PROMOTING CLIMATE ADAPTATION IN COASTAL BANGLADESH

Catalyzing Private Sector Participation to Champion Climate-Resilient Agriculture and Food Security

// October 2022

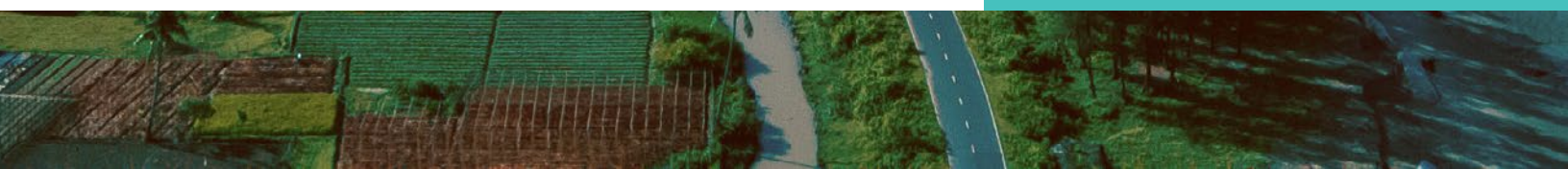
CLIMATE DELIVERY INITIATIVE SERIES //

Case Study

CIF Program: PPCR

TOPICS

- Adaptation
- Climate Resilience
- Climate-Smart Agriculture
- Coastal Resilience



ACKNOWLEDGMENTS

www.climateinvestmentfunds.org

This report is issued by the Climate Investment Funds (CIF) — a multilateral climate fund housed within the World Bank. The case study was prepared by Amel El Abed and Jacob Bathanti for CIF.

The authors express their gratitude for the contributions of the stakeholders interviewed, who generously gave their time to share their implementation experiences. In particular, Harsh Vivek and Akira Dhakwa from the International Finance Corporation (IFC) provided extensive insights into the project. From CIF, Loreta Rufo, Xianfu Lu, Madu Selvakumar, Katsumasa Hamaguchi, Farah Odeldait, and Hanna Schweitzer provided helpful feedback.

Photo Credits
All photos by CIF or under license to CIF unless otherwise noted.

Design
Art Direction: Andrea Carega
Graphic Design: Karlien Truyens

PROJECT DATA

PROJECT TITLE	Climate-Resilient Agriculture and Food Security (CRAFS) project
PARTNER ORGANIZATION/S	Pilot Program for Climate Resilience (PPCR); International Finance Corporation (IFC)
COUNTRY	Bangladesh
SECTOR/S	Climate-Smart Agriculture, Private-Sector Development
TOTAL PROJECT COST	USD3.1 million, fully financed from PPCR and executed by IFC
PROJECT DURATION	Aug 2, 2014 – Jun 30, 2020

DELIVERY CHALLENGES	• Geographic Access and Transportation • Business Environment: Risk and Reward Perceptions • Skills and Human Resource Misalignment
DEVELOPMENT CHALLENGE	• Need to Improve Agricultural Livelihoods • Nascent, Remote, and Poorly Connected Rural Markets • Vulnerability to Climate Change
CASE AUTHORS	Amel El Abed, CIF Jacob Bathanti, CIF
PROJECT EXPERTS	Harsh Vivek, IFC Akira Dhakwa, IFC

EXECUTIVE SUMMARY

KEY MESSAGES

This project demonstrated that the private sector could play a key role in adaptation and building resilience to climate change.

The project demonstrated the critical importance of creating space for flexibility and responsiveness when designing and implementing projects.

Integrating and mobilizing innovative ICT and digital services was crucial for overcoming geographic barriers.

This case study examines the Climate Resilient Agriculture and Food Security (CRAFS) project in Bangladesh's coastal polders. Polders are tracts of floodplain, at or below sea level, which are surrounded by earthen embankments. CRAFS sought to build smallholder farmers' resilience to the effects of climate change by promoting sustainable climate-smart agriculture (CSA) technologies and practices in the polders. This project was carried out by the International Financial Corporation (IFC), with financing from the Climate Investment Funds' (CIF) Pilot Program for Climate Resilience (PPCR). The intervention was implemented between 2014 and 2020 in two phases: Phase One — the pilot phase (2014–2016) and Phase Two — the scale-up phase (2018–2020).

To promote CSA, IFC worked with local agribusiness firms (referred to as lead firms), which were the main clients whose business was intended to provide a variety of important goods and services to smallholder farmers in the polders, including:

- agricultural extension and advisory services;
- demonstration of CSA practices and techniques through dedicated field days and community capacity-building workshops;
- development and application of digital agricultural extension tools and services;
- establishment of weather forecast stations and weather-related services for farmers;
- identification of insurance schemes; and
- provision of (subsequent) support for climate-focused small and medium enterprises (SMEs) and start-ups to empower them in becoming new champions of climate change adaptation and resilience.

The core development challenge addressed by the project was improving agricultural livelihoods and increasing resilience to climate change in Bangladesh's polder regions. Climate stresses, changes in weather patterns and growing conditions, and extreme weather events in Bangladesh pose a significant problem for farmers and a threat to their livelihoods.

This case study examines the delivery challenges that the project encountered during implementation and the steps taken by implementers to address these challenges. These challenges included:

CHALLENGE 1: Business Environment: Risk and Reward Perception. Because of the polders' isolation, poverty levels, and poor infrastructure, many private-sector firms were initially reluctant to work in these areas, perceiving them as presenting elevated risks and operating expenses, while offering unproven returns in an impoverished market. To tackle this challenge, the IFC team developed and demonstrated a strong business case, further refined over time with feedback from private sector partners. The project also provided technical support to help mitigate risk.

CHALLENGE 2: Skills and Human Resource Misalignment. Many farmers lacked information about CSA practices and were unaware of the potential benefits of climate-smart crop varieties. The solution to this challenge was a key part of the project itself, with the lead firms setting up distribution networks and providing information and training to farmers in the polders. The lead firms rolled out training packages to provide farmers with information on the characteristics and advantages of climate-smart seeds (in particular, salt-resistant seeds) and CSA techniques. Trainings were delivered in the local vernacular and focused on concrete demonstrations of the benefits of CSA seeds and planting techniques. The trainers also worked with selected farmers to set up demonstration plots, which were planted with climate-smart seeds to show firsthand the advantages of these seeds.

CHALLENGE 3: Geographic Access and Transportation. The polder areas are remote and lack good transportation connections with other parts of Bangladesh. Private-sector actors were often reluctant to engage in these areas, since infrastructure challenges would entail higher operating expenses. During project implementation, implementers faced difficulties in carrying out face-to-face engagements. To address this challenge, the project mobilized information and communication technology (ICT) to deliver cost-effective digital farm extension support.

At the end of Phase One, based on feedback from partners, the project underwent a restructuring to adjust approaches before scaling up. Key adjustments included focusing the intervention on polders with commercial potential and identifying and targeting markets where beneficiaries would sell their crops. This was a crucial refinement in adjusting the business case to ensure long-term business engagement.

In Phase Two, the project scaled up training and introduced additional services to support farmers, along with SMEs and start-ups, in the polders. A key service was the provision of digital extension services, including weather forecasts, weather-based crop advisory services, and a call center-based farmer query service (FQS). The project also provided risk capital and capacity building to SMEs and start-ups that worked in the polders, both in the agricultural and non-agricultural sectors, whose business models were relevant for climate adaptation.

The project improved the resilience of thousands of smallholder households. Farm yields for major crops and farm revenues increased by 38 percent and 18 percent, respectively. More than 96,000 smallholder farmers, including over 11,000 women, benefited from capacity building on climate-smart agriculture, and over 73,000 farmers indicated that they were using at least one CSA practice. Crucially, the project demonstrated that the private sector could do business in the polders and catalyze climate adaptation and resilience through climate-smart agriculture.

This case study found four key lessons from the project:

- **The project demonstrated that the private sector could play a key role in adaptation and building resilience to climate change.** For the project to do this in a geographic area often seen as unprofitable, it needed to demonstrate a strong business case to incentivize private firms to work with the project. IFC's technical support to mitigate risk also helped encourage the firms to participate.
- **The PPCR project demonstrated the critical importance of flexibility when designing projects.** The project built in flexibility and modularity through a phased approach, beginning with a pilot phase to test relevant climate-resilient practices and technologies, disseminate knowledge, establish trust among key stakeholders, and demonstrate a business case. This approach enabled knowledge building and the project provided space to pause, take stock, and fine-tune before scaling up, thereby enabling the IFC team to adjust its strategies over time.
- **Early investments in digital technology and innovative approaches were key to overcoming geographic barriers, and provided protection against unexpected delivery challenges.** Implementers realized early on that, given the inaccessibility of the polders, it would be difficult to carry out a significant number of face-to-face engagements and conduct in-person data collection. In response, they developed digital tools and applications to provide remote support, which were critical to extending the reach of the project in a cost-effective way.
- **The importance of South-South connections and learning.** Learning from other IFC and PPCR projects, particularly the contemporaneous Promoting Climate Resilient Agriculture Project in Nepal, helped accelerate learning on issues such as agricultural techniques, the utilization of ICT, and strategies to engage with the private sector.

LIST OF ABBREVIATIONS

ACI	Advanced Chemicals Industries Ltd
BPFIL	Bikrampur Potato Flakes Industries Limited
CIF	Climate Investment Funds
CII	Cyclone Index Insurance
CRAFS	Climate-Resilient Agriculture and Food Security
CSA	Climate-Smart Agriculture
FQS	Farmer Query Service
ICT	Information and Communications Technology
IFC	International Finance Corporation
PPCR	Pilot Program for Climate Resilience
SME	Small and Medium Enterprises
SPCR	Strategic Program for Climate Resilience
SSCL	Supreme Seed Company Ltd.

TABLE OF CONTENTS

LIST OF EXHIBITS

1. INTRODUCTION

Coastal Bangladesh is often characterized as one of the world's most vulnerable regions to climate change. In particular, the polders of the country's southern coastline — tracts of floodplain surrounded by earthen embankments, strewn across the breadth of the Ganges-Brahmaputra delta — are uniquely vulnerable. In recent years, the specter of climate change and extreme weather shocks, including flooding, sea-level rises, and salinification, have threatened the lives and livelihoods of the smallholder farmers who call the polders home.[1]

This case study examines the experience of the Climate-Resilient Agriculture and Food Security (CRAFS) project in Bangladesh. CRAFS sought to build smallholder farmers' resilience to the effects of climate change by promoting sustainable climate-smart agriculture (CSA) technologies and practices in the polders. This project was carried out by the International Financial Corporation (IFC), with financing from the Climate Investment Funds' (CIF) Pilot Program for Climate Resilience (PPCR1.1.).

1.1. Private Sector Participation in Climate Adaptation: Creating Beneficial Linkages in the Agricultural Sector

The core theme of this case study — private sector participation in climate adaptation — has drawn increasing interest over the past decade. There is growing recognition of the importance of the private sector in funding and implementing adaptation and resilience to climate change. This shift in perception is a response to the scale of need versus the limits of public budgets, as well as the recognition that many core adaptation activities (including, of particular relevance to this case study, supply chain links the sale and distribution of climate-smart seeds, the marketing of produce, and the integration of CSA into agricultural supply chains) fall largely under the purview of the private sector.[2]

CRAFS was one of the first climate adaptation projects undertaken by IFC.[3] When the project was under consideration to receive funding from PPCR in 2012, the approach of involving the private sector in climate adaptation activities was not a common one— private sector actors often viewed adaptation as falling outside their purview, and were reluctant to get involved in an untested and evolving arena.[4] However, with IFC's focus on enhancing private-sector participation in developing countries, the project served as an important demonstration of how IFC – and by extension, a range of other organizations - could help bring the private sector into the climate adaptation space, thereby providing much-needed services for farmers. A core proposition of CRAFS was that profit-oriented, revenue-generating, and market-developing agribusiness firms could offer "products/ technology that can benefit vulnerable farming communities" and enhance those communities' resilience to climate change.[5] This case study examines what this engagement looked like in practice.

1.2. Project Implementation and Results: A Multi-Pronged and Responsive Approach

This engagement was implemented between 2014 and 2020 in two phases: Phase One — the pilot phase (2014–2016), and Phase Two — the scale-up phase (2018–2020).

IFC worked to build the capacity of private firms and smallholder farmers to use and adopt CSA practices and techniques, working with local firms to support and liaise with farmers in a variety of ways:

- agricultural extension and advisory services;
- demonstration of CSA practices and techniques through dedicated field days and community capacity-building workshops;
- development and application of digital agricultural extension tools and services;
- establishment of weather forecast stations and weather-related services to farmers;
- identification of insurance schemes; and
- provision of (subsequent) support for climate-focused small and medium enterprises (SMEs) and start-ups to empower them in becoming new champions of climate change adaptation and resilience.

When the project concluded in August 2020, it had surpassed its intended targets. The project engaged over 96,000 farmers, including 11,000 female farmers (11.5 percent), and facilitated the increased adoption of CSA techniques. Farm yields, cropping intensity, and incomes increased. The project constructed micro weather stations, which can continue to benefit farmers even after project completion. It also worked to build a robust and resilient business ecosystem that included new market linkages between farmers and firms and enabled the emergence of new start-ups to benefit agriculture in the polders.

This case study examines how IFC and its partners in Bangladesh achieved these results, traces the process of project implementation, and unpacks the challenges that the project faced. The overall experience, including how the team worked in a flexible fashion to overcome delivery challenges, offers lessons on how projects can harness private-sector collaboration to build climate resilience in agricultural societies and markets.

2. CONTEXT

Bangladesh is highly vulnerable to the effects of climate change. The country is densely populated, and about 24 percent of its 150 million inhabitants lived below the poverty line as of 2016.[6] Much of Bangladesh's territory is situated on a river delta at near-sea level, making it susceptible to flooding.

In particular, Bangladesh's 123 polders — home to around eight million people — stand out as being especially vulnerable. These tracts of floodplain, lying at or below sea level, are bounded by earthworks to hold back the water that surrounds them. The effects of climate change on the polders include sea-level rises, resulting in salinification of the rivers surrounding the polder areas. Saltwater intrusion, particularly during the dry season (bari), threatens the livelihoods of polder inhabitants.

The share of the gross domestic product (GDP) and employment represented by agriculture has declined over time. In 2010, just under 50 percent of Bangladesh's workers were employed in agriculture, and the sector contributed to approximately 18 percent of the country's GDP in 2013. Nonetheless, agriculture still plays a key role in the country's economy and provides food security for households. Agriculture is of particular importance in rural areas, with 87 percent of households reporting that they receive at least some income from agriculture.[7]

The Government of Bangladesh considers economic lag and climate vulnerability in the polders to be important policy concerns. As such, it mandated that development activities, carried out under the auspices of the Strategic Program for Climate Resilience (SPCR), prioritize the country's coastal areas. This mandate, in turn, was a key factor in shaping CRAFS. While implementers had considerable flexibility in many aspects of the project's design and implementation, the project's baseline geographic area of focus was determined by this mandate.

2.1. Development Challenges: Need for Improved Agricultural Livelihoods and Increased Resilience to Climate Change

The core development challenge addressed by the project was the need to **improve agricultural livelihoods and increase resilience to climate change** in Bangladesh's polder regions. Climate stresses, changes in weather patterns and therefore crop growing conditions, and extreme weather events pose a significant threat to farmers' livelihoods in Bangladesh. Farmers in the polders reported a host of weather-related shocks: heavy rains, flooding, water-logging, tidal surges, droughts, and intrusions of salt water into their fields. Bangladesh's winters, moreover, are becoming shorter, negatively affecting crops that need a period of cooler weather. The country has also historically been highly vulnerable to the effects of cyclones. Rising sea levels may come with stronger winds, more rain, and higher storm surges during cyclones, which also may become more frequent. More powerful storm surges present a dire threat to lives and livelihoods.[8]

2.2. The Intervention: Supporting Climate Adaptation among Agribusiness Firms and Smallholder Farmers

CRAFS addressed these development challenges through multiple complementary components. The project's objective was to increase farmer and agribusiness firm revenues through the adoption of CSA technologies and practices. It sought to demonstrate a business model for CSA technologies, products, and services to improve farmers' productivity and strengthen their resilience to climate change. In turn, this business model would provide incentives for the private sector to invest in CSA products and services to ensure sustainable sourcing.[9]

To reach these objectives, the IFC team worked with client firms (referred to as lead firms) to promote climate resilience. The lead firms were agribusiness companies offering a range of services, including the marketing of crops specifically bred for their climate-resilient characteristics.[10] The project proposed to work with the lead firms to extend these services, including the sale of climate-smart seeds and complementary agricultural extension support, in the polders. A key piece of the project was therefore to build the capacity of extension teams who would thereafter build the capacity of farmers, who were intended to be the ultimate beneficiaries.

The project envisioned three components, with implementation structured in two phases. Phase One aimed to demonstrate the business case for CSA solutions and technologies, while Phase Two was the scale-up phase. The project in **Phase One included the following components:**

- **Capacity building of lead firms** to address climate change, including through the development of a sustainability strategy, provision of extension services to farmers, and securing of buyers for agricultural products from the polders;
- **Capacity building of farmers** through trainings on CSA practices, with an initial key objective of reaching 82,500 farmers and catalyzing the uptake of CSA practices by 43,500 farmers; and
- **Piloting weather risk insurance,** with the objective of launching Cyclone Index Insurance (CII) to manage risk and ensure farmers' access to finance.[11]

As these components were modular, they allowed for adjustments as needed. By the time the project entered its scale-up phase, the project was restructured to incorporate the knowledge and experience gained during the initial phase of implementation.

3. DELIVERY CHALLENGES

While the project results were positive, this did not mean that there were no hurdles on the road to these results. CRAFS confronted three main *delivery challenges* — non-technical barriers that hindered the implementation process or threatened to impede it (see Table 1).

1 **CHALLENGE 1: Business Environment: Risk and Reward Perception**

A core challenge was that, in part due to the polders' isolation, poverty levels, and poor infrastructure, many private-sector firms were initially reluctant to work in these areas, which they perceived as offering elevated risks and higher operating expenses in the face of unproven returns in an impoverished market.

Nonetheless, identifying lead firms that could implement the project was a critical aspect of the intervention, and without accomplishing this step, the project could not proceed. This issue also posed a challenge to attracting SMEs and start-ups during the scale-up phase. Companies with smaller business volumes and a lack of access to resources and climate-resilience knowledge capacity did not necessarily perceive the value of adopting new business strategies and did not consider the polders investment-worthy.

Solution: Demonstrating a strong business case and providing technical support to de-risk investments. To tackle this challenge, it was critical that the IFC team develop and demonstrate a strong business case, which would be refined over time with feedback from private-sector partners. The project also provided technical support to help mitigate risk for the lead firms.

2 **CHALLENGE 2: Skills and Human Resource Misalignment**

Many farmers lacked information about CSA practices; expressed skepticism or uncertainty in their knowledge regarding the purchase and performance of climate-resilient seeds;[12] and were unaware of the potential benefits of climate-smart crop varieties. Farmers also did not have information on the product quality standards necessary to access markets.

Solution: Training packages (including multimedia content) and a broad array of dissemination and demonstration activities (including farmer field days, demonstration plots, and media outreach). This solution was ultimately a key part of the project itself, with the lead firms setting up distribution networks and using multiple modalities to provide information and training to farmers in the polders.

3 **CHALLENGE 3: Geographic Access and Transportation**

One of the most fundamental challenges the project faced was simply reaching the polders. These areas are remote and lack good transportation connections with other parts of Bangladesh—they are situated among waterways, and road infrastructure is generally poor. Private-sector actors were often reluctant to engage in these areas, as infrastructure challenges could entail higher operating expenses. For similar reasons, project implementers would also face difficulties in carrying out face-to-face engagements in these areas.

Solution: Deployment of innovative ICT solutions. The project mobilized information and communication technology (ICT) to deliver cost-effective digital farm extension support to beneficiaries. This reduced the need for frequent face-to-face engagement, while also providing farmers (including women) with tailored remote support.

TABLE 1. Delivery Challenges Encountered and Solutions Developed

DELIVERY CHALLENGE	DELIVERY SOLUTION
Business Environment: Risk and Reward Perception	IFC engaged intensively with lead client firms to make the business case for opportunities in the polders and to refine the business case over time. Technical support and low-interest, highly concessional financing were provided to reduce risks.
Skills and Human Resource Misalignment	The IFC team and partners explored creative ways to engage farmers and provided information about CSA techniques, including the creation of demonstration plots and farmer field days.
Geographic Access and Transportation	The project developed ICT solutions to support farmers without depending on face-to-face engagement. This was particularly salient in the scale-up phase, which saw the development of tailor-made text messages and a customized call center to respond to farmer queries.

As the project team confronted and addressed these challenges, it strengthened the pathway for ultimately achieving its goals. The following section traces in more detail how they did so.

4. TRACING THE IMPLEMENTATION PROCESS

This section examines how the project was implemented, with particular attention to how the project components worked to address the delivery challenges in each phase of the project.

4.1. Phase One (Pilot): August 2014 – August 2016

Phase One focused on creating knowledge on CSA in the polders, testing approaches, and developing and demonstrating the business case for private firms' engagement in the polders. In Phase Two, the project scaled up to consolidate lead firms' markets and activities in the polders, and fortify farmers' resilience (see Figure 1 for more details on the project timeline).

4.1.1. Forging partnerships with the private sector to demonstrate a business case

During Phase One, the first critical step in the project was to establish a partnership with the lead firms that would carry out core project activities. This initial step confronted a core **delivery challenge 1: companies' risk and reward perception** with regard to doing business in the polders. As firms were skeptical of getting involved in the polders, gaining their commitment required presenting a strong business case for investing resources. The business case for investment centered, in particular, on the potential for climate adaptation approaches to strengthen supply chains and increase productivity, as well as on improving access to finance. IFC would also provide technical support for capacity-building exercises, thereby reducing upfront costs for firms and reducing risk. The business case for investing in climate adaptation in the polders thus rested on the prospect

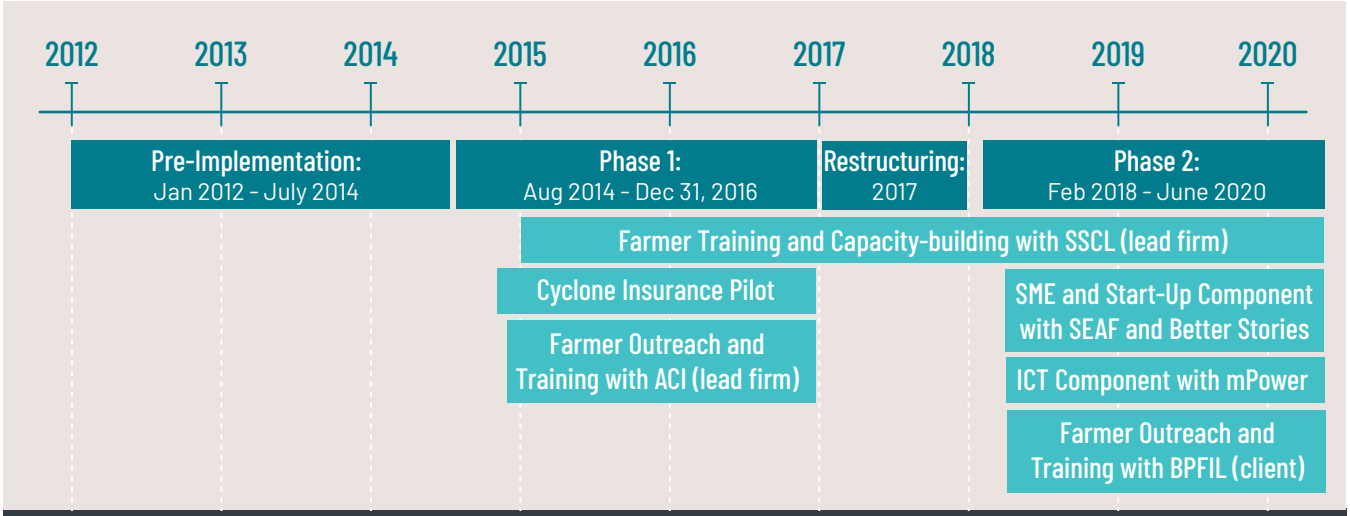


FIGURE 1. Timeline of Project Implementation

Source: Prepared by authors based on information provided by IFC.

of gains both for lead firms, who could benefit from increased sales and new markets, and for farmers, who could benefit from increased productivity of their crops and ultimately resilience to climate change. To convince both firms and farmers, the business case would need to be demonstrated through increased farm productivity using the climate-smart seeds supplied by the lead firms.

Over the first year of the project, IFC worked to prepare the business case, to present it to potential lead firms, and to leverage previously established relationships and prior work experience to identify and engage with lead firms willing to take the risk of investment. In the last trimester of 2015, IFC partnered with two agribusiness companies — Supreme Seed Company Ltd. (SSCL) and Advanced Chemicals Industries Ltd. (ACI).[13] Both lead firms would provide seeds to farmers and carry out extension work and training. As important seed suppliers in Bangladesh, both SSCL and ACI had already engaged with IFC in prior agricultural projects, which reflected these firms' ability to lead efficiently on the capacity-building component of the project. SSCL and ACI would be charged with developing a climate risk adaptation strategy that would then be promoted through customized CSA trainings and climate change adaptation and mitigation solutions.

Phase One was implemented in 12 polders in the districts of Satkhira, Khulna, Bagherhat, Pirojpur, Barguna, Patuakhali, Bhola, Noakhali, Lakshmipur, Feni, Chittagong, and Cox's Bazar (see Map 1).

MAP 1. Coastal Bangladesh and the Polders Targeted in Phase One

Source: Adapted from a map provided by IFC.

4.1.2. Engaging farmers and disseminating knowledge: Rolling out trainings

Once the lead firms joined the project, they engaged farmers through a set of training activities, addressing **delivery challenge 2 — skill and human resource gaps and misalignments —** by building farmers' skills and knowledge around CSA practices and technologies. The lead firms conducted farmer field days, where trainings were delivered by field-level trainers. The training packages included modules, in local vernacular, on climate-resilient crop-management technologies for coastal areas and post-harvest management technologies for major crops, along with crop-specific modules in different formats (booklets and videos).[14] On average, around 25 farmers attended each field day, with women farmers making up 10 percent of the attendees.

Firms set up demonstration plots to support the trainings: tracts of land planted with climate-smart seeds to showcase their performance, as well as the usefulness of CSA practices and technologies, with the goal of building farmers' confidence. Demonstration plots were located beside main village roads to ensure clear visibility and easy accessibility for neighboring farmers and other interested persons.

The lead firms mobilized local marketing teams to promote the project, and led trainings and field days for farmers. They also adopted innovative marketing and dissemination strategies to promote the project and engage farmers, including working with local media outlets (newspaper articles, TV ads, telecasted shows, videos, and testimonies). Farmers in the targeted polders, who had historically adopted a traditional labor-intensive and seasonal agriculture system, were eager to adopt the new techniques.[15] By December 2016, as Phase One came to an end, over 8,800 farmers, including more than 1,200 women farmers, had been trained.[16]

4.2. Project Restructuring (2017): Incorporating Lessons from the Phase-One Pilot

By the end of Phase One, the pilot had anchored awareness about CSA technologies and practices among farmers, and the team had gained valuable implementation knowledge on the dynamics of the polder areas. Crucially, the pilot showed enough increased sales for lead firms and increased yields for farmers to demonstrate the business case for working in the polders.

At the same time, IFC and its project partners realized that an adjustment to the project was critical for achieving long-term objectives. This was based on extensive, continuous consultations between IFC and the lead firms, which informed the project's understanding of the commercial viability of different crops and specific polders. Learning from similar PPCR experiences, particularly IFC's Promoting Climate Resilient Agriculture Project in Nepal, also informed adjustments in the prioritization of project components, some of which were incorporated into CRAFS.[17] For example, the Nepal project demonstrated the importance of ensuring that off-takers - buyers for farmers' produce - were available, and incorporated a successful component on engaging with and providing investment capital for start-up incubators and accelerators to provide access to finance. Therefore, CRAFS paused operations temporarily to restructure and make the necessary adjustments. Key adjustments included:

- **Restructuring the access to finance component:** As a separate IFC project was working on cyclone insurance with Green Delta Insurance Company, CRAFS dropped this component in order to avoid duplication of efforts. However, CRAFS continued efforts to provide access to finance through entrepreneurship support to increase the investment readiness of SMEs, including CSA-relevant start-ups.
- **Use of ICT to scale:** IFC included and scaled up the use of ICT solutions to strengthen the capacity-building component of the project. This would be implemented by mPower Limited, a company

that leveraged ICT for development in Bangladesh. mPower would develop and deploy ICT solutions in the polder regions for 35,000 smallholders, including 4,000 female farmers.

- **Focus on polders with commercial potential:** The team elevated the importance of identifying and targeting markets where the beneficiaries would sell their crops. This was crucial to ensuring long-term business appetite and continuous demand beyond the project's completion.
- Based on findings from assessments commissioned under the project, coupled with feedback from the lead firms, the project **prioritized trainings for products and markets that showed potential for a strong business case.** It decided to narrow its focus to seven of the 12 polders, selecting those with the greatest commercial potential. The project also adopted a "Polder Plus Strategy," which aimed to ensure that communities immediately adjacent to the polders were served by trainings. This allowed the project to extend its benefits for farmers and helped bolster the business case by broadening the market served by the lead firms.
- The restructuring also put in place a time extension, under which the project would run until June 2020, instead of June 2019, with **increased targets alongside more time for the adoption of climate-smart practices by smallholder farmers** (see Table 2).

TABLE 2. Initial and Revised Project Targets

DEVELOPMENT INDICATOR	INITIAL PROJECT TARGET	REVISED TARGET
Number of farmers reached (direct and indirect)	75,000	82,500
Number of farmers who adopted improved practices	40,500 of 67,500 farmers trained	43,500 of 72,500 farmers trained

Source: Adapted from IFC project documents.

4.3. Phase Two: February 2018 – June 2020

Phase One had established the viability of doing business in the polders. ACI decided to discontinue work with the project, but to continue to do business in the polders on its own as a going concern.[18] SSCL continued in the project as the core lead firm, playing a pivotal role in Phase Two, as it ramped up capacity-building mechanisms, including increasing trainings, demonstration days, and the presentation of good practices. As such, it continued to play a key role in addressing the challenge of skill gaps through the provision of agricultural extension support.

SSCL sold climate-smart seeds to farmers, with salt and heat tolerance a particularly important characteristic. The firm continued to build knowledge and skills among farmers through trainings on the characteristics of the seeds and to provide guidance on climate-smart planting systems. These techniques included floating beds, in which seeds were planted in beds constructed on a floating material that enabled them to rise and fall in tandem with the water levels; and raised-bed cropping (also referred to as *serjon*) in which the beds for planting crops were built up to raise them above the water level to prevent inundation and a pond or furrow was created between the beds to hold water during the dry season (the photographs in Figure 2 show examples of these techniques).[19] Climate-smart techniques helped farmers increase cropping intensity, providing year-round opportunities for income generation.

Rice received particular focus during the project. As a staple food, rice had its own local market. It was naturally less perishable and also a mainstay in the diets of the farmers themselves, boosting food security. This led the project to promote climate-smart rice production, both for both sale and for farmers' own consumption.

SSCL strengthened its retail and distribution network in the polder region in order to better supply farmers with climate-smart seeds. SSCL also initiated farmer-dealer network meetings, during which farmers received information on seed varieties,

FIGURE 2. Floating Gardens (Left) and Raised Beds (Right) in Targeted Polders

Source: Pictures courtesy of SSCL.

and instructions on best practices for planting and nurturing these seeds. Dealers, meanwhile, through these interactions with farmers, gained a better understanding of the farmers' needs and demands, thereby enabling them to make more informed market decisions. The dealer-farmer meetings were set up as an initiative of the firm to add value, which had not been considered previously by the project team.

The business continuity through SSCL's involvement was particularly important for the project, as it increased the chances of behavior change to adopt climate-resilience practices. Moreover, it established a business ecosystem that incorporated SSCL, its suppliers, and farmers.

4.3.1. Expanding value chains for additional targeted commodities: Piloting potatoes in the polders

In Phase Two, the project worked to build an innovative value chain for potatoes — a crop that had not been previously grown in the polders. Bangladesh's shortening winters pose a dire problem for traditional varieties of potatoes, which typically need 90 days of cool weather to mature. The project saw an opportunity to partner with Bikrampur Potato Flakes Industries Limited (BPFIL), an industrial potato producer. BPFIL expressed interest in working in the polders to pilot varieties of potatoes (including Lady Rosetta, Diamond, and Astrix) that could reach maturity in 60 days. CSA trainings were imparted to farmers by SEBA Agro — a local implementation partner that joined in Phase Two. The geographical position of the polders, which in other circumstances presented a challenge, in this case turned out to be advantageous. The polders were located close to the potato-processing mills in Munshiganj (a municipality just south of Dhaka), which are situated near a river branch; therefore, moving the produce by water, rather than over land, proved to be more cost-effective. This arrangement benefited both firms and farmers, as explained by Mohammed Jayed Noman, Managing Director at BPFIL: "Working under PPCR project helped BPFIL to extend our potato production program in the south. Our lead and smallholder farmers become more resilient to climate change through practicing sustainable CSA technologies which not only improved productivity but also increased the farmers' and BPFIL's revenues."

BOX 1. Engaging Women in a Challenging Context

In rural Bangladesh, including in the polders, women play an important role in agriculture. However, due to sociocultural dynamics, women often participate less than men in public life and economic activities outside the household and outside their home villages. They also have less access to resources, inputs, information, and services compared to men. CRAFS sought to overcome these barriers and increase women's participation in agricultural extension activities so that women could benefit from the program's capacity- and resilience-building effects. The project ultimately surpassed its target for women farmers engaged by outreach and extension activities.

The project implemented several measures to target women specifically: demonstration trainings aimed to engage at least 10 percent women farmers in each session; some trainings were delivered by female trainers, which helped to boost women's participation; and the project promoted practices to supplement women's incomes, such as homestead gardening. In the start-up and SME component, IFC and its partners stipulated that the boot camps had to include women entrepreneurs, reserving a set number of slots for women in the different trainings. The digital advisory activities carried out by mPower helped to support women's access to knowledge and advisory services, as they could reach women in their homes, on their phones, without necessitating face-to-face support.

Sources: IFC, 2021; Mamun-ur-Rashid and Mustafa, 2018; Ratna et al., 2019.

4.3.2. Supporting farmers through ICT services

CRAFS mobilized ICT services to overcome **delivery challenge 3 — geographic access and transportation.** The ICT component was undertaken in partnership with mPower — a social enterprise focused on ICT for development. This component included digital farm extension, weather forecasts, and weather-based crop advisory services.

Providing weather-related advisory was a critical intervention, as weather-related information was mainly within the domain of the public sector (the national Bangladesh Weather Service), which provided forecasts and updates at a high level of aggregation (for example, district-level forecasts).

To provide farmers with useful information that could be more closely targeted to their geographic location, mPower installed automated weather stations to generate real-time highly local weather forecast data that could be shared with farmers. Moreover, mPower developed a web-based ICT platform[20] for the project to integrate farmer information, geo-located data, and weather data in order to provide farmers with customized, precise, and timely advisory services, including on post-disaster and preventive measures to mitigate the impact of severe weather events. Weather-based advisory information was delivered to farmers through automated, tailor-made text and voice messages. Expert consultations through a "farmer query service" (FQS) were made available through a call center to compensate for the lack of staff presence on site.

These ICT approaches and services proved to be a cost-effective solution to provide farmers in remote locations with weather-based advisory services and help them prepare for extreme weather and climate shocks. The project was able to reach over 34,000 smallholders, including 7,218 female farmers, and help them to make informed decisions to address climate-

related challenges (for example, through drainage and irrigation techniques). These digital innovations helped overcome the infrastructure and geographic bottlenecks of the polders' remoteness.[21] As summed up by Mridul Chowdury, the founder and CEO of mPower: "ICT has the power to transform smallholder agriculture by providing a cost-effective means for farmer extension support and precision agriculture. Under the PPCR collaboration, we were given the opportunity to demonstrate its success."

4.3.3. Scaling up access to finance through support for agricultural technology (AgTech) SMEs

In Phase Two, the cyclone insurance component was replaced by an initiative providing risk capital to SMEs. The project partnered with SEAF Ventures (SEAF), an impact investor company in Bangladesh, and Better Stories Limited, a start-up accelerator.

The project invested USD10 million in SEAF to build the investor's capacity to identify climate investment and risk, and to accelerate climate-related SMEs' access to risk capital. The project organized a training program at the Oxford Adaptation Academy on climate change adaptation and climate finance in December 2016. This provided SEAF with tools and methodologies to assess climate finance, manage risks, and make informed decisions on climate-related investments. Altaf Uz-Zaman, Managing Director at SEAF, highlighted that the trainings in Oxford and Dhaka "provided [SEAF] with clarity on PPCR investment framework and allowed them to map their portfolio risks to climate and tap new climate-related investment." As a result of the project, SEAF Ventures committed investments of around USD7.58 million in climate-smart SMEs in the agricultural and non-agricultural sectors. This approach was modeled on an approach successfully used by IFC in the PPCR program in Nepal.[22]

Meanwhile, Better Stories launched an accelerator program to train and support selected SMEs and startups in the polder region to become scalable and investment-ready. In 2018, an initial residential bootcamp, involving 17 polder startups that aspired to be climate-smart businesses, conducted modules

focused on making business decisions on a variety of subjects (for example, finance and planning); redesigning business identities; and adjusting business strategies to achieve climate-smart objectives.

At the conclusion of the bootcamp, Better Stories invited potential local and international investors to a business pitch session where the entrepreneurs presented their new business plans and visions. Some candidates from the polder region, such as Natural Fibers — a start-up producing coconut fibers, were able to subsequently raise funding, thanks to their successful pitches.[23] As Minhaz Anwar, Managing Director at Better Stories, explained: "With inputs and support from IFC, under PPCR, Better Stories could, for the first time, select entrepreneurs from polder regions in climate-smart businesses for capacity building for greater investor readiness."

BOX 2. Working through the COVID-19 Pandemic: A Potential Delivery Challenge Disarmed

When the COVID-19 pandemic reached Bangladesh in March 2020, CRAFS was winding down. Many program activities had been completed or were nearing completion. Nonetheless, epidemics can present a delivery challenge, and the pandemic brought restrictions on mobility and holding meetings. However, the project's early investments in digital solutions and ICT helped to mitigate the effects of the pandemic on project operations, as they obviated the need for face-to-face interactions and trainings. While the project invested in ICT to overcome a different, major delivery challenge related to geographic access and poor infrastructure, these investments also helped the project to cope with the mobility restrictions that followed the advent of COVID-19.

5. RESULTS

CRAFS met or exceeded its goals and targets, generating important improvements in the well-being and resilience of thousands of smallholder households. The results not only suggest improved outcomes for farmers, but also a larger catalytic reaction for CSA in the polders. Concrete improvements in both productivity and incomes were accompanied by a powerful demonstration of the private sector's potential to drive climate adaptation.

Key results at the farm level include:

- Increased farm yields and revenues for major crops (that is, rice, potatoes, and vegetables) by 38 percent and 18 percent, respectively (exceeding the targets of 20 percent and 15 percent, respectively).[24]
- More than 96,000 smallholder farmers, including over 11,000 women, received capacity building on CSA, exceeding the target of 82,500 farmers (including 7,500 women). Over 73,000 farms reported adopting at least one CSA approach.
- Over 80 percent of project-supported potato farmers indicated that they used faster-maturing climate-resilient potato seeds.
- Over 75 percent of vegetable farmers reported using recommended irrigation practices, compared to 40 percent of identified farmers who did not receive training.

The project provided proof of concept for private-sector participation in adaptation practices. Firms involved in the project expressed optimism about working in the polders, CSA practices, and the persistence of the networks built during the project. This represented an important shift in attitudes to doing business in the polders. As Mr. Humayun Kabir of SSCL explained: "The technical assistance provided by IFC under the PPCR has allowed Supreme Seeds to explore new markets in polder regions. Prior to PPCR, we were not focusing on polder regions from a business perspective. Going forward, we will strengthen our presence in polder regions to build on the work done under PPCR and reach out to more farmers with extension and advice for use of climate-resilient seeds."

Moreover, the project's ICT platform, SHUFOLA, supported by IFC, continued to generate new clients after it was introduced. Shah Md. Mushfiqur Rahman, Director of E-Agriculture at mPower, elaborated: "Based on the success of the ICT work in PPCR, many agribusiness companies have reached out to us for collaboration. We have entered into partnerships with firms for providing digital extension support to the farmers in their value-chain across Bangladesh, including polder regions."

The positive impact of the project influenced similar interventions through experience-sharing events organized by CIF in Zambia. The Bangladesh project team shared lessons on how to efficiently design new climate adaptation initiatives. In addition, the National Adaptation Programme of Action (NAPA), prepared by the Government of Bangladesh in 2009, was revised in 2019 to place a greater emphasis on capacity building for smallholders, adaptation to safeguard livelihoods and food security, and greater private-sector participation.

In the following, final section, we turn to lessons from the project on how to boost and leverage private sector engagement in CSA.

6. CONCLUSIONS AND LESSONS

The experience of CRAFS highlights an early IFC effort to support climate adaptation by testing new advisory approaches to building resilience and strengthening markets in the challenging case of the polder regions. Below, we present four lessons drawn from the project on how the private sector can catalyze transformational change in the climate space; the importance of flexibility and course correction in project design and implementation; the effects of investing early in ICT to overcome multiple delivery challenges; and the utility of South-South cross-project learning.

1 **First, and most importantly, the project demonstrated that the private sector could play a key role in adaptation and building resilience to climate change.** Ernest E. Bethe III, Regional Lead – Asia, IFC Manufacturing, Agribusiness and Services (MAS) Advisory Services, explained that "The PPCR project that IFC implemented in Bangladesh was very early in our advisory work with agricultural climate change adaptation. The polders of Bangladesh where the project was implemented is an extremely challenging region. Through the success of this project, we have been able to take lessons and adopt or adapt them to inform private sector led adaptation projects elsewhere."

For the project to succeed, it needed to demonstrate a strong business case to involve private firms and incentivize them to work with the project. When the project was initiated in 2014, the proposition that private-sector participation could catalyze climate adaptation and promote climate resilience was uncertain. This was particularly the case in remote, rural, or difficult environments. It was crucial for IFC to provide knowledge and technical support to boost private-sector participation. This deliberate effort to de-risk initial exploration was essential to catalyzing the entry of firms that might otherwise have focused on larger and more lucrative markets to sell seeds and provide farm extension services. Yet a relatively modest push yielded big results for project sustainability, with firms incentivized to continue their work in the polders.

To effectively bring in the private sector, consultation with and feedback from the lead firms were crucial, as in the approach to focus on polders with demonstrated commercial potential. As the lead firms invested in outreach, farmers became increasingly interested in CSA, once they witnessed the demonstration plots set up by lead firms. Meanwhile, the lead firms were able to generate new business opportunities and benefit more farmers, which created new markets for the firms' climate-smart seeds, and incentivized the lead firms to remain engaged.

By the end of the project, it was clear that this approach had yielded results, creating sustainable economic networks that could continue to provide services and create value. The project was able to tap into the ingenuity of the lead firms in addressing obstacles and the innovation of smaller partners in providing cutting-edge tools. Private-sector participation helped to turn challenges into opportunities, as demonstrated by the example of BPFIL. Although the lack of infrastructure represented a persistent constraint on getting crops to market, BPFIL was able to circumvent this challenge by determining that it was more cost-effective to ship potatoes via the waterways that crisscross the polders than relying on land transportation.

2 **The project demonstrated the critical importance of creating space for flexibility and responsiveness when designing and implementing projects.** One key aspect of the project's initial design was building in flexibility and modularity through a phased approach. This

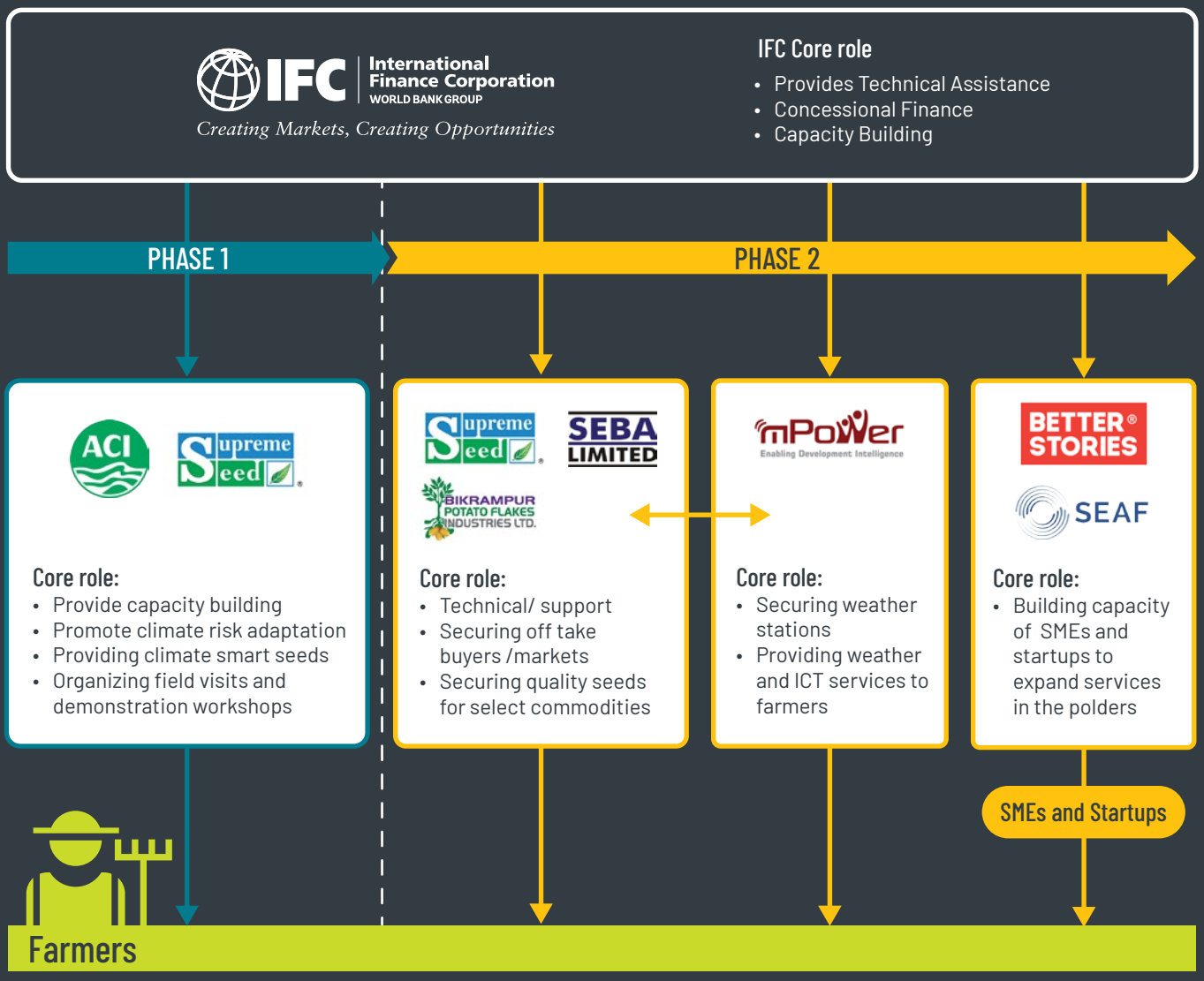
phased approach was vital to the success of the PPCR project. Phase One allowed the testing of relevant CSA practices, knowledge building, and demonstration of a business case that enabled the team to adjust its strategies for scaling up from the implementation experience.

Moreover, the project adjusted its approaches in response to new information and learning with regard to market conditions, and made mid-course adjustments to accomplish the objectives of the project. This intentional agility was manifested in the flexible responses to feedback from lead firms and other lessons learned during implementation, including shifting emphases among crops and polders as the business case was refined during Phase One.

3 **Integrating and mobilizing innovative ICT and digital services were crucial for overcoming geographic barriers and providing protection against unexpected delivery challenges.** The project initially began to invest in digital technology to adapt to the geographical challenges of working in the polder regions. Implementers realized early on that, given the inaccessibility of the polders, it would be difficult to carry out a significant number of face-to-face engagements and data collection. In response, they developed digital tools and applications to provide remote support. These tools were critical to extending the reach of the project: they helped overcome the delivery challenges posed by geographic remoteness and poor infrastructure in a cost-effective way.[25] Moreover, these investments prevented disruptions to the project when the COVID-19 pandemic threatened to constrain implementation.

4 **South-South learning from a similar, contemporaneous project helped spur the adoption of solutions.** CRAFS learned from other projects, particularly through exchanging notes with a similar project in Nepal that was initiated a year earlier. This exchange accelerated the project's learning on agricultural techniques, the importance of identifying off-takers, and how to engage with the private sector. The PPCR Nepal project provided an initial idea and proof of concept for the approach of working with local investors and entrepreneurship accelerators to spark SME investment. The Nepal experience also highlighted the importance of securing markets for farmers' produce. Furthermore, weather data technology was used in Nepal prior to its application in Bangladesh, providing confidence about the approaches and technology later used by CRAFS.[26]

ANNEX 1: STAKEHOLDER MAPPING



ANNEX 2: LIST OF STAKEHOLDERS INVERVIEWED

NAME	POSITION	ORGANIZATION
Harsh Vivek	Operations Officer	IFC
Akira Dhakwa	Consultant	IFC
Humayun Kabir	Managing Director	Supreme Seed Company Limited
Shah Md. Mushfiqur Rahman	Director of e-Agriculture	mPower Social Enterprises Ltd.
Ratna Amin Shoma	Executive Director	Seba Limited
Asif Mahmood	Managing Partner	SEAF Ventures Management Ltd
Nurul Hai	Vice President	SEAF Ventures Management Ltd
Minhaz Anwar	Managing Director	Better Stories Limited

ANNEX 3: REFERENCES

Cacho, Oscar J., Jonathan Moss, Philip K. Thornton, Mario Herrero, Ben Henderson, Benjamin L. Bodirsky, Florian Humpenöder, Alexander Popp, and Leslie Lipper. 2020. "The Value of Climate-Resilient Seeds for Smallholder Adaptation in Sub-Saharan Africa." *Climatic Change 162*, 1213–29.

Dasgupta, Susmita, Mainul Huq, Zahirul Huq Khan, Manjur Murshed Zahid Ahmed, Nandan Mukherjee, Malik Fida Khan, and Kiran Pandey. 2010. "Vulnerability of Bangladesh to Cyclones in a Changing Climate: Potential Damages and Adaptation Cost." Policy Research Working Paper 5280. World Bank, Washington, DC.

Garcia, Jon. 2018. *Promoting Climate Resilient Agriculture in Nepal Building Climate Change Resilient Communities through Private Sector Participation.* Climate Investment Funds and International Finance Corporation, Washington, DC.

Gordon, Were, and Ajayi. 2019. "Putting the Private Sector at the Centre of Climate-Smart Agriculture." CTA.

IFAD (International Fund for Agricultural Development). 2015. "Climate-Resilient Agricultural Development: Scaling Up Note." IFAD, Rome. https://www.ifad.org/documents/38714170/40264252/climate_sun.pdf/15655fe0-d06f-434e-b4ea-df9017c93ef2.

IFC (International Finance Corporation). 2021. Project Completion Report (PCR): PPCR -AGRI BD (584887).

IRG (International Resource Group) Development Services Limited. 2020. Endline Study Report of Rice Farmers, supported by Supreme Seed Co. Ltd. Report prepared for International Finance Corporation (IFC).

Ishtiaque, Asif, Nikhil Sangwan, and David J. Yu. 2017. Robust-Yet-Fragile Nature of Partly Engineered Social-Ecological Systems: A Case Study of Coastal Bangladesh. *Ecology and Society 22* (3), Article 5. https://doi.org/10.5751/ES-09186-220305.

Mamun-ur-Rashid, M., M. Kamruzzaman, and Emad Mustafa. 2018. Women Participation in Agricultural Extension Services in Bangladesh: Current Status, Prospects and Challenges. *Bangladesh Journal of Extension Education*, Volume 29, No. 1&2, 2017: 93-107

Persson, Svante. 2018. The Business Case for Climate Resilience. Inter-American Development Bank. https://blogs.iadb.org/sostenibilidad/en/el-incentivo-de-negocios-de-la-resiliencia-climatica-2/

Ratna, Rokhsana Parvin, Sudhir Yadav, Manoranjan Mondal, Ranjitha Puskur, and Krishna Jagadish (2019). What Mechanization Means to Women: Case Studies from Polder Communities of Coastal Bangladesh. https://blogs.k-state.edu/siil/2019/11/04/what-mechanization-means-to-women-case-studies-from-polder-communities-of-coastal-bangladesh/

Tall, Arame, Sarah Lynagh, Candela Blanco Vecchi, Pepukaye Bardouille, Felipe Montoya Pino, Elham Shabahat, Vladimir Stenek, Fiona Stewart, Samantha Power, Cindy Paladines, Philippe Neves and Lori Kerr. 2021. Enabling Private Investment in Climate Adaptation and Resilience: Current Status, Barriers to Investment and Blueprint for Action. World Bank, Washington, DC. https://openknowledge.worldbank.org/handle/10986/35203.

UFCCC. 2019. The Business Case for Adaptation. UNFCCC (United Nations Framework Convention on Climate Change). Accessed at https://unfccc.int/documents/200006.

World Bank. 2016. *Dynamics of Rural Growth in Bangladesh: Sustaining Poverty Reduction* (Conference Edition). Washington, DC: World Bank.

World Bank. 2020. "Poverty and Equity Brief: Bangladesh." Washington, DC: World Bank. https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_BGD.pdf.

ENDNOTES

CLICK ON ANY NOTE TO GO BACK TO THE REFERENCED PAGE

→ 1 Ishtiaque, Asif, Nikhil Sangwan, and David J. Yu. 2017. Robust-Yet-Fragile Nature of Partly Engineered Social-Ecological Systems: A Case Study of Coastal Bangladesh. *Ecology and Society 22* (3), Article 5. https://doi.org/10.5751/ES-09186-220305.

→ 2 See, for example, Gordon, Were, and Ajayi. 2019. "Putting the Private Sector at the Centre of Climate-Smart Agriculture." CTA; Persson, Svante. 2018. The Business Case for Climate Resilience. Inter-American Development Bank. https://blogs.iadb.org/sostenibilidad/en/el-incentivo-de-negocios-de-la-resiliencia-climatica-2/; Tall, Arame, Sarah Lynagh, Candela Blanco Vecchi, Pepukaye Bardouille, Felipe Montoya Pino, Elham Shabahat, Vladimir Stenek, Fiona Stewart, Samantha Power, Cindy Paladines, Philippe Neves and Lori Kerr. 2021. Enabling Private Investment in Climate Adaptation and Resilience: Current Status, Barriers to Investment and Blueprint for Action. World Bank, Washington, DC. https://openknowledge.worldbank.org/handle/10986/35203; UFCCC (United Nations Framework Convention on Climate Change). 2019. The Business Case for Adaptation. United

→ 3 The International Financial Corporation (IFC) — a member of the World Bank Group — is the largest global development institution focused exclusively on the private sector in developing countries.

→ 4 Interview with Harsh Vivek and Akira Dhakwa from IFC, December 2021.

→ 5 IFC (International Finance Corporation). 2021. Project Completion Report (PCR): PPCR -AGRI BD (584887).

→ 6 World Bank. 2020. "Poverty and Equity Brief: Bangladesh." Washington, DC: World Bank.

→ 7 World Bank. 2016. Dynamics of Rural Growth in Bangladesh: Sustaining Poverty Reduction (Conference Edition). Washington, DC: World Bank.

→ 8 Dasgupta, Susmita, Mainul Huq, Zahirul Huq Khan, Manjur Murshed Zahid Ahmed, Nandan Mukherjee, Malik Fida Khan, and Kiran Pandey. 2010. "Vulnerability of Bangladesh to Cyclones in a Changing Climate: Potential Damages and Adaptation Cost." Policy Research Working Paper 5280. World Bank, Washington, DC.

→ 9 Adapted from IFC's project objectives.

→ 10 Climate-resilient characteristics include resistance to, or tolerance for, droughts, heat, floods, water-logging, and salinity, as well as requiring shorter time to reach maturity. See IFAD (International Fund for Agricultural Development). 2015. "Climate-Resilient Agricultural Development: Scaling Up Note." IFAD, Rome; and Cacho, Oscar J., Jonathan Moss, Philip K. Thornton, Mario Herrero, Ben Henderson, Benjamin L. Bodirsky, Florian Humpenöder, Alexander Popp, and Leslie Lipper. 2020. "The Value of Climate-Resilient Seeds for Smallholder Adaptation in Sub-Saharan Africa." *Climatic Change 162,* 1213–29.

→ 11 IFC, 2021.

→ 12 See IRG (International Resource Group) Development Services Limited. 2020. Endline Study Report of Rice Farmers, supported by Supreme Seed Co. Ltd. Report prepared for International Finance Corporation (IFC).

→ 13 Supreme Seed Company Ltd. (SSCL) specializes in producing, processing, marketing, and breeding crops and vegetable seeds. Advanced Chemicals Industries Ltd. (ACI) is a leading conglomerate involved in the manufacturing, marketing, and distribution of food products.

→ 14 A variety of crops were grown in the polders. They included rice, wheat, watermelon, and vegetables such as eggplant, tomato, okra, bitter gourd, sweet gourd, ridge gourd, and chili.

→ 15 Interview with Mr. Humayun Kabir, SSCL, December 2021. Stakeholders interviewed indicated that the trainings had a clear persuasive effect in convincing farmers to participate.

→ 16 See Box 1 in Section 3.2 for more information on how the project engaged women in the polders.

→ 17 See Garcia, 2018. Garcia, Jon. 2018. *Promoting Climate Resilient Agriculture in Nepal Building Climate Change Resilient Communities through Private Sector Participation.* Climate Investment Funds and International Finance Corporation, Washington, DC.

→ 18 IFC, 2021.

→ 19 Interview with Mr. Humayun Kabir, December 2021; Information from "Climate-Resilient Agriculture and Food Security (CRAFS) Project: Sharing Regional Experience," PowerPoint Presentation. The ponds can also be used to raise fish.

→ 20 The platform, later dubbed SHUFOLA, garnered awards in 2019 and 2020, including the Bangladesh Innovation Award in agriculture.

→ 21 Interview with Harsh Vivek and Akira Dhakwa, December 2021.

→ 22 Interview with Harsh Vivek and Akira Dhakwa, December 2021; Garcia, 2018.

→ 23 Interview with Minhaz Anwar, December 2021.

→ 24 IFC, 2021.

→ 25 Interview with Harsh Vivek and Akira Dhakwa, December 2021; Interview with Shah Md. Mushfiqur Rahman, mPower, December 2021.

→ 26 Interview with Harsh Vivek and Akira Dhakwa, December 2021.

THE CLIMATE INVESTMENT FUNDS

The Climate Investment Funds (CIF) is one of the largest multilateral climate funds in the world. It was established in 2008 to mobilize finance for low-carbon, climate-resilient development at scale in developing countries. 14 contributor countries have pledged over US$10 billion to the funds. To date CIF committed capital has mobilized more than $62 billion in additional financing, particularly from the private sector, in 72 countries. CIF's large-scale, low-cost, long-term financing lowers the risk and cost of climate financing. It tests new business models, builds track records in unproven markets, and boosts investor confidence to unlock additional sources of finance.

CIF CLIMATE INVESTMENT FUNDS

The Climate Investment Funds
c/o The World Bank Group
1818 H Street NW, Washington, D.C. 20433 USA

Telephone: +1 (202) 458-1801
Internet: www.cif.org

@CIF_action CIFaction CIFaction
CIFaction CIFaction @CIF_action

Implementing MDB

IFC International Finance Corporation WORLD BANK GROUP

Creating Markets, Creating Opportunities