deliver humanitarian assistance and which areas of the market system may need additional support in this aid delivery. It can further suggest ways in which interventions may strengthen the market system in the long run."

1.2 Rationale and Methodology

Due to security concerns all expatriate movement outside Dhaka was prohibited, and severely limited within the city. Therefore, neither facilitators/assessment leaders were able to participate directly in data collection. For collecting and subsequently analyzing the data, two field teams were created; one of 9 members and the other of 16 members, all of whom are Bangladeshi. The 9-person team traveled to the countryside to collect data in the rural Sirajganj area, while the large team remained in Dhaka and collected data in the Korail neighborhood, a slum nestled between Lake Gulshan and the diplomatic neighborhood of Banani. None of the team members, field team leaders included, had any prior market analysis experience, which was conducive to a non-hierarchical approach as all members of the field teams used their new PCMMA skills for the first time following the just-completed 3 days of PCMMA training. The two PCMMA facilitators/assessment leaders were not always able to provide in-person support to the field team, especially to the team in Sirajganj, more than five hours drive from Dhaka.

Korail: Although many humanitarian and development agencies are providing a variety of assistance to meet the needs of the inhabitants of Korail, a better understanding of the market systems upon which its habitants rely is critical for increasing preparedness, improving resilience, reducing risk, and speeding recovery from natural disaster. The PCMMA findings illustrate that those Korail households in the lower economic strata face a host of health hazards associated with the rainy season, when very little water from Korail sources is safe to use without treatment.

Sirajganj Sadar Upazila: Despite the efforts from the government, the UN and other developmental and humanitarian agencies, landless agricultural workers likely remain in absolute poverty,⁵ and are among the poorest people in rural Bangladesh. The aim of investigating the agricultural labour market system in an area recurrently hit by disasters, such as Sirajganj, is to examine potential interventions to enhance the recovery process, and to identify entry points to improve preparedness, reduce risk, and increase resilience. The PCMMA concludes that to build resilience for the target group the focus should be on providing alternative sources of food and income, especially during the lean time.

Data was collected from key informants and market actors using semi-structured interview tools and from communities through focus group discussions, key informant interviews, and household interviews. The Korail sample included 64 household interviews, 7 key informant interviews and 4 focus group discussions. The Sirajganj sample included 22 key informant interviews, and 8 focus group discussions. Qualitative and quantitative data was entered into databases for purposes of analysis during the data collection fieldwork and completed for final analysis during the post-fieldwork analysis phase.

⁵ Absolute poverty is based on an individual average daily caloric intake of less than 2122 kcal per day. Hard-core is based on an individual average daily caloric intake of less than 1805 kcal per capita per day. The PCMMA measured household income and expenditure, not caloric intake. The reference to the terms 'absolute' and 'hard-core' is made as an indication of proximal similarity. Further elaboration on the terms can be found in: The Bangladesh Bureau of Statistics and The United Nations World Food Programme, "Local Estimation of Poverty and Malnutrition in Bangladesh, 2004"

An earnest, intensive effort was made to discuss outstanding questions and clarify key findings with the field team, but the 'remote control' of the baseline, and the relative inexperience of the enumerators have implications for the quality of data and the resulting analysis. However, this first PCMMA baseline effort is an auspicious beginning to strengthening and expanding market-based programing in Bangladesh, and should be followed by many more such efforts.

Section 2: Scenario Selection

Waterlogging in urban Korail Floods recur on a regular basis in Bangladesh: more than 80% of the country is considered a floodplain.⁶ The emergency context chosen is seasonal waterlogging in Korail because during times of waterlogging the risk of disease from water is high: "the major portion of excreta is deposited into water bodies and open places, as such polluting water sources, groundwater and the general environment, [and] as a result, the majority of the population in



Photo 3: A Sirajganj man gathers a harvest

Bangladesh suffer from different kinds of water and excreta-borne diseases."⁷ Dhaka is a megacity (more than 10 million inhabitants, with a population density of more than 2,000 people per square kilometer), and Korail itself has a population density of more than 200,000 per square kilometer.⁸ The density of Korail, the ubiquitous presence of solid and human waste, and its proximity to the highly contaminated Lake Gulshan are all factors that contribute to the risk and impact of disasters and seasonal hazards.

In Korail, 'waterlogging' is a scenario in which seasonal rains do not drain away from dwelling areas, and standing water lingers in houses for hours or days at a time. The standing water, flooding, and the rainy season generally lead to spikes in incidences of waterborne diseases.⁹ Drainage of rainwaters is impeded by accumulated solid waste blocking drainage ditches, pathways, and pipes that drain water from the high ground of Korail, over the low ground, and into Lake Gulshan, which borders Korail to the south, east, and west. The inundation and standing water contaminates drinking water by entering at imperfectly sealed joints in the pipes that carry water to and

through Korail, by spilling into boreholes, and by bacteria transmission at the point of use.¹⁰ The numerous pit latrines in and around Korail can also contaminate the shallow, hand-dug wells as well as the deeper boreholes that some households also use as water sources.¹¹

⁶ Denissen, Anne-Katrien "Climate Change & its Impacts on Bangladesh", March 4, 2012, <http://bit.ly/1PqHVXF>, accessed December 23, 2015

⁷ Pramanik Biplob, Dipok Chandra Sarker, Ram Chandra Sarker, "Assessment of Water Supply and Sanitation Facilities for Korail Slum in Dhaka City", *International Journal of Civil & Environmental Engineering*, October 11, volume 11, number 5.

⁸ Streatfield PK, Karar ZA, "Population Challenges for Bangladesh in the Coming Decades", *Journal of Health, Population, and Nutrition*. 2008;26(3):261-272.

⁹ Reuters, Taipei Times, "Diarrhea takes its toll on Bangladesh flood victims", August 13, 2004, <http://bit.ly/1MtGGQe>, accessed December 22, 2015.

¹⁰ Daniele Lantagne, Thomas Clasen, "Point of Use Water Treatment in Emergency Response", *London School of Hygiene and Tropical Medicine*, October 2009.

¹¹ "Assessing Risk to Groundwater from On-site Sanitation: Scientific Review and Case Studies", *British Geologic Survey*, Commissioned Report CR/02/079N, <http://r4d.dfid.gov.uk/pdf/outputs/r68692.pdf>, accessed December 27, 2015

Flood and lean season in Sirajganj Sadar Upazila Sirajganj Sadar Upazila lies on the bank of the river Jamuna. Almost every year, at the time of the monsoon, Jamuna overflows its banks and floods most of the low-lying parts of the Upazila. Flash floods and moderate, periodic floods are common from June to September, and there were severe floods in 2002, 2004, 2007, 2008, 2010, 2014, and 2015. Rain patterns are becoming erratic: in 2015 an early flood occurred in May, which is harvest time, a second flood happened in mid-August, followed by a third flood the first week of September.

The impact of floods on the agri-labourers differs depending on the timing of the flood: most flooding normally occurs during the lean season, from June to September. Flooding during the lean season affects women's home-based livelihoods, such as poultry farming and homestead gardening. Additionally, ultra-poor families have to sell their livestock as they lack access to fodder and safe water for animals. Other common impacts, include damage in houses and loss of other assets that undermine economic security in the short and medium term. Early floods have the additional effect of killing standing crops, thusly reducing or eliminating the demand for agri-labourers at harvest time. In case of early rains, basic financial solvency of vulnerable, small-scale farmers can be threatened as they lose part of their produce, and/or seeds and seedbeds, and are consequently unable to afford to purchase the required inputs and the labour needed for the next planting season.

Floods in Sirajganj also impact markets: during the floods, the combined effect of supply chain disruption and restocking delays caused by standing water leads to a price hike during the initial days of flooding. However, once the access of supplies to markets is restored, availability of key items and prices quickly return to normal.

In any case, seasonality and more specifically, the lack of labour opportunities during the lean season is the "major disaster" faced year after year by the agricultural landless labourers: lack of income opportunities during the four consecutive months of the lean season has a major impact on household economic security—much more so than the floods themselves.

2.1 Scenario Timeframes

Seasonality and timeframes in Korail:

Table 1: Korail Seasonal Calendar

Korail Calendar	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Season	Summer				Rainy season				Winter			
Inundation and waterlogging						Inundation						
Water Availability			Water table low; water rationed			Water supply readily available						
Water Contamination	High											
Primary water source	Local WASA				Purchase from market and external sources				Local WASA			
Waterborne diseases			Jaundice & dysentery		Diarrhoea and skin diseases							
Demand for safe drinking water	Low				High							

Water contamination is most prevalent during the peak of the rainy season; August and September, which coincides with the highest incidences of waterlogging. The level of risk of inundation and waterlogging has a long crescendo and de-crescendo period at the beginning and end of the rainy season, respectively. The latter half of the summer—when the water table is lowest—is also a hazardous time for water consumption, as the level of water in wells is low, ambient air temperatures are high, and contamination is concentrated in diminishing water supplies.

Income and expenditure patterns at the household level also have seasons; across a number of different typical professions for Korail inhabitants—day laborer, domestic work, petty trading—income was lowest in the months of August, September, and October, which coincides with the inundation and waterlogging season. See Annex 2 for a basic seasonal calendar of the target group's income and expenditure patterns.

Table 2: Sirajganj Seasonal Calendar

[illegible]

Hail Storms												
River Erosion												
Cold Wave												

Sirajganj Letter Key	
Land Preparation	LP
Planting	P
Harvesting	H

The cropping season in Sirajganj Sadar Upazila, many areas are wetlands or backswamp,¹² the Bengali word for which is “haor.” The characteristics of the haor present some differences and challenges compared to most areas of the Bangladesh: In most districts of rural Bangladesh, the planting season for Amman rice, which provides work opportunities to agricultural labourers, takes place from mid-May to mid-August. This is not the case in the haor areas of Sirajganj, where the lean season is acute from June to September, with no agricultural work opportunities, as can be seen in the seasonal calendar. Moreover, from October to December, work opportunities are limited to planting two rice varieties and a range of vegetables, and land preparation for the main rice variety, which requires hiring few labourers. Indeed, from October to December, agri-labourers work on average ten days a month, compared with the 22 days a month males work from January to May. For females, 10 days of paid work per month is the norm during those months, except for January, the sole month were they work up to 22 days.

Alternative sources of income such as fishing or rickshaw pulling, as well as migration, take places during the lean/flood season. Daily wage rates are also seasonal and gender-specific. Men’s rates range from 400 BDT during the peak season (April- May) to 200 BDT in the lower demand months from October to December. For females, the daily wage rate of +/-150 BDT is the same for all working months, except for January when it increases to 200 BDT.

Expenditures and cost of living does also vary during the year, with food prices higher from October to March and extraordinary expenditures, mostly related to housing repairs, after floods and festivals at the end of the year.

Section 3: Target Population and Gap Analysis

The target populations of the PCMMAs in Korail and Sirajganj are defined in Table 3, with accompanying explanatory text below.

Table 3: Selected Target Groups in Korail and Sirajganj

General Location	Target	Number	Additional Characteristics	Locations	PCMMA Focus
Korail, Dhaka	Very poor and ultra poor HHs with monthly income < 9,000 BDT	1,000 HH	Less access to safe drinking water Regularly using contaminated water Use shared latrine and defecate in the open One or more children, persons with disabilities, pregnant women	On the edges bordering the lake and low-laying areas	Those vulnerable households where not all water consumed is potable, especially during dry seasons and rainy seasons
Sirajganj Sadar Upazilla	Landless agricultural labourers (male and female) flood affected	97,169 male 19,433 female	Depend on agricultural work, very limited sources of income Severely affected by seasonality – no income during the lean/floods season High levels of indebtedness	Sirajganj	Landless agricultural labourers that do not have any alternative income (80%)

¹² Natural levees form by spillover of sediment during floods. If covered in water much of the time, those areas behind the levees form a backswamp.

The Target Population in Korail: More than 20,000 families reside in Korail, and make their livings in the garment, transportation, construction, land development, domestic help, waste management, small industry and informal sectors of Dhaka.¹³ The entire Korail neighborhood is an informal settlement, albeit very longstanding: it has been settled, and growing as a settlement for decades. As it's an informal, illegal settlement, the constant threat of eviction¹⁴ was the greatest concern reported by households interviewed during the PCMMA. The threat of eviction applies to all who dwell in Korail, so in the interests of narrowing down the target population, the field teams identified households meeting especially acute vulnerability criteria based on physical location and household income per month. It was discovered that the households situated at the edge of the settlement, bordering the lake are particularly prone to waterlogging and waterborne diseases, in part because contaminated water and waste from the higher ground of Korail flows through those areas, and because the presence of standing water is a source of numerous health and safety hazards in the rainy season.

Many households interviewed treated their water by boiling or with chemicals some of the time, but few treated it all the time: boiling takes time and requires purchasing fuel or wood. Chemical treatments cost money and require a trip to a retailer. Korail latrines often empty directly into the lake, and the combination of dense habitation and unsanitary conditions creates “the perfect environment for an outbreak of diarrheal disease.”¹⁵

Based on data from interviews of 64 households, the households in Korail were divided into three income-based wealth groups, displayed in Table 4. The target population identified in Korail is households earning less than 9,000 BDT per month—the two categories of lowest earnings, representing the bottom 30% of the income range in Korail. Of those two wealth groups, the targeting can be further narrowed to those households which dwell on the lakeshore and low-lying areas of Korail, as the members of those households often face the most intense environmental

Monthly Household Income (BDT)	Percentage of Households Represented
9,000 or more	70%
6,000 to 9,000	28%
Less than 6,000	2%

Table 4: Korail Wealth Groups

health hazards, and often don't have as direct or easy access to water points. It is estimated that there are at least 1,000 households that meet that vulnerability criteria. Implementing agencies may wish to further refine the targeting criteria to households with persons with disabilities, pregnant or lactating mothers, or female-headed households.

Characteristics of the Target Population in Sirajganj: Landless agricultural labourers lack the most essential productive asset in rural Bangladesh, and subsequently depend uniquely on selling their manual labour as their primary livelihood strategy. Most labourers work exclusively in agricultural related activities; only 20% of the landless agricultural labourers are engaged in alternative income generating activities such as rickshaw pulling and fishing, which happen mainly during the lean season. As a result, the income and thus the food and economic security of the target group are heavily dependent on the demand for labour in the agriculture sector. As a consequence, income suffers from extreme seasonality: around **80% of landless labourers report having no income during the lean season**. According to the data gathered in the field, the annual income for households of

¹³ Shiree (the common name for the Economic Empowerment of the Poorest programme, which is a joint DFID and Government of Bangladesh livelihoods programme) and DSK (Dushtha Shasthya Kendra), “Moving Backwards: Korail Slum Eviction”, April, 2012, page 7

¹⁴ Syed Zain Al-Mahmood, “Dhaka slum dwellers live under threat of eviction”, *The Guardian*, April 11, 2012, <http://bit.ly/1kgO7DK>, accessed December 21, 2015

¹⁵ Zimmerman, Rachel, “Perspective: Poverty, Health And Forced Eviction In The Slums Of Bangladesh”, *WBUR*, April 12, 2012, <http://wbur.fm/1OeN7w5>, accessed December 26, 2015

landless labourers not engaged with non-agricultural activities is around 50,000 BDT¹⁶. This is far below the 104,953 BDT/year (or approximately 8,746 BDT/month for households with four members), which represents the upper poverty threshold in Sirajganj. Even if most ultra-poor households complement their sources of food and income from agricultural wages with homestead gardening and animal husbandry for vegetables, dairy products, and poultry, their minimum needs for food and economic security remain unmet, especially during the lean season.

In terms of food security, for instance, the average monthly income of targeted households is below the cost of the essential food basket¹⁷ in the area investigated. This means that **most households are unable to meet their basic food needs** most months of the year. Moreover, during the lean season they have only access to three to four varieties of food, which indicates a poor, insufficient diet.¹⁸ Households of agricultural labourers engaged in alternative sources of income during the lean months can reach annual incomes of 75,000 BDT. Although that annual income is still below the poverty line in Sirajganj, it is 30% higher than the income of the target group: households that rely exclusively on agricultural work. Only around 12% of households have a member that migrates during the lean season. The normal destination of economic migration is Dhaka, to engage in unskilled daily labour. Unskilled labourers can remit around 7,000 BDT/month to support family expenditures during the lean period. Nevertheless, most targeted households in Sirajganj suffer from food and livelihood insecurity.

Landless agricultural **labourers are highly dependent on loans to meet their basic needs** during the lean season, at which time they obtain loans from a series of lenders. For example, to obtain additional capital and to be able to service the loan from the first lender, a second loan is taken out. To be able to service the second loan, a third loan is taken out, and so on. Many households are in debt to 3 or more creditors. As credit becomes harder to obtain, households are forced to resort to borrowing from informal moneylenders, where they face less favourable and sometimes exploitative interest rates. Loan interest and principal payments represent a high share of household annual expenditures.

Women's labour wages come mostly from mustard cultivation and weeding rice paddies. There is a significant **gender-based wage inequality** for agricultural labour: women often receive less than half of a man's wage for similar work. The general daily wage for males ranges from 250 to 400 BDT, depending on the area and season. For women, the daily wage ranges from 120 to 200 BDT. Additionally, most women are also responsible for agricultural activities in their own homestead gardens, and supporting relatives and neighbours in harvesting. They do not receive any payment for such activities.

Normally, the floods take place during the lean season (from June to September), when labourers are not working, so the floods have no immediate impact on their income. However, the disaster does exacerbate their food and economic insecurity as they have to face some extraordinary expenses, such as repairing their houses and replacing damaged household items. Floods, destroying a small-but still important-source of food and income, often wash away homestead gardens and poultry.

During the floods as well as in the lean season, most households employ a series of common coping mechanisms or strategies. Table 5 below shows the frequency the coping strategies are used and how harmful they are perceived to be by interviewees.

¹⁶ Detailed data around income and expenditures gathered in three focus group discussions can be found in the annexes

¹⁷ The essential food basket is calculated to provide the required 2,122 kilocalories per person per day

¹⁸ Results of the HDDS (Household Dietary Diversity Score) can be found in Annex 5

Table 5: Coping Strategies in Sirajganj

Negative or irreversible coping strategies most commonly undertaken during lean season or flooding		
Rank in terms of frequency	From less to more harmful to their food and economic security according to community members point of view	
	Less harmful	More harmful
1		Taking a loan This is the most common strategy used to cover basic needs during the lean season
2	Selling livestock A common strategy both during the lean season to realize income to cover basic needs, as well as after the floods when HH's can no longer keep the livestock	
3		Credit from retailers to buy food
4		Change eating habits Limiting portions at meal time/ eat less meals a day/ eat cheaper food even if the diet is imbalanced
5	Migration In the assessed communities around 12% of the families have a member that migrates	
6		Early marriages Poor HHs organise an early marriage for their female child to reduce HH expenses

In terms of landless agri-labourers priorities and preferred humanitarian assistance and support, respondents clearly preferred **alternative sources of income** (in addition to agri-labour opportunities) to cope with the shortage of income year-round, and especially during the lean season. **Cash for work** schemes after flooding were also mentioned as a desirable form of support.

Gap analysis for Targeted Households in Korail: Sphere standards dictate that the minimum volume of drinking water needed per individual per day is 3 litres, and the total daily need, which includes water for hygiene and for cooking is between 7.5 and 15 litres, depending on the context.¹⁹ As indicated in Table 6 below, the baseline average consumption of potable water per household per day is 18.85 litres, which meets sphere standards, assuming all of that water consumed really is clean. Comparing the volume of potable water consumed per household in the baseline scenario with the amount of potable water consumed in the emergency scenario reveals the average shortfall, measured in litres, per household per day. Based on data from the field, the average targeted household in Korail faces 60 days of inundation over the course of a year. The total gap is the average shortfall of the volume of potable water per day multiplied by the number of days of shortfall. As revealed in the table below, this rough calculation reveals a total gap of 283,800 litres of water per year across the 1,000 targeted households.

¹⁹ The Sphere Project, "Water supply standard 1: Access and water quantity", <http://bit.ly/1PvnmbM>, accessed December 26, 2015

Table 6: Korail Potable Water Household Gap Analysis

No. Targeted HHs	Avg. potable water consumption per HH per day (Baseline)	Avg. potable water consumption per HH per day (Emergency/ Inundation)	Gap in litres, per day per HH	Gap duration in days during 1 year	TOTAL GAP (litres)
1,000	18.85 ltr	14.12 ltr	4.73 ltr	60 days	283,800

The seasonality of the income and expenditure patterns of the targeted household are displayed in Table 7, which shows that the largest effect of an emergency is a nearly 20% dip in household income. This indicates that the market systems that support the households are quite resilient to seasonality and even disaster, but household incomes are considerably more sensitive.

Monthly household income/ expense	Avg. Baseline (BDT)	Avg. Emergency (BDT)	% Change	Difference (BDT)
Income	12,100	9,750	19%	2,350
Expenses	10,640	10,371	3%	268

Table 7: Korail Household Income and Expenditure Profile

Gap analysis for Targeted Households in Sirajganj:

Total pop. (HH)	No. landless HHs that rely on ag.	Cost of monthly minimum expenditure basket (MEB) for an average landless rural HH's size of 4 members ²⁰ (BDT)	Avg. annual HH income/ expenditure ²¹ (BDT)	Avg. HH monthly shortfall (BDT)	GAP (BDT)	Duration in months	TOTAL GAP (BDT)
185,485	64,779	8,746	6,844	1,902	123,209,658	12	1,478,515,896

Table 8: Income Gap analysis, Sirajganj Target Group

The gap analysis for the agricultural labour market-an income market-is calculated as income shortfall at the household level. In this PCMMA exercise, the household shortfall in income was calculated on the basis of current household income compared to the cost of the minimum expenditure basket. As per the current income levels, three focus groups discussions were held, following the HEA methodology to gather information on income and expenditure. The focus group discussions were held in three different localities with representative members of the landless

²⁰ Equals to Upper Poverty Line in Rajshahi as per HIES 2010, adjusted with historical inflation (2010 to 2015)

²¹ Calculated by adding all the income during the 12 months and divided by 12

agricultural workers. In all three focus group discussions results, there was a substantial gap between the income and the expenditures declared, with the declared expenditures almost double the income. The explanation from the interviewed groups was that during the lean season households “survive” thanks to the loans, which explains the difference between income and expenditure. However, this is not a valid explanation as the gap appears when looking at the whole year and across years. A potential reason around the inconsistency is that expenditures are overestimated, especially during the lean season where, despite the shortage in income, expenditures remain practically the same. Another hypothesis is that income was under-declared. According to the information provided, the income would be more than 50% below the upper poverty line and even considerably below the essential food basket cost.

After triangulation with secondary data (HIES 2010), and to allow for a “good enough” income gap calculation, a conservative approach was adopted: The income considered in the calculations is equal to the expenditures declared which is most consistent with secondary data around landless rural income levels. For the minimum expenditure basket, the reference used is the Upper Poverty Line calculated in the 2010 HIES (Household Income and Expenditure Survey) for the Province of Rajshahi-where Sirajganj is located-by the Bangladesh Bureau of Statistics (BBS) with the support of the World Bank. In the absence of more updated data, the 2010 upper poverty line for Rajshahi was adjusted for inflation. The upper poverty line is calculated on three steps: first, the value of the essential food basket-a food bundle that consists of eleven items: rice, wheat, pulses, milk, oil, meat, fish, potato, other vegetables, sugar, and fruits that provides minimal nutritional requirements corresponding to 2,122 kcal per day per person-is settled at the cost of the selected items and required quantities in the province. As a second step, the cost of other essential non-food items and services such as education, health, clothing, transportation, utilities, etc., is obtained by taking the median amount spent for non-food items by a group of households whose per capita food expenditure is close to the value of the essential food basket. This is called the “upper non-food allowance”; finally, by adding the value of the essential food basket to the upper non-food allowance one can have the minimum expenditure basket that corresponds to the Upper Poverty Line in Bangladesh.

The average monthly income shortfall is around 1,900 BDK, which is almost 22% below the cost of the minimum expenditure basket. This shortfall is very irregularly distributed along the year: during April and May income is above the MEB, in January, February and March income almost equals the MEB, and for the rest of the months of the year, income is below the MEB. Taking into consideration the seasonality of income, it is clear that the reduced income during the lean season undermines economic security during the whole year.

The table below reflects the variation in the income levels along the year. Although we need to be cautious with these data- as already explained- it still serves to illustrate how seriously seasonality impacts on economic security.

Agro labour involved only in agriculture												
Income source	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Agri Labour (Male)-rice, mustard	5500	5500	6600	8800	8800					2000	2000	2000
Agri Labour (Female)-rice, mustard	2400	1200	1200	2000	2000					1200	1200	1200
Homestead Vegetable						150	150	150	150	200	200	
Dairy Production	90	60	60	30	30							90
Poultry Production						500				1500		
Total	7990	6760	7860	10830	10830	650	150	150	150	4900	3400	3290

Table 8: Sirajganj Household Income Sources and Seasonality

Section 4: Market System Maps and Analysis

4.1: The Potable Water Market System Map in Korail

The key actors of the potable water market system in Korail are:

Dhaka WASA Dhaka WASA (also sometimes referred to as 'DWASA') is the government water supply and sewerage authority of the Dhaka metropolitan area, which is more than 360 square kilometers and contains more than 12.5 million inhabitants.

The major responsibilities and functions of DWASA are:

- Construction, operation, improvement and maintenance of the necessary infrastructure for collecting, treating, preserving and supplying potable water to the public, industry and commercial concerns
- Construction, operation, improvement and maintenance of the necessary infrastructure for collecting, treating and disposing domestic sewerage and industrial wastes
- Construction, operation, improvement and maintenance of the necessary infrastructures for drainage facilities of Dhaka

The total service area of DWASA is divided into 11 geographic zones, which includes 10 in Dhaka City and 1 in Narayanganj. There is an office for each zone and this office carries out the responsibilities of engineering operation as well as revenue activities. DWASA provides approximately 2.11 million cubic meters of water per day to Dhaka.²²

Dhaka North City Corporation Dhaka City Corporation (DCC) North is the self-governing corporation that is associated with the task of running the affairs of Dhaka. The incorporated area is divided into several wards, each with an elected ward councillor. There is a wing to support slum dwellers called the 'Slum Development Wing' under the Social Welfare and Slum Development Department of City Corporation. The Slum Development Wing is charged with oversight or delivery of:

- Housing and shelter for the slum and squatter dwellers.
- Increasing the potable water supply for slum dwellers
- Improving sanitary conditions at slums
- Improving drainage systems at slums
- Providing footpaths for slums
- Improving street lighting at slums
- Improving the garbage disposal system at slums
- Providing pre-primary, grade-1 and 2, adult literacy and informal education to urban slum dwellers
- Providing micro-credit for self-employment and income generation activities

Ward Counselor As per the City Corporation Act of 2009 (amended in 2011),²³ one councillor from each ward is elected by the area constituents. Ward Counsellors are authorized to attend the DCC general meeting and standing committee meetings, and can formulate development plans relating to their wards with assistance from the staff of the zone executive office and submit it for inclusion in the DCC's development program. Counsellors also monitor ward-level services of the DCC. Ward Counsellors have considerable political influence, and coordination with their office should be a consideration in programme design.

²² Taqsem A. Khan, "Dhaka Water Supply and Sewerage Authority: Performance and Challenges"

²³ <http://bit.ly/1OcURP6>, English translation not available.

Manufacturer Manufacturers are companies that manufacture materials (water pump, pipe, filter etc.) for the Dhaka water supply system. DWASA purchases the materials directly from manufacturers, but Korail inhabitants cannot do so legally.

Local traders/wholesalers of water supply materials Local traders (wholesalers and retailers) are the key service providers for the slum dwellers. Local traders purchase the water supply materials from the whole sellers and sell it to the local people. Supply materials include pipe segments, pipe joints, and hand pump parts. The slum dwellers can purchase the materials easily from these traders, who are situated in and around Korail. Wholesalers are service providers who purchase the materials from the manufacturers and sell it to the local traders.

Vending Machine There is currently one water vending machine located in Korail. Installed by Oxfam, water from it costs .25 BDT per litre, and it can produce 4,000 litres of potable water per hour. It is hooked up to a DWASA point, and treats the water before vending it. The machine currently serves 150 households. The machine cost almost 5.9 million BDT, but is self-cleaning and came from the manufacturer with one year of free maintenance. The vending machine is well regarded and has proven reliable thus far.

D-WASA Pipe Water Supply Pipe Water Supply is a system of water supply network built by Dhaka WASA, which treats approximately 450 million litres of water per day at the Saidabad Water Treatment Plant.²⁴ Slum dwellers have access to water supply from legal and illegal connections to the DWASA infrastructure. DWASA water accounts for 75% of water consumed by households in Korail. Daily HH water use varies from less than 100 litres to over 300 litres, at .01 BDT per litre; water connections are mostly metered (at community point or at HHs level) in the slums and most platforms of water sources are made of concrete.

Community-based water supply system Community based pipe water supply is a pipe network water supply arrangement. This includes a deep tube well which pumps water up to a raised storage tank. Head pressure from the storage tanks pushes water to households through a network of pipes installed and managed by a group of community members by their own financial and physical efforts. Across Korail, community wells and their pipe networks form a series of hubs. Households located in the gaps between the hubs must gather water from their water-connected neighbours, or go on foot to gather water from a public water point.

Deep tube well Tube wells are installed to tap deep aquifers where the water table is very low. Tube wells are operated with a submersible electric pump, and the well itself consists of a pipe, 10cm to 20cm in diameter, bored into the ground to the water table. A strainer at the base of the pipe keeps out grit from being sucked up into the pipe by the pump placed at the wellhead. WASA runs 600 deep tube wells in Dhaka to extract water, and there are also 2,000 private tube wells throughout the city. About 87 percent of Dhaka's water provided by WASA comes from tube wells extracting ground water, while the remaining 13 percent use treated surface water. Tube wells have a limited horizon of reliability: according to an undated report from WASA, "the upper and lower aquifers of Dhaka city are about to exceed its withdrawal limit. Ground water depletion is occurring at alarming rate, [and] in most places the layer of ground water has been decreasing by two to three meters each year due to the lifting of ground water."²⁵

Contractor A person or firm that undertakes a contract to provide materials or labour to build the Water supply system. The contractor works as per the direction of Dhaka WASA.

²⁴ Dhaka Water Supply and Sewerage Authority Annual Report, 2011-2012, page 33

²⁵ Taqsem A. Khan, "Dhaka Water Supply and Sewerage Authority: Performance and Challenges", page 13

Slum dwellers engage contractors to install the community based water supply system: wells, water points, and pipes.

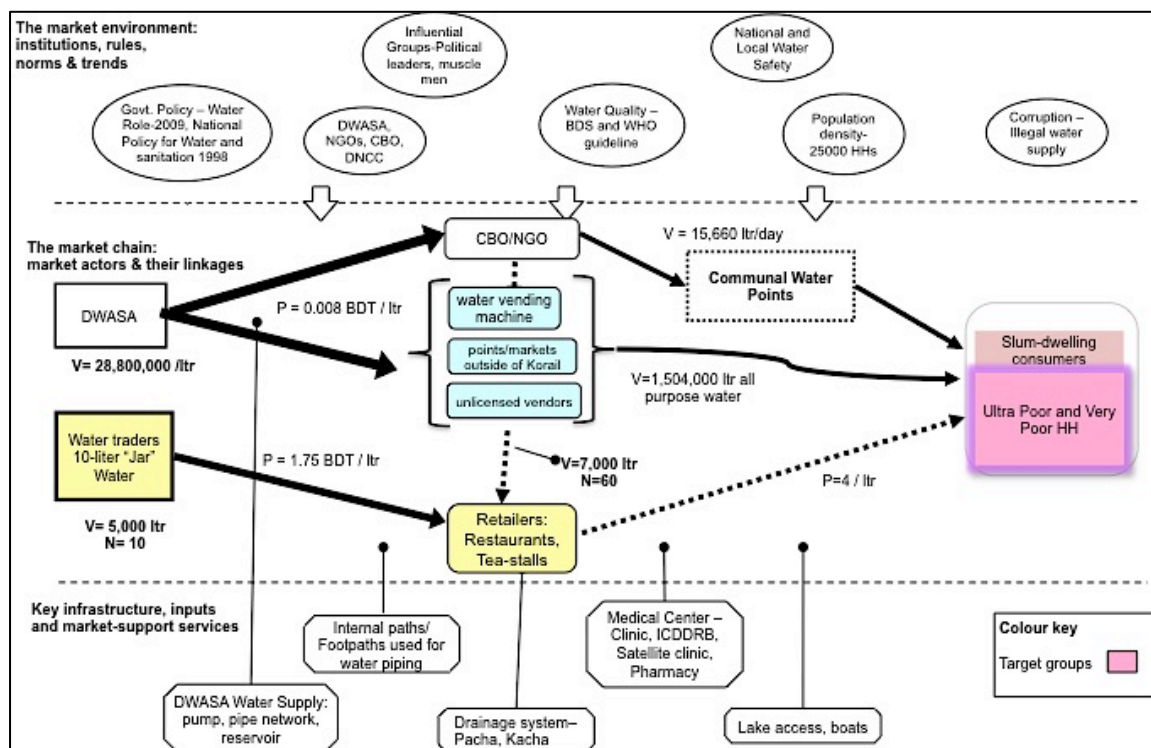


Figure 1: The Potable Water Market Baseline Map for Korail

The sources of water, the total volume output from each source, the price per litre, and the number of target households served are displayed in Table 9, below. The figures represent the baseline situation. In the event of an emergency, unlicensed vendors typically stop all supply, but all other suppliers remain roughly the same in the volume of water provided and the price per liter. What changes is consumer preferences: consumers know that water in Korail is contaminated, so they obtain more or all of their drinking water from other sources in Korail and in nearby areas.

Table 9: Korail Market System Actors

Type of Suppliers	Total volume per day (baseline and emergency)	Price per litre, BDT	Number of targeted HH served
WASA	15,660	.01	783
Vending Machine	200	.25	10
Illegal Suppliers	3,140	.012	157
Market retail (10 litre jar)	1,000	4	50
Total	20,000		1,000

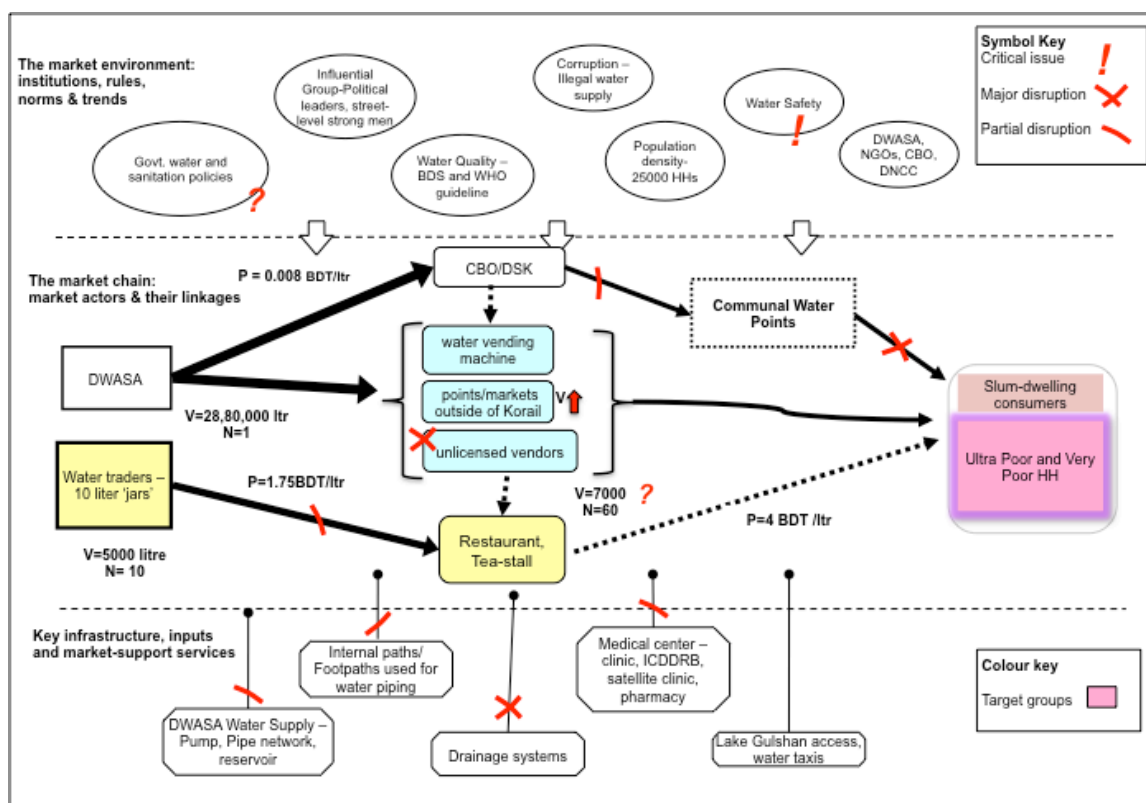


Figure 2: The Potable Water Emergency Scenario Market Map for Korail

Figure 2 above is a map of the anticipated emergency scenario, and the effects that emergency will have on the various actors and elements of the market system. The key findings, which also reflect an emergency scenario, are summarized in Table 10 below.

Key Actor	Key Findings	Implications for Response
Most vulnerable households	HH's access water year-round, but widespread water contamination is a constant and seasonal factor.	Agencies should help to ensure that households have access to treated water and/or water treatment options
	Environmental hazards from total breakdown of drainage systems raise the general health risk profile	Management of human and solid waste is key risk factor that impacts preparedness, resilience and recovery.
	Households change their sources of potable water based on perceptions of cleanliness and contamination, and exercise those choices in the market	Households are accustomed to changing their potable water sources, and are experienced in interacting with the market. As such, market-based interventions are appropriate.
DWASA	DWASA infrastructure is compromised by contamination during the rainy season	Water from DWASA water points in Korail should be treated before HH consumption
Water access outside Korail	Water vendors and water points outside Korail increase substantially in importance (and volume of water dispensed) during emergencies	Households affected by inundation and waterlogging in Korail are spending time, effort and money on safe water: cash or direct provision

		of water is advisable
Medical center/clinic	The constant exposure to environmental hazards makes access to medicines and medical care key for targeted households. Lost income due to illness is a significant economic effect of inundation and waterlogging	Health interventions, including provision of medicines and medical care should be considered as a component to a cross-sectoral response

Table 10: Key Actors and Key Findings for Korail

4.2: The Agricultural Labour Market System Map in Sirajganj

A Brief Overview of Key Agricultural Issues: Bangladesh is unrivaled in its challenge to feed such a large population from such a limited area of land. The population of Bangladesh is still growing whilst the amount of agricultural land available is declining. Every year, over 60,000 bhas of agricultural land is being lost in Bangladesh due to urbanisation or degradation.²⁶ Moreover, land inheritance patterns are also impacting in agricultural performance by reducing farm-level scale of cultivation: the average farm size has been dramatically reduced over the last decades, with many farmers cultivating less than subsistence plantations.²⁷ In turn, this reduction in farm size has exerted downward pressure on the demand for farm labour, with a concomitant shift of some part of the labour supply to other, non-agricultural activities.

Some constraints to agricultural production in the area of study are:

- Lack of sufficient land to cultivate, increased landlessness
- Lack of capital to invest in mechanization or other measures to increase crop productivity
- Difficulty accessing agricultural loans
- High and increasing prices for agricultural inputs, including chemical fertilizers and pesticides
- High irrigation costs: irrigation costs can average one-quarter the total value of production
- Lack of agricultural services as government extension services often only benefit rich farmers
- Poor harvest storage facilities
- Poor transportation and marketing, particularly during the flooding season, which often results in farming households prematurely selling their produce at low prices.
- Flooding and untimely rains disrupt production, and often undermine agricultural production.

The key actors of the Sirajganj agricultural labour market systems are:

Agricultural labourers. There are an estimated 97,169 males and 19,433 females in Sirajganj Sadar Upazila whose primary and often only source of income are wages from agricultural labour. Men engage mostly in land preparation, planting and harvesting of three different rice varieties, as well as wheat, sesame seeds, radishes, potatoes, cord fibre and some leaf vegetables. Women are hired for agricultural activities like weeding rice fields and mustard cultivation. Wages differ from men to women with no apparent reason; wages also vary along the year depending on the demand of agricultural labour, the geographic location, and the nature of the activities. Besides the daily wage, agri-labourers receive a meal of rice with daal and vegetables.

²⁶ Food and Agriculture Organization of the United Nations, "Agriculture statistics Bangladesh: the importance of agricultural statistics in Bangladesh," 2014 <http://bit.ly/1OtIKc7>, accessed December 27, 2015

²⁷ Rural Bangladesh Socio-economic profiles of WFP operational areas & beneficiaries, 2006, WFP

Landowners, large-scale constitute a small minority. “Large scale” status is conferred to those who own around 100 bighas or more of agricultural land. Measurement of bighas varies, but is between one third and two fifths of an acre. On large farms they cultivate rice and other crops that are sold in local markets. Although most large-scale farmers still live in the community, there is a trend to migrate to urban areas to engage in more profitable business there, whilst hiring someone to manage their plantations. The level of mechanisation and investment remains low in the haor lands, as the land there is sandy and less desirable for agriculture, relative to the neighbouring plains.

Landowners, medium-scale own and cultivate between 30 to 50 bighas. Plots of that size ensure HH economic security. Medium scale landowners are not always directly involved in their plantations and often hire all the required manpower.

Landowners, small-scale The extension of the plantations for this group is around 10 to 30 bighas. Usually farming is their primary livelihood activity and family members are directly engaged in cultivation. Small-scale farms often need to source extra manpower from outside the family. Small-scale farms can be severely affected by flooding, especially if floods arrive during the harvesting time, which can compromise their ability to plant in the next season without resorting in unsustainable levels of indebtedness.

A high percentage of landowners’ properties are below 10 bighas²⁸ in size. In such cases, the families themselves are able to cultivate their lands and thus, there is no need to hire agricultural labourers. Moreover, in most cases the size of the land is often not productive enough to ensure the small farmers economic security, and they often fall under the poverty line. This category has not been included as an actor in the market ma, as they do not hire landless agricultural labourers.

Government safety net programs. There are several government departments that implement safety net programs. These programmes attempt to address the most vulnerable households’ food insecurity during the lean season, although the seasonal distribution of public food supplies frequently expands to other months. The safety net programs often aim to link long-term development goals with medium-term food security. For instance, the food-for-education (FFE) programme is one of the most significant of the safety nets programmes operating throughout rural Bangladesh.

NGOs - Cash for work schemes. NGOs implement post disaster rehabilitation works targeting the ultra-poor (lowest 10th percentile) and HHs with disabilities and/or other socio-demographic characteristic of vulnerability. NGOs are not significant market actor during normal times (baseline map), but they do play a role in the market system when implementing cash-based interventions, often related to flood damage remediation in the emergency recovery phase.

The key infrastructure, inputs and market support services of the Sirajganj agricultural labour market systems are:

Loans from Banks There are two types of banks that target famers: Agricultural development banks such as Rajshahi Krishi Unnayan Bank (RAKUB) and other government or private commercial banks that have some initiatives to support the agricultural sector and follow the central bank regulations and policies. Loan interest rates are 11-12% and agricultural support loans range in value from 20,000 to 3,00,000 BDT. As there are collateral and documentation requirements only big and medium-size landowners can access such loans. There are some mechanisms to reschedule

²⁸ “There are no up-to-date figures on land distribution and average farm size, but approximately 80 percent of farm households are classified as small (between 0.02 and 1.0 hectares, with an average farm size of 0.35 hectares) and they account for about 40 percent of the agricultural land area”. “On solid ground: addressing land tenure issues following natural disasters”, United Nations Human Settlements Programme and United Nations Food and Agriculture Organization, 2011

payments after a disaster. Despite the perception that providing loans to erosion-prone and chronically flooded areas entails major risks, there are no related restrictions. Loans are also provided in post-disaster scenarios.

Microfinance Institutions (MFI) In Sirajganj as in all of Bangladesh, there are four main types of institutions involved in micro-finance activities. These are 1) Grameen Bank (GB), a member-owned specialized institution; 2) Non-Governmental Organizations (NGO) like BRAC, Proshika, ASA, BURO-Tangail, BEES, CODEC, SUS, TMSS, and Action- Aid; 3) Commercial and specialized banks like Bangladesh Krishi Bank (BKB), Rajshahi Krishi Unnayan Bank (RAKUB); 4) Government sponsored microfinance programs like BRDB, RD-12 and others which are run through several Ministries (Ministry of Women & Children Affairs, Ministry of Youth & Sports, Ministry of Social Welfare, etc.). All these programs target landless rural poor.

All the MFIs provide mostly small, un-collateralized one-year loans to individuals belonging to jointly liable peer groups, and they use similar on-site loan disbursement and weekly collection methods by forming village organizations or centres.

There is no special package for agricultural labour but loans are provided for agriculture across the different seasons. There is a common trend of landless agricultural labourers in the flood-prone areas of Sirajganj taking a loan before the disaster/lean time of year, to meet their basic requirements during lean period. The common interest rate of such loans is 13-15%, which is higher than the loan products from the commercial banks that this target group cannot access.

Moneylenders This is a traditional system in rural areas. Borrowers, mostly poor HHs, resort to moneylenders for additional funds because of insufficient supply from microfinance institutions during the months of “no-income” to cover their basic needs. Poor households also borrow from moneylenders to meet repayment schedules from other loans. Moneylender interest rates are the highest in the market, which makes them the last resort for poor HHs and their use an indication economic insecurity.

Local market for agricultural production (paddy and vegetable production) In Sirajganj there is one big vegetable market where retailers from all the whole area travel to purchase vegetables. Retailers can also buy from wholesalers as well as directly from farmers close to their communities. Some small farmers sell their produce directly in the village market. Generally, the profit for retailers ranges between 2 and 3 BDT per kg. In terms of rice, Sirajganj Sadar Upazila as well as Sirajganj face shortfall. Most of the farmers sell their rice at the nearest market, which is known as ‘hat’ (village market), others sell their production to middlemen. In recent years there is an increasing trend to sell the paddy production directly to the rice millers who process the rice and sell it at the district level. There are 364 rice millers in the Sirajganj upazilla level who generally purchase rice from wholesalers, (‘Mokadems’), who collect rice from resellers, (‘hat’), and directly from farmers.

Fuel and electricity Fuel and electricity are essential for irrigation. In the haor islands (unlike in the planes), most famers don’t have access to electricity for irrigation purposes, and thus, fuel is needed to run irrigation equipment. The price of fuel and electricity has a high impact on the irrigated produce price as well as the access to government subsidies for fuel. In general, haor island farmers are uninterested in cultivating products that depend on regular irrigation.

Agricultural inputs such as seeds, fertilizer, pesticide, and machinery are all required items that are available in the market most time of the year. However, when severe floods occur, roads can remain impassable for a period of some days, causing brief shortages of agricultural inputs.

The market environment in Sirajganj is characterised by:

Seasonality The majority of landless agricultural workers suffer from a chronic seasonal hunger period during the lean season that lasts at least from June to September. There are no agricultural

labour opportunities; only 20% of households have alternative, non-agricultural income opportunities. To cope with this “no income” period, some families have a member that migrates to Dhaka, many must sell their cattle – often only one head- and poultry and, the majority of them have to rely on a series of loans to cover basic needs. Monthly household income can vary along the year from around 10,000 BDT in April (the peak season) to 150 BDT during June, July, August, and September. November and December are also months with low income.

Men work in the field around 22 days a month from January to May; 0 days from June to September, and 10 days from October to December. Women work 20 days a month only on January, and 10 days a month for the rest of the year, except for the lean season where they do not engage in any paid agricultural labour.

Government of Bangladesh Department of Agriculture Extension (DAE) The DAE provides support to farmers in areas such as: provision of equipment, fertilizers, pesticides and seeds for developmental purposes as well after disasters. The DAE also undertakes agricultural research to development new technologies; skills development and technical support from the extension workers; support to women to enhance empowerment, and farmer credit schemes.

Department of Social Service The Upazila Social Services Department provides social safety net services for the ultra-poor, microcredit loan products, veterans benefits, allowances to the elderly scholarships for the disabled, and grants to small CBOs and NGOs.

Migration During flooding and lean season months around 12% of agri-labourers migrate to Dhaka to seek alternative income to sustain their HHs for the lean period. Whilst in Dhaka they usually engage in activities such as rickshaw pulling, construction work, and other unskilled labour.

Access to khas²⁹land Although there is available khas land in the upazila that is theoretically accessible to poor households for productive purposes, landless agri-labourers do not have real access to this land. Instead, rural elites are appropriating the land for their own purposes, which do not benefit landless HHs.

Sharecropping and lease Some farmers are leasing or sharecropping, whereby they have a contract with the landowners, explicitly stating terms and conditions. Sometimes sharecroppers and leaseholders pay a rental fee, other times their payment obligation is structured as a percentage of the harvest.

29 State-owned land often located in marginal areas along the coasts and rivers

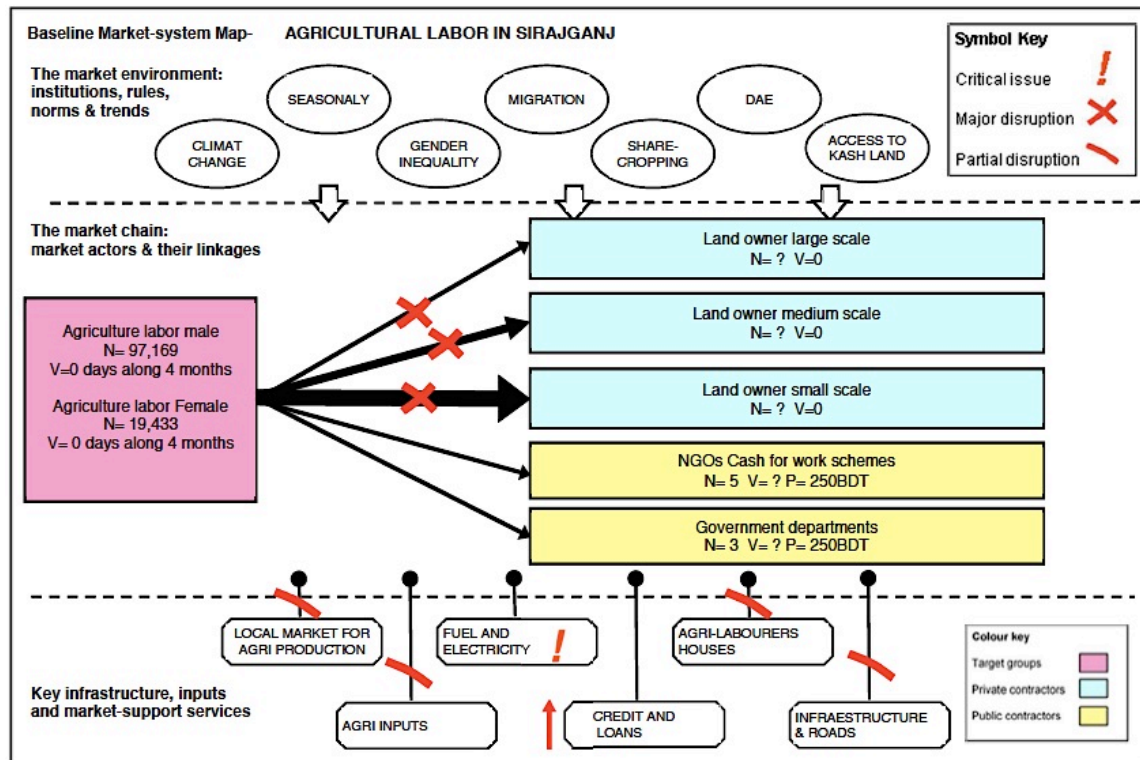
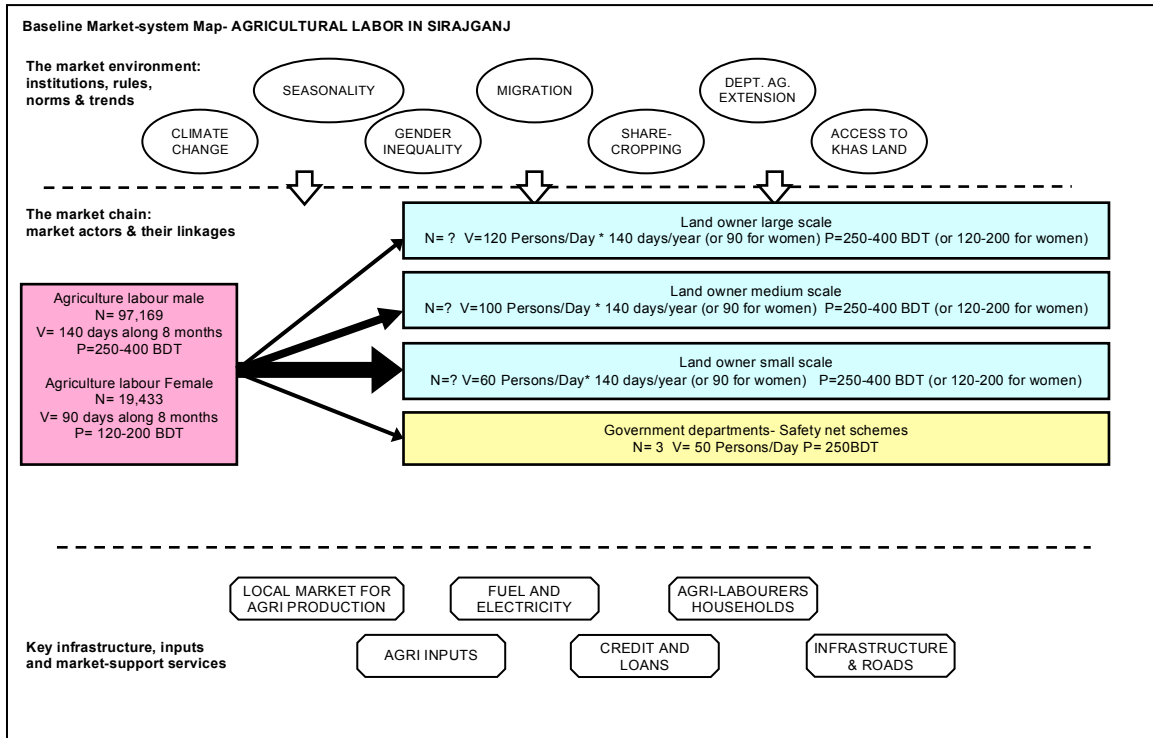


Figure 3: Sirajganj Agricultural Labour Baseline and Emergency Market System Maps

Key elements of the Sirajganj agricultural labour market systems impacted by the floods

Floods take place in the lean season, with is already a chronic emergency situation for the agri-labourers. As reflected in the maps, there is no agricultural work available. Floods can have additional impacts, affecting the market system and a) the access of agri-inputs for famers might be reduced due to lack of supply due to damage on roads and infrastructure; b) the price of the fuel can increase, which has a negative impact on irrigated crops; c) houses of agri-labourers are often damaged; and d) the demand for credits and loan increases substantially after floods.

Section 5: Comparing the Gap in Needs with Market Capacity

Gap and Market Capacity in Korail: The gap in needs-an estimated 283,800 litres per year-can easily be supplied by the market. Indeed, Korail residents already obtain water from alternative sources in the rainy months, by purchasing water from private water points in nearby areas, purchasing directly from retailers, or treating locally obtained water at home. The water market system in Korail is deeply integrated with the larger Dhaka marketplace, which is competitive and robust. There are myriad private sector and non-profit actors involved in the sale and distribution of water in and around Korail, creating a resilience of supply in emergency scenarios.

Gap and Market Capacity in Sirajganj: The agricultural labour market system capacity to cover the gap in agri-labourers' household income is extremely limited. Indeed, the supply of manpower exceeds demand all year, except the two months at the peak in agricultural activities- the harvesting period-and to a lesser extent on January to March. For the rest of the year, it is evident that the demand is insufficient to absorb the supply. This is especially true during the four months of the lean season where any single agricultural activity takes place.

In regard to the emergency years, when severe flooding occurs, there is no significant difference in terms of agricultural manpower demand compared to a normal (baseline year). Normally, during the lean season-when floods occur-there is no demand for agricultural labour. There is very little agricultural labour market expandability during the lean season. Agricultural labour market could expand during October, November and December if vegetable production increased. In general terms, the constraints explained above in this report prevent expansion that would meaningfully impact the demand for agricultural labour.

Agri-labourers move within the same Upazila in the search of a daily work but not further. When the lean season takes place it does not make sense to move to another area in the search of work, only to find the same lack of labour opportunities. When agri-labourers decide to migrate they move to Dhaka, where there is a greater possibility of finding work, and where wages are higher. The agricultural labour market is competitive both in the normal years as well as in the emergency years, and there are many actors, so there is no great concentration of market power.

Key Analytical Questions for Sirajganj

Key Analytical Question 1: *What is the capacity of the agricultural labour market to cover the gap in household income for landless agri-labourers in both baseline and emergency years, as well and especially during the lean season?*

At present, the market (and its demand of agri-labour) can only ensure the agricultural landless households economic security (their ability to cover their essential basic needs) for five months out of the year, assuming men work 22 days/months with a 'high' salary. During the lean season and last term of the year demand remains extremely low: from 0 to 10 days a month with low salaries for both men and women. In fact, the lack of or meagerness of income for seven months each year makes landless households economically insecure all year long.

As no agricultural activity needs to take place during the lean/floods season, it seems obvious that in the investigated area, there is no capacity for the agricultural labour system to cover the gap in household income. Moreover, although a very significant percentage of Bangladesh's population relies on agriculture to make a living, this sector is in decline, with less land available for cultivation, more manpower available as agri-labourers. With the current constraints faced by the small landowners to expand their plantations and/or increase their productivity, it is unlikely that the demand for agri-cultural manpower will increase in the short or medium term.

Key Analytical Question 2: *What kind of support/intervention can be provided to the landless agricultural labourers to improve their access to labour opportunities and other sources of food and income options during and after the floods, in the lean season as well as in normal times?* The response to key analytical question one shows that the agricultural market is not able to absorb all the available manpower. Therefore, the main strategy to support landless labourers to cover their gap focuses on enhancing their ability to diversify their sources of food and income with new income generating activities (IGAs), as well as strengthening some already existing secondary sources of food and income such as homestead gardening, poultry and livestock.

Livelihoods diversification should focus on providing new income opportunities for the "no income" months (basically the lean season/flooding season), but also during the last term of the year.

Vocational training and training on small-scale IGAs-which has to include entrepreneurship and micro-business financial management skills, and literacy and numeracy when required-is a recommended option. A starting point should be identifying the IGAs niches. As floods are recurrent during monsoons in Sirajganj Sadar Upazila, IGAs adapted to flooding season need to be identified. Indeed, in the response recommendations there are potential activities to be explored.

Livelihoods strengthening should look at the already existing secondary livelihoods strategies that households take to complement the income from agri-labour. Support should be provided to improve and expand these activities. During the emergency and early recovery phases, emergency unconditional cash should be used to cover basic needs, conditional cash used for small-scale farmers to hire agri-labourers, and cash for work used for DRR-related projects at community the community. Under disaster mitigation and climate change adaptation, vouchers for flood resistant paddy varieties is an option to be further explored.

Finally, although PCMMA is not meant to recommend developmental interventions, the team considered it appropriate to include the option for the creation of agricultural cooperatives. The graduation development model used to good effect by BRAC in rural Bangladesh is also appropriate and encouraged for Sirajganj.

The Key Analytical Questions for Korail

Key analytical question 1: *What are the different options households have for clean water, and how do they exercise those options?*

Households have many options for clean water, and their typical choice of which option is exercised varies by season. The houses on the edge of Korail don't often have direct access to a water point, so for a fee they use a neighbor's water point, a publicly accessible water point, purchase from a retailer, a vending machine, or an illegal water distributor. Households collect their water in 10 litre 'jars', 10 litre Jerri cans, 20 litre 'pitchers', or 10 litre bladders, which they fill themselves and transport to their houses on foot or with the aid of a cart. During times of inundation and waterlogging, water points in Korail are often contaminated, especially shallow wells and those whose which are connected to WASA points or wells via plastic pipes placed on the ground, in ditches, or in standing water.

Key analytical question 2: *Do households affected by waterlogging have access to adequate, affordable, and safe access to clean water?*

Yes. Households will sometimes but not always treat drinking water if they suspect it is contaminated, particularly during the rainy months when it is common knowledge that the risk of water-borne disease is high. Chemical treatments in the form of tablets and powder are readily available in the market. Boiling of water is also a common treatment technique. Illegal water suppliers, which source their water from WASA water points, will stop selling water during inundation times, and household members will often travel on foot or by boat to adjoining neighborhoods where they can fill portable containers from private or public water points deemed safe or at least safer than water points in Korail. Access to water and water treatment techniques cost money, but even for the poorest 30% of the Korail residents, the cost of obtaining and treating water represents only about 2% of monthly household expenditure.

Section 6: Main Recommendations

Table 11 presents the key recommendations resulting from the PCMMA findings. A longer list of response options for Korail can be found in Annex 3, and in Annex 4 for Sirajganj. The key response recommendations in Table 11 represent the responses that answer the key analytical questions for Korail, and best represent the needs of the target beneficiaries, and what is most feasible and impactful. The logic of two of the three recommendations below directs the humanitarian community to responses that rely on the market system performing well. The third option, mobile water treatment plants can be implemented in place of or as a complement to market-oriented responses. Indeed, given the sheer number of residents in Korail, a large natural disaster event would likely require responses across modalities and sectors.

Table 11: Recommended Responses for Korail

Activities	Risk & Assumptions	Timing Issues	Effects on Market & Population	Indicators
1. Unconditional Cash Transfer (Cash in Envelope)	<ul style="list-style-type: none"> Security issues Corruptions (Biasness in selecting beneficiaries, influential group) NGOAB Approval (Time consuming) Market functional 	7-15 days	<ul style="list-style-type: none"> Purchasing capacity increase for beneficiary on own choices Meeting basic survival needs Market stability 	<ul style="list-style-type: none"> Value of total transfer Frequency of meal % of HHs using negative coping mechanism HH income/ expenditure HH income > expense
2. Mobile Water Treatment Plan	<ul style="list-style-type: none"> Availability of treatment plant/accessories Skilled Human Resources Machine disorder 	24-72 hours	<ul style="list-style-type: none"> Access to safe drinking water without traveling outside Korail 	<ul style="list-style-type: none"> # of affected HHs getting potable water % of water consumed @ HH is potable
3. Distribute Water jars from Local/ National market traders	<ul style="list-style-type: none"> Ensure water quality Inclusive distribution Preparedness/ Framework Agreement with traders/ suppliers Coordination with other NGOS, INGOs & other stakeholders 	6-24 hours	<ul style="list-style-type: none"> Access to safe drinking water via familiar source Market actors benefit from procurement 	<ul style="list-style-type: none"> # of affected HHs getting potable water % of water consumed @ HH is potable

The key response recommendations in Table 12 below represent the responses that answer the key analytical questions for Sirajganj, and best represent the needs of the target beneficiaries, and what is most feasible and impactful.

Table 12: Response Recommendations for Sirajganj

Response recommendations	Assumptions and risks	Timing issues	Effects on markets and populations	Indicators
Preparedness, DRR and Resilience building through ensuring alternative income during floods				
Vouchers to introduce flood resistant rice varieties	<p>Retailers and farmers are interested and willing to engage into the program</p> <p>The variety does not fit with the local population taste</p>	Before the normal planting time	<p>Crops can be harvested even if the floods occur sooner than usual during the harvest time (in may)</p> <p>Agri labourers engaged in their normal harvesting works, reducing the impact of the floods in the labour market</p>	<p># vouchers redeemed in the shops</p> <p>Production of Rice</p>
<p>Alternative sources of income for the agri-labourers during the floods</p> <p>These initiatives need to be done in advance as preparation activities to support the agri-labourers to cope with the floods through alternative sources of income</p> <p>Some suggested income generation activities could be:</p> <ul style="list-style-type: none"> - Fish culture in box - Floating vegetation - Provide fishing equipment so as that agri-labourers can engage in fishing during flooding time 	<p>New initiative in this area, needs to be piloted</p> <p>New activity for this areas, needs to be piloted</p> <p>Training and technical advice needs to be provided, as it requires technical knowledge</p> <p>Future management, maintenance and storage of equipment (specially fishing equipment) needs to be agreed and ensured for sustainability</p> <p>The appropriate fish species might not be available in the area at that time</p> <p>Very low risk that they sell the equipment during the next lean season</p>	Immediately during flooding	<p>Can provide quick cash during the floods time</p> <p>Prevent food and economic insecurity</p> <p>Provides and alternative source of income during the floods</p>	<p>Number of box functional</p> <p>Kg of sold fish from boxes</p> <p># floating vegetation gardens</p> <p># people engaged on fishing</p> <p># people engaged in the program</p> <p># HHs able to meet their basic needs (livelihoods protection threshold)</p> <p># HHs eating three meals a day</p> <p># HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times)</p> <p># HHs engaging in negative coping mechanisms</p>

Preparedness, DRR and Resilience building through ensuring alternative income during the lean season				
<p>Agri-labourers livelihoods diversification: Support to get alternative skills to engage in alternative livelihoods especially during the lean season</p> <p>This means:</p> <ul style="list-style-type: none"> - To identify niches of work/demand - To identify potential contractors - Train beneficiaries when needed (vocational and/or financial trainings) - Provide seed capital to launch IGA - Provide technical support -Crosscutting issues need to be taken into consideration 	<p>Niches of new IGA and work opportunities are identified</p> <p>The range of IGA is varied enough to avoid market saturation</p> <p>Agri-labourers are interested in gaining new skills and engaging in alternative activities during the lean season</p> <p>The agencies can engage in long-term programs as livelihoods diversification requires a long-term technical support, counseling and monitoring</p>	<p>Can take place any time but during the peak season</p> <p>This is a long term programme</p>	<p>Agri-labourers can work during the lean season months to ensure sufficient income all over the year</p> <p>Ensures economic security of agri-labourers</p>	<p>Number of new IGA established</p> <p>Number of IGA functional after 6 months</p> <p>Number of people contracted</p> <p>Number of HHs with a monthly income level during lean season equal to half of the income during planting season</p> <p>Number of HHs able to meet their basic needs (livelihoods protection threshold)</p> <p>Number of HHs eating three meals a day</p> <p>Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times)</p> <p>Number of HHs engaging in negative coping mechanisms</p>
<p>Agri-labourers livelihoods strengthening:</p> <p>Support agri-labourers to improve their income from existing alternative sources of income</p> <p>Potential activities:</p> <ul style="list-style-type: none"> -Develop poultry and livestock production -Homestead gardening (vertical gardens) 	<p>Agri-labourers are willing to engage in the program</p> <p>Agri-labourers have access to market to sell their produce</p> <p>High risk of disease with poultry</p>	<p>Can be implemented any time (except before the rainy season for the poultry and livestock)</p>	<p>Supply of proteins in local market increase</p> <p>HHs improve their income and food security</p>	<p>Number of HHs engaged in the program</p> <p>Number of HHs that get alternative income through these initiatives</p>

Emergency	Assumptions/Risks	Timing considerations	Likely effect on market and population	Indicator
Unconditional cash + emergency basic items ³⁰	Market is functional (even if partially) Price inflation	Can be implemented very quickly From 48 hours to one week after disaster for the first kick-in; to be followed by monthly unconditional cash when needed	Commodities provided purchased at central level (Dhaka), therefore no benefits at local market level for some products (tarpaulin, mats, etc.) Unconditional cash helps the recovery of the local markets systems as the grants have a positive effect on people's purchasing power	People purchases in local market Number of HHs' able to cover their basic needs (Livelihoods protection threshold) Number of HHs eating three meals a day Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times) Number of HHs engaging in negative coping mechanisms
Early recovery	Assumptions/Risks	Timing consideration	Likely effect on market and population	Indicator
Conditional cash to support poor (small scale) farmers for the planting season after the floods Cash is intended to allow farmers to hire agricultural labour for the planting season without engaging in a harmful indebtedness cycle. If/when crops where	Farmers are interested and willing to engage in the program according to the terms and conditions set by the agencies such as number of labourers that need to be hired, number of days and daily wages.	Should be ready for the land preparation and the plantation period which will happens as the waters recede (September, and October land preparation; November planting)	Reactivates the agricultural labour market as farmers will hire local agricultural labour Prevents the poor famers to get into an indebtedness negative cycle Supplies rice to the local marked	People purchases in local market Number of HHs' able to cover their basic needs (Livelihoods protection threshold) Number of HHs eating three meals a day Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times)

³⁰ This combined emergency intervention (in-kind emergency basic items + cash in envelopes) is currently commonly implemented in Bangladesh/ However, it would be worthwhile to conduct evaluations and undertake market analysis to identify which emergency items are still to be provided in kind and which ones people can easily access in the local markets; and thus emergency cash could be a more appropriate option.

severely affected by floods, and farmers are facing economic insecurity the amount of the grant should also cover the purchase of seeds, tools and other needed inputs.				Number of HHs engaging in negative coping mechanisms
<p>Cash for work to provide alternative sources of income for agri-labourers as well as to enhance recovery, disaster risk reduction and mitigation measures at HHs and community level.</p> <p>Relevant cash for work schemes could be:</p> <ul style="list-style-type: none"> - Houses plinth raising - School field raising - Pond excavation - Canal digging 	<p>Agri-labourers have the required skills to contribute to the CFW schemes – or else there is the possibility to train them- and are willing to engage</p> <p>There are work opportunities for both, men and women (especially FHHs) that take into account their diverse needs and constraints</p> <p>There is relevant housing or community works to be undertaken</p> <p>The CFW activities/schemes selected are meaningful for the agri-labourers as they can see the benefits of such works</p> <p>The daily wages are according to the ones agreed in Bangladesh</p> <p>Needs to be done before the planting season (November)</p>	<p>Can be done on September and October after the waters have receded and before most of them engage in planting. During September and October only a reduced number of agri-labourers engage in land preparation or in early planting winter vegetables.</p>	<p>Cash Injection into the community that revitalise the local markets</p> <p>Increased purchasing power for the agri-labourers</p> <p>Risk reduction benefits in their housing that will be less severely affected in future floods</p> <p>Risk reduction benefits in community assets such as schools, etc..</p> <p>Rapid impact on recovery for the community if the works relate to infrastructure that lead to better communication (i.e roads)</p>	<p># people engaged in the program</p> <p># HHs able to meet their basic needs (livelihoods protection threshold)</p> <p># HHs eating three meals a day</p> <p># HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times)</p> <p>Number of HHs engaging in negative coping mechanisms</p> <p># repaired or upgraded community assets</p> <p># houses which plinths have been raised</p>
Development	Assumptions/Risks	Timing consideration	Likely effect on market and population	Indicator
Create farmers' cooperatives to facilitate storage of produce, improve access to markets, get better prices for their produce and reduce costs (i.e economies of scale when buying inputs)	<p>The farmers see the interest in participating in an organised structure</p> <p>Risk of misappropriation on behalf of influential/political people</p> <p>Risk of boycott from powerful/money lenders “</p>	<p>Any time</p> <p>Long term program (from three to five years)</p>	<p>Increase the income of targeted farmers</p> <p>Improved market linkages for the associated farmers</p> <p>In long run can have a positive effect on agri-labourers if # of bigah or vegetable production increases</p>	<p>Number of active associations and number members</p> <p>Increase of profit for farmers</p>

Annex 1: Monitoring

The data presented in this report and the appropriateness of the recommended responses can be used to inform the design of preparedness and response programming, but further refinement of targeting and verification gaps and beneficiary needs is advisable before completing the design of any humanitarian or development project in Korail. To support the accumulation and refinement of relevant data, monitoring of key indicators and thresholds should be undertaken by interested stakeholders.

Table 13: Monitoring Matrix for Korail

Key Indicators to be monitored as Early Warning:	<ol style="list-style-type: none"> 1. Market “expandability” – any significant changes in market actors, key water infrastructure, or price per litre 2. Economic status of most vulnerable HHs
Triggers/ Threshold:	<ol style="list-style-type: none"> 1. Rainy season- any inundation or waterlogging in the areas bordering the lake 2. Latter half of dry season: May and June 3. Increased outbreak of water born diseases, as measured by clinics and NGOs in Korail
Monitoring Frequency:	<ol style="list-style-type: none"> 1. Prior to rainy/dry season 2. Bi-weekly monitoring in rainy season 3. Bi-monthly monitoring during dry Season
Collection of Information:	<ol style="list-style-type: none"> 1. Direct HHs interview 2. Secondary data: government publications, CaLP website, reports from the Bangladesh WASH, shelter, and health clusters, and the cash working group 3. CBOs/Satellite Clinic, I/NGOs 4. Market actors (WASA, Water suppliers, traders, ect.)

Table 14: Recommended Actions and Monitoring Indicators, Sirajganj

Key Indicators to be monitored as Early Warning:	<ol style="list-style-type: none"> 3. Any significant change in the number of market actors. Special attention should be paid to: a) the small landowners to check if the number of actors or the extension of Bighas they are able to cultivate is reducing b) the marginal or “micro” landowners, to check if they have to sell their labour force in the market, and thus, the supply of agro-labour is increasing 4. Daily wages (disaggregated men and women) 5. Number of days agro- labourers are hired per month 6. Terms of trade between the daily wage and the cost of 1 kg of rice 7. Household income and expenditure compared with: a) Food Poverty Line and; b) Lower Poverty Line; c) Upper Poverty Line
Triggers/ Threshold:	<ol style="list-style-type: none"> 4. Emergency and early recovery responses: <ol style="list-style-type: none"> a) Unconditional cash grant and/or Cash for work: <ul style="list-style-type: none"> - Income for agro-labourers is below the Upper poverty line - More than 50% of agro-labourers have two meals a day - More than 50% of agro-labourers reduced their food variety to 3 groups of food (HDDS) - Early marriages are taking place - More than 50% of agro-labourers are taking loans from moneylenders

	<ul style="list-style-type: none"> b) Conditional cash to support small landowners <ul style="list-style-type: none"> - Small landowners have lost more than 50% of their produce or income for paddy cultivation - Small landowners haven't sufficient capital to engage in the coming cultivation season without engaging in unsustainable debts. 2. Preparedness, DRR, Resilience Building <ul style="list-style-type: none"> a) Livelihoods diversification or strengthening <ul style="list-style-type: none"> - Income for agro-labourers is below the Upper poverty line as an average for the whole year - Income is for agro-labourers is below the Upper poverty line during the lean season
Monitoring Frequency:	<ul style="list-style-type: none"> 4. On June, at the beginning of the lean season 5. Bi-monthly during the lean season 6. Quarterly during the rest of the year 7. Once the floods have taken place (if prior to the lean season) 8. Bi-weekly monitoring in case of severe floods
Collection of Information:	<ul style="list-style-type: none"> 5. Direct HHs interview and FGD with landless agri-labourers, marginal and small scale land owner 6. Key Informant Interviews with market actors 7. Secondary data: government publications, the JNA and other needs assessments, reports from clusters, UN and other humanitarian actors.

Annex 3: Korail Response Options

Below is a long list of response options, from which the response recommendations in the main body of the report were selected. The wider list of options is included here in case one or more of them might be of interest.

Response Options	Feasibility	Advantages	Disadvantages	Timing	
				Lead time for response	When?
1. Provide drinking water: Vending Machine	<ul style="list-style-type: none"> - High feasibility in DRR, resilience, and preparedness scenarios - Low feasibility in emergency response - 4000 ltr/hr - Current machine is covering 150 HHs (680 people) - One machine costs +/- 5,878,000 BDT including installation and 1 year maintenance - Machine is self-cleaning 	<ul style="list-style-type: none"> - Good water quality - Long term support to HHs - Low operation/maintenance cost - Large volume 	<ul style="list-style-type: none"> - Not available in local market. - Need to buy it from vendor, which can take at least 2 months' time. - Need space to install this machine. - Requires electricity and supply water 	At least 2 (two) months	Pick time = Summer & Rainy seasons. Provide year round (long term intervention)
2. Provide drinking water through water tankers from WASA	<ul style="list-style-type: none"> High feasibility - 3,785 ltr (1000 gallon) per tanker. 	<ul style="list-style-type: none"> - Low cost - Easy access - Quick response 	<ul style="list-style-type: none"> - More challenging for women and children to go to collect the water from the other side of the slum - Not friendly for persons with disabilities - Water quality control may be difficult - Political issues - Can create long queues. - Short-term solution only 	< 1 week	Rapid deployment

3. Set up a Water treatment plant	Feasibility is high for relief scenario - Fits existing NGO capacity - Materials available	- Available in stock with NGOs/INGOs. - Ensures good quality water - Quick response - Easy operating system - Components available and can build in different sizes	- Depends on supply of chemicals - Requires electricity for pump - Requires technical expertise for installation	24 – 72 hours	Short term for emergency.
4. Distribute water in jars procured from local/national market	Highly feasible option for relief Also good for preparedness	- Quick response - Market and user friendly	- Quality control concern - Not optimally cost effective	Less than 24 hours	Short term for emergency.
5. Unconditional cash transfer to HH (vulnerable) [Cash in envelope, MMT]	High feasibility For relief – MMT/Envelope, Early recovery – MMT, For preparedness – MMT, Resilience – MMT	- Maximum choice for beneficiaries. - Easy access. - Market friendly - Meets espoused preferences of the beneficiaries	- Security/ protection concerns. - Political influence/corruption -	MMT: 15 – 25 days Cash in hand: < 7 days	Short-medium term.
6. Conditional cash voucher for shelter materials	Medium feasibility. Useful for Contingency, early recovery, resilience, and preparedness scenarios	-Less risk of misuse -Market friendly	-Voucher modality unfamiliar -Beneficiaries preference unclear	4-6 weeks	Mid-long term
7. Cash for work to construct latrines, clean solid waste, and repair water point	High feasibility Appropriate for early recovery, DRR, preparedness, resilience	- Cash for basic needs - Infrastructure of community rehabilitated	- Costs beneficiaries time needed for shelter repair, etc. - Health hazards of work - PWD, women, children exclusion.	2-4 weeks Implementation	Short-medium
8. HH vouchers for Water	Low to medium feasibility Useful for relief and early recovery scenarios	- Ensure supply of drinking water -Market friendly	-Modality less familiar in Bangladesh -Less preferred by beneficiary	2-8 weeks	Short term
9. Floating latrines	High feasibility, useful for relief scenario	-Materials available in local market -Low cost	-Beneficiary preference unclear -Access difficulties for PWD, pregnant women children - Precise cost unknown	- 2-4 weeks to deploy. -Usable for 1-2 years	Short-long term

Annex 4: Sirajganj Response Options

Response options	Assumptions and risks	Timing issues	Effects on markets and populations	Indicators
Preparedness, DRR and Resilience building through ensuring alternative income during the floods	Assumptions/Risks	Timing considerations	Likely effect on market and population	Indicator
Vouchers to introduce flood resistant rice varieties	<p>Retailers and farmers are interested and willing to engage into the program</p> <p>The variety does not fit with the local population taste</p>	Before the normal planting time	<p>The crops can be harvested even if the floods occur sooner than usual during the harvest time (in may)</p> <p>Agri labourers will be engaged in their normal harvesting works, therefore it reduces the impact of the floods in the labour market</p>	<p>Number of vouchers redeemed in the shops</p> <p>Production of Rice</p>
<p>Alternative sources of income for the agri-labourers during the floods</p> <p>These initiatives need to be done in advance as preparation activities to support the agri-labourers to cope with the floods through alternative sources of income</p> <p>Some suggested income generation activities could be:</p> <ul style="list-style-type: none"> - Fish culture in box - Floating vegetation 	<p>New initiative in this area, needs to be piloted</p> <p>New activity for this areas, needs to be piloted</p> <p>Training and technical advice needs to be provided, as it requires technical knowledge</p> <p>Future management, maintenance and storage of equipment</p>	Immediately during flooding	<p>Can provide quick cash during the floods time</p> <p>Prevent food and economic insecurity</p> <p>Provides and alternative source of income during the floods</p>	<p>Number of box functional</p> <p>Kg of sold fish from boxes</p> <p>Number of floating vegetation gardens</p> <p>Number of people engaged on fishing</p> <p>Number of people engaged in the program</p> <p>Number of HHs able to meet their basic needs (livelihoods protection threshold)</p> <p>Number of HHs eating three meals</p>

- Provide fishing equipment so as that agri-labours can engage in fishing during flooding time	(specially fishing equipments) needs to be agreed and ensured for sustainability The appropriate fish species might not be available in the area at that time Very low risk that they sell the equipment during the next lean season			a day Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times) Number of HHs engaging in negative coping mechanisms
Preparedness, DRR and Resilience building through ensuring alternative income during the lean season	Assumptions/Risks	Timing considerations	Likely effect on market and population	Indicator
Agri-labourers livelihoods diversification: Support to get alternative skills to engage in alternative livelihoods especially during the lean season This means: <ul style="list-style-type: none"> - To identify niches of work/demand - To identify potential contractors - Train beneficiaries when needed (vocational and/or financial trainings) - Provide seed capital to launch IGA 	Niches of new IGA and work opportunities are identified The range of IGA is varied enough to avoid market saturation Agri-labourers are interested in gaining new skills and engaging in alternative activities during the lean season The agencies can engage in long-term programs as livelihoods diversification requires a long-term technical support, counselling and	Can take place any time but during the peak season This is a long term programme	Agri-labourers can work during the lean season months to ensure sufficient income all over the year Ensures economic security of agri-labourers	Number of new IGA established Number of IGA functional after 6 months Number of people contracted Number of HHs with a monthly income level during lean season equal to half of the income during planting season Number of HHs able to meet their basic needs (livelihoods protection threshold) Number of HHs eating three meals a day Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline

<ul style="list-style-type: none"> - Provide technical support - Crosscutting issues need to be taken into consideration 	monitoring			during normal times) Number of HHs engaging in negative coping mechanisms
Agri-labourers livelihoods strengthening: Support agri-labourers to improve their income from existing alternative sources of income that are under-exploited Some potential activities could be: <ul style="list-style-type: none"> - Develop poultry and livestock production - Homestead gardening (vertical gardens) 	Agri-labourers are willing to engage in the program Agri-labourers have access to market to sell their produce High risk of disease with poultry	Can be implemented any time (except before the rainy season for the poultry and livestock)	Supply of proteins in local market increase HHs improve their income and food security	Number of HHs engaged in the program Number of HHs that get alternative income through these initiatives
Emergency	Assumptions/Risks	Timing considerations	Likely effect on market and population	Indicator
Unconditional cash + emergency basic items ³¹	Market is functional (even if partially) Price inflation	Can be implemented very quickly From 48 hours to one week after disaster for the first kick-in; to be	Commodities provided purchased at central level (Dhaka), therefore no benefits at local market level for some products (tarpaulin,	People purchases in local market Number of HHs' able to cover their basic needs (Livelihoods protection threshold) Number of HHs eating three meals a day

³¹ This combined emergency intervention (in-kind emergency basic items + cash in envelopes) is currently commonly implemented in Bangladesh which seems to have very good results in terms of timeliness and appropriateness. However, it would be worth to conduct some evaluations and undertake some market analysis to identify which emergency items are still to be provided in kind and which ones people can easily access them in the local markets, and thus emergency cash could be a more appropriate option.

		followed by monthly unconditional cash when needed	mats, etc.) Unconditional cash helps the recovery of the local markets systems as the grants have a positive effect on people's purchasing power	Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times) Number of HHs engaging in negative coping mechanisms
Early recovery	Assumptions/Risks	Timing consideration	Likely effect on market and population	Indicator
<p>Conditional cash to support poor (small scale) farmers for the planting season after the floods</p> <p>Cash is intended to allow farmers to hire agricultural labour for the planting season without engaging in a harmful indebtedness cycle.</p> <p>If/when crops were severely affected by floods, and farmers are facing economic insecurity the amount of the grant should also cover the purchase of seeds, tools and other needed inputs.</p>	<p>Farmers are interested and willing to engage in the program according to the terms and conditions set by the agencies such as number of labourers that need to be hired, number of days and daily wages.</p>	<p>Should be ready for the land preparation and the plantation period which will happen as the waters recede (September, and October land preparation; November planting)</p>	<p>Reactivates the agricultural labour market as farmers will hire local agricultural labour</p> <p>Prevents the poor farmers to get into an indebtedness negative cycle</p> <p>Supplies rice to the local market</p>	<p>People purchases in local market</p> <p>Number of HHs' able to cover their basic needs (Livelihoods protection threshold)</p> <p>Number of HHs eating three meals a day</p> <p>Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times)</p> <p>Number of HHs engaging in negative coping mechanisms</p>
<p>Cash for work to provide alternative sources of income for agri-labourers as well as to enhance recovery, disaster risk reduction and mitigation measures at HHs and community level.</p>	<p>Agri-labourers have the required skills to contribute to the cfw schemes – or else there is the possibility to train them- and are willing to engage</p>	<p>Can be done on September and October after the waters have recede and before most of them engage in planting. During</p>	<p>Cash Injection into the community that revitalise the local markets</p> <p>Increased purchasing power for the agri-labourers</p>	<p>Number of people engaged in the program</p> <p>Number of HHs able to meet their basic needs (livelihoods protection threshold)</p> <p>Number of HHs eating three meals a day</p>

<p>Relevant cash for work schemes could be:</p> <ul style="list-style-type: none"> - Houses plinth raising - School field raising - Pond excavation - Canal digging 	<p>There are work opportunities for both, men and women (especially FHHs) that take into account their diverse needs and constraints</p> <p>There are relevant housing or community works to be undertaken</p> <p>The cfw schemes selected are meaningful for the agri-labourers: they can see the benefits of such works</p> <p>daily wages according Bangladesh standard</p> <p>Needs to be done before the planting season (November)</p>	<p>September and October only a reduced number of agri-labourers engage in land preparation or in early planting winter vegetables.</p>	<p>Risk reduction benefits in their housing that will be less severely affected in future floods</p> <p>Risk reduction benefits in community assets such as schools, etc..</p> <p>Rapid impact on recovery for the community if the works relate to infrastructure that lead to better communication (i.e roads)</p>	<p>Number of HHs with a variety of food categories consumed equal or above 5 (or as per HDDS baseline during normal times)</p> <p>Number of HHs engaging in negative coping mechanisms</p> <p>Number of repaired or upgraded community assets</p> <p>Number of Houses which plinths have been raised</p>
Development	Assumptions/Risks	Timing consideration	Likely effect on market and population	Indicator
<p>Create farmers' cooperatives in order to facilitate the storage of their produce, improve their access to the market (access to other actors i.e the Government), get better prices for their produce and reduce their cost (i.e economies of scale when buying inputs)</p>	<p>The farmers see the interest in participating in an organised structure</p> <p>Risk of misappropriation on behalf of influential/political people</p> <p>Risk boycott from powerful money lenders</p>	<p>Any time</p> <p>Long term program (from three to five years)</p>	<p>Increase the income of targeted farmers</p> <p>Improved market linkages for the associated farmers</p> <p>long run positive effect on agri-labourers if number of bigah or vegetable production increases</p>	<p>Number of active associations and number members</p> <p>Increase of profit for farmers</p>

Annex 5: Household Dietary Diversity Score, Sirajganj

Food	Tick the box if HHs normally eat this food (in 24 hours) (✓) Before the flood	Name the food	Tick the box if they normally eat this food during lean season/floods
CEREALS	✓	Rice, Pulse	✓ Depend mostly on rice and pulse
ROOTS AND TUBERS	✓	Raddish, Onion, potato	✓ Only potato
LEGUMES AND NUTS			
VEGETABLES	✓	Leaf vegetable, carb, vegitable available in market	✓ Reduce weekly intake
FRUITS			
MEAT	1 time per month		
EGGS	2 times per week		
FISH AND SEAFOOD	2 times per week		
MILK			
OIL	✓	Soyabean, oil, mustard oil	✓Very Little
SUGAR/HONEY	✓	Sugar	
OTHER (especify)			
TOTAL NUMBER OF ✓	5		3

Annex 6: Sirajganj Monthly Household Income and Expenditures

Focus Group Discussion 1: Saidabad Union INCOME SOURCES

Agro labour involved only agriculture													
Income source	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Agro Labour (Male)-rice, mustard	5,500	5,500	6,600	8,800	8,800					2,000	2,000	2,000	
Agro Labour (Female)-rice, mustard	2,400	1,200	1,200	2,000	2,000					1,200	1,200	1200	
Homestead Vegetable						150	150	150	150	200	200		
Dairy Production	90	60	60	30	30							90	
Poultry Production						500				1500			
Total	7,990	6,760	7860	10830	10830	650	150	150	150	4900	3400	3290	56960
Agro labour involved in other activity													
Income source	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Agro Labour (Male)-rice, mustard	5,500	5,500	6,600	8,800	8,800					2,000	2,000	2,000	
Agro Labour (Female)-rice, mustard	2,400	1,200	1,200	2000	2,000					1,200	1,200	1,200	
Homestead Vegetable						150	150	150	150	200	200		
Dairy Production	90	60	60	30	30							90	
Poultry Production						500				1500			
Fishing						200	200	200	120				
Van puller						200	200	200	200				
Total	7990	6760	7860	10830	10830	1050	550	550	470	4900	3400	3290	58480

Expenditure	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	TOTALS
Rice	2700	2700	2700	2700	2700	2700	3000	2700	2700	2700	2700	2700	
Pulse	200	200	200	200	200	300	300	300	200	200	200	200	
Vegetable	1200	1200	1200	1200	1200	600	600	600	1200	1200	1200	1200	
Chicken	400	400	400	400	400	120	120	120	400	400	400	400	
Oil	220	220	220	220	220	100	100	100	220	220	220	220	
Sugar	160	160	160	160	160	80	80	80	160	160	160	160	
Egg	100	100	100	100	100	40	40	40	100	100	100	100	
Milk	40	40	40	40	40						40	40	
Others (spices)	100	100	100	100	100	70	70	70	100	100	100	100	
Fuel (Kerosene)	150	150	150	150	150	150	150	150	150	150	150	150	
Sub Total	5270	5270	5270	5270	5270	4160	4460	4160	5230	5230	5270	5270	
Mobile bill	400	400	400	400	400	400	400	400	400	400	400	400	
Transportation	300	300	300	300	300	200	200	200	300	300	300	300	
Education	8000	200	200	200	200	200	200	200	200	200	200	200	
Clothes							7000					1000	
Health & medicine	150	150	150	150	150	200	200	200	150	150	150	150	
Livestock diseases							1000						
Shelter (Pre disaster preparation)						1500							
Shelter (Post disaster preparation)										3000			
Social festival									500				
Social ceremony									1000				
Service charge against loan	250	250	250	250	250	250	250	250	250	250	250	250	
Sub total	9100	1300	1300	1300	1300	2750	9250	1250	2800	4300	1300	2300	
Total Expenditure	14370	6570	6570	6570	6570	6910	13710	5410	8030	9530	6570	7570	8198

Annex 7: Map of the Sirajganj assessment area and visited communities

