

IMPACT ASSESSMENT PLAN

Bangladesh

Coastal Climate Resilient Infrastructure Project
(CCRIP)

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Arslan, A. and D. Higgins. 2018. Impact Assessment Plan: Coastal Climate Resilient Infrastructure Project, Bangladesh. Rome, Italy: IFAD.

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Introduction

This document outlines the design of the ex-post impact assessment of the Coastal Climate Resilient Infrastructure Project (CCRIP). The Research and Impact Assessment (RIA) division of IFAD will conduct the assessment in collaboration with the project team, combining the work with their own Mid Term Review of the project. CCRIP is one of around twenty projects selected to be part of the IFAD10 Impact Assessment Initiative. Following on from the IFAD9 Impact Assessment Initiative (See Garbero, 2016), RIA will use this set of impact assessments to extrapolate and estimate the impact of IFAD's overall portfolio for its 10th replenishment period (2016-2018). The data collection for this assessment will take place in mid-2018, and RIA will complete the final report before the end of the year.

This Plan presents the CCRIP theory of change, which we use to identify the key impact indicators, and explains the design of the sampling frame and data analysis. We use the sampling frame and the data analysis to compare sets of beneficiaries and non-beneficiaries to measure CCRIP's impact. For this, we use specific techniques to ensure that non-beneficiaries accurately represent how beneficiaries would have fared in the absence of the project, which is the key to effective impact measurement (Gertler et al., 2011). The CCRIP impact assessment is termed as "ex-post" because it uses one round of data collected after project implementation.

CCRIP aims to improve the connectivity of farms and households in the face of climatic shocks, focusing on one of the most shock-prone areas of one of the most shock-prone countries in the world (Saha, 2014; Kreft, 2017). The project became operational in mid-2013 and is due to be completed by the end of 2019 and has three broad components: (i) Improved roads (ii) Improved market access (iii) Enhanced climate change adaptation capacity. One common theme across the components is their involvement of Labour Contracting Societies (LCS), which are groups of mainly destitute women. These groups were contracted to carry out construction work, and also benefitted from Women's Market Sections installed in community markets. With a budget of US\$150 million—co-financed by IFAD, the ADB, KfW, and the Bangladesh government—the project aims to reach 600,000 households from 32 Upazilas across 12 coastal districts of southwest Bangladesh. The project is the result of the decision to merge IFAD's Sustainable Infrastructure for Livelihoods Enhancement (SMILE) project with the ADB and KfW's Climate Resilient Infrastructure Improvement in Coastal Zone Project (CRIICZP). This impact assessment will focus only on the impact of IFAD's work.

The development community needs more evidence and insights into how best to improve rural livelihoods in the face of climatic shocks. Climate change-induced shocks are increasing and are threatening rural poverty reduction (Kirtman et al., 2013; World Bank, 2017). Smallholder farmers constitute the majority of the rural poor, and they are particularly vulnerable to these shocks (Harvey et al., 2014; Rapsomanikis, 2015). Their dependence on agricultural productivity and market access means that when a shock damages land, physical markets, roads, and other infrastructure and assets, their livelihoods are heavily disrupted. Although investment in building the resilience of smallholders to shocks is rising, robust site-specific evidence is needed to guide it (Béné et al., 2017). This impact assessment will test whether CCRIP achieved its goals, and will investigate the factors that helped and hindered its impact. During the process of the assessment, we will seek input from a range of project stakeholders, in a bid to maximise the value of the insights generated.

Project logic and main research questions

a. Understanding CCRIP

i. Implementation

CCRIP effectively functions as three almost completely separate sub-projects. IFAD's component focuses on union and village roads and bridges, and on community and village markets; while the ADB component focuses on larger scale Upazila roads, and large markets and growth centers; and KfW focuses on the provision of cyclone shelters and other climate resilience support.

The IFAD interventions are being implemented in 32 Upazilas of 12 districts in southwest coastal Bangladesh. Table 1 presents the CCRIP districts and the spread of project Upazilas across these districts. These were identified from a set of 77 Upazilas that were assessed for inclusion using a scoring system which resulted mainly in the prioritisation of coastal, flood-prone, low-lying, and infrastructure-poor chars. The scoring system was based on the following criteria:

- Proportion of population below poverty line
- Agricultural labour rate
- Vulnerability to tidal surge, storm, floods and river erosion
- Remoteness
- Poor communication (percent of paved road to total road)
- Road density by population
- Percent of undeveloped markets

Table 1: Distribution of Upazilas across project districts

| District | Number of Upazilas | District | Number of Upazilas |
|-----------|--------------------|------------|--------------------|
| Bagerhat | 2 | Khulna | 3 |
| Barisal | 3 | Madaripur | 2 |
| Bhola | 3 | Patuakhali | 5 |
| Borguna | 4 | Pirojpur | 2 |
| Gopalganj | 2 | Satkhira | 3 |
| Jhalkati | 1 | Shariatpur | 2 |

The ADB's selection process was demand-driven, meaning any Upazila in the 12 districts could apply for project inclusion, leading to a wider coverage of 68 Upazilas. This led to a wider coverage, with work being implemented across 68 Upazilas, with some overlap with the work of IFAD and KfW. The KfW work focuses on the most climate vulnerable areas, covering 10 Upazilas in total.

Within selected Upazilas, IFAD roads and markets are placed in areas that maximise the reach of their benefits to poor people. This involves identifying the least developed unions and villages within each Upazila, especially rural markets from char, low-lying, disaster-prone, and infrastructure poor villages. For the LCS groups, households apply to be members, and are then selected based on poverty level and on their experience in either construction or running a market stall.

For markets to be eligible for CCRIP support, they must meet the following criteria:

- Strategically located and serve as an assembly market to benefit a large number of villages and connect other larger market and growth centers

- Location not vulnerable to river erosion in the short and medium term
- Has potential for development in terms of availability of space and placing suitable layouts
- Support from market stakeholders
- Agreement to share lease income with Market Management Committee

Within the markets that meet this criteria, the final beneficiary markets are selected based on their potential for poor women to participate in the construction of the market and to participate as buyers and sellers; the willingness of stakeholders to share part of the development cost to be used for the further expansion of the works; and willingness of stakeholders to reserve sections for temporary sellers, especially women and small producers.

Another important aspect of CCRIP's work is that all infrastructure is built on government-owned land that is allocated to the project. In this way, CCRIP avoids time consuming, expensive, and potentially fractuous land acquisition using other means.

ii. CCRIP Theory of change

CCRIP is trying to solve the fundamental development problem of access, with smallholder farmers in southwest Bangladesh suffering from low connectivity of their households and their farms to markets, roads and urban centers (Rahman and Rahman, 2015). Low household connectivity hinders access to education, healthcare, financial and support services, as well as employment opportunities. Low farm connectivity hinders access to input and output markets, technology and productive facilities, and market information and extension services. This lack of access has significant livelihood implications. At the household-level, limited access to these services is widely regarded as a major determinant of short and long-term livelihood and wellbeing (Alkire and Santos, 2010). At the farm-level, restricted access to input, technology, extension and financial services can hinder the volume, quality and diversity of production, and integration into value chains (Fan et al., 2012; Rehima et al., 2013; Bokelmann and Adamseged, 2016). Combined with poor access to vibrant markets and market information, plus high transport costs, this can have a negative effect on the prices and profits that farmers receive for their goods (FAO, 2003).

Both regular and unexpected climatic stresses exacerbate the connectivity issues in already remote areas of southwest Bangladesh (Huq et al., 2015). During the annual rainy season, many connecting roads become submerged and unusable, severely restricting transport during this time. In terms of unexpected shocks, the country is reported to experience a tropical cyclone every three years, and a severe flood every four-five years, with the southwest coastal region often bearing the brunt of the damage (Nishat et al., 2013; Saha, 2014). For instance, two of the most recent major disasters in the country—Cyclone Sidr in 2007: 3,400 deaths, 8,000km of roads damaged; Cyclone Aila in 2009: 180 deaths, 7,000km of roads damaged—damaged mainly the southwest region (Relief Web, 2008; Relief Web, 2009).

CCRIP targets the connectivity issue in the region by building and upgrading climate resilient roads and markets. Roads are built to connect districts, villages and unions to each other and to markets. These roads are made from materials that can withstand frequent submersion by salty or brackish water. Roads are also raised and have higher and wider shoulders, with culverts and water gates installed to manage flood water. Where suitable, vetiver grass is also used to line road slopes to prevent erosion.

Households' market access is hindered by both a lack of transport infrastructure and a lack of physical markets themselves. Cyclone Sidr alone is estimated to have caused damage and losses to the country's agriculture sector of US\$437 million, partly through damages to physical markets

(Relief Web, 2008). In order to complement the road work, CCRIP also establishes new markets and upgrades existing ones. These markets range from "special" markets with over 200 permanent shops serving over ten villages implemented by the ADB, to medium markets with around 100 permanent shops serving up to ten villages, and smaller village markets with 10-50 shops serving up to four villages implemented by IFAD. In terms of upgrades, CCRIP adds multi-purpose sheds, fish sheds, boat landing platforms, open paved/raised areas, women's sections, toilet blocks, internal roads, and improved drainage, depending on need.

The project also recognises that improving the management of markets in Bangladesh is key to market sustainability (See Ahmed, 2010). Market Management Committees (MMCs) are groups made up of market users and local government, with a proportion of the committee having to be made up of women, who are tasked with administration, maintenance and security of markets, but are often not functional. As part of the market access component, CCRIP helps to organise these groups and provides them with capacity building support. It also works with the local government to enforce the legal stipulation that 25 percent of the market lease income should go to the MMCs for maintenance costs.

CCRIP is designed to improve the livelihoods of vulnerable women across its components, by forming LSCs. These groups consist of around 25 mainly destitute women who are trained and contracted to carry out road and market construction. In selected markets, Women's Market Sections are also established. These areas are reserved for LCS members and provide a permanent shop with favourable rent agreements in a safe environment. The project also provides training to these groups to support other income generating activities. By offering these opportunities, the project seeks to address the low social and economic status and education of women in Bangladesh that restrict their livelihood activities (See Roy et al., 2008).

Finally, to boost household's connectivity to information, the project has set-up a rural radio service. This is broadcast to farmers and has content focusing on improved farming practices, market information, and weather forecasts.

Figure 1 presents the theory of change (ToC) for CCRIP, which maps the impact chains expected to link the activities of the project through outputs and outcomes to final intended impacts. The TOC helps us identify the key indicators of success at each stage to track the expected impact pathways of the project. We also identify the assumed conditions that are required to be present for the expected impact to hold. Outlining assumptions is an important part of the ToC that helps to identify additional factors that we need to investigate to generate have a thorough understanding of the project's impact "story".

Figure 1: CCRIP Theory of Change



ASSUMPTIONS – Factors that need to be in place for the outputs, outcomes and impacts to be achieved

- There is sufficient demand and institutional support for the activities
- There are no issues with acquiring land or other materials for the work
- Women are willing and able to work in LCS

- Roads, markets and shelters are well placed and well-designed
- Training for LCS is suitable

- Farmers face no other barriers to their productivity or their market participation – lack of labour, lack of capital etc.
- Income generating capacity is the only barrier to women's empowerment, they face no other barriers

CCRIP is designed to increase household income through a number of intermediate outcomes. First is increased market participation. With improved roads and accessible, better-managed markets, farmers are expected to face lower costs associated with bringing their goods to market and sell more. Selling a higher proportion of their crops should lead to higher incomes, and over time an increase in household and productive assets. The volume of sales as well as household food security is expected to also be boosted by higher productivity. With better farm connectivity, and more sellers at markets, farmers are expected to have better access to productivity-boosting inputs, technology, and extension services. They may also be able to invest more in their production if improved connectivity leads to improved access to credit providers.

Another expected intermediate outcome is higher prices. Better market access means more buyers at markets, more demand, more options, which are likely to drive up prices. Although the upward effect on prices of increased demand could be cancelled out by a downward effect of increased supply. Before the project, farmers were often forced into taking lower prices by selling to traders directly after harvest at the farm gate. With more favourable marketing options and improved access to inputs to improve crop quality, better market information from CCRIP's radio service, and better connection to post-harvest processing and storage facilities, this situation is expected to change (See Barrett, 2008; Svensson and Drott, 2010).

In addition to selling more and receiving higher prices, production and marketing expenditures are expected to decrease, boosting profit margins and adding to the expected income effect. Along with reduced transport costs, this is expected to occur as improved market access leads to improved input access, which has the potential to increase the quality and profitability of farmers' crops (Gulati et al., 2005; Khandker et al., 2009).

The project's climate resilience-building work is expected to ensure the above intended outcomes are not disrupted by climatic stresses and shocks, and to increase the overall stability and sustainability of household livelihoods (See Meybeck et al., 2012). By making roads and markets more durable to cyclones and floods, livelihoods that are dependent on this infrastructure are expected to be made less vulnerable, meaning the impact is lower when the shock hits, and households need less time and resources to recover in its wake (Vallejo and Mullan, 2017). The cyclone protection and disaster preparedness training of KfW and the support to MMCs to increase their capacity to repair markets after a shock are also expected to contribute to improved climate resilience.

The above effects are targeted at all beneficiaries, whilst the LCS work is designed to produce income and wellbeing benefits specifically for vulnerable women and women-headed households. In addition to increased income generating capacity and increased economic opportunities from LCS participation, LCS members' increased economic independence is expected to lead to the resource and power allocation shifts needed for increased empowerment and wellbeing (See Sheoran, 2016). Whether the LCS member is the head or not, members' households are also expected to benefit as LCS members contribute more to household income and its diversification. The latter also potentially provides a further boost to the resilience of household livelihoods to shocks (See Ellis, 1999).

At the bottom of Figure 1, we identify a number of key assumptions that are required to hold in order for the above impacts to be fully achieved. If they these assumptions do not hold, impact could be constrained. For outputs to be achieved, it is assumed that the project will actually be able to identify and acquire suitable land for roads, markets and shelters, and that these will be effectively placed, so that they are actually used. In terms of translating outputs into outcomes and impacts, the project is designed under the assumption that households face no other significant barriers to their production or market access such as a lack of capital. Finally, for the LCS activities, it is assumed that women

face no other barriers to their participation, and that women actually want to get involved. Once they have joined, it is also assumed that they face no other economic or social barriers to their empowerment that the project does not address.

b. Impact assessment questions

As noted, this impact assessment will focus on the impact of IFAD's activities delivered through CCRIP. The ToC diagram considers all of CCRIP's components in recognition of the expected overlap with the ADB and KfW work. Based on the expected impact pathways of IFAD's activities and the potential complementarities with the other activities, we will use the impact assessment to answer the following questions:

- 1. Did the community roads and markets delivered through CCRIP improve the household and farm connectivity of beneficiaries? What were the subsequent effects on agricultural productivity, market participation, and household income?*
- 2. Did the IFAD activities delivered through CCRIP improve the climate resilience of beneficiary livelihoods? What were the subsequent effects on household income levels and stability?*
- 3. What were the impacts on women's livelihoods from the LCS-related activities? Were there barriers to their participation in these groups? How effective were the different LCS activities (labour contracting, income generation training, Women's Market Sections)?*
- 4. What are the contextual factors that may have shaped the impacts of the project on beneficiary households and on women? What other lessons can be learned from the project that can be taken into future rural development, climate resilience, and rural women's empowerment work in Bangladesh?*

Impact assessment design

This impact assessment will be based on quantitative and qualitative data. The main element will be a quantitative household survey of beneficiary and control households. This section presents the sampling strategy for the household survey and for the qualitative data collection, along with the strategy for conducting the data analysis, followed by an overview of the key impact indicators that will be used to assess CCRIP's impact.

a. Overall approach

The CCRIP impact assessment will be a collaborative effort between the project team and RIA. By combining the expertise from both teams, we will conduct a rigorous analysis of the project's mid-term indicators according to the log-frame in the Project Design Report, as well as the impact on beneficiaries that have already been reached by the project during the earlier stages of CCRIP. This collaboration represents an ideal opportunity for cost-saving, and to connect IFAD's field operations with its impact assessment programme, and is expected to lead to better integration in the future in Bangladesh and beyond.

The impact assessment will use a mixed-methods approach combining quantitative and qualitative data analysis. A detailed household survey questionnaire will be designed to collect information on production, market participation, other income sources, access to services, as well as socio-demographic details of each household. The survey will also include information needed to meet the RIMS requirements of the Mid Term Review. This quantitative data will be complemented with qualitative data that will be collected from project staff and from markets and LCSs through focus group discussions (FGD) and key informant interviews (KIIs). As part of the data collection exercise, the project team will also conduct the following additional surveys: (i) Survey of LCS members; (ii) Child anthropometric measurement; and (iii) Surveys of road and market performance.

The household survey will cover both beneficiary and non-beneficiary households. The key to an effective impact assessment is to compare a set of beneficiaries (the treatment group) with a set of non-beneficiaries (the control group) who accurately represent how the set of beneficiaries would have fared in the absence of the project. In this way, we are able to isolate the effect caused by the project from other effects that occurred over time. The treatment population of interest for the CCRIP impact assessment is all smallholder households within the catchment areas of CCRIP roads and markets. The challenge of this assessment is therefore to identify a representative sample of this population for the treatment group, and to identify a suitable comparable group of control households.

To produce the final impact estimates, we will conduct an econometric analysis of the household data, comparing treatment and control households in a model that estimates the size of the effect on each impact indicator, along with a measure of the effect's statistical significance. Statistical significance represents the reliability of the result, giving the percentage probability that the result is a reflection of reality and not due to chance (See Gallo, 2016). The analysis will use statistical matching techniques (such as propensity score matching) to improve the accuracy of the treatment and control group comparison. . These techniques consist of a variety of matching algorithms to ensure that only similar households are compared across the treatment and control groups, and are the main among the key methods used for ensuring accurate impact estimates in ex-post impact assessments (Austin, 2011).

b. Sample distribution

The sample for the household survey will be drawn from eight of the twelve project districts. To collect data from all twelve districts would have been unfeasible and inefficient, thus we selected eight districts covering the three project regions (Barisal, Khulna, and Madaripur) according to those with the largest CCRIP presence and those with the largest number of potential treatment and control markets. In discussion with the project team, it was decided that the total sample size of the household survey will be 3,000: a sample size deemed to provide sufficient power to detect impact, and to cover a large enough area to gain a reliable and representative estimation of impact.

In terms of the distribution of the sample, it was agreed that we would work to achieve representativeness at the regional level, which we have done using data on CCRIP investment by region as a proxy for the number of beneficiaries in each region. Within each region, the sample will be evenly distributed across the eight districts. Table 2 presents the distribution of the sample across regions and districts, based on a sample size of 3,000, with 45 percent allocated to treatment and 55 percent to control.

Table 2: Sample distribution across project regions and districts

| Region | Sample allocation | Nr. treatment households | Nr. control households | Nr households per district |
|-----------|-------------------|--------------------------|------------------------|--|
| Barisal | 61% | 824 | 1,006 | Treatment = 206; Control = 252 (Provinces: Bhola, Patuakhali, Barisal, Barguna) |
| Khulna | 16% | 216 | 264 | Treatment = 108; Control = 132 (Provinces: Bagerhat, Satkira) |
| Madaripur | 23% | 311 | 380 | Treatment = 156; Control = 190 (Provinces: Gopalganj, Madaripur) |

Whilst we will attempt to quantify CCRIP's impact using the household data, we will use the complementary qualitative data to try to explain the quantitative findings. The qualitative data will therefore focus upon the underlying impact mechanisms and the barriers to impact that may have been faced. This will be conducted simultaneously with the household survey and will consist of the following:

- Treatment markets: 5 x KII with MMC members; 5 x FGD with road construction LCS members; 5 x FGD with market construction LCS members.
- Control markets: 3 x KII with MMC members or Market Manager; 2 x KII with Union Parishad Womens' Representative.
- Project staff: 3 x KII with senior project staff; 3 x KII with regional staff (one for each project region).

c. Identification of treatment and control groups

For both the treatment and control groups, we have first identified suitable treatment and control markets, with the intention of sampling households from villages within the catchment areas of these markets. In order to capture the impact of being close to a CCRIP market, and the incremental impact of being close to a CCRIP market and a CCRIP connecting road, two catchment areas will be used for each market. To capture the impact of being close to a CCRIP market without a CCRIP road, we will sample households who are located within 2km of a CCRIP market (or control market)

but not within 1km of a CCRIP connecting road (or a un-improved connecting road in the case of control markets). To capture the impact of being close to both a CCRIP market and a CCRIP connecting road, we will also sample households who are located within 2km of a CCRIP market and within 1km of a CCRIP connecting road. The radius size used for these catchment areas was decided with assistance from the project team, who explained that these were distances within which households would travel to the market or road, meaning these were the areas of expected impact. The 2km radius for the markets was also used for the baseline study.

The treatment markets for the sample have been selected from CCRIP markets where work was completed before mid-2015. The period 2013-2015 was considered as Phase 1 of CCRIP's implementation, and taking households from the earliest phase means they will have been exposed to CCRIP's work for a sufficient amount of time for impact to develop. Using households linked to markets where work was completed later risks underestimating our impact by not allowing enough time to pass before taking the impact measurement.

The control markets for the sample have been selected from markets on CCRIP's back-up list, along with additional markets identified by local project staff within the eight project districts covered by the sample. The back-up list contains 19 markets located in the 8 project districts that just missed-out on being included in the project according to the project's market selection criteria outlined above. This means that households linked to these markets should be quite similar to treatment households, and it also means that because they have been considered for inclusion we will have sufficient information and connections to the areas to identify a suitable sample. Due to the limited number of markets on this list, we also use control markets identified with the assistance of local project staff, who were instructed to identify markets that would also have been eligible for inclusion in the project at the baseline stage.

Using the above strategies, we identified a total of 46 potential treatment markets for the sample, and 51 potential control markets. In order to reduce the number of potential control markets we conducted a scoring exercise, whereby we asked local project staff to assign scores for each market for a set of criteria that represented the selection criteria for CCRIP markets¹. In this way we were able to build a better picture of which markets would provide the most accurate counterfactual to treatment markets. Through this process we eliminated 32 of the potential control markets which were deemed as unsuitable for inclusion. This left us with 19 potential control markets. In order to identify the final set of markets that were the most well-matched, we used GIS mapping to obtain the population densities of the 2km catchment areas around each of the shortlisted treatment and control markets. This allowed us, first, to identify whether any of the markets had overlapping catchment areas, and to thus eliminate treatment and control markets that were overlapping. Secondly, it provided an additional characteristic upon which to match treatment and control markets—a characteristic that is linked to both market size and the income level of the surrounding area. We therefore selected the final set of treatment and control markets by producing matched pairs according to population density and also, when possible, from within the same upazila. Based on this strategy, the final set of treatment and control markets, and their associated sample sizes are presented in Table 3 below.

¹ To reflect the CCRIP market eligibility criteria, scores were assigned for the following: (i) Based in char, low-lying, remote, disaster-prone and infrastructure poor area (Yes/Somewhat/No) ; (ii) Connecting roads to market are dirt roads that are not flood resistant (Yes/Somewhat/No); (iii) Market has a multi-purpose shed (Yes/No); (iv) Market has a fish shed (Yes/No); (v) Market has a boat landing platform (Yes/No); (vi) Market has an open paved/raised area (Yes/No); (vii) Market has a women's section (Yes/No); (viii) Market has an internal road (Yes/No); (ix) Market has improved drainage (Yes/No).

Table 3: Final set of treatment and control markets

| Market name | Region | District | Upazila | T/C | Sample size |
|---------------------|-----------|------------|-------------|-----------|-------------|
| Joyer Hat | Barisal | Bhola | Burhanuddin | Treatment | 103 |
| Chanmiar Hat | | Bhola | Burhanuddin | Control | 126 |
| Uttar Manika Bazar | | Bhola | Charfession | Treatment | 103 |
| Dolar Hat | | Bhola | Charfession | Control | 126 |
| Pazakhali Bazer | | Patuakhali | Sadar | Treatment | 206 |
| Akhai Bari | | Patuakhali | Sadar | Control | 252 |
| Gutia Bazar | | Barisal | Uzirpur | Treatment | 206 |
| Gondershor bazar | | Barisal | Uzirpur | Control | 252 |
| Badurtala Hat | | Barguna | Pathorghata | Treatment | 206 |
| Barotaleshwar Bazar | | Barguna | Bamna | Control | 252 |
| Chutukar Hat | Khulna | Bagerhat | Sharankhola | Treatment | 108 |
| Rajapur Bazar | | Bagerhat | Sharankhola | Control | 132 |
| Ghorkumarpur Bazar | | Satkhira | Shyamnagar | Treatment | 108 |
| Patakhali Bazar | | Satkhira | Shyamnagar | Control | 132 |
| Suagram hat | Madaripur | Gopalgonj | Kotalipara | Treatment | 156 |
| Hasua Bazar | | Gopalgonj | Kotalipara | Control | 190 |
| Bairagir Bazar | | Madaripur | Rajoir | Treatment | 156 |
| Sonapara Bazar | | Madaripur | Rajoir | Control | 190 |
| Total | | | | | 3,004 |

For each treatment and control market selected for the sample, the distribution of the sample across the two catchment groups will be equal. We considered weighting the distribution based on relative population density in the two catchment groups, but at this level we are not looking to achieve representativeness, we are looking to obtain a sufficient sample size to measure impact on both the catchment groups, and using an equal distribution is the best way to achieve this.

Households will be selected randomly from within the catchment areas of each market. As we do not have lists of all households within each area from which to conduct a purely random selection, we have devised a three-stage process. Firstly, for each market, with the assistance of the local leaders (primarily the Union Parishad Chairman), we will compile lists of all of the villages located in each of the catchment areas, along with an estimate of the number of households in each village. Our target will be to collect data from 15 households per village, meaning the second stage will involve randomly selecting the villages to be included in the sample in order to meet this target. If there is an insufficient number of villages to meet the target, we will include all villages and increase the sample size per village. For the final stage, within each village, households will then be randomly selected through the random walk method, using a sampling interval based on the estimated village population size.

d. Key indicators

Table 4 presents the key impact indicators that will be used to measure the impact of CCRIP. These were identified using the CCRIP ToC in Figure 1 and will be collected through the household survey.

Table 4: Main CCRIP impact indicators

| Impact area | Indicator |
|-----------------------------|---|
| Harvest | <ul style="list-style-type: none"> - Yield (kg per hectare) - Gross margins of harvest (value of harvest minus value of inputs (Taka) /Land cultivated (ha.)) - Type of crops grown (diversity and growing of higher value crops) |
| Food security and nutrition | <ul style="list-style-type: none"> - Nr hungry months in part year - Food Insecurity Experience Scale score - Household Dietary Diversity Score |
| Market participation | <ul style="list-style-type: none"> - Proportion of harvest sold at market (%) - Price received (Taka per kg) - Income from sale (Taka per ha. of land used) |
| Other livelihood indicators | <ul style="list-style-type: none"> - Income and crop diversification indices - Smoothness of income (within year variability of income) - Resilience to shocks (variation in income in response to shocks) - Access to financial services |
| Women's empowerment | <ul style="list-style-type: none"> - Women's involvement in income generating activities - Women's participation in household decisionmaking (A-WEIA index) |
| Household connectivity | <ul style="list-style-type: none"> - Educational enrolment (% of school-age children) - Access to other relevant support services (incl. healthcare etc.) |

Deliverables, timeline and team responsibilities

a. Key deliverables

RIA will produce the following deliverables for the CCRIP impact assessment

1. Finalised and cleaned household dataset that can be used for the Mid Term Review reporting and the ex-post impact assessment.
2. Interim report soon after the data collection is completed to provide an update on progress and to present initial findings.
3. Impact Assessment Report: This will be a comprehensive report of the project's impact and the factors that shaped it. This will be compiled with input from the project team in order to maximise its relevance.
4. Additional presentations and academic papers: RIA will also produce published academic journal articles and policy briefs based on the research results, and present the work in various for a (including policy makers, project stakeholders and academia).

b. Preliminary timeline

Table 5 below presents the expected timeline moving forward with the impact assessment.

Table 5: Preliminary timeline of CCRIP impact assessment activities

| Activities | Date | Responsible party |
|--------------------------------------|-----------------------|--|
| Finalise impact assessment design | 14th March 2018 | Lead: RIA Support: Project team |
| Procure local data collection firm | 31st June 2018 | Lead: Project team Support: RIA |
| Finalise data collection instruments | 31st June 2018 | Lead: RIA Support: Project team, Data collection firm |
| Conduct data collection | August-October 2018 | Lead: Data collection firm Support: RIA, Project team |
| Complete interim report | November 2018 | Lead: RIA Support Project team, Data collection team |
| Complete Impact Assessment Report | January-February 2019 | Lead: RIA Support: Project team, Data collection team |

c. Composition of impact assessment team and responsibilities

Table 6 presents the sub-teams that make up the team that will execute the work.

Table 6: CCRIP impact assessment team composition and responsibilities.

| Sub-team | Responsibilities |
|--|---|
| RIA Aslihan Arslan, Senior Agricultural Economist (Lead) Daniel Higgins, Technical consultant Saiful Islam, Local consultant | Coordinate and supervise all aspects of the impact assessment for which RIA is responsible, from design, data collection, data analysis, reporting and dissemination. |
| Project Staff Luthfur Rahman, Project Director Shahjahan Miah, M&E Specialist Sherina Tabassum, Country Programme Officer Benoit Thierry, Country Program Manager Philipp Baumgartner, Programme Officer Wanaporn Yanguentham, Consultant | Provide input and support to RIA team when needed on scoping missions, design of sample and data collection instruments, data collection logistics, reporting and dissemination |
| Data collection firm: BETS Consulting Ltd Dr. Shaker Ahmed, Project Manager Mr. Rubaiyat Khandakar, Field Manager | Complete all required activities for data collection: hire and train enumerators (with RIA support), arrange logistics and collect data, clean and submit data to RIA |

d. Validation of results and dissemination plan

Upon completion of the final report, the findings will be validated by the Project Management Unit and other key stakeholders. In terms of dissemination, a plan for this will be compiled with the assistance of the PMU and IFAD staff, and will involve communicating the findings in various fora at increasing levels of the hierarchy of stakeholders.

References

- Ahmed, Z. 2010. Role of local government in indigenous market management in the rural areas of Bangladesh: Do these markets play development roles? *Journal of Sustainable Development*, 3(1): 120-135
- Alkire, S. and M.E. Santos. 2010. Acute multidimensional poverty: A new index for developing countries. Oxford Poverty and Human Development Initiative (OPHI) Working Paper No. 38. Oxford, UK: OPHI. https://www.econstor.eu/bitstream/10419/48297/1/3_alkire.pdf
- Austin, P.C. 2011. An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behavioural Research*, 46(3): 399-424
- Barrett, C. 2008. Smallholder market participation: Concepts and evidence from eastern and southern Africa. *Food Policy*, 33: 299-317
- Béné, C., F.S. Chowdhury, M. Rashid, S.A. Dhali, and F. Jahan. 2017. Squaring the circle: reconciling the need for rigor with the reality on the ground in resilience impact assessment. *World Development* 97: 212–231.
- Bokelmann, W. And M.E. Adamseged. 2016. *Contributing to a better understanding of the value chain framework in developing countries*. Invited poster presented at the 5th International Conference of the African Association of Agricultural Economists, September 23-26, 2016, Addis Ababa, Ethiopia.
- Ellis, F. 1999. *Rural livelihood diversity in developing countries: Evidence and policy implications*. ODI Natural Resource Perspectives No. 40. <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinions-files/2881.pdf>
- Fan, M., J. Shen, L. Yuan, R. Jiang, X. Chen, W.J. Davies, F. Zhang. 2012. Improving crop productivity and resource use efficiency to ensure food security and environmental quality in China. *Journal of Experimental Botany*, 63(1): 13-24
- FAO (Food and Agriculture Organisation of the United Nations). 2003. *Planning and designing rural markets*. Rome, Italy: FAO.
- Gallo, A. 2016. *A refresher on statistical significance*. Harvard Business Review. <https://hbr.org/2016/02/a-refresher-on-statistical-significance>
- Garbero, A. 2016. *Measuring IFAD's impact: Background paper to the IFAD9 Impact Assessment Initiative*. IFAD Research Series No. 7. Rome, Italy: IFAD
- Gertler, P., S. Martinez, P. Premand, L.B. Rawlings, and C.M. Vermeersch. 2011. *Impact evaluation in practice*. Washington, DC, USA: World Bank.
- Gulati, A., N. Minot, C. Delgado, and S. Bora. 2005. *Growth in high-value agriculture in Asia and the emergence of vertical links with farmers*. Paper presented at the workshop "Linking small-scale producers to markets: Old and new challenges" The World Bank, 15 December 2005.
- Harvey, C.A., Z.L. Rakotobe, N.S. Rao, R. Dave, H. Razafimahatratra, R.H. Rabarijohn, H. Rajaofara and J.L. MacKinnon. 2014. Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 369(1639): 20130089

- Huq, N., J. Huge, E. Boon, and A.K. Gain. 2015. Climate change impacts in agricultural communities in rural areas of coastal Bangladesh: A tale of many stories. *Sustainability*, 7:8437-8460
- Khandker, R., Z. Bakht, and G.B. Koolwal. 2009. The poverty impact of rural roads: Evidence from Bangladesh. *Economic Development and Cultural Change*, Vol 57(4): 685-722
- Kirtman, B., S.B. Power, J.A. Adedoyin, G.J. Boer, R. Bojariu, I. Camilloni, F.J. Doblas-Reyes, A.M. Fiore, M. Kimoto, G.A. Meehl, M. Prather, A. Sarr, C. Schär, R. Sutton, G.J. van Oldenborgh, G. Vecchi and H.J. Wang. 2013: *Near-term Climate Change: Projections and Predictability*. In: Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley. (eds) *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.
- Kreft, S., D. Eckstein, L. Junghans, C. Kerestan and U. Hagen. 2013. *Global climate risk index 2015: Who suffers most from extreme weather events? Weather-related loss events in 2013 and 1994 to 2013*. Germanwatch Briefing Paper. Available at: <http://germanwatch.org/en/download/10333.pdf>
- Meybeck, A., J. Lankoski, S. Redfern, N. Azzu, and V. Gitz. 2012. *Building resilience for adaptation to climate change in the agriculture sector*. Proceedings of a joint FAO/OECD workshop 23-24 April 2012. Rome, Italy: FAP
- Nishat, A., N. Mukherjee, E. Roberts, and A. Hasemann. 2013. *A range of approaches to address loss and damage from climate change impacts in Bangladesh*. Loss and Damage Publication. Bonn, Germany: Germanwatch
- Rahman, S. and M.A. Rahman. 2015. Climate extremes and challenges to infrastructure development in coastal cities in Bangladesh. *Weather and Climate Extremes*, 7:96-108
- Rapsomanikis, R., 2015. *The economic lives of smallholder farmers: An analysis based on household data from nine countries*. Rome, Italy: Food and Agriculture Organisation
- Rehima, M., K. Belay, A. Dawit, S. Rashid. 2013. Factors influencing farmers' crop diversification: Evidence from SNNPR, Ethiopia. *International Journal of Agricultural Studies*, 3(8): 558-565
- Relief Web. 2008. Cyclone Sidr in Bangladesh: Damage, loss and needs assessment for disaster recovery and reconstruction. A report prepared by the Government of Bangladesh assisted by the international development community with financial support from the European Commission. New York City, USA: Relief Web
- Relief Web. 2009. Cyclone Aila losses in Bangladesh estimated at USD269 million. <https://reliefweb.int/report/bangladesh/cyclone-aila-losses-bangladesh-estimated-269-mln-usd>
- Roy, S.K., F Bilkes, K. Islam, G. Ara, P. Tanner, I. Wosk, A.S. Rahman, B. Chakraborty, S.P. Jolly, W. Khatun. 2008. Impact of pilot project of Rural Maintenance Programme (RMP) on destitute women: CARE, Bangladesh. *Food and Nutrition Bulletin*, 29(1): 67-75
- Saha, C.K. 2014. Dynamics of disaster-induced risk in southwestern coastal Bangladesh: An analysis on Tropical Cyclone Aila 2009. *Natural Hazards*. 75(1): 727-754
- Sheoran, J. 2016. Aspects of women empowerment: A brief overview. *International Research Journal of Management, Science and Technology*, 7(4):135-140

Svensson, J. and D.Y. Drott. 2010. *Tuning in the market signal: The impact of market price information on agricultural outcomes*. Institute for International Economic Studies Working Paper. Stockholm, Sweden: Stockholm University

Vallejo, L. and M. Mullan. 2017. *Climate-resilient infrastructure: Getting the policies right*. OECD Environmental Working Papers No. 121. Paris, France: OECD Publishing

World Bank, 2017. *Atlas of sustainable development goals 2017: From World Development Indicators*. Washington, DC, USA: World Bank




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