SFSA Bangladesh
Annual Review
2020-2021

Syngenta Foundation for Sustainable Agriculture
Bangladesh

syngenta foundation
for sustainable
agriculture

The report is also available in our website www.syngentafoundation.org

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Contents

Foreward

Innovation and collaboration for greater impact in Bangladesh Agriculture

Agriculture continues to be a crucial sector for Bangladesh. As well as providing food for our large population, it is also a major employer and earns the country important export income. Despite many challenges, farming continues to support GDP growth. The broader agricultural sector improves livelihoods in general, benefiting from stimuli for small and medium agri-enterprises and an efficient blend of labor- and capital-intensive processing. We live in an era of transformation from traditional agriculture to modern, 'tech-savvy', inclusive and market-based value chains. To accelerate this transformation, it is essential to focus on innovation and collaboration among the public and private sectors.

In 2021, the Syngenta Foundation for Sustainable Agriculture (SFSA) marked ten years of commitment to Bangladesh's smallholders. Since 2011, we have been working with government, the private sector and development partners to create sustainable innovations and robust business models. Over that decade, we have established ourselves as an incubator of agricultural innovations and scaled-up, science-based solutions. These have contributed to the overall uplift in our country's agriculture.

This Annual Review serves two main purposes. It describes the progress and performance of SFSA itself. More importantly, it also showcases a broad spectrum of our contributions to agriculture in Bangladesh. These include technical innovation, smallholder development, agribusiness entrepreneurship and climate-smart adaptation of farming practices. The following pages present how SFSA acts in relevant areas and links them – from the laboratory to farmers' fields, from rural to urban, and from home to abroad. As an Annual Review, it is naturally a snapshot, but it provides a combination of strong current evidence and longer-term reflection.

A report on the last two years in any sector has to mention the devastating effects of the Covid pandemic. Many economic and social activities came to a halt. Bangladesh agriculture and its associated organizations, however, did not. We joined with government and other stakeholders to support farmers in tackling the challenges to production, supply and incomes. Our team and partners showed huge creativeness and innovative strength. These enabled us to meet our targets despite the pandemic. We also gained many insights that will help us strengthen our programs in more 'normal' times.

At the international level, SFSA last year launched its strategy for 2021-2025. Bangladesh is a focus country for many of the activities. To achieve the strategic targets and intended change at scale, we and our colleagues in other countries all emphasize partnerships and collaboration. Our common aim is for long-standing, fruitful relationships with governments, donors, private companies and many other partners. In Bangladesh as elsewhere, we are always looking for new coalition opportunities. Our independent position as a non-profit development organization allows us to seek and create the best options for smallholders. If you're enthusiastic about improving their lives, please get in touch!

I would like to thank all our partners, the Government of Bangladesh, and our generous donors for their continued support and cooperation. We are grateful to our global management for its strategic guidance in designing and rolling out innovative programs. Together, we can address the underlying challenges and opportunities in Bangladesh's smallholder agriculture and food systems. I would also like to express my gratitude to all our local employees for their unfaltering commitment to creating a bright future for smallholder farming.

Wishing us all a greener Bangladesh and world, free of hunger and Covid-19!

Md. Farhad Zamil
Country Director, Bangladesh

Messages from the Foundation's head office in Switzerland

Simon Winter - Executive Director

My thanks and congratulations to our team in Bangladesh! Like Syngenta Foundation colleagues everywhere, they have not allowed the pandemic to stop them supporting smallholders. They continue to put farmers first in all they do. This report shows how our Bangladesh team is helping smallholders to create a bright future for themselves, their families and communities. Despite all the challenges of Covid, our Farmers' Hubs and Insurance programs have advanced, and are creating increasingly impressive impact. We are very grateful to the growing number of local and international partners who have helped make that possible. We welcome engagement with others who want to collaborate in delivering smallholder advancement at scale. Bangladesh is a key pillar of the Foundation's strategy for 2021-2025. I hugely look forward to visiting again as soon as travel conditions permit.

Robert Berlin - Head of Agriservices, Digital Delivery & Country Programs

Bangladesh is one of our focused country. To achieve 2021 was a year of anniversaries. Bangladesh celebrated 50 years of nationhood. The Syngenta Foundation marked ten years of working with the country's smallholders – and I am delighted to say that several staff members there have been with us throughout. Over that decade, the Foundation and its partners have helped Bangladesh's crucial agricultural sector take big steps forward, for example in digitalization, upgrading vegetable production and rural business models. Furthermore, our team has established innovations such as the Farmers' Hubs so successfully that we have scaled them up internationally as well. I hope that you enjoy reading this report as much as I have. The growth that it describes looks set to continue!

About SFSA Global

Syngenta Foundation for Sustainable Agriculture (SFSA) is a non-profit international development organization established by Syngenta AG in 2001 under Swiss law and governed by an independent board. Through taking over legacy programs, SFSA has over 40 years' experience in agriculture development with an excellent track record and reputation in bringing agricultural innovations to "pre-commercial" smallholders to help them improve their productivity and incomes.

SFSA operates in 13 countries spread across Africa and Asia, seeking a bright future for smallholder farming. The Foundation's mission has been to strengthen smallholder farming and food systems by catalyzing market developments and delivery of innovations while building capacity across the public and private sectors.

Following a pipeline approach, Syngenta Foundation currently operates across three major streams– Agriservices, Agricultural Insurance Solutions, and Access to Seeds. These key streams are backed by Research & Development and Policy works.

More than two hundred highly motivated employees, representing over forty nationalities, work in several different country offices including Senegal, Mali, Nigeria, Kenya, India, Bangladesh, Mekong, Indonesia, China, and at the head office in Basel, Switzerland.

SFSA works operationally and in thought leadership with a wide range of local, regional, and international partners. These include governments, public institutions, private sectors, international organizations, think tanks, other foundations, social entrepreneurs, and NGOs.

SFSA is not a typical donor. We seek partners with complementary interests and expertise to share investment in programs. We receive core funding from Syngenta and further funding from third parties. This core funding is not a Corporate Social Responsible (CSR) initiative of Syngenta; rather, the company separately runs its CSR activities in the countries where they do business. The Syngenta Company focuses more on large, medium, and commercial farmers whereas the Foundation is more directed towards the needs of smallholders and pre-commercial farmers.

Our Vision

A bright future for smallholder farming

Our Mission

To strengthen smallholder farming and food systems, we catalyze market development and delivery of innovations, while building capacity across the public and private sectors

Our Values

Passion: Drive to achieve our vision and create sustainable impact is at the heart of all we do.

Innovation: We invest in and enable innovations for long term impact, that help smallholders prosper and thrive in a sustainable and resilient way. Agility and an entrepreneurial mindset are crucial here.

Integrity: Ethics, safety and compliance are core to the way we operate. As our statutes demand, we work outside the commercial arena of Syngenta; remaining independent in our views and decisions.

Respect and Growth for All: We embrace a diverse and inclusive culture in our teams and programs that encourages opportunities for all, notably women, and respects diverse opinions and abilities.

Collaborative Spirit: Our work in partnership and programs is based on trust and transparency.

Reliability: We earn trust by delivering on our commitments and creating value for our beneficiaries.

About SFSA Bangladesh

SFSA Bangladesh is registered as an international non-governmental organization with the NGO Affairs Bureau of Bangladesh. SFSA has been active since 2011. SFSA Bangladesh is the fully fledged country office of the SFSA and responsible for operational management of country program and smallholders development mission in Bangladesh. At present, we have been implementing 10+ projects with the funding support from SDC, SCBF, ISF/BMZ, ACIAR, World Bank, and CABI, along with contributions from SFSA itself.

Our developmentworks contribute to government's commitment to achieving the SDG Goals, specifically: 1, 2, 5, 8, 13, 15, and 17. We have added a new dimension to work here: developing innovations and programs specifically designed to support female smallholders and entrepreneurs in strategic partnership with key stakeholders to co-create, co-finance, and collectively innovate, develop, and scale smallholder-appropriate agriculture and climate-resilient solutions. SFSA is motivated by innovation, technical solutions, and linkages to markets for smallholders that have the potential for scaling-up and delivering impact for many farmers.

We operate a wide range of agricultural development activities in 20 districts under 4 divisions (Rangpur, Rajshahi, Khulna and Mymensingh) in Bangladesh through partnerships with government, private, and development organizations.

Syngenta Foundation for Sustainable Agriculture (SFSA) is an independent non-profit international organization established by Syngenta AG in 2001. SFSA operates outside the commercial activities of the company and operated by an independent board. Foundation is not a Corporate Social Responsible (CSR) initiative of Syngenta rather the company separately runs its CSR activities in the countries where they do business.

Our Works

- Focus on agriculture and smallholder development
- Innovation is in our DNA and conveyed via a CSRA and D&I lens
- Follow a market development approach and systemic changes
- Incubate rural agri-enterprises and engage youth and women
- Agile method in implementation and science based solutions
- Enhance efficiency in the field of agriculture through digitalization

SFSA Bangladesh at a Glance 2021

350K+
Smallholder Farmers

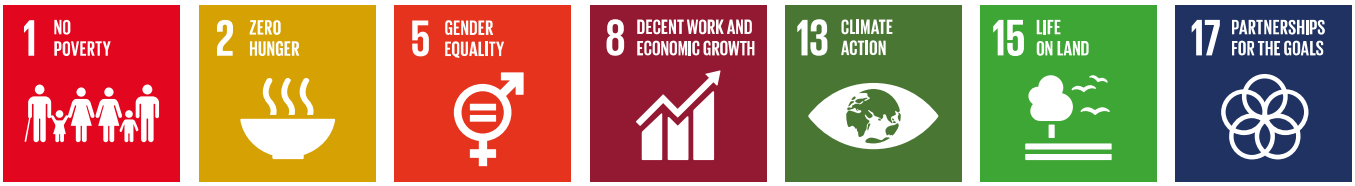
25%
Yeild Increase

30%
Female Farmers

350+
Farmers' Hubs

$182+
Per HH Income Increase

14+
Ag Innovations



PARTNERSHIP

18+
Private Sector partners

10+
Development partners

4+
Public Sector and Research partners

VALUE CHAIN

16+
High value, safe and nutritious crops includes vegetables, cereal and fruits

STREAM

3
Agriservices
Agricultural Insurance Solutions
Seeds2B

backed by Research & Development and Policy works

APPROACH

Mainly market development and multi- stakeholder partnerships

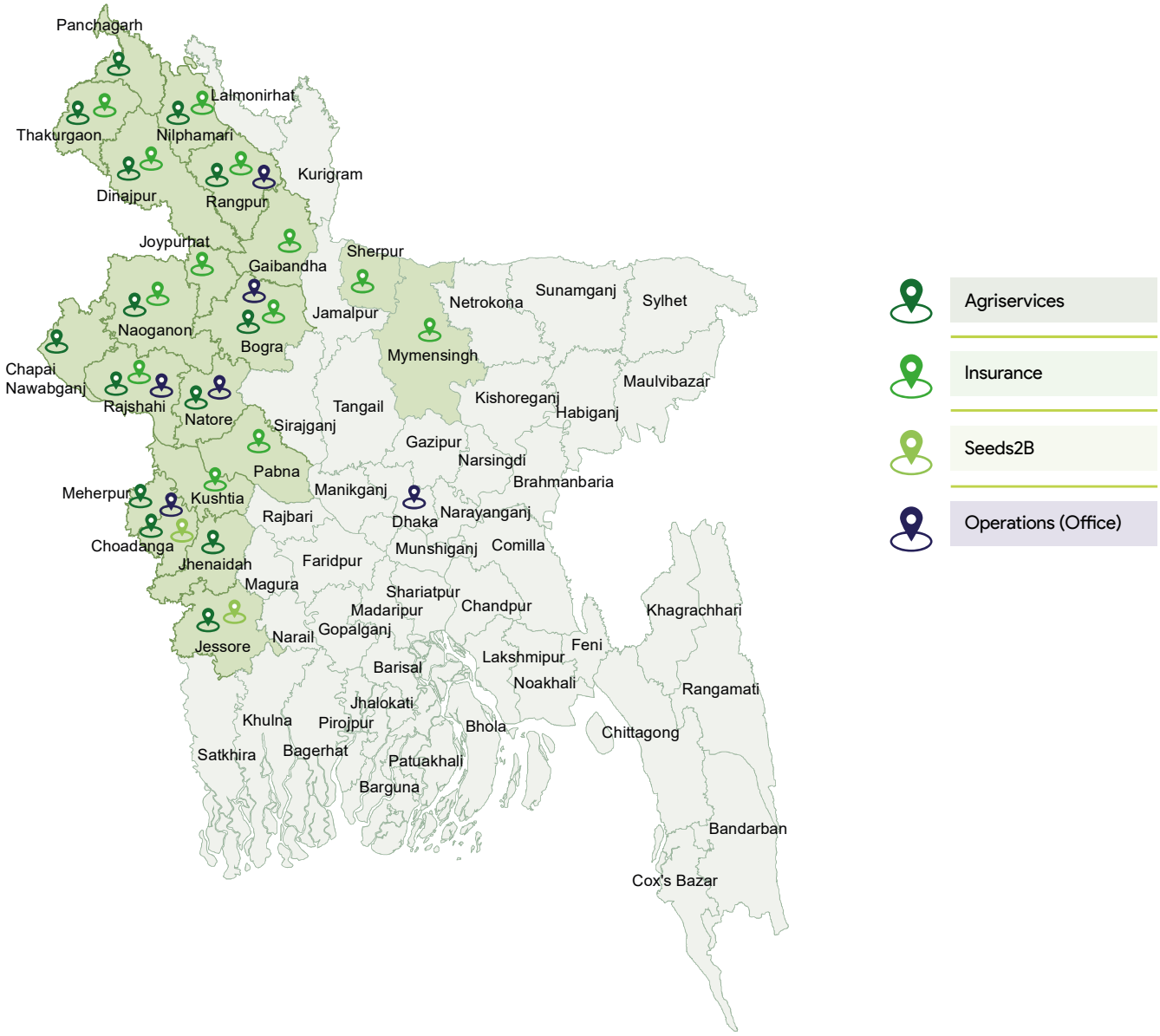
STRATEGY

Smallholders get tools they need, cope with climate changes and benefits from market

DOMAIN

Agribusiness Developement
Climate Smart Resilient Agriculture
Nutrition and Food Systems
Crop Insurance and Risk Mitigation
Ag Digitalization

SFSA Bangladesh Working Area



Agriservices Program:

Rangpur Division – Rangpur, Dinajpur, Nilphamari, Thakurgaon, Panchagarh

Rajshahi Division – Rajshahi, Naogaon, Chapainawabganj, Natore

Khulna Division – Chuadanga, Jeshore, Meherpur, Jhenaidah

Insurance Program:

Rangpur Division – Rangpur, Dinajpur, Nilphamari, Thakurgaon, Gaibandha

Rajshahi Division – Rajshahi, Naogaon, Bogura, Joypurhat, Pabna

Khulna Division – Jeshore, Chuadanga, Kushtia

Mymensingh Division – Mymensingh, Sherpur

Seeds2B Program:

Rangpur Division – Dinajpur

Khulna Division – Chuadanga, Jeshore

Operations:

Country Office - Dhaka ; Field Offices - Rangpur, Bogura, Rajshahi, Natore, Chuadanga

Chapter 1

COMMERCIALIZING AG-INNOVATION FOR SCALE-UP

Since the birth of Bangladesh, the country has accomplished striking growth in food production and has been striving hard to attain self-sufficiency. The economy of Bangladesh is predominantly dependent on agriculture. In 2020, the agriculture sector contributed 13 percent of Bangladesh's GDP of USD 324.24 billion. It also provides the livelihoods of around 40 percent of the labour force. About 80 percent of the country's population lives in rural areas, and 62 percent is directly involved, with many others indirectly engaged in a wide range of agricultural activities. The pivotal role played by the sector in accelerating the economic growth of the country ensures active commitment from the Government of Bangladesh (GoB) towards food security and poverty eradication through augmented crop production, sustainable sector growth, and employment opportunities.

With a population of 162 million living on an area of 147,570 sq km, Bangladesh is one of the world's most densely populated countries with 60 percent of the land in use for cultivation. A total of 16.5 million farmers families of which 84% are smallholders having less than one hectare of cultivable land. Persisting population pressures place a severe burden on productive capacity, creating a food deficit and endangering the agriculture sector. The majority of problems plaguing the agriculture sector of Bangladesh stems from inefficient value chains and unstructured market systems. The following section spotlights the priority interventions led by SFSA to unlock the full potential of the agriculture sector in Bangladesh.

1.1 Fostering rural entrepreneurship – the Farmers' Hub an agribusiness model for the delivery of technology and market solution

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SFSA's Farmers' Hubs are providing access to a new and unique offering to small and marginal farmers in Bangladesh. While farmers are satisfied, there is an opportunity to deepen impact.

- 60 Decibel, 2020

The SFSA Farmers' Hubs provide across all information where input sellers and traders provide pesticides and fertilizer related information mostly to the farmers.

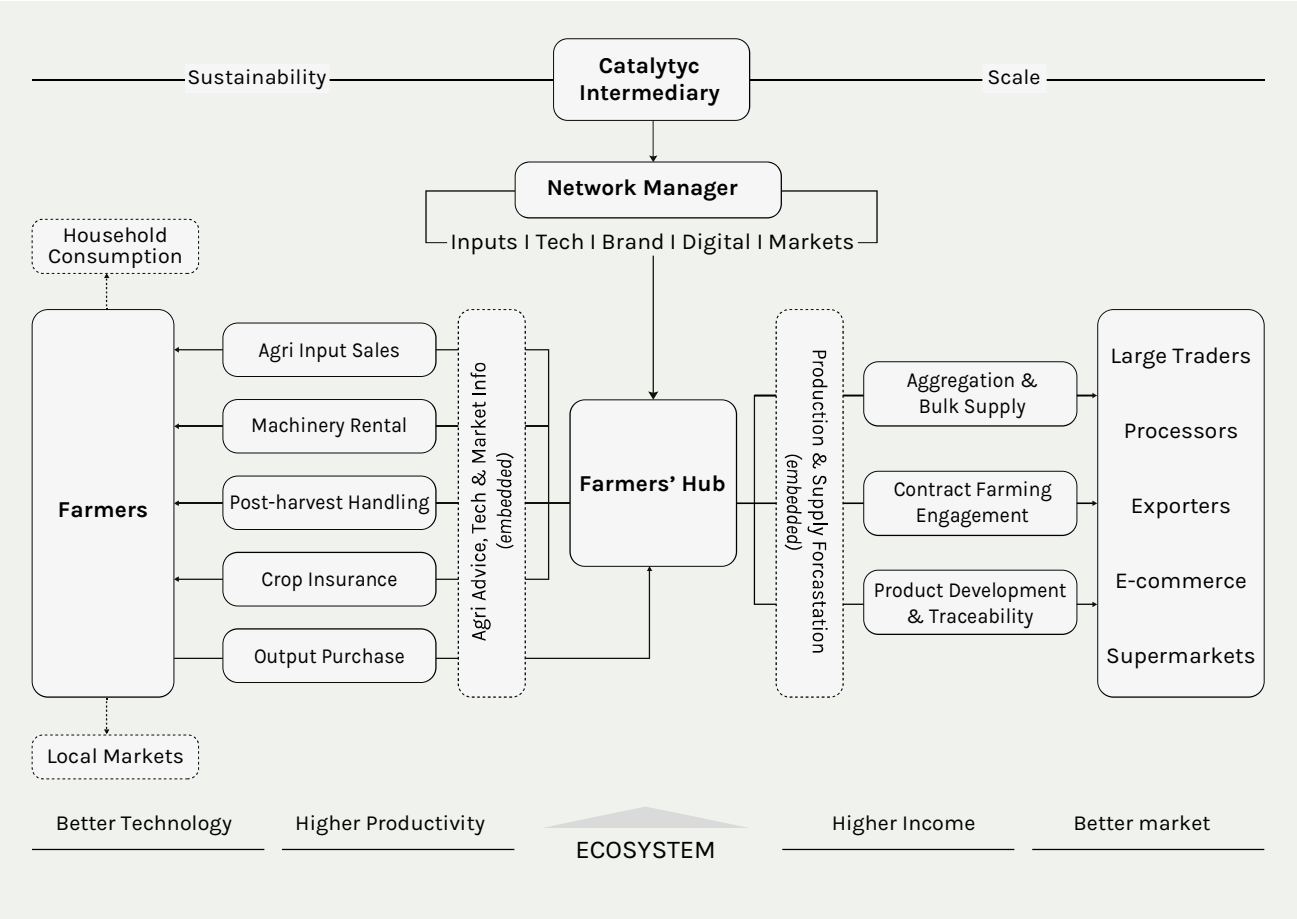
- ACIAR and BAU, 2021

Smallholder farmers in developing countries such as Bangladesh face significant problems of access to both buying and selling markets, and suffer from inadequate knowledge and information about modern cultivation and post-harvest, storage techniques, resulting in low productivity and reduced income from farming. On the other hand, agribusiness companies and large distributors often struggle to collect the necessary quantity of quality raw materials that they need. There are both a demand imbalance and a supply gap at either end of the markets, which represented the key issue and the central question that needed a response.

Besides, many farmers are moving from farming to other types of labor or employment. No farmer is willing to engage their child in farming when there is a choice of other employment opportunity. Traditional agriculture involves intensive physical labor and is not seen as attractive or lucrative proposition for educated rural youth due to uncertain and low income, unstructured institutional form and lack of respect from the society. They are migrating from rural to urban for doing any job, even industry labor. But it is possible to create respectful employment opportunity at rural level with handsome income and make the agriculture profitable by enhancing technology driven commercial agriculture through activation of efficient agri value chains.

In this context, Syngenta Foundation for Sustainable Agriculture (SFSA) has designed and innovated a robust agri-business model called "Farmers' Hub" to frame and address smallholders' farming and marketing challenges and to encourage youth and private sector engagement in the agriculture value chains.

The "Farmers' Hub" is a one-stop commercial service platform creating smallholders' access to quality inputs, agri machineries, crop insurance, markets, finance and knowledge. It helps increase farm productivity, ensures quality and fair prices.



Farmers' Hub Business Model

Farmers' Hub (FH) businesses, owned and operated by rural youth entrepreneurs, are close to the farming zones as well as being connected with road and transport facilities, but are distanced from regular formal markets. Farmers purchase quality products and services from the hubs and grow profitable crops. They also sell their produce to the FH and/or channel through FH, and enjoy competitive market advantages by saving post-harvest losses, cost and time in transportation and marketing, and avoiding unseen weight cuts. FH centralized the facility of purchasing aggregated quality product for large buyers, processors and/or exporters. An ideal Farmers' Hub can provide quality agribusiness services to around 500-1,000 farmers in a radius of 3-5 km at Bangladesh context. By investing USD 2,000 to 4,000, a Farmers' Hub Entrepreneur earns on average USD 3,600 annually. Each FH creates 5-8 employments for poor males and females. FH business comes to a break-even within 18 to 24 months.

Farmers' Hub is a branded agribusiness model and is being piloted via a commercial franchise system where the Network Manager (acting as master franchisee) manages the FHs in a territory, ensures the banding and quality of services (following SOPs developed with SFSA support) and maintains a business relationship with member hubs through supplying input materials and purchasing aggregated output from them.

SFSA plays the role of 'franchisor' of this FH franchising system. As a non-profit entity, the foundation does not engage in the core business rather facilitates to auto run the franchise system. SFSA provides supports in business planning and kicks off the system through proper training, mentoring, technology inclusion and branding; business automation through digital apps 'eFarmersHub'; product pipelining through Research and Development (R&D); and market linkage through contract management with large buyers, processors and exporters. SFSA will gradually withdrawal its 'Franchisor' role and handover to a Catalytic Intermediary according to the exit plan of this model. Its scale up options are open for injecting some more development funds for replicating other locations, government acquisition for massive countrywide expansion and/or private sector investment etc.

The "Farmers' Hub" model is designed and innovated in Bangladesh in 2014 and now more than 350 units, run by five Network Manager (master franchisees), are operating successfully in the Rangpur, Rajshahi, and Khulna divisions, and reach over 200,000 farmers though FH services, contributing to an increase in yields of 34 percent and a 25 percent increase in additional income.

farmers' Hub
DEAL WITH AGRICULTURE

Farmers' Hub Services to Farmers

Agri-Input Selling Services: High quality, high value, zero mortality seedlings grown in a controlled environment with soilless medium increasing yield by up to 35%; also climate shock resistant.

Farm Machinery Rental Services: As local service providers, renting out farm machinery to farmers to boost their agri-productivity and reduce labor costs by 10-50%.

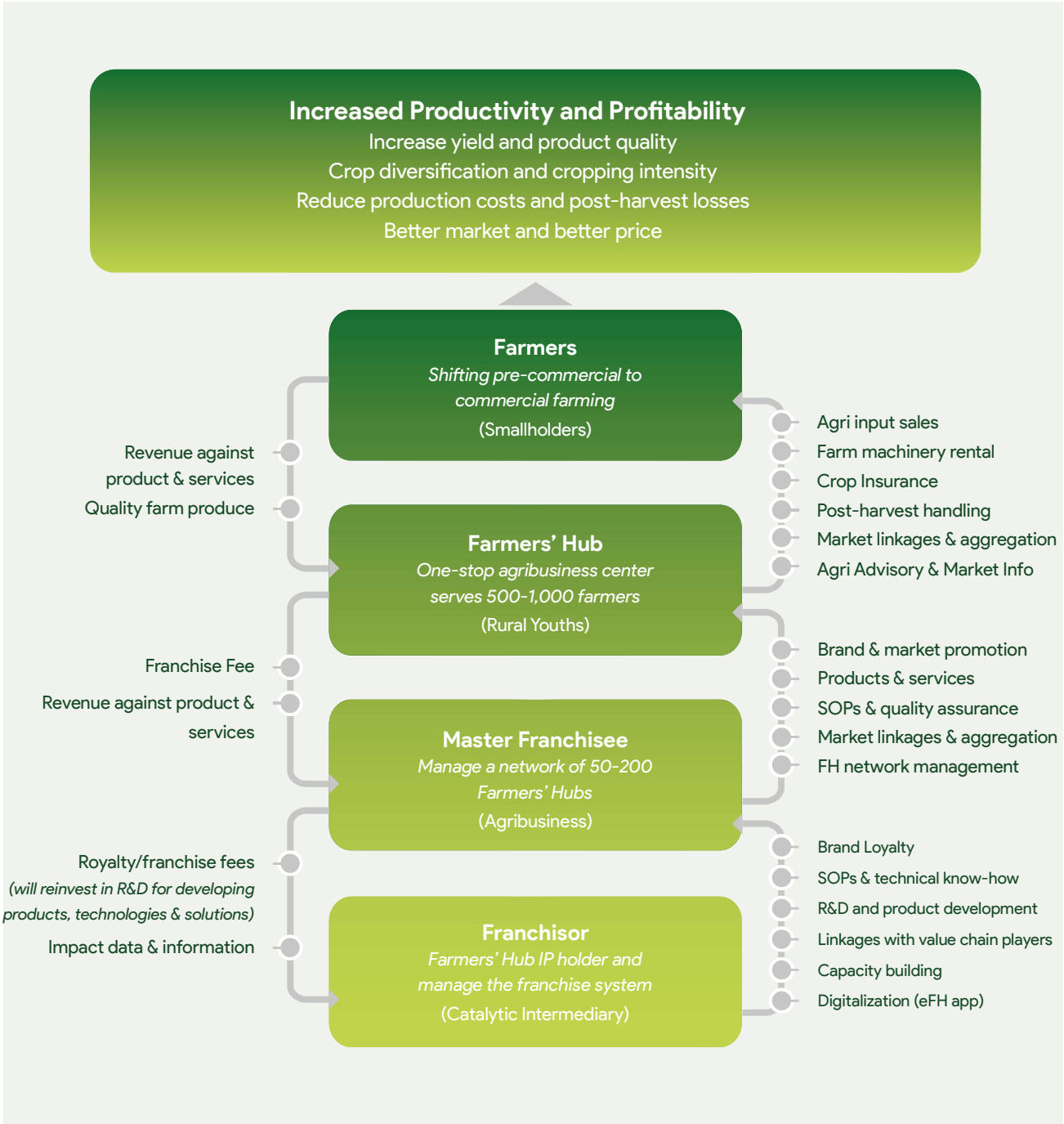
Post-Harvest Handling Services: Centralizing facilities so the product is carried, sorted, graded, washed, and scaled, with quality control to reduce post-harvest losses (up to 8%) and ensure quality aggregation.

Crop Insurance: Selling corp insurance to the farmers as an aggregator of insurance companies.

Buying and Selling Services: Buying back farm produce and aggregation for the Network Manager or large off-taker. FH also manages contract farming.

Agri advisory and market information: Providing basic information about what and how to grow, how to protect crops and where to sell as an embedded service.

Farmers' Hub as a flexible business model, any new products/services can be defined based on the local context and demand.



Farmers' Hub Franchise Model

The success of the FH business model has been replicated in another six countries in Asia and Africa: Indonesia, Cambodia, Senegal, Mali, Kenya, and Nigeria. Several independent studies on the FH business model conducted by ACIAR, 60 Decibel, and LightCastle Partners reveal that it is an inclusive, bankable, commercial, high-impact agribusiness model which works as a vehicle to deliver solutions and services to farming communities.

1.2 Paradigm shift in agriculture inputs – seeds to soilless seedling technology

"We can proudly say that NASSIK Plant & Pot is the pioneer of large scale commercial production of soilless vegetables seedlings in Bangladesh. In 2014, Syngenta Foundation approached us to adopt this technology and provided complete support in recipe of growing media preparation, SOPs for soilless seedling production and sourcing and making the seeding trays. We are grateful and acknowledge the contribution of Syngenta Foundation in scaling up the soilless seedling technology through the private sectors in Bangladesh.

Kbd Md. Atikur Rahman
Chairman
NASSIK Plant & Pot
Rangpur, Bangladesh

Seeds have been treasured since ancient times and human beings were collecting and eating them long before they began to domesticate them.

'Quality Seed' is the pre-condition for healthy plant and good yield. But without the right environment for germination and intensive care, efficient crop production cannot be sustained. Over time, in developed and developing countries, this mechanism went through many changes and modern processes were gradually adopted. But in Bangladesh, the age-old traditional methods of sowing seeds in seed beds and planting in the main fields is still followed. These conventional methods expose a multitude of challenges including a lower germination rate, high transplantation shocks, pest and insect attacks, and soil borne diseases resulting lower productivity and higher dependency on pesticides. Sometimes, the yield and growth of plants is further interrupted due to uncertain weather conditions in the country.

Several years ago, many countries with modern agricultural sector began to adopt soilless seedling production. It has been estimated that using soilless quality seedling can amplify crop yield by 30-35 percent and reduce by at least 30 days the duration of the crop lifecycle in the main field, thus increasing cropping intensity and raising income for smallholder farmers by up to 35 percent. However, despite the massive potential of

this technology for the future of Bangladesh agriculture, until 2013 it remained relatively unknown outside of research laboratories. Three predominant factors contributed to the slow evolution of this technology in Bangladesh:

- Unavailability of plastic trays to grow seedlings due to lack of local production and high import costs.
- Prevailing knowledge gaps regarding easy and low-cost growing media composition.
- Lack of commercial scaling-up of laboratory knowledge.

In mid-2013, SFSA Bangladesh came forward to solve this problem, by re-introducing soilless seedling-based vegetable cultivation and circulating this opportunity to smallholders. They coalesced their global experiences from India, Vietnam and Thailand and adapted them to the local context. R&D was launched to devise low-cost growing media, support local company 'NASSIK Plant & Pot' to produce plastic trays at reasonable price, and identify entrepreneurs to set-up soilless quality seedling nurseries.

At its own R&D center, SFSA Bangladesh innovated a unique composition of low-cost soilless growing medium using coconut coir dust and locally available granular fertilizers for producing vegetable seedlings, which is a first-of-its kind in the country. Beginning in 2013, and after more than 15 composition and component trials, successful results were achieved a year later. This unique media recipe aided the rapid growth of modern soilless seedling vegetable nurseries between 2014 and 2021. Rather than using independent nurseries, SFSA established agriservice centers – the Farmers' Hub – for commercializing this seedling technology. Through this Farmers' Hub Business model, soilless seedling production and large- scale commercial distribution was initiated. These mechanisms – the first of their kind to be introduced in the Bangladesh agriculture sector – are acknowledged within government and the private sector, as well as in the media.

Currently, over 1000 medium and large soilless seedling nurseries exist in the country and more than 350 of those nurseries have been developed through the SFSA Farmers' Hub network. This initiative has also influenced the establishment of 3–5 private entities who have emerged as suppliers of the raw materials required to set up quality seedling nurseries. It is predicted that traditional seedling methods will no longer prevail within the sector, but rather that there will be a paradigm shift towards a soilless seedling-oriented industry. It is expected that increasing numbers of entrepreneurs and private companies will emerge to penetrate the huge untapped market demand for quality seedlings.

Benefits of Soilless Seedlings:

- Higher germination rate
- Free from soil borne pest like bacteria, fungus and nematode
- 'Zero' mortality rate at farmers' field
- Less/no pest and disease attract as grown in net or poly house
- Save 15-30 days at main field enhance cropping intensity
- No root damage during transplantation and transportation
- Post plantation shock is almost nil

Additionally, several agribusinesses and organizations are in large scale production and marketing of soilless seedlings in Bangladesh, includes: NASSIK Plant & Pot in 2014, Agri Plus Ltd (APL) and Rural Development Academy (RDA) in 2017, Maxim Agro in 2018, Agro-1 in 2019 and several more in 2020. PKSF has also supported the training of approximately 30 farmers in establishing this type of nursery.

Operating in northern and southern Bangladesh, Syngenta Foundation Farmers' Hubs produce around 80 million soilless vegetable seedlings annually, which represents only 1–2 percent of market potential. Huge scope yet exists for cultivating these seedling nurseries and creating a better food supply, while also making the agricultural sector more lucrative.

1.3 Simple innovation – basic design, massive impact – era of agri-mechanization coupled with a sustainable service delivery model

"We, ACI Motors sell not only agri machines but help in creating assess to agri machinery services for all. Partnership with Syngenta Foundation gives us extra miles in designing a service delivery model through Farmers' Hubs and reaching more smallholder farmers. Thanks foundation for their continuous efforts in transforming traditional farming to mechanized farming.

Subrata Ranjan Das
Executive Director
ACI Motors Ltd.

In developing countries, many smallholders have no access to appropriate farming knowledge, technologies, or commercial markets and hence face inherent barriers. Smallholders also face weak links to both input and output market infrastructures, attributed to their limited production volumes. From the input side, purchase and use of machines for plowing, sowing, or harvesting often tends to be too expensive for the smallholder farmers. Agricultural mechanization is the only way towards economic transformation for Bangladesh, particularly in the agriculture sector. SFSA and CIMMYT jointly designed and implemented a project titled "CoSMec" to commercialize small-scale mechanization in Bangladesh. Additionally, in partnership with ACI Motors, SFSA Bangladesh developed a rental service modality of large-scale farm machinery (Combine Rice Harvester) that creates community farmers' access to high efficient farm mechanization service solutions.

With the help of a local engineering workshop, SFSA Bangladesh calibrated and remodeled three machine tools: the potato planter, the potato harvester, and the potato grader. As well as being locally available, these innovations are also low-cost, relative to the purchasing capacity of a local service provider like Farmers' Hub. Two national level agricultural machinery importers and manufacturing private companies,

The Metal (Pvt.) Ltd. and R. K. Metal, were engaged to commercially scale up these machines. SFSA Bangladesh then developed commercially viable service- delivery business model to facilitate access to these redesigned tools, through Farmers' Hubs. The core focus was to amplify access to mechanized farming services by developing a market for sustainable local service provision.

The service-delivery model entailed a wide distribution network of 350 FHs in the country. The network facilitated a pathway for marginal and smallholder farmers to access agricultural machinery. Beyond creating agricultural value for smallholders, it also generated an income channel for FHs, through machine rentals. Farmers rent these machine tools for a wide range of practices, such as land preparation, transplantation, irrigation, spraying insecticides or pesticides, harvesting, and post-harvest management of crops. In turn, FH owners earn revenue through rentals of three categories of agricultural machines:

Small: seedling transplanter, weeder, foot pump, charger and power sprayer, irrigation pipe

Medium: mini tiller, power tiller, shallow pump, single-row potato planter and harvester, rice thresher, maize sheller, reaper, rice transplanter

Large: four-wheel tractor, combine harvester

This service provision is being popular among the community farmers and becoming an attractive revenue stream of the Farmers' Hub business. It enhances the efficiency of farming by reducing cost, time and labor dependency. A total of 111 Farmers' Hubs provided mechanization service solutions and earned total revenue of USD 285,573.

Chapter 2

BUILDING CLIMATE SMART RESILIENT AGRICULTURE FOR BANGLADESH

Bangladesh identifies as one of the most densely populated countries in the world, with approximately 1240 people per sq-km of land area . Bangladesh's flat topography, dense population and weak infrastructure makes it pregnable to the powerful and unpredictable forces that climate change is compounding . Despite being one of the lowest contributors to the world's greenhouse emissions, the country is prone to glaring climate-related risks, which can disrupt the economy. For a country with a growing population, this can perpetuate the perils of food insecurity. To prepare for the consequences of rising global temperatures, Bangladesh needs long-term adaptation plans. The following section focuses on the interventions steered by SFSA Bangladesh to help Bangladeshi farmers adapt to climate-related risks.

2.1 Bringing cutting-edge risk mitigation measures and finance for smallholders: Weather index crop insurance

"Weather Index Insurance (WII) is new in Bangladesh and has huge business challenges for any insurance company at this early stage. But we foresee the opportunity and our development partners make our journey easy and sustainable. We show our gratitude to Syngenta Foundation for their extensive support through insurance projects in terms of product development and awareness creation and market development. Jointly we run the country's largest weather index crop insurance program.

Ms. Farzanah Chowdhury
Managing Director & CEO
Green Delta Insurance Company Limited

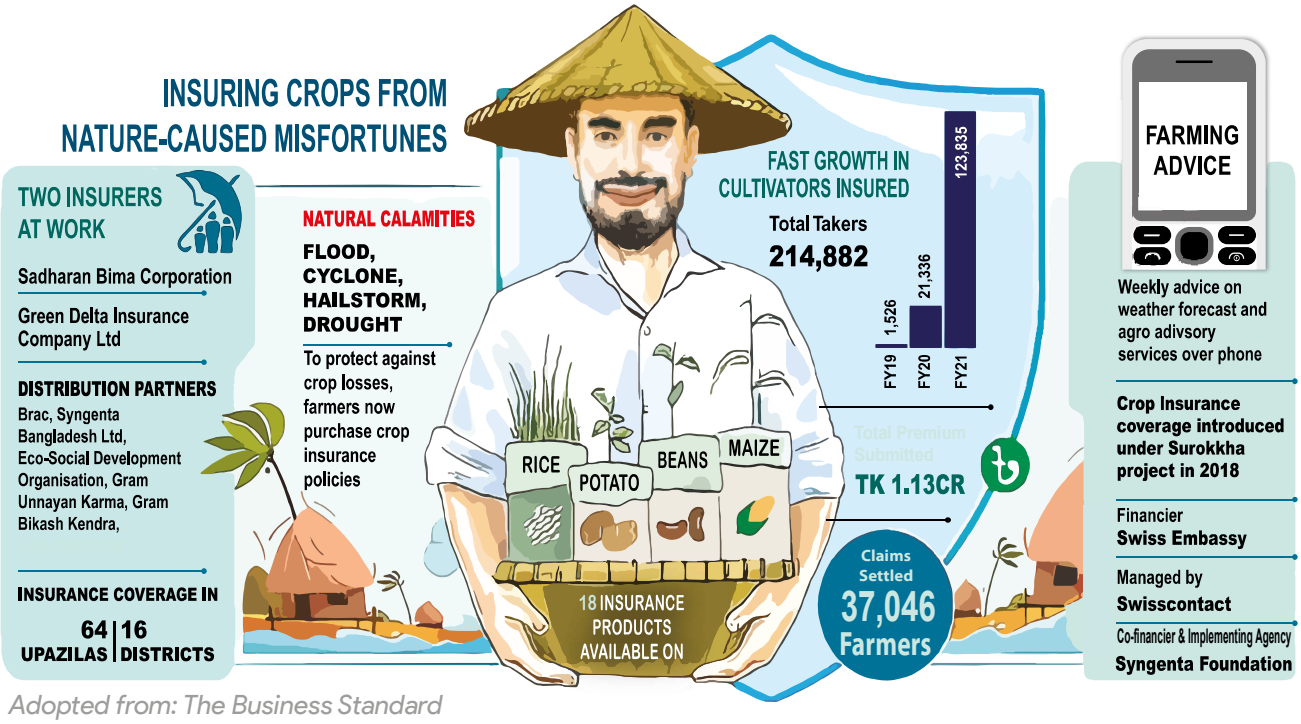
Agricultural production – largely dominated by smallholder farmers – and food security have made notable progress in South and South-East Asia over recent decades. These improvements have played a critical role in fueling economic growth. However, erratic weather conditions threaten farmers' livelihoods by causing poor harvests. Such outcomes affect farmers' ability to repay loans and curb their willingness to access credit or modern inputs in the next harvest season. Agricultural insurance can break this vicious circle, relieving smallholder farmers of some of their weather-related risks by providing a safety net.

Bangladesh, as one of the largest deltas across the world, experiences adverse meteorological consequences which can commonly include floods, cyclones, tidal surges, drought, temperature fluctuation, untimely rainfall, etc. Smallholder farmers are particularly vulnerable to these natural disasters. However, the provision for offering insurance or risk mitigation solutions which are targeted at this critical sector is virtually nonexistent. These challenges are exacerbated as smallholders possess limited savings and access to social safety net services.

Weather Index Insurance (WII) has great potential to mitigate these risks for smallholder farmers. Index insurance leverages historical weather data on rainfall, humidity, temperature, soil

moisture from Bangladesh Meteorological Department (BMD) and satellite sources, to build insurance products tailored to specific crops. The Swiss Embassy in Bangladesh administered a crop insurance component under the Bangladesh Microinsurance Market Development Project (BMMDP) for Promoting Risk Mitigation Measures for Climate Change Adaptation (Surokkha) implemented and co-funded by SFSA Bangladesh and managed by Swisscontact. The SFSA and the Swiss Embassy agreed to a public-private development partnership in building awareness, education and capacity among insurers, insurance distributors, farmers and various service providers in regard to pilot and up-scale of affordable agricultural insurance solutions.

SFSA Bangladesh has already made prominent contributions on the road to weather index crop insurance. Since 2019, SFSA Bangladesh focuses on piloting and testing different commercially viable and sustainable weather index crop insurance products and risk mitigation methods for establishing agriculture insurance market in Bangladesh. To ensure crop insurance to the last mile, SFSA Bangladesh has been piloting different distribution channels like Input-linked channel through Syngenta Bangladesh's dedicated *Krishite Syngenta* retailers ensuring crop insurance bundle with agro inputs; MFI-linked distribution channel where BRAC, Eco Social Development Organization, Gram Unnayan Karma follow its micro credit channels; GBK Enterprise follows Service-linked distribution channel through Farmers' Hub model and Ejab Agro Ltd. with its contract farmers. Sadharan Bima Corporation and Green Delta Insurance Company Limited are involved to underwrite the insurance product and risk taker. Besides weather index insurance, weekly weather forecast and agro advisory services have been providing over the cell phone to the insured farmers for increasing resilience.



Adopted from: The Business Standard

2.2 More crop per drop - increasing farmer income by introducing transformative water management technology and bringing in a density dividend

"The next revolution of the mango orchard will be Ultra High Density Plantation (UHDP). In this system, good quality and higher mango production will be ensured through proper management practices. Big thanks to Syngenta Foundation and the IWET project for starting this initiative timely in our country in a systematic way and continuously supporting farmers to adopt the technologies. Joining their hands with government in technology transfer is really pragmatic.

Dr. Md. Sorof Uddin
Senior Scientific Officer
Pomology Division
Horticulture Research Centre
BARI, Gazipur, Bangladesh

Every year, the topography of Bangladesh exposes it to flooding to the extent of 26,000 km² (around 18% of the country). However, approximately, 8,720 km² of the Barind Tract area in the northwestern region of the country suffers from low rainfall and continuous degradation of ground water levels. This constant decline of groundwater tables has triggered over-abstraction and pollution of surface water – a critical threat to sustainable water access. SFSA Bangladesh, with its associated sponsor and partners , has introduced water efficient technologies to save ground water extraction and improve crop productivity, resulting in additional income for farmers of the Barind Tract area.

The High Barind areas, mostly Rajshahi, Chapai Nawabganj, and Naogaon are popular for mango and rice cultivation but suitable modern technologies have not yet been adopted and traditional cultivation practice results in decreased productivity. In addition to this, water stresses hamper optimum yields and income. Under a project called 'Introducing Water Efficient Technologies in Barind Tract (IWET)' we initiated a revolution in fruit production: Ultra-High-Density Plantation (UHDP) of mango with drip- irrigation technology. It has revolutionized the traditional mango gardening in country system.

With the UHDP technique, 667 mango trees are planted in a single acre of land with the maximum tree height reaching 2-3 meters. By contrast, in a traditional plantation a meager 47 mango trees can be planted in an acre of land and tree height reaches 10-12 meters.

Drip irrigation and fertigation technology in UHDP results in 10 Mt per acre yield against 2.4 Mt in a traditional plantation. Drip irrigation also saves 85 percent of water compared to traditional flood irrigation. Consequently, this technology yields more fruit per drop of water and acre of land.

SFSA Bangladesh identified the gap for such mechanisms in Bangladesh and launched this technology in the Chapai Nawabganj, Rajshahi and Naogaon districts in 2018. This technology addresses not only density plantation but also variety selection, sapling production, fertigation, plant training, pruning, and finally harvesting and marketing. The Bangladesh Mango Research Institute, university academics and the Department of Agriculture Extension kindly helped us in reviewing and validating this technology and its modules for commercial scale-up. SFSA Bangladesh in association with 2030WRG and DASCOH trained up 6,000 individual farmers in UHDP and drip irrigation technologies to implement a fresh start and gradual conversion from traditional to UHDP mango gardening. This is the first and largest commercial UHDP mango gardening initiative in the country.

SFSA Bangladesh regards this total initiative through the lens of Climate Smart Resilient Agriculture to bring solutions that enhance agricultural water productivity. Besides drip irrigation in UHDP mango plantations, it has also introduced Alternate Wetting and Drying (AWD) technology for rice cultivation and for changing cropping patterns from water-loving crops to less water-loving crops such as high-value vegetable cultivation. All together this ensures the resilience, mitigation, and profitability of the climate-vulnerable Barind area.

CSRA Lens	Resilience	Mitigation	Profitability
Ultra-High Density Plantation (Mango)	- Reduce post-harvest loss due to hand picking (mango)	- More efficient pesticide use	- Higher yield and selling price - Reduced harvest loss
High Yielding Variety	- More consistent revenue	- Increased overall input use efficiency	- Higher yields (+200-300%) - Improved labour use efficiency
Drip Irrigation (mango)	- Reduce water use (-85%)	- More efficient fertilizer use - Improved water efficiency	- Higher yields - Improved input use efficiency - High up-front investment
AWD (Rice)	- Reduce water use (-25%) - Increased resilience to erratic water availability	- Reduced water use (-25%) - Lower GHG emissions than traditional rice production	- Reduced costs of irrigation (-23%) - Minimal investment cost
Crop Diversification	- Reduce water use (-90%) - Income diversification - Increased resilience to erratic water availability	- Reduced water use (-90%) - Reduced GHG emissions	- Increased revenue from higher yields and prices of vegetables and fruit

In the past three years, this technology has been copied widely in this region with approximately 1000 UHDP mango gardens being established or gradually transformed. To ensure supply of the right kind of quality sapling for UHDP and market linkages, SFSA has also introduced more than 50 sapling and vegetable nurseries here through the Farmers' Hub model.

2.3 Safe food for everyone – building low-cost screenhouses to produce quality perishables

"Ensuring safe food for all remains a major challenge now a day after managing the food security. Consuming safe food is not a single man choice rather process starts from production. We acknowledge the safe food production initiative of Syngenta Foundation but miles to for maintaining a holistic system- from farm to fork.

Abureza Md. Asaduzzaman
Upazila Agiculture Offcier (UAO)
Birganj, Dinajpur

Vegetables form a vital component of an individual's diet; however, consumption of unsafe vegetables can lead to detrimental health implications. Farm-level pesticide usage is particularly high in vegetable production, causing growing concern over the safety of vegetables amongst consumers in rich and poor countries. The microbial contamination of vegetables, typically resulting from the use of contaminated water in production and postharvest handling, is another associated danger with vegetable production. Standards are usually explicit about what farmers are not allowed to do, but information asymmetries prevail on how to manage vegetable pests and diseases without the utilization of chemical pesticides. Contaminated/unsafe vegetables can trigger harmful consequences for our health, including various diseases such as diarrhea, organ failure, and cancer.

Since 2011, SFSA Bangladesh has been focusing on poverty eradication and food security in northwest Bangladesh. Activities revolve around efficient vegetable production and better access to market resources and infrastructure. The core focus is to support smallholders in producing safe, high-quality vegetables for sale to regional wholesale markets, national markets, and supermarkets, thus increasing their income.

Many organizations and individuals across Bangladesh are trying to invest in safe food production, especially in vegetables. However, due to high production costs in relation to market prices, they have not yet come to the forefront. SFSA Bangladesh focuses on low-cost, safe vegetable production, under net houses. Safe food is fundamental for good health but is not always readily available.

To address this issue of demand-and-supply, SFSA Bangladesh has commercialized safe vegetable production in various districts in northern Bangladesh such as Rangpur, Dinajpur and Natore. Initially, through the ChESTA project, SFSA Bangladesh launched safe vegetable production with Santal farmers in Birganj, Dinajpur. Due to a lack of stringent guidelines for safe food production from concerned authorities, a set of specifications for safe vegetables was also established. Currently, there are 40 net houses for different vegetables such as tomato, bitter gourd, bottle gourd, chili, yardlong bean, capsicum, cauliflower, cabbage, etc.

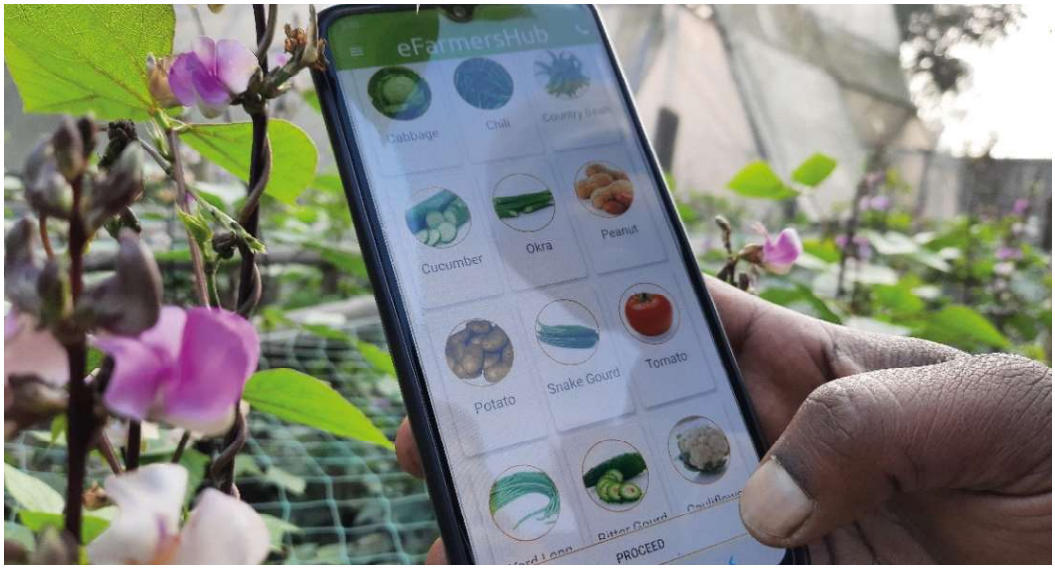
By adopting integrated pest management principles, applying compost, leveraging crop rotations, and creating a favorable growing environment in low-cost shade houses, farmers can reduce usage of chemical fertilizers and pesticide applications. These positive measures ensure the production of safe vegetables, protecting consumer and farm health.

Chapter 3

DIGITALIZATION: PREPARING AGRICULTURE FOR THE FUTURE

A paradigm shift is underway in the agriculture sector as the integration of data and agri-tech opens wider avenues of business opportunities. With increasing support and investment on the digital front across the country, Bangladesh's agriculture is likely to witness digital transformation. The fusion of the two streams can render greater income potential while addressing barriers within the agriculture sector. The following section underscores the solutions provided by SFSA to equip Bangladeshi agri-enterprises and smallholder farmers with tools for a changing business environment.

3.1 Data-sophistication and decision-making for rural businesses: Soluta Ag



“

Having last-mile visibility and real time data is becoming increasingly important in agriculture not just to improve business competitiveness but also to measure and manage impact. Soluta Ag is a step forward in that direction as smartphones and internet infrastructure becomes ubiquitous. Our journey with SFSA is highly ambitious in terms of changing the landscape of data-driven agibusiness strategy in Bangladesh.

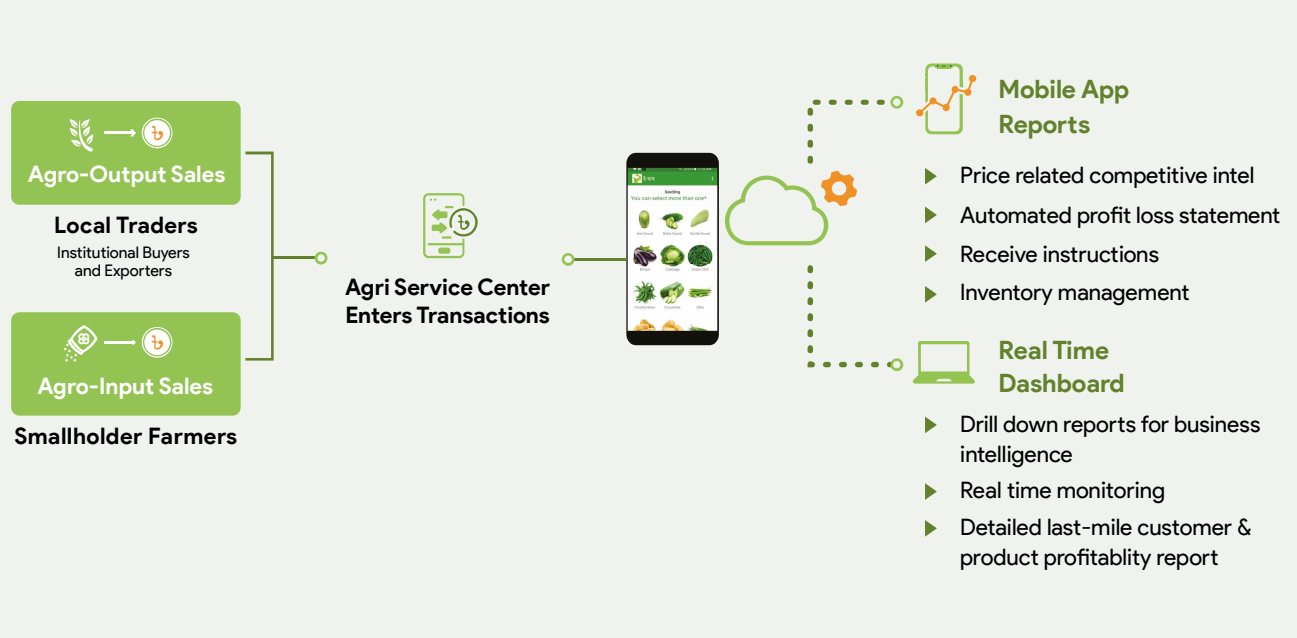
Bijon Islam
Cheif Exectutive Officer
LIghtCastle Partners

The absence of a data-driven approach is prevalent across the entire agriculture value chain, ranging from farmers to agri-entrepreneurs to franchisees to forward actors. Farmers require access to timely market information and agricultural inputs; agri-entrepreneurs struggle with timely cash payment and optimization of product inventory; franchisees and forward markets require robust backward value-chain profiling to warrant greater transparency and improve customer experience. The absence of last-mile visibility creates information asymmetries which manifest as inefficiency in the value chain. A scalable and efficient digital solution can address these growing challenges and add value across the agriculture value chain.

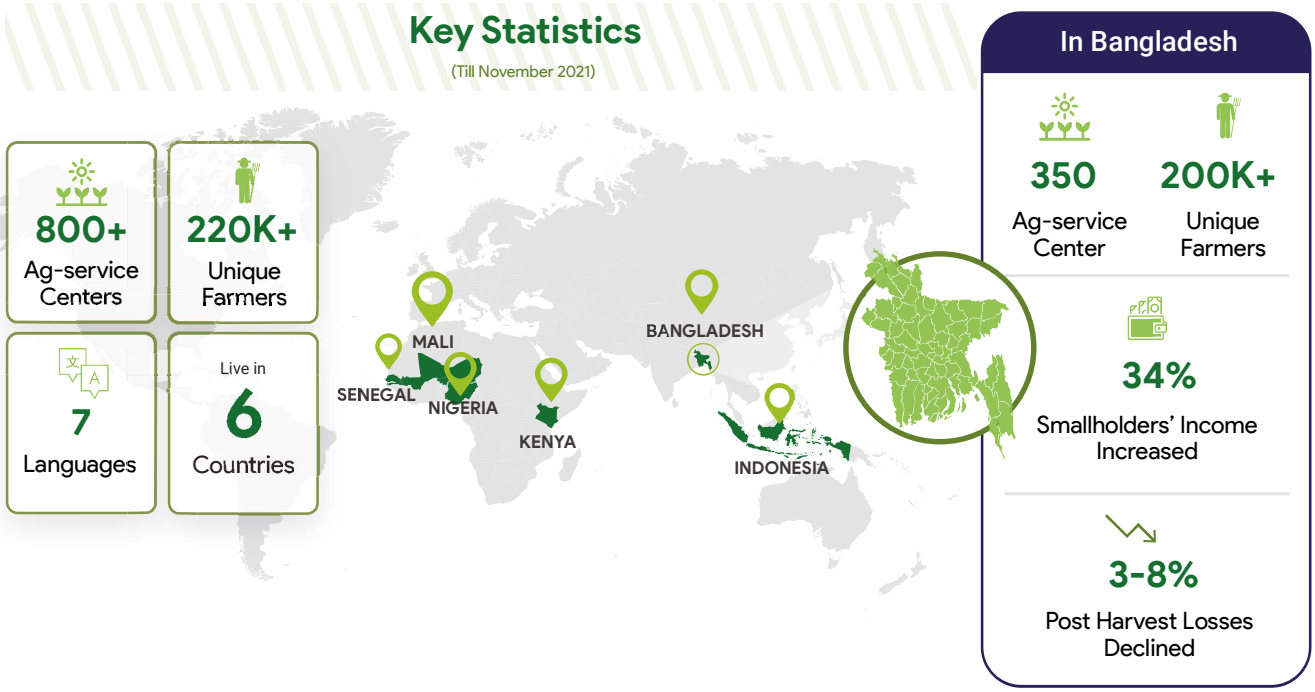
SFSA Bangladesh, in collaboration with LightCastle Partners (LCP), has introduced a novel mobile-light ERP Plus solution – “Soluta Ag” – to solve the farm-to-fork conundrum. The innovation started in 2017 with efforts to enhance the business efficiency of rural agri-enterprises via the hyper-local approach of the “eFarmersHub/ eHub”. Also tested out were similar kinds of business models, e.g. the VSO “Farmers’ Center”. The integrated solution offered by Soluta Ag is all about improving the “three T’s” in the value chain: Transaction, Transparency, and Traceability.

Soluta Ag is a combination of mobile app and web dashboard which can be operated in situations of reduced access capacity and linkage, such as might be experienced by rural youth entrepreneurs as well as functioning at different levels for agribusiness companies, corporations, investors, and development partners. It also has offline capability. The key feature of this solution are the real-time analytics of business profit-loss, inventory, marketplace, customer management, credit notification, and agri-advisory. Last-mile to first-mile individual data and collective analytics contribute to evidence-driven decisions regarding business and smallholders that can be made by rural entrepreneurs as readily as top-level CEOs and funding authorities/institutes.

The basic workflow of Soluta Ag is represented as below-



Syngenta Foundation owns the intellectual property of Soluta Ag and collaborates with LightCastle on technical development and commercialization of the platform across the country. In Bangladesh, more than 350 Farmers' Hub owners, 5 Network Managers, 15 agri-entrepreneurs and an agribusiness company use Soluta Ag, connecting over 200,000 smallholder farmers and 3,000 traders. Besides Bangladesh, another five countries – Indonesia in Asia and the African countries of Kenya, Senegal, Mali and Nigeria – also use the eFarmersHub tool powered by Soluta Ag to manage their 800+ Farmers' Hub businesses and take data-driven decisions.



This platform has generated about 340K transaction data (till 2021) with farmers' basic info and details of their purchasing patterns. Last-mile farmers' purchasing and selling behaviors always pay attention to the agri-input and output companies. With a strict data privacy policy and the right kind of customer service, this platform is now commercially bought by Oxfam Program for its enterprise management. At this moment, some more input companies and development organizations are in the pipeline to take up the service of Soluta Ag.

3.2 Actuarial "Garage" to farmers' hand- crop insurance at the doorstep: Resilient Engine

"At EnvEve SA, we are very proud to be the digital technology partner for Syngenta Foundation Bangladesh. Jointly, we are enabling to provide financial protection to smallholders against climate-related risks and make smallholder-based supply chains more resilient. In Year 2021, over 100'000 rice, potato and country bean farmers benefitted from micro-insurance products made available and affordable through the InsurTech Platform Resilience Engine. Together, we laid the foundation to expand micro-insurance to several hundred thousand farmers by 2022.

Susanne Lauber Fuerst
Chief Executive Officer
EnvEve SA

Resilience Engine, developed by the Syngenta Foundation in partnership with the Swiss software company EnvEve with a grant support from InsuResilience Solutions Fund (ISF) to expand the innovation to the last mile Bangladeshi users is a digital marketplace for innovative agricultural risk management and climate-risk insurance solutions for smallholder farmers globally. Resilience Engine (RE) is an end-to-end cloud-based platform that provides access to data, customer onboarding, underwriting and policy issuance, autonomous claims calculation, and claims settlement and offers an opportunity to deliver value-added services (agronomic advice and weather information) to smallholder farmers and value-chain actors. RE is composed of key modules revolving around product design, distribution, and delivery. The associated models include:

a) Climate Data Library accommodates all satellite and ground station data running online on the RE platform. The climate data library can automatically receive up-to-date satellite and AWS (Automated Weather Station) data from the respective sources. Currently, data sources such as CHIRPS,BMD and JRA-55 are being used to develop insurance products in Bangladesh.

b) Actuarial Factory enables the actuary to design and maximize the number of client-tailored products going into the marketplace. Since its inception in Bangladesh, eleven insur-

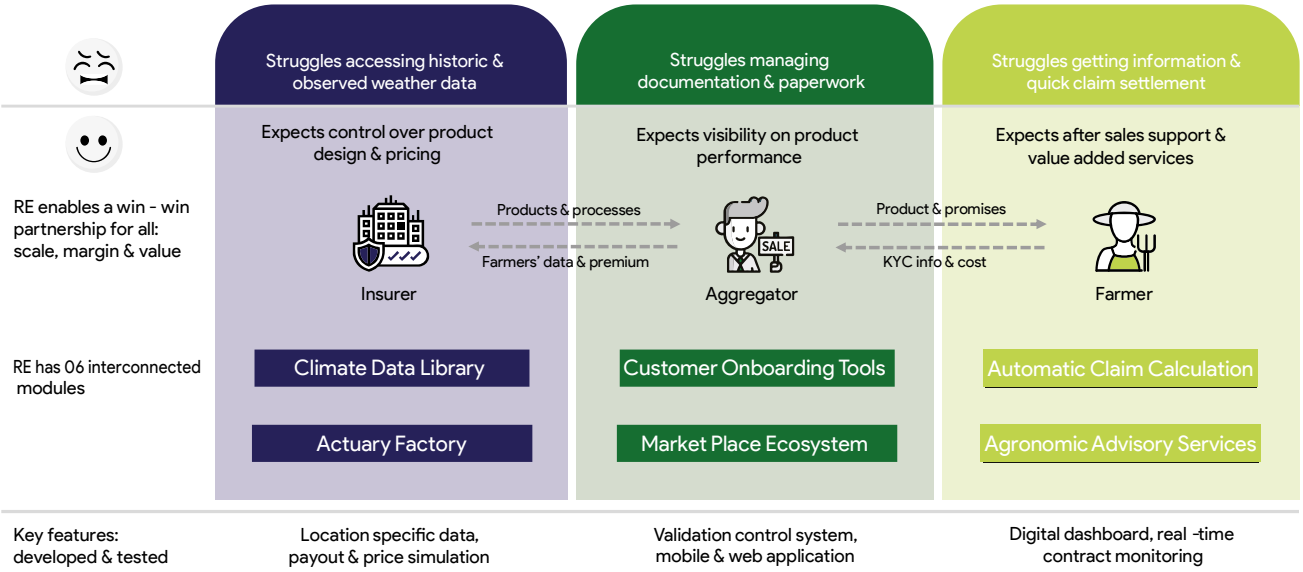
ance products associated with two insurers have been pushed.

c) Customer Onboarding Tools use in the collection of client/insured farmer details. The aggregators can facilitate the onboarding of their farmers through insurance products developed and pushed by the actuary. About 100,000 insured farmers administered by six distribution partners have been onboarded into the system.

d) Autonomous Claim Calculation Services integrate data from customer onboarding modules, the climate data library, and product index formulate and performs autonomous claim calculations based on live insurance products. This service has proven its capability to generate reliable results by calculating the exact amount and number of claims upon autonomously receiving data from the monitoring phase.

e) Agronomic Advisory Services deliver advisory services to the insured farmers regarding farm management practices and provides weather information services targeting increased production and broader risk- management solutions. The development of this module is still in the ideation phase.

The benefits of integrating RE manifest in the form of risk reduction and management, improved resilience, and greater financial inclusion of smallholder farmers. RE has also stimulated the distribution and scaling of commercially viable and sustainable market-driven interventions. Below diagram maps out the value proposition, features and capabilities of RE.



Features & capability of Resilience Engine (RE)

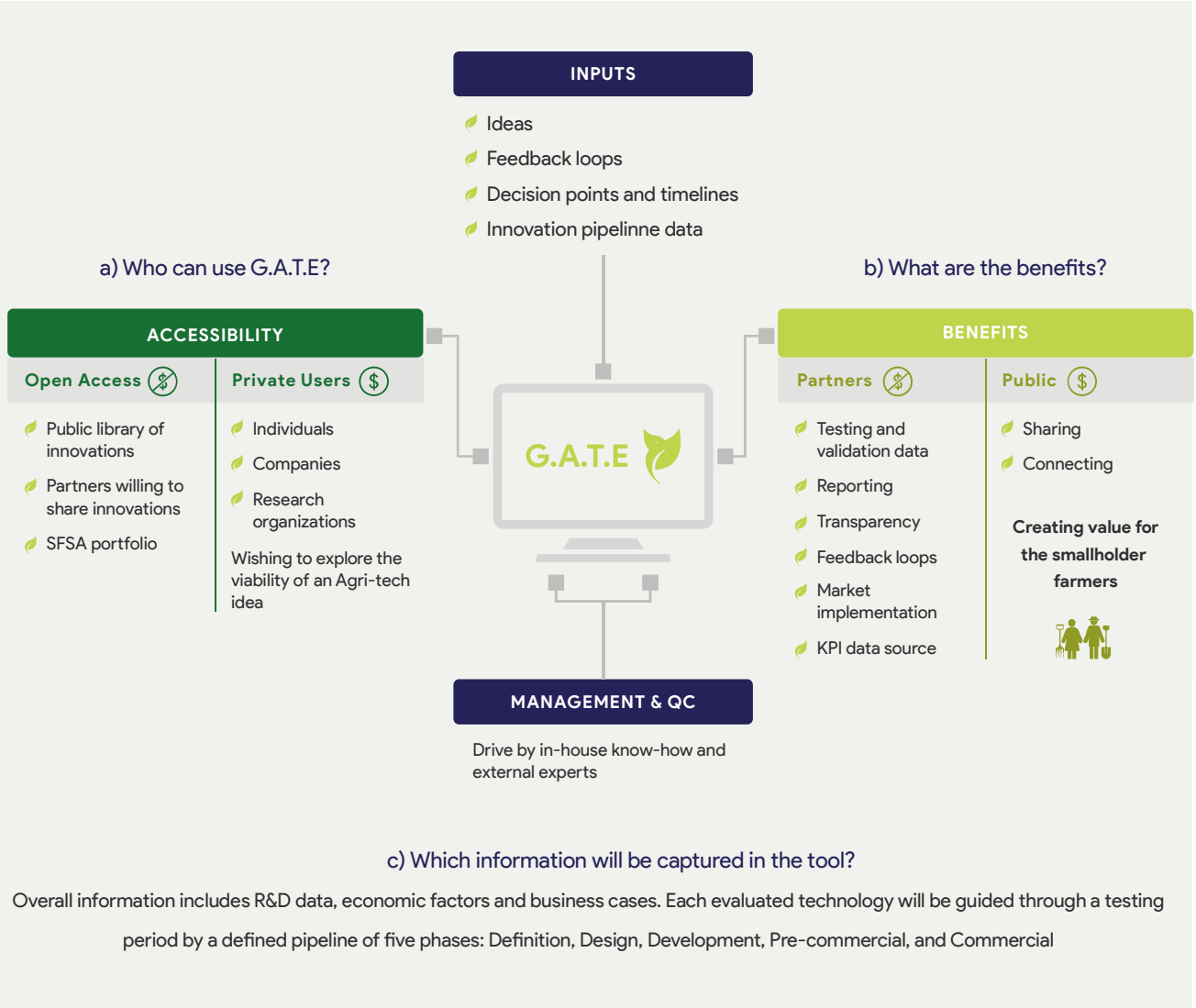
3.3 Innovation - lab to market - technology validation pathway: GATE

Millions of smallholder farmers are not yet reaching their full productive potential. Innovative technologies could help them in meeting increasing food demand, improving their livelihoods, and creating more opportunities in the agricultural sector for future generations. However, adopting and scaling-up the most relevant technologies from innovation providers to the local emerging markets is one of today's major challenges.

To provide solutions for this highly specialized sector, SFSA is offering a unique end-to-end service, including local capacities and the digital support to drive the process of agricultural technology transfer more efficiently and transparently. This service will support aspects ranging from the identification, testing and validation of new technologies, as well as implementation and upscaling. By bolstering a process of technology transfer, SFSA developed a platform with digital tools called GATE: Global Agri-Technology Evaluation – a gateway for channeling innovative ideas to market. A number of innovation fields in agriculture, e.g. knowledge extension, post-harvest, farming practices, nursery practices, livestock and poultry services, mechanization, digital tools for smart farming, etc. are included in this platform. From individual private companies up to research organizations or governments – all can utilize this platform to test out a particular innovation or select it for scale-up.

GATE not only aids the development of new markets for partners but also delivers high value for smallholder farmers and local businesses in developing regions.

The model below outlines how GATE functions:



GATE is a Global initiative of SFSA. In Bangladesh, 14 agricultural innovations went through the GATE platform, followed by a stage-gate approach from idea to commercial scale-up. These innovations have helped thousands of smallholders and hundreds of businesses. It also provided an opportunity for public and private stakeholders to test innovations or select those that had already been tested.

Chapter 4

AGRICULTURE WITH INCLUSIVITY, INNOVATION AND EMPOWERMENT: OUR ONGOING PROJECTS

At present, SFSA Bangladesh implements upwards of 10 projects in Bangladesh under the agri-services and digitalization, crop insurance and financial inclusion, and seeds for development sub-portfolios of SFSA. This is being done with an aim of contributing meaningfully to improving the livelihoods and income options for 0.5 million smallholder farming families through sustainable agricultural technology transfer and the activation of value chains through partnering with farmers and value chain actions. These projects are summarized below:

- Agri-Enterprise Development
- Livelihood Development
- Agri-water Technology
- Agri Risk Mitigation
- Nutrition Security
- Alternative Financing
- Digital Agriculture
- Agri-Mechanization
- Agri-inputs
- Policy Works

FHAME: Farmers' Hub Agri Marketing Enterprise

DURATION 2018-2025

SMALLHOLDERS 350,000

FUNDING SFSA

CONTEXT

Smallholders have limited access to the quality inputs, knowledge, modern technologies, and markets which could make agriculture more profitable and attractive for the next generation.

OBJECTIVES

Involve rural youth in the creation of an effective and efficient agribusiness center (Farmers' Hub) in rural communities as an option to serve smallholder farmers with quality inputs, machines, post-harvest technologies, markets, and knowledge to increase the yield and income of smallholder farmers.

ACTIVITIES

- Develop and introduce the Farmers' Hub agribusiness model in rural areas
- Nurture and educate rural youth in the Farmers' Hub business operation
- Develop the Farmers' Hub franchise model for quality of service and business sustainability
- Facilitate market linkages, branding, promotion and business expansion though R&D
- Support the training of farmers in modern technology, knowledge, and services.

LOCATIONS

Rangpur, Dinajpur, Nilphamari, Thakurgaon, Panchagarh, Rajshahi, Naogaon, Chapainawabganj, Natore, Chuadanga, Jeshore, Meherpur

PARTNERS

GBK Enterprise Ltd. (GBK-E), Shorna Enterprise (Shorna-E), Eco-Social Development Foundation (ESDF), SEBA AgroTech & Seeds Limited, and Sustainable Agri Solutions (SAS)

RESULTS

- **220,000+** farmers (12 percent female) get quality services on their doorstep, from input to output
- **25** percent yield increase due to better inputs and services
- **34** percent income increase due to better prices and production
- **14** new technologies adopted by farmers for better farming
- **350** Farmers' Hub agribusiness centers operating through five network managers under franchise system

ChESTA: Changing Economics of Santals Through Agriculture

DURATION 2018-2025 | SANTAL FARMERS 25,000 | FUNDING SFSA

CONTEXT

Santals, an ethnic, indigenous minority of Bangladesh, have limited opportunities to improve their livelihoods, or engage in economic activities and with mainstream communities.

OBJECTIVES

Economic empowerment of the Santal community and improvement of their livelihood through on-farm and off-farm agricultural activities.

ACTIVITIES

The project exclusively targeted the Santal community for engagement in economic activities related to agriculture, with a focus on women and youth:

- Santals lead small entrepreneurship (mini Farmers' Hubs) development to communicate modern agri-technology methods among their own and the neighboring local community
- Group-based, high-value safe food cultivation for quick earning and nutrition enrichment
- No-cost, group-based roadside medicinal plant plantation for easy and equal earning for community members
- Agri-based Local Service Provider (LSP) development as an alternative income source for the economically active
- Santal youth Introduction of sister beneficiary model in livestock-rearing among the Santal households

LOCATION

Dinajpur

PARTNER

Gram Bikash Kendra (GBK)

RESULTS

- **2,500** Santal households benefit directly from multiple options in agricultural activities
- **25** Farmers' Hub/agri-business centers run by 25 Santals entrepreneurs serve 4000 farmers including Santals
- **90** Santal small businesses developed as a mainstream income source for 90 Santal families
- **265** Santals families engaged in group-based high-value vegetable cultivation and marketing in 26 net houses
- **240** homestead nutrition gardens
- **645** Santals engaged in roadside medicinal plant (100K Bashok plants) cultivation and marketing dry leaves

IWET: Introducing Water Efficient Technologies in Barind Tract

DURATION 2018-2022 | BARIND FARMERS 15,000 | FUNDING TCCF

CONTEXT

The Barind Tract area in the northwestern part of the country suffers from low rainfall and continuous degradation of the groundwater level and this poses a serious threat to sustainable access to water resources. Excessive use of groundwater in the area poses a serious threat to agriculture.

OBJECTIVES

Enhancing agri-water productivity, reducing groundwater extraction, and increasing farmers' income, focusing on the water-stressed north-west region, especially the Barind Tract.

ACTIVITIES

This project has two main interventions:

Intervention 1: Ultra High Density (UHD) Mango Plantation using drip irrigation technology

Intervention 2: Paddy cultivation using Alternate Wetting and Drying (AWD) technology

Under these interventions the major activities are:

- To identify and calibrate suitable water efficient technologies in this local context
- Farmer mobilization and demonstration of water technologies and best agricultural practices
- To prepare a training module and train the partner organizations in facilitation
- Technical support to demonstrate water efficient technology at field level
- Farmers' Hub development and operation through the franchise system to disseminate technology and market linkage for farmers
- Results dissemination among multi-stakeholders to scale up impact and ensure sustainability

LOCATION

Rajshahi, Chapai Nawabganj, and Naogaon

PARTNER

Lead Agency: 2030 Water Resources Group (2030WRG), Implemented by: DASCOH Foundation

RESULTS

- **5.3** million cubic meters of water in mango and rice field saved through the use of drip irrigation technology with UHD plantation and AWD technology
- **10,000** famers receive knowledge (training), services, and tools to increase productivity (16%) and income (25%)
- **40** Farmers' Hubs established, serving about 20,000 farmers, connecting input and output markets and helping in the adoption of new technologies
- Activated multi-stakeholder platform and strengthened institutional alignment in the Barind Tract

NICE: Nutrition in City Ecosystems

DURATION 2021-2025 | CITY DWELLERS 40,000 | FUNDING SDC, SFSA

CONTEXT

Suboptimal diet is responsible for one third of the world population suffering from the malnutrition. The rapid increase in urbanization, population density, and slum settlements poses additional nutritional challenges in the urban areas. City nutrition ecosystem development is now highlighting issues over food governance, nutrition literacy, and supply chains for these vulnerable urban dwellers.

OBJECTIVES

To improve nutrition and health, and to reduce poverty by increasing the demand and supply of local, diverse, agroecological foods through engaging multisector, multi-stakeholders with a special focus on women, youth, and vulnerable population groups in secondary cities.

ACTIVITIES

The Nutrition in City Ecosystems (NICE) project has been implemented in three countries (Bangladesh, Kenya, and Rwanda) by a Swiss consortium comprising TPH, ETH, SAL and SFSA with the funding support from SDC. The following are the key activities for Bangladesh:

- Establish a functional, multi-sectoral platform for nutrition in city areas. Include women, youth, and civil society to develop a meaningful nutrition action plan
- Emphasize knowledge on agroecology for better farming systems and value chains of nutritious food
- Create consumer-centric insight through Social Behavior Change Communication techniques to change consumer and producer behavior.
- Policies will be required prior to implementation of scale-up strategies and horizontal learning in cities.

LOCATION

Rangpur City Corporation and Dinajpur Municipality

PARTNER

Consortium: Swiss Tropical and Public Health-Institute (Swiss TPH), Eidgenössische Technische Hochschule (ETH), Sight and Life, Syngenta Foundation for Sustainable Agriculture (SFSA)

Implementer: Rangpur City Corporation and Dinajpur Municipality, RDRS Bangladesh, Eco Social Development Organization (ESDO)

EXPECTED RESULTS

- **40,000+** HHs will be benefited through different multisectoral stakeholders working in nutrition.
- **40%** women of the project beneficiaries will be involved and empowered
- **30%** youth of the project beneficiaries will be engaged in income generation activities
- City dwellers will have the access to diverse, local, nutritious, and affordable food through linking rural producers to urban consumers

Plantwise - Farmers' Hub Hybrid Model Pilot Project

DURATION 2020-2021 | FARMERS 3,000 | FUNDING CABI

CONTEXT

Private agri-extension provision has little experience in providing advice to farmers regarding accurate diagnosis of pests and diseases. There is a temptation among some input retailers to promote sales of unnecessary, low-quality agro-chemicals and pesticides to smallholders. Therefore, efficient and proper agri-advice to smallholders remains suboptimal.

OBJECTIVES

To train up Farmers' Hub owners as "Plant Doctors", using CABI's module, equipped with digital tools and the Plantwise app/library. A physical "Plant Clinic" would be established in the Farmers' Hub compound as an embedded service of the Farmers' Hub, providing a quality, advanced level of agronomic advice to farmers.

ACTIVITIES

Plant clinics operate in a similar fashion to clinics for human health needs: farmers visit with samples of their crops; trained plant doctors diagnose the problem and make science-based recommendations on ways to manage them. Plant clinics also leverage digital interventions and are reinforced by the Plantwise Knowledge Bank which offers plant health information, including diagnostic resources, pest management advice, and frontline pest data for effective vigilance.

- Develop "Pest Management Decision Guide" involving academic, private, and public experts
- Formal training of Farmers' Hub owners on Plantwise modules to become plant doctors
- Stakeholders' workshop to disseminate information and ensure the availability of quality inputs
- Promotion of the Plant Clinic and encouraging farmers to choose the correct services

LOCATION

Rangpur , Dinajpur, Nilphamari

PARTNER

GBK Enterprise Ltd. (GBK-E)

RESULTS

- **10** Farmers' Hub owners received Plant Doctor training and established Plant Clinics at their Farmers' Hubs
- **10** trained Hub owners have been using the Plantwise digital platform to generate prescriptions and serve farmers
- **3000+** prescriptions generated in last six months
- Farmers acknowledged the quality of diagnosis and recommendation by Farmers' Hub Plant Doctors and demonstrate their satisfaction compared with other sources.

eFarmersHub (eFH): Enhancing agribusiness efficiency

DURATION 2018-2025 | FARMERS 350,000 | FUNDING SFSA

CONTEXT

A reason for the failure of some small agribusinesses in rural communities is the lack of efficient business management practices and the ability to make data-driven decisions. Access to affordable finance/-investment, linkage with markets and extra miles service to smallholders is always challenging for agri-enterprises like the Farmers' Hub.

OBJECTIVES

To enhance agri-business efficiency, connect more smallholders by providing links to markets and finance, and to facilitate data-driven decisions, SFSA has introduced an ERP Plus digital tool called "eFarmersHub" for Farmers' Hub owners and associated agribusinesses like network managers (master franchisees).

ACTIVITIES

The eFarmersHub (eFH) – a mobile light ERP Plus digital platform with an android app and web dashboard – helps agribusiness (Farmers' Hub) keep track of daily transactions and facilitate data-driven investment decisions. Its features include business management, marketplace, finance linkage, and learning content.

- Synthesis of the actual problems and opportunities; building the human center technology eFH for easy adaptation
- Building an ecosystem for connecting smallholders, agribusinesses, insurances, and finance through this technology
- Capacity-development of user on this tool through digital literacy
- Last-mile visibility and transparency in data analytics for making data-driven decisions
- Low-cost information dissemination and farmers' education through this digital platform

LOCATION

Rangpur, Dinajpur, Nilphamari, Thakurgaon, Panchagarh, Rajshahi, Nowgaon, Chapainawabganj, Natore, Chuadanga, Jeshore, Meherpur

PARTNER

LightCastle Partners

RESULTS

- Buy-in the eFH by 350 Farmers' Hubs and 5 Network Managers
- 200K smallholders prosper through this platform
- Scale up this intervention in other countries in Asia and Africa
- Business case for this intervention encourages development of a separate joint venture for commercial expansion of this platform in business models other than that of the Farmers' Hub

Surokkha: Promoting risk mitigation measures for climate change adaptation

DURATION 2018-2022 | FARMERS 233,000 | FUNDING SDC, SFSA

CONTEXT

In the climate-vulnerable context of Bangladesh, smallholder farming communities are susceptible to agricultural losses caused by floods, cyclones, tidal surges, droughts, and untimely rainfall. With limited savings and little or no access to social safety nets, in the event of unprecedented crop damage, they can then be further pushed into poverty.

OBJECTIVES

To develop the weather index-based crop insurance market and promote it among smallholder farmers to increase their resilience to weather shocks and to reinvest in crops like rice, maize, vegetable, and potato. The goal is to cover at least 233,000 small-holder farmers with crop insurance of which 20% of the insured farmers as the poor category and 30% as the women category.

ACTIVITIES

- Design, develop and improve relevant, feasible & affordable Weather Index Insurance (WII) products.
- Pilot different distribution channels of WII products to make these available to smallholder farmers.
- Educate and aware farmers of Weather Index Prod-ucts, benefits, and sources.
- Build the capacity of insurers and distribution partners on weather index product development and its business potentiality.
- Provide weather forecasting, agro advisory services along weather index insurance.

LOCATION

Rangpur, Dinajpur, Nilphamari, Thakurgaon, Gaibandha Rajshahi, Nowgaon, Bogura, Joypurhat, Pabna, Jeshore, Chuadanga, Kushtia, Mymensingh, Sherpur

PARTNER

Insurance Partner: Green Delta Insurance Company Limited, Sadharan Bima Corporation

Distribution Partner: BRAC, ESDO, GUK, GBK-E, Ejab Agro Ltd.

Strategic Partner: Syngenta Bangladesh Limited

Managing Agent: Swisscontact

RESULTS

- 18 Weather Index Insurance products developed on rice, potato, maize, bean, and tomato
- 04 distribution channels established (MFI-linked, input linked, agri-service linked and output linked
- 214K crop insurance policies were sold to the farmers and among them 36% were women
- 37,046 farmers received the payout
- 100K+ farmers received weather forecasting and agri-advisory services over phone call.

InsuResilience Solutions Fund: Boosting agriculture risk mitigation in bangladesh through climate insurance for smallholders

DURATION 2021-2022 | FARMERS 233,000 | FUNDING ISF

CONTEXT

The agricultural microinsurance sector in Bangladesh lacks proper skill and knowledge in both supply and demand side actors, struggles with designing client-centric product and process and has limited access to modern technology and data infrastructure which are hindering the growth and development of a win-win market for smallholder farmers.

OBJECTIVES

Design a set of client-centric agricultural climate risk insurance product for selected crops (i.e., Rice, Potato, Maize, Tomato and Country Bean) and peril (i.e., Flood), and test and implement an end-to-end Agri-InsurTech cloud platform (i.e., Resilience Engine) in Bangladesh.

ACTIVITIES

- Developed weather index insurance (WII) products for Rice, Potato, Maize, Winter Vegetables and Flood targeting the smallholder farmers.
- Introduce end-to-end digital solution for crop insurance value chain, the Resilience Engine (RE) to supply and demand side partners.
- Produce practical tools and templates like the Microinsurance Zoning Model, Household Economy Approach (HEA) Framework for supply- and demand-side partners
- Build technical capacity among stakeholders through production of training modules and advocacy materials.

LOCATION

Dinajpur, Nilphamari, Thakurgaon, Bogura, Jaypurhat, Rangpur, Gaibandha, Rajshahi and Pabna

PARTNER

BRAC, Green Delta Insurance Company Limited

RESULTS

- Weather-index insurance products were developed for Aman & Boro rice, Potato, Tomato and Country Bean, in collaboration with insurance partners.
- Selected features of RE were tested with the highest number of policyholder (i.e., 63,107 farmers of Aman Rice pilot) since the inception of implementation in Bangladesh.

Atlantic potato seed multiplication program

DURATION 2022-2025 | FARMERS 5,000 | FUNDING SFSA

CONTEXT

Potato is the third most important crop in Bangladesh and 1.7 million farmers are directly involved in this subsector. The domestic market for table potatoes is already saturated but there is a huge demand for potato flakes ($5.7 Billion in 2019) in the international market. There are four companies in the country that process potatoes to produce flakes. Besides, although the internationally popular "Atlantic" variety has been introduced to Bangladesh as BARI Alu-68, it has not been commercialized due to some technical errors in seed production and the lack of appropriate promotion to farmers.

OBJECTIVES

Provide technical assistance to increase the adoption of the Atlantic potato variety and grow commercial seeds for contract growers, enabling smallholder potato farmers to access remunerative offtake markets for processed and exported potatoes.

ACTIVITIES

Our main activities are to strengthen the capacity of private seed companies to produce the Atlantic variety seed and multiply it through contracted farmers. We support the company in applied research and farmer adaptation for processing varietal potato production. Our efforts are limited to R&D and technical support to the seed company. The specific activities are:

- In depth information-gathering to develop comprehensive production protocol in the context of Bangladesh
- Research suitable geography and develop a quality seed storage system
- Initiate seed and processing grade potato cultivation
- Seed and ware potato multiplication through smallholder farmers.

LOCATION

Chuadanga, Jeshore, Dinajpur

PARTNER

SEBA AgroTech & Seeds Limited

RESULTS

- Develop appropriate Atlantic seed and ware potato production protocol in the context of Bangladesh
- Develop a specialized quality storage system and tissue culture lab
- Develop 3000 Mt quality seed stock of Atlantic potato using the multiplication process by 2024
- Facilitate 30,000–35,000 Mt Atlantic potato flake production by 2025.

OUR PARTNERS

TOGETHER WE THRIVE - TOGETHER WE SUCCEED

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Donors

- Swiss Agency for Development and Cooperation (SDC)
- InsuResilience Solutions Fund (ISF/BMZ)
- The Coca-Cola Foundation (TCCF)
- World Bank Group/ 2030 Water Resource Group
- Swiss Capacity Building Facility (SCBF)
- International Maize and Wheat Improvement Center
- (CIMMYT)
- Business Finance for the Poor in Bangladesh (BFPB/UKaid)
- CABI

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Private Sector Partners

- Green Delta Insurance Company Limited (GDIC)
- LightCastle Partners (LCP)
- Win Incorporate
- AA Trade International
- Kellogg's/ SEBA Limited
- Syngenta Bangladesh Limited
- PRAN
- ACI Limited
- The Metal (Pvt.) Limited
- Ejab Group
- Quasem Food Products Ltd. (QFPL)
- Taiwan Food & Processing Industries Ltd. (TFPIL)
- Venture Investment Partners Bangladesh Ltd. (VIPB)
- Global Agro Research Inc (GARI)
- GBK Enterprise Ltd. (GBK-E)
- Sorna Enterprise (Sorna E)
- Sustainable Agriculture Solution (SAS)
- SEBA AgroTech & Seeds Limited (SEBA)
- Eco Social Development Foundation (ESDF)

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Development Partners

- Swiss TPH
- Zurich ETH
- Sight and Life (SAL)
- BRAC
- SwissContact
- Gram Bikash Kendra (GBK)
- Eco Social Development Organization (ESDO)
- Gram Unnayan Karma (GUK)
- Bangladesh Water Partnership (BWP)
- DASCOH Foundation
- RDRS Bangladesh

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Public Sector and Research Partners

- Sadharan Bima Corporation (SCB)
- Rangpur City Corporation
- Dinajpur Municipality
- Bangladesh Agricultural University (BAU)

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SFSA BANGLADESH TEAM

The power house behind our growth in transforming agriculture for Bangladesh

Acronyms

ACIAR	Australian Center for International Agriculture Research
AIS	Agricultural Insurance Solutions
AWS	Automated Weather Station
BDT	Bangladeshi Taka
BFPB	Business Finance for the Poor in Bangladesh
BMMDP	Bangladesh Microinsurance Market Development Project
BMZ	Federal Ministry for Economic Cooperation and Development
B2B	Business to Business
ChESTA	Changing Economics of Santal Through Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CoSMec	Commercialization of Small Scale Mechanization
CSR	Corporate Social Responsibility
CSRA	Climate Smart Resilience Agriculture
D&I	Diversity and Inclusion
eFH	eFarmersHub
ERP	Enterprise Resource Planning
ESDF	Eco-Social Development Foundation
ESDO	Eco-Social Development Organization
ETH	Eidgenössische Technische Hochschule
FH	Farmers' Hub
FHAME	Farmers' Hub Agri-Marketing Enterprise
GBK	Gram Bikash Kendra
GDIC	Green Delta Insurance Company
GHG	Green House Gas
GoB	Government of Bangladesh
GUK	Gram Unnayan Karma
HH	Households
IFC	International Finance Corporation
ISF	InsuResilience Solutions Fund
IWET	Introducing Water Efficient Technologies in Barind Tract
GBK-E	GBK Enterprise Ltd.
LCP	LightCastle Partners
MFIs	Micro Finance Institutes
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organization
R&D	Research and Development
RE	Resilience Engine
SAL	Sight and Life
SSAO	Sub Assistant Agriculture Officer
SCBF	Swiss Capacity Building Facility
SDC	Swiss Agency for Development and Cooperation
SFSA	Syngenta Foundation for Sustainable Agriculture
SOP	Standard Operating Procedure
TCCF	The CocaCola Foundation
TPH	Tropical and Public Health Institute
UHDP	Ultra-High Density Plantation
USD	United States Dollar
WII	Weather Index Insurance

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A BRIGHT FUTURE FOR SMALLHOLDER FARMING

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