

Landscape report on existing financial and logistic services in the agricultural sector in Bangladesh

Mehrab Bakhtiar, Riad Uddin, and Raisa Shamma

CONTENTS

- 1 Traditional Financial Services..... 1**
 - 1.1. Bank and non-Bank financial institutions 1
 - 1.1.1 Micro Finance Institutions (MFI) 3
 - 1.1.2 Insurance 3
 - 1.2. Traditional Logistic Services..... 4
 - 1.2.1. Access to input market 4
 - 1.2.2. Local Service Providers (LSPs) 4
- 2. Constraints of traditional services 4**
 - 2.1. Financial service limitations: 4
 - 2.2. Logistical service limitations: 5
- 3. Agri-Tech Innovations 6**
 - 3.1. Financial Innovation 6
 - 3.1.1. Agent Banking System 6
 - 3.1.2. Start-ups to support Banks and NBFIs 6
 - 3.1.3. Start-ups to support MFIs 7
 - 3.1.4. Insurance companies 7
 - 3.1.5. Digital Financial Services (DFSs) 8
 - 3.1.6. Crowdfunding 8
 - 3.2. Innovations in the logistic sector..... 8
 - 3.2.1. Soil Testing 9
 - 3.2.2. Access to inputs 9
 - 3.2.3. Access to market..... 10
 - 3.2.4. Training and Communication..... 10
 - 3.2.5. Artificial Cattle Insemination 11
 - 3.2.6. Local Service Providers (LSPs) 11
- About the Authors 11**
- Acknowledgments 12**
- References 12**

TABLES

Table 1: Disbursement of Agricultural loan (Billion BDT).....	2
Table 2: Amount disbursed by MFIs (Billion BDT)	3

FIGURES

Figure 1: Percentage of agricultural loan disbursement	2
---	----------

The economy of Bangladesh is largely defined by the agricultural sector, which is reflected in its yearly GDP contribution of approximately 11% in the past few years (World Bank, 2022). The sector holds potential for even higher contributions to the economy, provided effective initiatives related to financial inclusion and logistical innovations are implemented. Even during the immense global challenges during the Covid-19 pandemic, the country's agricultural sector persisted. Improving on traditional initiatives and practices to address constraints faced by farmers and other agricultural value chain actors will enable the sector to expand and benefit new sections of the population, including those most vulnerable such as the poor, women, and youth.

Many of the recent innovations in the agricultural sector in Bangladesh have been initiated by 'AgriTech' companies/start-ups in the space of financial and logistical services. Financial services are available for both small and large-scale agriculture operations in the country. Besides innovations in financial services, there has been a burgeoning list of logistical services as well. Utilizing this wave of innovations appropriately can help the agricultural sector reach its full potential for success.

This report is arranged in the following manner. First section 1 discusses the traditional services in financial and logistic sectors, and then section 2 discusses the existing constraints in both sectors. Sections 3 and 4 go into detail on financial and logistical innovations respectively that aim at addressing the discussed constraints. Both sections 3 and 4 have subsections giving a brief description of organizations that are behind these innovations.

1 TRADITIONAL FINANCIAL SERVICES

1.1. Bank and non-Bank financial institutions

In terms of traditional financial services, low-interest-based financing is the primary service available for farmers. These funds can be accessed without putting up any collateral depending on the loan taken and can be used to purchase agricultural machinery, inputs, and for the management of firms. Accessibility to agricultural subsidies and credit programs from the government have made bank services more accessible for farmers. For example, allowing farmers to open No-frills Accounts¹ (NFAs) with a minimum deposit amount of BDT 10 made access to financial services easier. In the span of 2010-2018, as many as 9,317,557 farmers have opened NFAs. Bangladesh Bank (the Central Bank of Bangladesh) along with some agricultural-related specialized banks has set up a special fund for rural and agricultural development. Consequently, many farmers in rural areas with small and medium enterprises (SMEs) are now able to take loans from the banking system. According to the annual report of Bangladesh Bank, agricultural credit have has also grown over time. Along with state-owned commercial banks, private commercial banks (PCBs) and foreign commercial banks (FCBs) distributed BDT 255.2 billion in Fiscal Year (FY21) 2021 to the agricultural sector (Bangladesh Bank, 2021). The amount was 12.14 percent higher than the amount distributed in FY20 (Bangladesh Bank, 2021).

¹ A bank account that can be opened and maintained with a zero balance, levies zero or nominal charges, and does away with unnecessary services or frills. In Bangladesh, no-frills accounts can be opened with an initial deposit of Tk 10, Tk 50, and Tk 100 by underprivileged people and school children under 18 years.

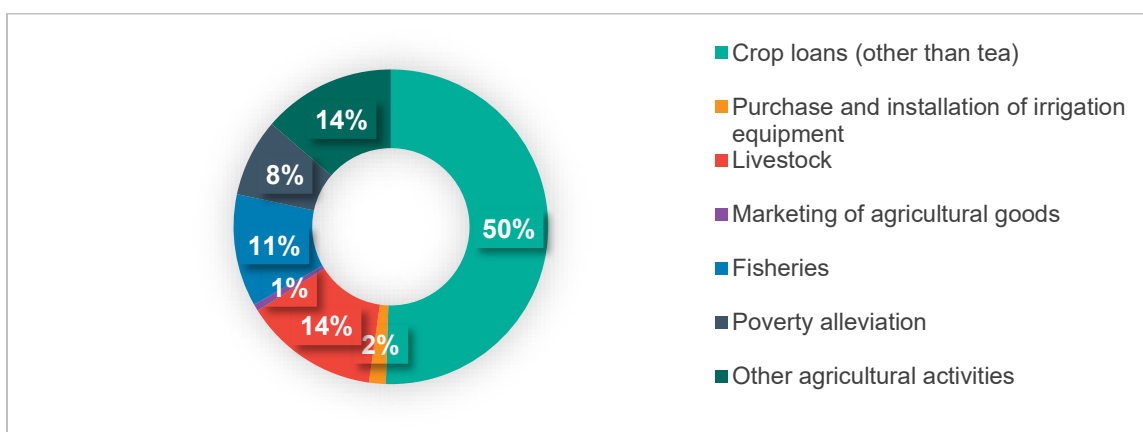
Table 1: Disbursement of Agricultural loan (Billion BDT)

Particulars	FY19	FY20	FY21
Crop loans (other than tea)	118.8	114	128.9
Purchase and installation of irrigation equipment	3.2	2.7	4.4
Livestock	32.5	31.7	35.3
Marketing of agricultural goods	1.2	1.3	1.8
Fisheries	26.8	26.1	29.5
Poverty alleviation	19.5	20.9	20.4
Other agricultural activities	34.3	30.9	34.9
Total	236.3	227.6	255.2

Source: Agricultural Credit Department, Bangladesh Bank.

In **Error! Reference source not found.**, the total disbursement amount in the agricultural sector by commercial banks is much higher in FY 21 compared to the previous 2 fiscal years. In the agricultural sector, crop loans constituted half of the total disbursement amount (**Error! Reference source not found.**). In livestock and fisheries, both received 13.8% and 11.6% respectively of the total disbursement amounts.

Figure 1: Percentage of agricultural loan disbursement



Along with commercial banks, non-bank financial institutions (NBFIs) are also providing loans to agricultural-related SMEs. In FY21, the total disbursement amount to agri-based industries in rural areas was 22.39 billion BDT and NBFIs distributed around 45% of that amount (Bangladesh Bank, 2021).

1.1.1 Micro Finance Institutions (MFI)

Microfinance lending has also been popular in Bangladesh ever since it was first introduced. The goal of microfinance is to make financial services available to marginal farmers and small and medium enterprises who would otherwise be ineligible for traditional credit options. This includes no-collateral loan options that are more accessible than traditional credit. Many organizations with microfinance licenses are operating in remote areas to reach marginal farmers or businesses in the agricultural sector. All of these organization are working under Microcredit Regulatory Authority (MRA). In FY21, in total 746 MFIs distributed BDT 1680.98 billion to 33.30 million borrowers (Bangladesh Bank, 2021).

Table 2: Amount disbursed by MFIs (Billion BDT)

Name of MFI	FY19	FY20	FY21
Grameen Bank	251.37	223.08	190.57
BRAC	396.12	360.99	429.01
ASA	283.68	252.16	285.67
Proshika	4.32	4.93	7.9
TMSS	49.67	43.91	48.95
BURO Bangladesh	91.48	82.2	76.08

Source: Microcredit Regulatory Authority.

1.1.2 Insurance

Among the many benefits of crop insurance, financially protecting farmers from crop loss is perhaps the most important. There is growing demand and need for insurance products due to the frequency of natural disasters affecting production in all areas. Bangladesh's insurance industry is supervised by the Insurance Development and Regulatory Authority (IDRA). In addition to the IDRA, under act 2006, the Microcredit Regularity Authority permits MFIs to provide micro-insurance linked to their micro-credit products (World Bank Group, 2018). However, there are some drawbacks to these microinsurance programs as the programs are not directly supervised by IDRA. Thus, they are not eligible for formal re-insurance. Additionally to protect against catastrophic loss for farmers, the government-backed MFI PKSF has established a catastrophic insurance fund (World Bank Group, 2018).

Lastly, cattle insurance is a service also available to farmers. Cattle can be a very costly investment and having insurance against losses minimizes risks by a significant margin for farmers.

1.2. Traditional Logistic Services

1.2.1. Access to input market

After independence the Bangladesh Agricultural Development Corporation (BADC) was the monopoly organization to distribute and procure agricultural inputs like fertilizers, seeds, and agricultural irrigation equipment (Jaim & Akter, 2010). In the 1980s, as a part of structural adjustment programs, the World Bank and IMF advocated allowing the private sector to have access to this input market. In FY 2022, industry had provided 121,598 metric tons of seeds and 5,691.50 thousand metric tons of fertilizers (Ministry of Finance, 2022). In fisheries, industry had contributed 46.64 thousand metric tons of fish (Ministry of Finance, 2022). In FY2021, in total, industry supplied 56,330 thousand livestock and 36,5850 thousand poultries (Ministry of Finance, 2022).

1.2.2. Local Service Providers (LSPs)

Traditional logistical services aren't as extensive as the financial sector. The most popular traditional logistical service is arguably the use of Local Service Providers (LSPs). In this model, local actors (farmers, business owners, breeders, etc.) are given training to provide extension services (knowledge, technology transfer, training, etc.) to farmers. They can overcome high transaction costs of reaching remote areas since LSPs live in the same communities as their target farmers. They can develop mechanisms for quality inputs in farmers' location based on their expressed needs, since LSPs are thought to be able to overcome the often observed "mismatch" between information demanded by farmers and the information supplied by public extension workers (Kruijssen et al., 2019).

2. CONSTRAINTS OF TRADITIONAL SERVICES

The extent of these services still leaves space for improvement, given the constraints they have. Some of the major challenges are:

2.1. Financial service limitations:

1. High operational costs

Financial institutions have high operational costs, which prevents them from reaching marginal farmers at the grassroots level. Establishing even a small branch in remote areas is usually not profitable for commercial banks.

2. High interest rates

MFIs charge generally high interest rates. These high interest rates make MFI loans unaffordable for a segment of the agricultural sector.

3. Proper assessment of creditworthiness

Assessing creditworthiness is difficult. The lack of credible sources to safely assess the credit history of the receiver makes it difficult to provide them with credit.

4. Reluctance towards insurance policies

Despite the need, due to the gap in communication between the insurance companies and the farmers, insurance is not popular. This lack of communication is created mostly due to the lack

of knowledge and trust. Moreover, conditions imposed by the insurance company have been found complicated by most of the farmers.

This is despite the fact that Bangladesh is vulnerable to several natural disasters that greatly affect the agricultural sector. The lack of both availability and adoption of weather-based insurance policies leave the sector unsafe from such losses. For instance, in 2017, Cyclone Sidr destroyed around 0.69 million hectares of cultivated croplands. Along with that, Sidr killed over 460,000 heads of livestock and poultry (World Bank Group, 2018).

5. Unfamiliarity with digital services

As digital technology evolves, several innovative technological services are being developed which are aimed at bridging the gap between creditors and debtors. However, there exists considerable hesitation and unwillingness to adopt and make use of such services.

Many digital financial services (e.g., bKash and Nagad) have taken off in Bangladesh, but these have been limited to mobile monetary transfers only. Digital financial services (DFSs) that specifically address the credit constraints of farmers, including smallholder farmers are still scarce.

6. Gendered constraints

Women are heavily involved in the agricultural sector, but scarcely recognized or facilitated. Female smallholder farmers face increased constraints when it comes to accessing formal financial services. Women are typically occupied with farming work, as well as taking care of the household. This reduces time available for engagement with agricultural organizations for their benefit. They face further constraints in wage rates, access to credit and inputs, ownership of assets etc. There also exists a gender digital divide in Bangladesh and South Asia – research shows that phone ownership is almost 30% higher among men in Nepal, Pakistan, and Bangladesh compared to women (UNICEF EAP, 2019). This has important implications in women's access to digital financial services.

7. Risk of heavy financial loss

Conventional debt contracts which demand a fixed repayment schedule leave the farmer at a higher risk of incurring loss when they are unable to sell with the desired profit margin.

2.2. Logistical service limitations:

1. Lack of optimal availability and use of inputs

Success of farming depends heavily on several inputs. Based on traditional services available, there is room for significant improvement in making agricultural input more accessible, affordable, and effective.

2. Lack of access to markets

Farmers are the main contributors to this industry. Very often, they are unable to sell their product at the right price, which makes them suffer heavy losses. Access to the market is an essential support for the farmers, which has been inadequate in the conventional methods.

3. Lack of technical knowledge

Farming knowledge can be improved based on new information from relevant research arenas. Orthodox practices are still in use in many regions, which has created a lack of technical and innovative knowledge space. This has an impact on the farming outputs.

4. Lack of sufficient profit from local breed

Cattle of local breed bring limited amount of profit. These are traditionally smaller in size, which consequently makes it difficult to exceed a certain minimal threshold of profit while selling.

3. AGRI-TECH INNOVATIONS

The total size of Bangladesh's agriculture industry is USD 47,549 billion (International Trade Administration, 2022). Given the size of the industry and the limitations detailed above, space for innovation exists. Over the last few years some innovative financial and logistical services have become available to farmers and other small actors in agricultural value chains. There are many start-ups in Bangladesh (with small and larger operational capacities) in the agricultural sector that have created new market-based tools to make their product sustainable with mutual benefits for the farmers. Broadly, we can divide their innovations into the categories of financial or logistics services innovations.

3.1. Financial Innovation

This section discusses the types of innovations that have been evolving, followed by a subsection of organizations that offer such innovations.

3.1.1. Agent Banking System

Agent banking is a popular financial service, which basically aims to bridge the gap between the banked and non-banked portion of the population. It provides limited scale, formal banking service on behalf of a commercial bank for the underserved population by appointing agents under a valid agency agreement, rather than a teller/cashier (Bangladesh Bank). Agent banking could be a powerful system to reach smallholder farmers and micro/small/medium enterprises in remote areas where banking services through formal banks is not perceived to be cost-effective.

Bank Asia: Bank Asia started agent-banking services in January 2014 to increase financial inclusion in rural Bangladesh. At present, they have around five thousand agent banking hubs all over the country. In this model, an agent takes the right to use a certain portion of capital from the bank with a small commission (of around 0.5% of every recovered loan) and are responsible for bearing all costs and setting up a fixed place to run the business. Agents are responsible for finding customers from the market and collecting all the documents from the customer, while the bank reviews all the documents and decides on whether to provide loans to a loanee and if so, the maximum amount of the loan. Agents are responsible for disbursing and recovering the loan amount.

3.1.2. Start-ups to support Banks and NBFIs

Due to increasing operational costs, many banks and NBFIs could not reach the marginal farmers. There are many start-ups who are operating their businesses in profit sharing, fixed higher price (selling products on credit with a fixed higher price), and low interest-based models as financing solutions for the farmers and SMEs. Bangladesh currently has 61 scheduled banks, and 5 non-scheduled banks (Bangladesh Bank). Despite this high number, the reach to grassroot level is insufficient and these start-ups can facilitate banks and NBFIs making that connection. This includes Agri-based startups like iFarmer and WeGro.

The following steps are followed by the startups to generate a list of farmers to provide finance to:

- ▶ Create Know Your Customer (KYC) database using their existing data
- ▶ Risk analysis based on existing data of the farmers
- ▶ Providing everyone's KYC to banks and bank finance by local branches
- ▶ Bank investigates the KYCs and identifies the farmers to provide finance

This facilitates in assessing their creditworthiness from a common reliable database.

Farmers Market Asia: This company operates Agri-related businesses and helps banks to provide Agri-loans to farmers. Farmers Market Asia developed an app based on the blockchain method to monitor the farm's financial activity. Based on the app, stakeholders can monitor the buying and selling activity of a farm. They partnered with City Bank and UCBL to provide loans to the large farmers. Banks use their software to monitor farmers' financial activity and the farmers are obligated to buy inputs from Farmers Market Asia. Farmers Market Asia makes a profit from selling the inputs and provides some informational support to farmers.

WeGro: There are many people in the urban landscape with idle money to invest in a profitable business. Agri-based startups like iFarmer, Prani Sheba and WeGro are trying use this investment desire to finance the farmers. WeGro finances the asset (livestock) and the farmer provides the labor and other inputs (cattle feed and other daily maintenance). The final profit is shared at a 2:1 ratio in favor of the farmer. To further reduce the risk to the financier and the farmer, the bundled intervention also has a livestock insurance component from a third insurance company. The insurance premium is borne equally by the farmer and the financier. WeGro will aid in getting the vaccines and proper cattle treatment as well. Similar services are offered by iFarmer and Adarsha Prani Sheba with different profit-sharing models.

3.1.3. Start-ups to support MFIs

Like for Banks and NBFIs, some innovations are also supporting MFIs to help to distribute loans, monitor them, and recover the loan amount for the farmers.

Bhalo: Bhalo is a start-up in Kurigram that works with Shadhin (an MFI) to distribute loans with a very low-interest rate. The loan amount is also very low (BDT 10,000), to be paid off in installments of BDT 2,626 over 4 months. From 2019 to 2022, Bhalo provided BDT 1.5 million to 155 farmers. They are also providing a 1 month credit product to farmers to buy farming inputs from them. Bhalo provides interest-free credit (while selling inputs) for a month to their farmers. Farmers are expected to repay the credit amount on the 25th of every month. If they cannot pay by that date, they are charged a 5 percent penalty and will not receive any credit additional services until they pay their outstanding amount.

3.1.4. Insurance companies

Agri-based start-ups are assisting farmers in meeting the due diligence requirements to be eligible for Agri insurance. The top 5 non-life insurance companies in Bangladesh are Green Delta, SBC, Pioneer, Reliance, and Pragati. Weather Index Based Agriculture Insurance is a form of insurance that is linked to weather events such as drought, excessive rainfall, moisture, frost, temperature, humidity, sunshine hour etc. with predetermined trigger points based on weather patterns. The essential feature of weather index insurance is that the insurance contract responds to an objective parameter (e.g., measurement of rainfall or temperature) at a defined weather station during an agreed upon period. The parameters

of the contract are set to correlate, as accurately as possible, with the loss of a specific crop type suffered by the policyholder. All policyholders within a defined area receive payouts based on the same contract and measurement at the same station, eliminating the need for in-field assessment.

Green Delta Insurance: Green Delta Insurance Company Limited, jointly with International Finance Corporation (IFC) of The World Bank Group, launched Weather Index Based Agriculture Insurance to mitigate risks for farmers as a pilot project in 2015. Later in 2018, after 3 years of successful piloting in different geographical areas of Bangladesh, Green Delta commercially launched Weather Index Based Agriculture Insurance, ensuring access to the product for any season, anywhere across Bangladesh. Currently, the Weather Index Based Agriculture Insurance of Green Delta covers perils including excess rainfall, drought, unseasonal rainfall, cold waves, heat waves, humidity, and inadequate sunshine hours. This insurance service mainly aims to serve marginal farmers cultivating multiple crops across the year. Each client at each location is facilitated through customized or tailored products as per the weather index and historical weather data. The range of services exceeds the marginal farmer base in many ways. Besides farmers, retailers, input farms, crop clinics, agri-machineries, contract farming, seed companies, fertilizer companies, irrigation companies, microfinance institutes, banks, and non-government organization (NGOs) also get direct or indirect benefits from providing insurance to the farmers.

3.1.5. Digital Financial Services (DFSs)

Digital financial services have been steadily growing more popular in the country due to the convenience of transactions. There is substantial scope for using this mode of service to ease constraints of marginal farmers more easily than the past.

Upay: Upay is a mobile financial service (MFS) in Bangladesh under the United Commercial Bank Limited that aims to provide digital financial services to agricultural households in Bangladesh. Upay started its journey on January 2021. Like Bkash and other MFSs, Upay provides mobile financial transactions, utility bill payments, in-store and e-commerce transactions, inward remittances, and salary disbursements. They currently have agreements with 60 corporate groups (Bangladesh Police, Indian Embassy, PRAN, etc.). Also, they have partnered with 8,000 merchants for bill payments and retailer payments. They charge a slightly lower percentage compared to other MFSs (1.4% for cash out). Upay is designing a product that involves providing loans to small and marginal farmers in remote areas.

3.1.6. Crowdfunding

Crowdfunding is an internet-based process of soliciting and accumulation of funds from people to finance business or non-business projects. Besides providing channels of communication to financial institutions, connecting funds from the urban landscape is also being done. Firms assist in financing projects via funds from the urban landscape, prior to which diligent background checks are carried out. Based on the creditworthiness and productivity of the farmers, the respective profiles are updated for the potential investors to assess.

3.2. Innovations in the logistic sector

This section discusses the type of innovations evolving, followed by a subsection of organizations that offer such innovations.

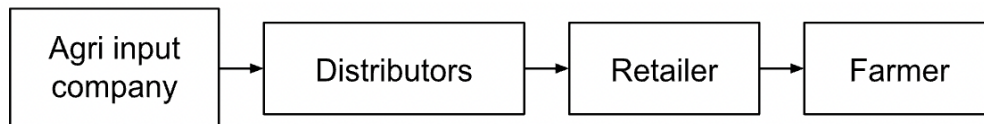
3.2.1. Soil Testing

Before crop farming, soil testing results help the farmer to know how best to use fertilizer. Thus, farmers can spend the minimum amount needed to boost their farming output. Soil testing is a highly beneficial tool to utilize inputs and labor for optimal profit. In Bangladesh, farmers from the Mymensingh area are benefitting from using soil testing kits with the help of the Bangladesh Agriculture University (The Business Standard, 2020).

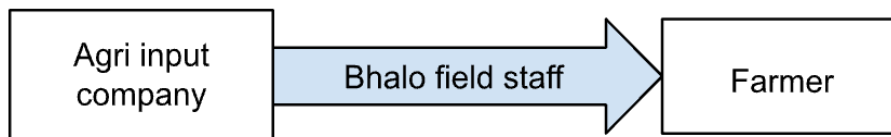
iPAGE: Local Startups like iPAGE are using AI-based technology for soil testing. Farmers can get a rough estimate of the baseline status of soil health using sensor-based technology. iPAGE partnered with Gono Unnayan Sanstha (NGO) and is closely working with farmers in the Gaibandha district (The Business Standard, 2021).

3.2.2. Access to inputs

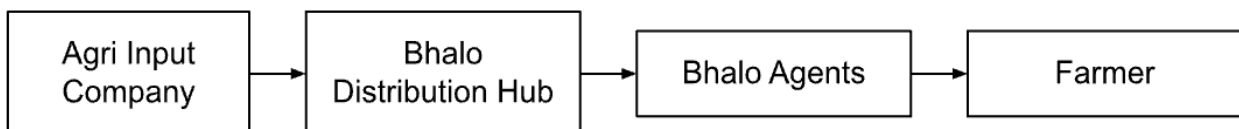
The input market evolved a lot with new innovations to support farmers. Along with the traditional input businesses, some new start-ups are also providing high-quality agricultural inputs to the farmers. The traditional model is:



Bhalo: Bhalo, an Agri input based start-up, is providing an option to buy high-quality agricultural inputs. Their model skips the intermediary steps of the traditional input model and instead operates as:



Bhalo's value chain is:



After selling high-quality inputs to cattle farmers, Bhalo field staff visit their farmers every week to follow their progress. They also keep records of their visit and the improvement of their cattle (through circumference measurement). They work on the following:

High-quality inputs: Bhalo buys high-quality inputs from authentic producers/manufacturers and sells them to farmers (quality is an issue for farmers; often farmers get different combinations of inputs from local input sellers/retailers which are not always in the farmers' interest)

Cattle treatment: Coverage-wise, the Bhalo team has some Local Service Providers (LSPs) who provide cattle treatment with a minimum fee (50 takas) per visit (treatment purpose). Bhalo also tracks the growth of the cattle.

Information: Bhalo provides free information [e.g., on the dosage/frequency of the input, whether there is a new disease seen in the area, for example] with possible precautions for their farmers to take care of their cattle.

3.2.3. Access to market

Nowadays, many business retailers and final consumers are directly reaching out to farmers with the aid of some digital platforms to facilitate access to market. For example, food for the nation is a government-owned online platform where farmers can directly sell their products.

Some other start-ups are directly reaching out to farmers to procure their desired products at a very good price by establishing collection points. Khash food, Khamar-e, Foshol.com, iFarmer, Nagar Krishi, Amader Khamar, Protein Market, and Parmeeda are the start-ups that are helping farmers directly or indirectly in the output market. WeGro and iFarmer are directly helping their farmers by connecting to some retailers to get the right price for their farming output.

Agroshift: Agroshift's mission is to transform the agricultural value chain through which farmers will get better yields and fair prices; consumers will get fresher and safer produce. Agroshift helps farmers sell their produce to businesses and consumers by providing a tech-enabled supply chain merging the physical and digital worlds for a "phy-gital" business model which takes care of the demand aggregation, sourcing, and delivery. Their novelty lies in eliminating the middlemen in the supply chain and providing businesses and consumers direct access to high quality, safe and affordable food. Customers place orders digitally through a web or mobile application. Their system fulfils the order by matching the demand with the supplies from their farmer networks. The farmers are notified through SMS or calls to bring their produce to the nearby Agroshift collection hubs and receive instant payments. From the collection hubs, the goods are transported the distribution center, from where the orders are aggregated, packaged, and shipped directly to customers. This facilitates farmers in getting the right prices for their produce.

3.2.4. Training and Communication

There are some NGOs that are providing farming-related training. Under their programs, Farmers get an opportunity to gain valuable knowledge about relevant farming techniques related to fields, crops, livestock, etc. This can be done via apps or programs suited to teaching Agri-students and farmers.

BRAC: BRAC, an international NGO provided hands-on training to a substantial portion of farmers under the ultra-poor graduation program. Under this program, BRAC reached around 2 million ultra-poor households (Brac, 2018). Some other NGOs like PKSF, RDRS ACDI/VOCA are also providing framing training to the marginal farmers.

Sara Bangla Krishak Society (SBKS): During the covid 19 pandemic, Sara Bangla Krishak Society (SBKS) established 57 call centers throughout northern and southern Bangladesh. To establish the call center, SBKS received technical support from FAO, through the Global Agriculture and Food Security Program's (GAFSP) Missing Middle Initiative (MMI. With the help of these call centers, farmers could communicate with the input dealers, traders, and service providers (FAO, 2020).

3.2.5. Artificial Cattle Insemination

Artificial cattle insemination has grown in popularity due to the advantages it has, noteworthy among which are the reduced risk of breeding, increased value addition to production and superior genetics.

BRAC: BRAC started artificial insemination to provide improved varieties of cattle for cattle farmers in 1985. In 2017, nearly 6 million cows were artificially inseminated (Shamsuddin & Garcia-Podesta, 2022). At present, other companies like Ejab Alliance Limited, American Dairy, Lal Teer Livestock Development (BD), and ACI Animal Genetics Limited are carrying out artificial insemination activities in the country (Khorshed, 2022).

3.2.6. Local Service Providers (LSPs)

Innovations in this service include the use of digital platforms to ease interactions between LSPs and farmers.

mPower: This private organization developed an app named *Shudokkho* to train LSPs. As of now, mPower has engaged around 7000 LSPs with the app. The functions of this app are:

- ▶ LSPs use this app to provide cattle and crop medicine service.
- ▶ LSPs collect primary information for the concerned cattle/crop from farmers.
- ▶ They also collect a photo of the cattle/crop and store it in the app.
- ▶ Based on the information provided in the app, the app recommends medicine.
- ▶ For antibiotic medicine, the app provides a strong reminder about the uses of the antibiotic.
- ▶ The app also saves information if the LSP needs to visit the farmer again.
- ▶ The app reminds the LSP on time to visit the farmer.
- ▶ The app works as a micro-ERP system as it stored information on beneficiary castles/crops.
- ▶ The app provides a strong reminder if cattle need a vaccine (with the name of the vaccine).
- ▶ The app has an e-learning system for cattle and crop treatment.

Recent shift of focus on innovative Agricultural interventions has promising prospects. With the emerging number of startups, government and non-government initiatives, and adoption of research-based policy interventions, a new era of success in the sector can be surely expected.

ABOUT THE AUTHORS

Mehrab Bakhtiar is a Research Fellow and Raisa Shamma is a Research Analyst with IFPRI's Poverty, Health, and Nutrition Division. Riad Uddin is a Research Analyst in IFPRI's Markets, Trade, and Institutions Division.

ACKNOWLEDGMENTS

This work is part of the CGIAR Research Initiatives on Rethinking Markets. CGIAR launched Rethinking Markets with national and international partners to leverage markets and value-chains to address nutrition, livelihoods, and environmental concerns in food systems, at national and subnational levels in seven countries in Africa, Asia, and Latin America. Other CGIAR centers participating in Rethinking Markets are: International Water Management Institute (IWMI), The Alliance of Bioversity International and the International Center for Tropical Agriculture (Alliance Bioversity-CIAT), International Institute of Tropical Agriculture (IITA), International Maize and Wheat Improvement Center (CIMMYT), International Center for Agricultural Research in the Dry Areas (ICARDA), and WorldFish. We would like to thank all funders who supported this research through their contributions to the [CGIAR Trust Fund](#). This publication has not been peer-reviewed. Any opinions are those of the authors and not necessarily representative of or endorsed by CGIAR.

REFERENCES

- Mukit, S. H., Raisa, N. N., Wasit, Z., & Tabassum, T. (n.d.). *AgriTech in Bangladesh*. Innovision.
- World Bank, World Development Indicators. (2022). *Agriculture, forestry, and fishing, value added (% of GDP) - Bangladesh* [Data file]. Retrieved August 6, 2022, from <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=BD>
- Bangladesh Bank. (2021). *Annual Report*. Bangladesh Bank. <https://www.bb.org.bd/pub/publicn.php>
- Brac. (2018). *Ultra-Poor Graduation Programme, Bangladesh*. <http://www.brac.net/program/wp-content/uploads/2021/09/UPG-programme-Bangladesh-overview.pdf>
- FAO. (2020). *Call centers are a lifeline for Bangladesh's farmers*. <https://www.fao.org/bangladesh/news/detail-events/ru/c/1294725/>
- International Trade Administration. (2022). *Bangladesh—Agriculture Sectors*. <https://www.trade.gov/country-commercial-guides/bangladesh-agriculture-sectors>
- Jaim, W. M. H., & Akter, S. (2010). *Seed, Fertilizer and Innovation in Bangladesh: Industry and Policy Issues for the Future*. 31.
- Khorshed, A. (2022, July 16). Artificial insemination revolutionises cattle farming in the country. *The Business Standard*. <https://www.tbsnews.net/economy/industry/artificial-insemination-revolutionises-cattle-farming-country-459046>
- Kruijssen, F., Golam, F., Braaten, Y., & Minneboo, E. (2019). *Assessment of the local service provider model in Bangladesh*.
- LightCastle Partners. (2021, June 30). An Overview of Digital Financial Services in Agriculture and MSME Sectors. *An Overview of Digital Financial Services in Agriculture and MSME Sectors*. <https://www.lightcastlebd.com/insights/2021/06/digital-financial-services-in-agriculture-and-msme-sectors/>
- Ministry of Finance. (2022). *Bangladesh Economic Review 2022*. https://mof.portal.gov.bd/sites/default/files/files/mof.portal.gov.bd/page/f2d8fabb_29c1_423a_9d37_cdb500260002/16_BER_22_En_Chapter07.pdf
- Shamsuddin, M., & Garcia-Podesta, M. (2022). Dairy Production in Diverse Regions: Southern Asia. In *Encyclopedia of Dairy Sciences* (pp. 253–262). Elsevier. <https://doi.org/10.1016/B978-0-12-818766-1.00017-9>
- The Business Standard. (2020, January 12). *New soil testing kit to help farmers make smart decisions*. <https://www.tbsnews.net/economy/agriculture/new-soil-testing-kit-help-farmers-make-smart-decisions-35799>
- The Business Standard. (2021, November 8). *iPage: An AI-based start-up helping farmers become smarter, richer*. The Business Standard. <https://www.tbsnews.net/features/panorama/ipage-ai-based-start-helping-farmers-become-smarter-richer-326683>
- United Nations Children's Fund. Gender Counts: A quantitative assessment of gender inequality and its impact on girls and boys in East and Southeast Asia. UNICEF East Asia and the Pacific, Bangkok, 2019. World Bank Group. (2018). *Bangladesh: Agriculture Insurance Situation Analysis*. <https://openknowledge.worldbank.org/handle/10986/31046>

© Copyright of this publication remains with IFPRI.

Funding for this work was provided by the CGIAR Research Initiatives on Rethinking Markets. This publication has been prepared as an output of CGIAR Research Initiatives on Rethinking Markets and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI or CGIAR.

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

A world free of hunger and malnutrition

IFPRI is a CGIAR Research Center

1201 Eye Street, NW, Washington, DC 20005 USA | T. +1-202-862-5600 | F. +1-202-862-5606 | Email: ifpri@cgiar.org | www.ifpri.org | www.ifpri.info

© 2022, copyright remains with the author(s). All rights reserved.