



USAID Agricultural Extension Support Activity

Public and Private Extension Agents' in USAID Agricultural Extension Support Activity (AESA) Project

December 2017

Project Implementation: Dhaka Ahsania Mission, CARE Bangladesh and mPower

Funded by: USAID



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Prepared by:



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ACKNOWLEDGEMENT

We would like to express our gratitude to Dhaka Ahsania Mission and CARE Bangladesh, for giving us the opportunity to conduct the “Performance Assessment of Public and Private Extension Agents in USAID Agricultural Extension Support Activity” under Agriculture Extension Support Activity (AESA) Project. It was both a challenging but rewarding experience for us to conduct this assignment for CARE. The Consiglieri team worked hard to make this endeavor successful and I would like to thank my research team for putting up a good effort in a very short time.

We extend thanks to the experts of Dhaka Ahsania Mission, CARE Bangladesh and mPower for providing their valuable feedback in finalizing this report. We are especially thankful to Bidyuth K. Mahalder, Chief of Party of AESA project. From CARE Bangladesh we thank Tania Sharmin, National Technical Coordinator AESA project; Md. Azizullah Al Mahmud, Agri Business Marketing Specialist; Biswajit Mondal, Technical Manager; Md. Hassanuzzaman, Technical Manager; Saif M M Islam, Private Sector Engagement Coordinator, Ahmad Sadequl Amin, Coordinator-Agriculture & Value Chain (ERPP) and Dr. Shantana Rani Halder, Head of M&E, AESA project.

We look forward to future engagements with the dynamic team in CARE Bangladesh and Dhaka Ahsania Mission.



Abdullah Al Shakib

Assessment Team Leader

November 2017

EXECUTIVE SUMMARY

Introduction

The USAID Agricultural Extension Support Activity (AESAs) has been implementing since October 2012 with the primary objective of increasing farmers' access to improved agricultural extension services leading in increased household income, nutritional status and food security for 112,000 participating farmers. The Ag Extension Project is being implemented by a consortium of Dhaka Ahsania Mission (DAM), CARE Bangladesh and mPower. The Dhaka Ahsania Mission has been implementing the project with the technical assistance of CARE Bangladesh and mPower. This project has been implementing in 231 union of 26 upazilas under 12 districts in the central and south-west of Bangladesh. The project is working where the most vulnerable low income group of people reside. These impoverished people face difficulties in accessing quality agricultural inputs and other services in a timely manner.

The project is trying to strengthen the public and also the private extension service provision in the project areas. Thus the project has engaged with public and private extension service providers to develop their capacity. The project now wanted to conduct an assessment of the capacity and performance of the service providers that they have supported or developed. The broad objectives would be to understand the level of development of the service providers, the quality of services they are providing and whether the linkages between the service providers and the beneficiaries are functioning properly. Though transparent bidding process, Consiglieri Private Limited was contracted to conduct the assessment.

Study Methodology

The study analysis, besides highlighting changes in knowledge, practice and benefit for each individual actors; would focus on identifying the market system changes that resulted due to project intervention. Reporting of the underlying reason for both individual and market level changes would be part of the analysis. Since the project wants to evaluate the assessment of the capacity and performance of private and public extension service agents, the sample was drawn from both public and private extension service agents working in three broad sectors of agriculture, i.e. Aquaculture, Crop and Livestock. Factoring the views of service recipients is of paramount importance to properly assess the effectiveness of a service and the service providers. Thus, data from farmers (both project beneficiary farmers and non-beneficiary farmers) were collected. In total 163 private sector extension agents were interviewed and 74 public extension agents. Furthermore, 153 project farmers and 153 non project farmers were interviewed for the purpose of this study. The study took place in 9 upazilas under 9 districts in South-West Bangladesh. The assessment data collection was mostly quantitative in nature, as such semi-structured Interview (SSI) questionnaire was developed by the CARE Agribusiness Team. Furthermore, **25 FGDs** were conducted with farmers (Crop, Livestock, and Aquaculture) to collect more in-depth data, which is not always easy to extract from a quantitative survey.

The main body of the report will be broadly divided into two chapters. The first chapter would deal with the assessment of the private extension agents. There will be separate sub sections for each of the 10 private sector actors and will be clustered along their agricultural sectors, i.e. crop, aquaculture and livestock.

1. PRIVATE EXTENSION SERVICE PROVISION

CROP SECTOR FINDINGS

Input retailers

In retrospect, there has been visible positive changes in the market system, with greater linkage and connectivity with input retailers and farmers. Input retailers have not only increase their customer numbers but there is tangible impact in their revenue growth as well. Although there is room for improvement for the input retailers in the accuracy of recommendations they provide to the customers, they have fared reasonably well in accurate knowledge dissemination. Major improvements were noticed in case of trained retailers in the area of disease management, with more than 9 in 10 retailers providing accurate information to the farmers. Fertilizer application and dose is a major area where there is much room for improving the accuracy of service. However, compared to pre-project period the improvements in most areas is noticeable. Project Farmers were generally satisfied with the support received from the retailers and three quarters of them were content with the technical accuracy provided by the retailers. However satisfaction level with non-project farmers was moderate, thus this is an area where input retailers can try to improve their service provision. However, what is notable is that the greater integration of input retailers in the overall market system and how well they are now interacting with farmers, GoB line departments and private sector companies.

Irrigation Service Provider

Irrigation service providers have managed to improve their business performance as a result of association with the project. They are now more proactive in engaging with farmers and are frequently visiting their fields to get a better understanding of farmer's need. Project linkage activities also helped them to link up with more farmers, GoB line department officials and private sector actors. The increased interconnectivity has entailed knowledge and practice level changes in the irrigation service provider which is also being trickled down to the farmers. In case of Jute and mung bean, irrigation service providers were providing relatively accurate information to the farmers in areas of seeding rate, fertilization practice and disease/insect management. However, there is room for improvement in the technical accuracy of recommendations related to the chili subsector for the non-trained service providers. Around three quarter of farmers were content with accuracy of service provided by them, which shows they have made good progress. Study results also shows that irrigation service providers have improved their linkage with their counterparts in the government service, as well as with private companies. Increase linkage with farmers have also contributed to their business growth and long term sustainability. In the coming days, the providers should try to leverage the relationships made for greater business growth and greater customer acquisition.

Tillage Service provider

Analysis reveals that tillage service providers have managed to improve their business performance as a result of association with the project. They have improved their revenue stream as well as increased their customer base, compared to 2 years before. Project linkage activities also helped them to link up with more farmers, GoB line department officials and private sector actors. The increased interconnectivity has

entailed knowledge and practice level changes in the irrigation service provider which is also being trickled down to the farmers.

For all the sub-sectors, both trained and non-trained service providers showed moderate to high accuracy in their service provision to the farmers. The improvement is remarkable if compared to pre-project period when only around 1 in 10 providers were providing accurate information to the farmers. In case of **Chili**, service providers were precise when recommending about tillage, though their accuracy was a bit off the mark when recommending about the seed rate for chili. In case of recommending for fertilizer dose, they were mostly correct. In the case of advising **Jute** farmers on tillage requirements, all the trained service provider provided correct or partially correct answers to the farmers. However, they showed good accuracy when recommending about mung bean. In the coming days the actors should focus on strengthening and leveraging the linkages they have in place now for further business growth.

Spray Service Provider

Spray service providers have seen improved performance in their business and customer enhancement. The project activities helped them to link up with various actors such as farmers, GoB line department and private sector actors. The increased culture of inter-cooperation helped them and the other associated market actors, especially the farmers. An increasing number of service providers were seen to be making farmer field visits, which points to a growing sense of business development initiative being nurtured in them. In the area of technical accuracy, majority of the trained and non-trained providers were getting it right though there is room for improvement in some specific areas. However, such deficiencies can be rectified with further training and sensitization. Overall, three quarters of farmers were content with their service delivery and their service quality. Moving forward, the providers need to engage with more farmers and strengthen the linkage with government and private sector bodies. They also need to fine tune their technical acumen further to better serve their customer.

AQUACULTURE SECTOR FINDINGS

Input retailers

There has been visible positive changes in the market system, with greater linkage and connectivity with input retailers and farmers. Input retailers have not only increase their customer numbers but there is tangible impact in their revenue growth as well. They have also managed to add to their repertoire of service compared to before and are more active in advisory service. They got more involved with farmers through business linkage meetings which led to business growth for them. In the area of technical accuracy, there were notable improvements in their performance compared to pre-project period. The accuracy level in terms suggesting dose for fertilizer and lime application for pond/gher preparation shows that majority of trained input retailers providing correct recommendation to the farmers. In areas of stocking density and feed management and disease management, majority of retailers were giving accurate information to farmers. The major improvement areas seems to be in the area of feed management where half of the providers were still not providing accurate information to the farmers. In areas of disease management the performance of the trained retailers was quite good with non-trained retailers closely following behind. Around three in four project farmers acknowledged that input retailers

were providing useful and accurate information, whereas non-project farmers were more reserved in their appreciation of the performance of the input retailers. The input retailers also showed great drive to improve their business performance as evidenced by increased linkage with government extension service and private companies. As a result of those linkages they got exposed to training opportunities which enhanced their skill and knowledge further. Thus the retailers were very much part of the wider market system and were doing their part efficiently, in an increasingly integrated market system.

Nurserer

The nurserers improved their business performance appreciably as a result of improved service delivery and greater linkage with various market actors. They provided embedded services for free to the farmer with the hope forging win-win partnerships with them. Their actions ensured more farmers and patilwalas were subscribing to them. Nurserers also showed good depth of knowledge when placing recommendations. In case of fertilizer application, stocking density, feed management, most of the trained nurserers forwarded accurate information the farmers, though there was room for improvement in the case of non-trained nurserers. However both trained and non-trained nurserers showed better grasp of technical knowledge compared to pre-project period. However, the project may want to provide technical training to the non-trained personnel as well to improve the accuracy of their advisory service. The actors showed promise in their linkage building activities with linkage endeavors with hatcheries, DoF and private sector companies such as ACI. The linkages helped them to stay updated on burning issues about fish sector such as outbreak of a disease or changes in pond management, feeding practice etc. The linkages helped them to mingle with knowledgeable person of the industry and learn from them. These learnings helped them to recommend farmer's more confidently than before. Thus the nurserers were active members of the wider fish market system and playing there part well, in an increasingly integrated market system.

Patilwala

Alike many actors in the fish value chain, patilwalas also managed to integrate themselves well in the market system with gains in their customer numbers and business performance. Linkage meetings with farmer producer groups helped them gain more recognition in their area, which helped their cause. In the technical accuracy aspect patilwalas demonstrated good grasp of basic aquaculture practices and were relatively accurate in their recommendations to the farmers. Two thirds of Farmers were satisfied with the accuracy of service provided by the patilwalas, in areas of fingerling transportation, stocking density, feeding practice and disease diagnosis/management. In the coming days the actors should focus on strengthening and leveraging the linkages they have in place now for further business growth.

LIVESTOCK SECTOR FINDINGS

Input retailers

There has been visible positive changes in the market system, with greater linkage and connectivity with input retailers and farmers. The farmers also reported to have quality inputs and timely services from the input retailers. In case of technical accuracy, it was seen that trained providers were providing accurate information about deworming schedule but had lack of knowledge about the frequency of de-worming.

There was also lacking in knowledge and understanding about concentrate feed and fodder requirement from both trained and non-trained retailers. Regarding vaccination schedule of FMD, Anthrax, BQ and HS, it was seen around 50% of the trained retailers had adequate knowledge, whereas around 3 in 10 non trained retailers had adequate knowledge. In case of disease management, input retailers showed decent aptitude in proper diagnosis, though there is room for improvement. However, such deficiencies can be rectified with further training and sensitization. Overall, the farmers were content with their service delivery and service quality of the input retailers. Furthermore, there was sustainable linkages created between the input retailers and private companies and government extensions service providers. Furthermore, we see that retailers and farmers are working more closely with each other than before. Moving forward, the providers need to engage with more farmers and strengthen the linkage with government and private sector bodies. They also need to fine tune their technical acumen further to better serve their customer.

Local Service Provider (LSP)-Livestock

LSPs have managed to improve their business performance as a result of association with the project. They are now more proactive in engaging with farmers and are frequently visiting their Household or dairy farms to get a better understanding of farmer's need. Project linkage activities also helped them to link up with more farmers, department of livestock officials and private sector actors. The increased interconnectivity has brought knowledge and practice level changes, which is also being trickled down to the farmers. In case of de-worming and artificial insemination, LSPs were providing relatively accurate information to the farmers in areas of schedule and timely service. However, there is room for improvement in the technical accuracy of recommendations related to the vaccination and feed management. Around three quarter of farmers were content with accuracy of service provided by them, which shows they have made good progress. In the coming days the actors should focus on strengthening and leveraging the linkages they have in place now for further business growth.

On another note, a total of 20 women LSP-Livestock have been trained by the Faculty of Animal Science and Veterinary Medicine of Patuakhali Science and Technology University (PSTU). Those LSPs were selected through overall service market assessment in 7 districts of dairy and beef fattening value chain covered areas. Through a MoU signing with PSTU, these LSPs have been trained and equipped with provision of services. The ACI Animal Health division has taken part on this capacity building activity and ACI provided CMT Kit (Mastitis testing kits) to the LSPs for providing testing services to the farmers. The training improved the technical knowledge of women LSPs and built their confidence to provide services for large animal beyond poultry vaccination. This kind of training helped the local service providers to gain recognition to provide primary animal health care support for livestock farmers at community level. Those LSPs are now working successfully and expanding their service market and reported an average of 88% increased number of customers and around 150% increase in income. The training was facilitated by the University teachers. The duration of the training was 5 days covering both theoretical and practical session. Major areas of the training were Primary Animal Health care and management, vaccination, de-worming, feed management, Artificial Insemination, disease diagnosis, etc.

AI worker

LSP-AI workers have experienced improvements in their customer numbers and subsequently saw improvement in their revenue flow. They have conducted frequent visits to farmer's household and tried to engage with them as much as possible. The linkage with farmers and other market actors was strengthened through project activity and AI workers are reaping the benefits of increased linkage. The increased interconnectivity has entailed knowledge and practice level changes in the provider which is also being trickled down to the farmers. In case of de-worming and artificial insemination, LSP-AI were providing accurate information to the farmers in areas of schedule and timely service. However, there is room for improvement in the technical accuracy of recommendations related to the feed management. However, overall they were quite accurate with their service delivery to the farmers which will only benefit them in the long run. Most of the farmers were content with accuracy of service provided by them, which shows they have made good progress. AI workers would do themselves no hard by focusing on strengthening and leveraging the linkages they have in place now for further business growth.

2. PUBLIC EXTENSION SERVICE PROVISION

Crop Sector (DAE)

The Department of Agricultural Extension (DAE) has been working with the mission to provide efficient and effective needs based extension services to all categories of farmer, to enable them to optimize their use of resources, in order to promote sustainable agricultural and socio-economic development. The quantitative survey was carried out among 60 agriculture officers (UAO & SAAO) who received training under AESA project. They had increased their range of service provision and increased usage of ICT tools helped them to improve their service quality. They also provided support to private extension agents such as input retailers, tillage service providers, spray service providers and irrigation service providers in areas of improved agronomic practice. Thus the public agents were increasing the strength and scope of their linkages appreciably, as is expected of them. Most of the extension officers also mentioned about increase in their outreach. Motorcycles provided by the project in four demo upazila also helped them to reach greater number of farmers. Thus, the extension agents have learnt a lot of new things by being associated with the project. They now know the use of ICT and Mobile Apps, how to effectively deliver services to a group of farmers, how to conduct demo plots, value chain and 5 key improved agronomic practices for Jute, Mungbean and Chili. They have also learnt about cross cutting issues like gender equality and nutrition.

Aquaculture Sector (DoF)

Department of Fisheries (DoF) has been working for the development of fisheries sector with a group of dedicated employees. Its mandate is to disseminate improved aquaculture technologies through training and demonstration and to extend extension advisory services to the focal stakeholders. Public extension agents from DoF serve 4,600 farmers on an average among which 73% are men. They have added many new services in their repertoire. DoF extension officials have also increased their meeting with farmers, increased the use of demo plot and use of printed materials for service delivery. Around 40% of the DoF

officials were seen using ICT mediums. They were proactive in building linkages with not only farmers, but with other market actors. They provided technical and advisory service to private extension agents, which empowered the latter to provide better service to the farmers. The linkage with private companies have helped public extension service agents to provide updated information. Thus the project has helped them to improve their performance. They have learnt how to provide ICT applications for better service delivery. Furthermore, they have learnt to provide services in to a group of farmers, as compared to individual farmers. This actually saves their time a lot. They would like to see more development project enter the project area with similar mandate in the coming future.

Livestock Sector (DLS)

Department of Livestock Services (DLS) has employed sub-district wise field level ULO, VFA, VS staffs for the improvement of cattle wealth, prevention and control of animal disease, dairies management of cattle farms, artificial insemination, merchandise livestock inputs through advisory services and field level interventions. The AESA projects conducted training for the Upazilla Livestock officers along with respective private companies for their capacity building and information sensitization. In recent years they have managed to increase their customer base appreciably and included many new services in their repertoire. They provided technical and advisory services to private extension agents, which empowered the latter to provide better service to the farmers. The linkage with private companies have helped public extension service agents to provide updated information. The public extension agents have learnt various things for capacity building with the help of the project. They are informed about different topics, developed skills in livestock rearing. They have received training on ICT, gender and nutrition. They have also build capacity in supporting a group of farmers at the same time. The project has helped them in changing point of views regarding services and working as a team.

1. INTRODUCTION

1.1 Background

The USAID Agricultural Extension Support Activity (AESAs) has been implementing since October 2012 with the primary objective of increasing farmers' access to improved agricultural extension services leading in increased household income, nutritional status and food security for 112,000 participating farmers. These farmers are mobilized into 3,942 Farmers' Producer Groups (FPG) under 6 value chains including Jute, Chili, Mungbean, Dairy, Beef Fattening and Fish. The project is being implemented by a consortium of Dhaka Ahsania Mission (DAM), CARE Bangladesh and mPower. The Dhaka Ahsania Mission has been implementing the project with the technical assistance of CARE Bangladesh and mPower. The project facilitates linkages of farmers to markets for inputs and sale of value-chain products through enhancing better access and opportunities.

This project has been implementing in 231 union of 26 upazilas under 12 districts in the central and south-west of Bangladesh. The project is working where the most vulnerable low income group of people reside. These impoverished people face difficulties in accessing quality agricultural inputs and other services in a timely manner. Government Extension service activities also struggle to cater to the needs of these marginalized people effectively. Thus the project is trying to strengthen the public and also the private extension service provision in the project areas. Thus the project has engaged with public extension service providers to develop their capacity, jointly established extension service centers and introduced digital monitoring system. Furthermore, the project has identified and trained private extension service providers engaged in the 6 value chains and provided select number of actors with equipment, instruments so that they can render their services more effectively to the target beneficiaries.

The project now wanted to conduct an assessment of the capacity and performance of the service providers that they have supported or developed. The broad objectives would be to understand the level of development of the service providers, the quality of service they are providing and whether the linkages between the service providers and the beneficiaries are functioning properly. Thus after a transparent bidding process and evaluation, Consiglieri Private Limited was contracted to conduct the assessment. The objective was to analyze the data already collected from relevant stakeholders and produce a quality report, followed by a dissemination workshop with relevant stakeholders.

More specifically, the objectives of the consultancy is to assess capacity and performance of private and public extension agents after intervention from project side through facilitating GoB line departments, private companies, university and fish hatchery on the following area:

- Improved and increased private and public service provision;
- Technical capacity, accuracy or quality of services;
- Linkages and communication with demand and supply;
- Business growth, satisfaction and outreach in service provision.

1.2 Study Methodology

1.2.1 Background of Project Intervention with Extension service providers

The USAID Agricultural Extension Support Activity (AESA) project aims to strengthen and increase access to agricultural extension and advisory services (EAS) for farmers' through both public and private providers. Although public extension service activity in a formal structure has been going on for a long time, private extension service providers are increasingly becoming prominent and relevant for the farmers. In a way, private extension service providers complement the service provided by the government line departments with the ultimate objective being serving the needs of the farmers effectively. A productive farmer is not only an asset to the country but an asset to his or her family as well, with potential to increase their personal income.

On the public extension end, the project has targeted the pool of public extension agents at Department of Agricultural Extension (DAE), Department of Fisheries (DoF) and Department of Livestock Services (DLS). The project coordinated with line managers and training heads from the three government extension agencies to identify the soft skills and technical training needs of their field level extension agents. On the private extension end, the project teamed up with private input companies to develop the capacity of selected private extension service providers in the project area.

Once Private EAS providers were selected, the project conducted a qualitative needs assessment of selected providers. The objective of the needs assessment was to identify specific gaps in knowledge and technical capacity with skills of the private EAS providers, particularly around the five key practices promoted by AESA in each of the selected value chains. Based on findings of the need assessment, capacity building events (e.g. trainings, business meeting linkages, cross-visits, etc.) were organized to address specific gaps identified. AESA engaged and facilitated private entities (like private input company, hatchery owner, AIRN etc.) and public departments (DLS, DoF and DAE) to lead these capacity building events.

Eventually trainings were conducted for private extension agents where GoB line department officials were invited to give lectures and sensitize the private actors. The discussion ranged from technical sessions and challenges of extension activity. Furthermore, private companies as mentioned above, provided their technical persons as facilitators for capacity building of private extension agents. The companies also provided various kits such as pH meter, ammonia meter, DO meter, CMT (mastitis testing). Three companies also provided feed, seed and probiotic in the demonstration plot to disseminate updated technology. These events and training sessions provided a unique opportunity for private extension service agents to build linkages with government extensions service agents and private companies.

As mentioned before, the project directly trained 980 private extension service providers and provided other associated support to 274 other provides. Even though the 274 service providers did not received direct training, they were very much under the purview of the project activities and had the opportunity to link up with public extension service agents and private input company representatives. For reporting purpose, we have classified the provider who received the training as "trained" and the providers who did not receive the training as "non-trained".

1.2.2 Analytical Framework

The ideal situation is an integrated market system in the agricultural value chains, which has enough incentives for all the market players to participate and collaborate with each other. Thus the project wanted to reduce the market inefficiencies, increase cooperation and collaboration within the market actors and foster an environment of innovation and exchange. It is expected that the project intervention would not only result in capacity enhancement of service providers, but the service delivery aspects of the providers; which would ultimately trickle down to the target beneficiaries. The disjointed efforts by the service providers and the relative isolation of the marginal farmers are the vices that the project would like to minimize.

The figure below depicts a simplistic explanation of the **expected market system changes** that the project envisages to achieve:

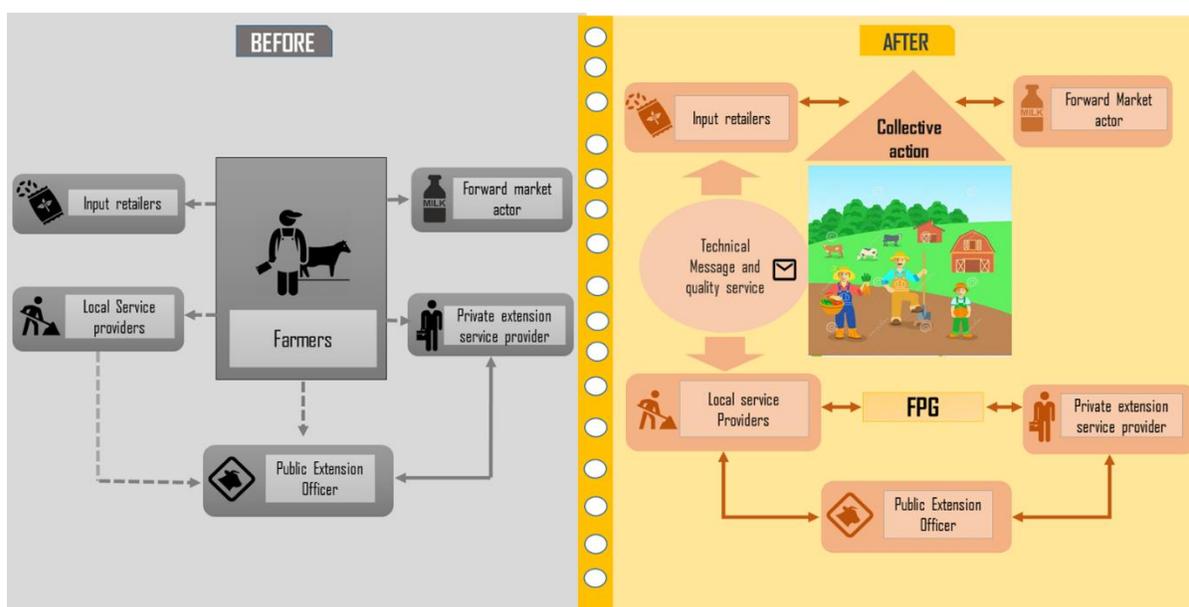


Figure 1 Expected market system changes that the project envisages to achieve

From the figure above, it can be inferred that in the pre-project scenario, the market actors were mostly acting independently of each other, without sufficient contact and culture of collaboration. However, after the project intervention, there should be visible changes in the way actors interact with each other and the market system would become more integrated; which would benefit all the actors.

Thus the analysis, besides highlighting changes in knowledge, practice and benefit for each individual actors; would focus on identifying the market system changes that resulted due to project intervention. Reporting of the underlying reason for both individual and market level changes would be part of the analysis.

1.2.3 Sampling Plan

The project is being implemented in 26 upazilas of 12 districts in the central and south-west of Bangladesh. Considering geographical context (hard to reach, climate vulnerability, less number of service providers and value chain coverage), 9 Upazila have been identified from 9 districts for data collection.

The project has engaged with public and private extension service providers, in order to build up their capacity for better service provision to the farmers. The project has jointly organized and facilitated 3-5 days long technical and professional capacity building training on improved crop production technologies, community mobilization activities and agri-business and value chain development strategies or options and ICT based service delivery to the 590 SAAOs of DAE. Furthermore, 980 private extension agents received training and practical session and out of them 101 provider got various testing kits, reagent, machine and accessories. The diagram below depicts the range of actors covered by the project:

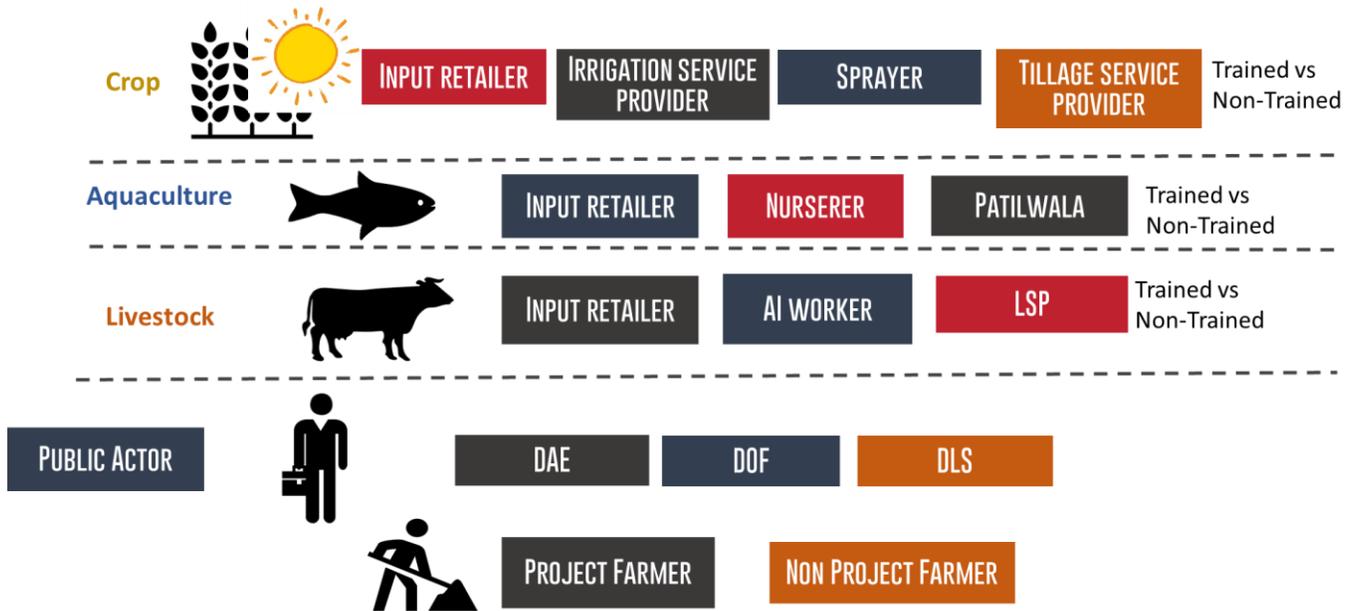


Figure 2: Range and type of actors under the project

Since the project wants to evaluate the assessment of the capacity and performance of private and public extension service agents, the sample was drawn from both public and private extension service agents working in agricultural sector, i.e. Fisheries, Crop and Livestock. Factoring the views of service recipients is of paramount importance to properly assess the effectiveness of a service and the service providers. Thus, data from farmers (both project beneficiary farmers and non-beneficiary farmers) were collected. The table below depicts the detailed sampling plan employed by the project to collect data for the assessment.

Table 1: Detailed Sampling distribution for the study

District	Upazila	Private Extension Agent			Public Extension Agent				Farmer		
		Trained	Non-trained	Total	DAE	DLS	DoF	Total	Project	Non-Project	Total
Barguna	Amtali	20	3	23	5	0	2	7	23	23	46
Barisal	Barisala sadar	16	4	20	9	0	0	9	21	21	42
Bhola	Charfasson	7	1	8	5	0	0	5	8	8	16
Jessore	Chougacha	23	5	28	9	2	0	11	17	17	34
Khulna	Dacope	14	4	18	5	2	0	7	18	18	36
Faridpur	Faridpur sadar	15	10	25	9	1	0	10	24	24	48
Rajbari	Goalondo	10	2	12	4	2	0	6	12	12	24
Narail	Kalia	8	5	13	9	2	2	13	13	13	26
Satkhira	Kaligonj	11	5	16	5	0	1	6	17	17	34
Total		124	39	163	60	9	5	74	153	153	306

From the private extension agents (both trained and non-trained) 13% of the total population (the actors with whom project worked with, i.e. 1,254 actors) was considered for sampling, whereas for DAE, 10% of the total population (600) was considered. In case of DLS and DoF, convenience sampling was applied where one relevant person from each upazila was considered. On the other hand, farmers were reached through **snowballing method**, i.e. each private extension agent were requested to tag the data collection team with one project and one non-project farmer.

The assessment data collection was mostly quantitative in nature, as such semi-structured Interview (SSI) questionnaire was developed by the CARE Agribusiness Team. The questionnaires were adopted based on findings from the field test. Furthermore, **25 FGDs** were conducted with farmers (Crop, Livestock, and Aquaculture) to collect more in-depth data, which is not always easy to extract from a quantitative survey.

1.2.4 Limitations of the Study

The consultancy firm was not involved with the data collection endeavor. Our consultants were not exposed to the field realities and did not have the opportunity to interact with the beneficiaries or service providers face to face. Thus the firm had to rely on collected quantitative and qualitative data to conduct the analysis and reporting of results.

1.2.5 Report Structure

The main body of the report will be broadly divided into two chapters. The first chapter would deal with the assessment of the private extension agents. There will be separate sub sections for each of the 10 private sector actors and will be clustered along their agricultural sectors, i.e. crop, aquaculture and livestock. The second chapter will present the findings regarding the public extension agents and findings will be disseminated along the broad areas of service provision, linkages and communication, outreach and learnings.

PRIVATE EXTENSION SERVICE EVALUATION

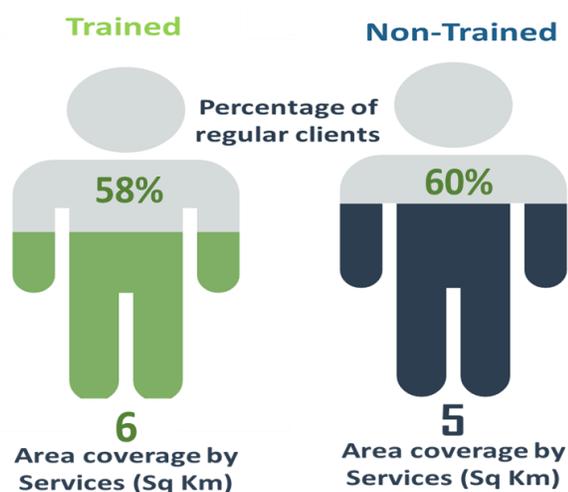
2. CROP SECTOR FINDINGS

The project intervention in the crop sector focused on three subsectors of Jute, Chili, and Mungbean. The private extension agents identified in the crop sector were input retailers, irrigation service providers, tillage service provider and spray service provider. Private extension agents have been delivering agro inputs and few technical advisory services as embedded to the producers, but their knowledge on production technologies, business modalities, business services and practice were in need of improvement on the basis of farmers' requirement. The following sub chapters would evaluate the knowledge and performance level of each of the extension service providers, along with evaluation of their services from their service recipients, i.e. the farmers. The objective is to develop a better understanding of the progress made by the Crop sector extension agents due to project interventions.

2.1. Area Coverage & Customer Base

Area coverage denotes the radius of the service delivery area for the extension agents. Survey data shows that in general crop extension agents have their customer base spread out to 5-6 kilometers from their base. Furthermore, 60-70% of their customers are regular and repeat customers.

It was seen that extension agents like input retailers interviewed had an average customer base of 553, out of which 61 were females.



2.2. Service provided

Private extension agents were asked about what added services they provided to the farmers in the last 2 years. The figure below depicts their responses:

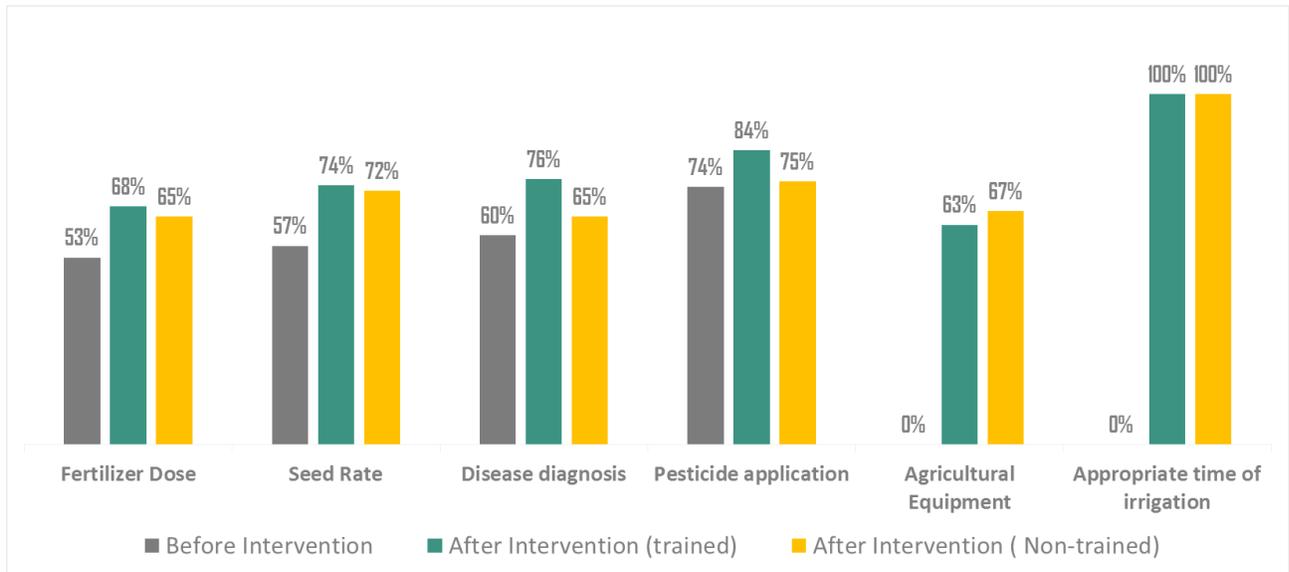


Figure 3: Service provided to farmers in last 2 years (as % of input retailers)

The figure depicts the range of services that the service providers have provided or added to their service list in the last 2 years. It was seen that service providers are more involved with all kind of services and notably, two new services has been introduce to the range of services with most of the providers which are equipment provision and knowledge of irrigation.

It has been found that major services like fertilizer dose, seed rate are mostly provided by input retailer (98% of retailer) which is less by other actor like around 50% irrigation provider and 40% of tillage provider.

The service providers also mentioned the process through which they provided the services. The diagrams below depicts their service provision methods:

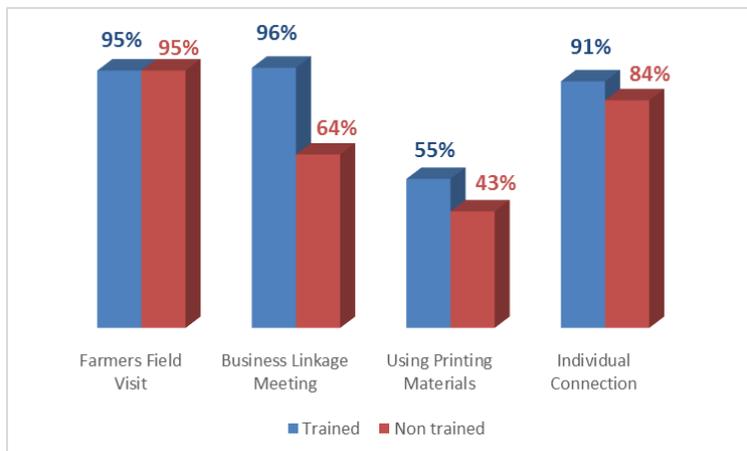


Figure 4: Method of service provision by retailers (as % of retailers)

The figure shows that trained service providers mostly preferred farmer's field visit, business linkage meeting and individual contact. In case of the non-trained group, tendency to initiate direct engagement with group of farmers was visibly less and they mostly relied on individual contact and field visit for service delivery. The fact that trained service providers had relatively more access to FPG meetings and greater exposure to the input company

representatives accounted for them being more prone to attend farmer’s fields and attending linkage meetings.



Figure 5: Outcome of Business linkage meetings

The figure also gives some additional insights about the outcome from business linkage meetings which is one of the best source of the service providers. The results show that the meetings were highly beneficial for the service providers as they saw increased

customer acquisition and business development. Most of the service providers mentioned about receiving greater demand for their products and actually managing to sell greater quantities of input as a result of conducting meeting with farmers. Some of the service providers, who did not conduct meeting with farmers, mentioned that farmers were too busy to give them time or they could not muster enough farmers to arrange a meeting.

Data from farmers revealed that 93% of the project farmers mentioned about getting service through farm visits and 72% of them get service through linkage meetings with them. 89% of the farmers mentioned that it is personal face to face to contact through which they interact and avail services from them. The figure below depicts the discussion made above:

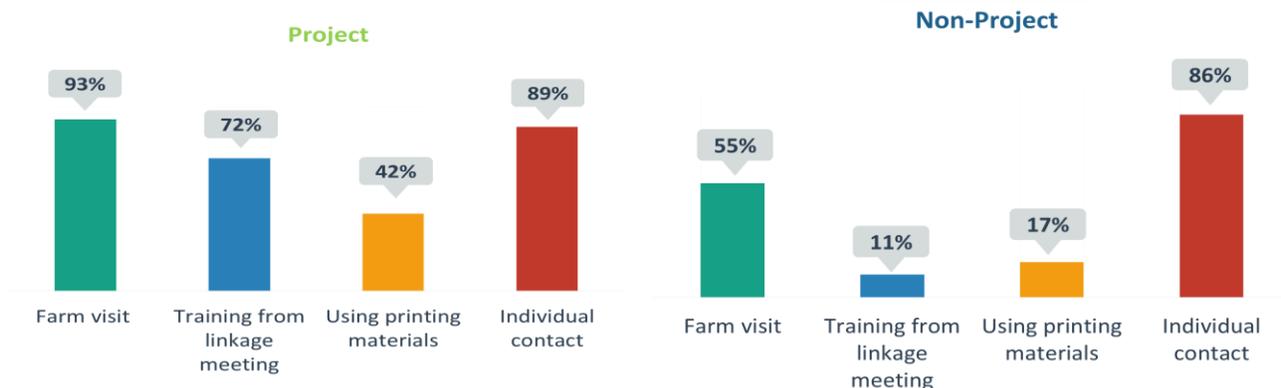


Figure 5: Method of receiving extension service provision by farmers (as % of farmers)

From the figure above, it is seen that non-project farmers were not very connected with service providers through any other medium except personal contact. Thus project farmers have been facilitated well in terms of linkage building with the service providers. In fact, data reveals that only 28% of the non-project farmers actually conduct any sort of meeting and sitting with service providers. The figure below depicts the results:

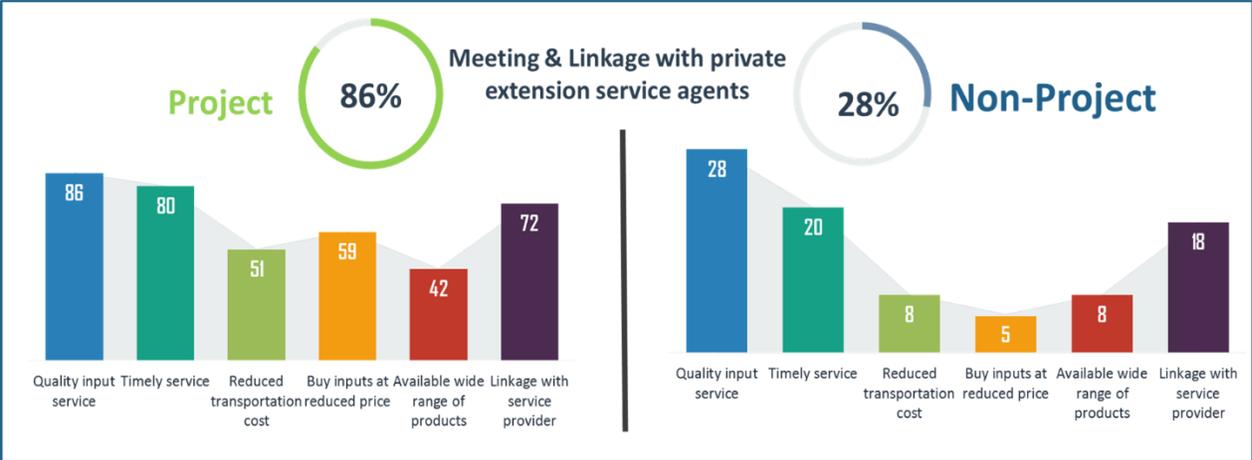


Figure 6: Meeting of farmers with private extension service agents and meeting outcomes (as % of farmers)

Data from figure above reveals the stark differences with project and non-project farmers. As a result of frequent meeting with different service providers like input retailers, the project farmers got a lot of benefits such as access to quality inputs, timely access to inputs, reduction in transportation cost and access to a wide range of products. However, non-project farmers were lagging behind quite significantly in those aspects.

2.3. Technical Authenticity/Accuracy of Service

The farmers have high dependency on private service provider especially to the input retailers about the information related to the cultivation, as embedded service. One of the important objectives of the project was to ensure that service providers provide accurate information to the farmers on issues pertaining to agricultural practice. The figure below depicts the accuracy of services rendered by the retailers on various agricultural practice issues:

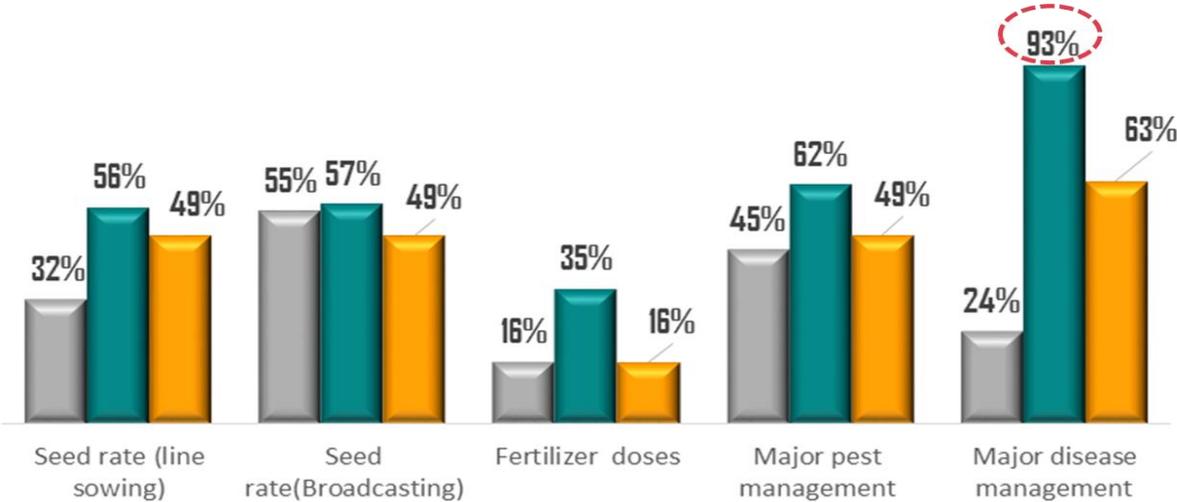


Figure 7 Accuracy of service provision as per advisory service areas (as % of input retailers)

From the figure above, it is seen that trained retailers performed better in all aspects of advisory service compared to non-trained retailers. Furthermore, compared to pre-project period, the input retailers in general have shown better accuracy of service provision. Major improvements were noticed in case of trained retailers in the area of disease management. Non trained retailers also performed moderately well in all the areas of advisory service though there is much room for improvement in the case of fertilizer application and dose for both trained and non-trained retailers. However, compared to pre-project period the improvements in most areas are noticeable.

It is worthwhile mentioning that the responses collected from the input retailers were compared with standard practices and it was determined how accurate the responses of the retailers were compared to standard practice. The standard was set after discussion with industry experts and literature review.

Breaking down the findings **as per subsector**, it was found that in case of **Jute**, input retailers were giving mostly accurate advice to the farmers, though there is room for improvement in the case of recommendations related to fertilizer application and insect management. The other providers like irrigation providers accuracy rate is 63% and tillage providers 68%. Non trained providers also showed good knowledge and understanding about these issues but were lagging behind in terms of providing quality service in areas of disease management and insect management.

In case of **Chili**, it was seen that there is much room for improvement especially on seed rate and fertilizer application. However, the trained input retailers were adept at giving accurate advice regarding disease and insect management where irrigation providers' accuracy rate is 77% and tillage providers 100%. The same trend was witnessed in case of non-trained retailers as almost half of them were not providing accurate advice on fertilizer application and the other half not having sufficient knowledge about fertilizer application. Furthermore, around one-third of them had no knowledge about inaccurate advice of seeding rate.

In case of **Mungbean**, accuracy rate for seeding rate and fertilizer application was more or less satisfactory, however knowledge level was low about MoP application. There was also evident lack of concrete knowledge with regards to insect and identification and management, however their performance was satisfactory when it came to advising farmers on disease management. From field data it is seen that irrigation provider's accuracy rate is 55% and tillage providers 79%. In case of non-trained retailers, they had no knowledge or inaccurate knowledge about seeding rate, and application of fertilizers. However in areas of disease and insect management, they displayed good accuracy.

The breakdown of the above mentioned information has been provided in the **annex**.

It is seen that most farmers had high opinion of the services provided by the input retailers regarding issues that are pertinent for the retailers. FGD with crop farmers also revealed that the farmers can buy good quality seeds, fertilizer and pesticides in affordable price from the input retailers, including option to buy in credit. They can also buy inputs in group as bulk and hence, got inputs in less time with discounts. Farmers also opined that technical accuracy of the information received is moderately good, though there are room for improvement. In general they are content with the accuracy of the service but would like greater accuracy in the coming days. However, they attributed their improved performance due to use of improved seeds and using right type and dose of fertilizers, along with proper disease managements.

The input retailers did play a part in disseminating the knowledge to the farmers. It is also seen that satisfaction level about the accuracy of service from input retailers is visibly low in non-project group, as compared to project group. Thus it is plausible to say that business linkage meetings developed better understanding between project farmers and input retailers, whereas non-project farmers could not build a solid relationship of trust with their input retailers; thus the notable variance in the response of the two groups.

2.4. Linkages & Communication

One of the major goals of the project was to ensure that all the actor within the market system are interacting and collaborating with each other, with a view for mutual benefit. Additionally strong linkage between actors fosters innovation and growth for all the actors. Thus service providers were asked whether they have forged linkages with other stakeholders; which would not only benefit their business but also improve their service quality for farmers.

Survey data revealed that all the service providers (trained and non-trained) had linkages with DAE and 65% had linkages with BADC. Most Input retailers had linkages with input companies with ACI and Syngenta being the notable companies. Detailed information about linkages have been provided in the annex.

Survey data also revealed the type and range of services that the retailers were receiving as a result of those linkages from both GoB line departments and private companies, as depicted in the diagram below:

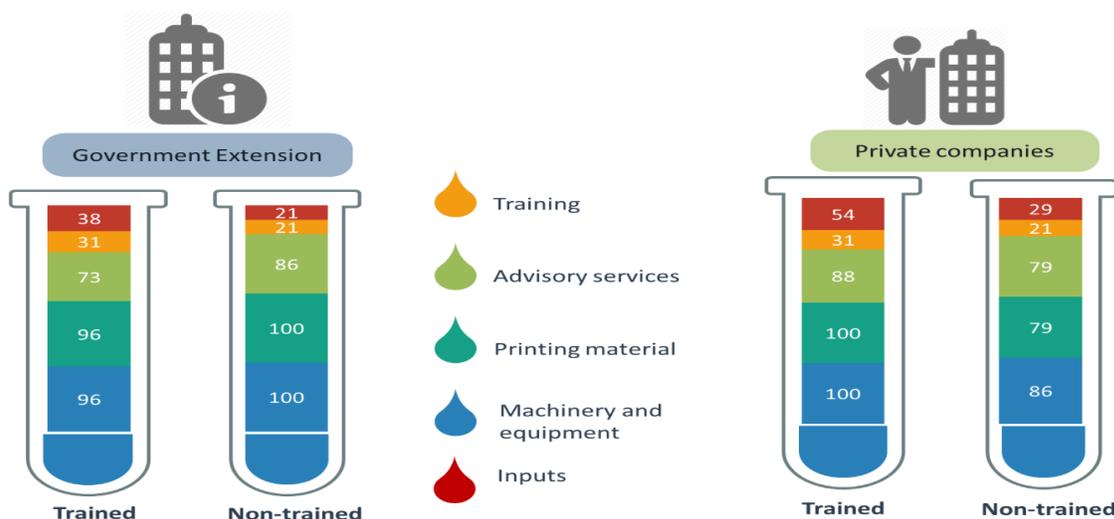


Figure 8: Services received from public bodies and private companies as a result of linkages

The diagram above shows that both trained and non-trained service providers were receiving various types of services from government and private sources, such as machinery and equipment, inputs, printing materials, advisory services, and training. It is notable to see that relatively small percentage of retailers actually received training from GoB line departments and input companies, although most of them received advisory services from them which complements the need for training to some extent.

2.5. Business Growth

Market development approach understands that in order to ensure sustainability of any intervention, the relevant market actors need to be sufficiently motivated to continue providing the service, after project completion. Thus input retailers got associated with the project with a long term benefit in mind, in terms of business growth and profitability. Survey data shows that compared to 2 years back, there has been visible improvement in the performance of the input retailers, as evidenced by the diagram below:

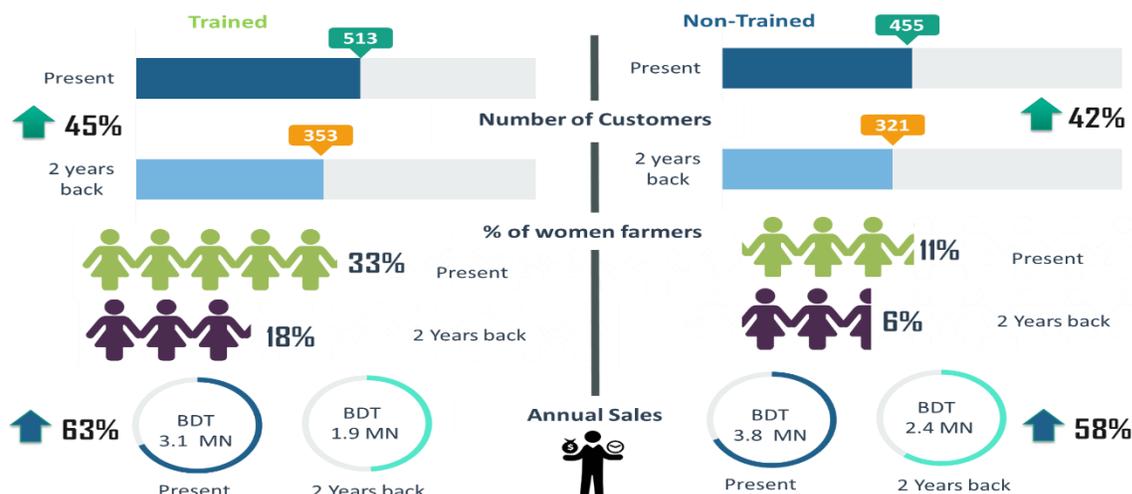


Figure 9: Business and revenue growth compared to last 2 years (as % of input retailers)

The figure above shows both trained and non-trained retailers have made good advancement in their business growth compared to 2 years back, including acquisition of more women customers than before. FGDs also revealed that women farmers are now more mobile and are less conservative about buying their required input directly from the retailers, instead of sending their husbands and sons. In case of trained retailers, it was seen that they saw around 63% business growth whereas non-trained retailers saw around 58% business growth. The main reasons for improvement in their business performance was mentioned by the input retailers, which has been captured in the table below:

Table 2: Reasons behind improved business performance (as % of input retailers)

Reasons of increasing the number of customers	Trained	Non-Trained
Better advisory service	92%	86%
Selling quality inputs	96%	79%
Wide range of inputs	85%	71%
Providing buy back services	85%	86%
Reasonable price of inputs	92%	79%
GoB registered business	73%	43%
Business linkage meeting with farmers' groups	88%	57%

From the table above it is seen that a multitude of factors contributed to the better performance of input retailers, but mostly selling of quality inputs, offering reasonable price, and business linkages with private

and public entities helped them to expand their business. However, non-trained retailers were still lagging behind compared to trained retailers, in leveraging the business linkages for greater business.

2.6. Lessons learnt from project involvement and recommendations from actor

The input retailers mentioned about various benefits and lessons learned due to their association with the project. They mentioned about improvements in their business planning capacity and introduction to service provision through ICT devices. Some of them opined that ICT based services will be the thing of the future and thus they were excited to learn about it. The association also helped them to increase their business volume and profitability due to various linkage initiatives from the project. As a result of knowledge increase at their end, they are much better equipped to serve the needs of the farmer's better which would lead to further business development.

The retailers also put forward some suggestions for various actors of the market system. For government line agencies they requested to make the pesticide licensing easier and conduct regular training for them. They also stressed the need for greater market monitoring. They also clamored for a reduction in the Value Added Tax (VAT) on agri inputs, which would help them to reduce the price to the farmers. For the input companies, they requested for reduction of input prices so that they can provide the farmers inputs at reasonable prices as well as provide them regular training to keep their knowledge updated. Some retailers mentioned that packets should clearly mention the contents there within, so as to avoid confusion among them and farmers. They also requested development projects such as AESA to continue the good work they are doing and always provide training opportunities for the retailers. They opined that farmers are getting more and more modern and are able to follow instructions better than before. However, willingness to pay a bit higher amount for quality input is still lacking and this is one area where their mindset needs to be changed.

2.7. Conclusion

In retrospect, there has been visible positive changes in the market system, with greater linkage and connectivity with input retailers and farmers. Input retailers have not only increase their customer numbers but there is tangible impact in their revenue growth as well. Although there is room for improvement for the input retailers in the accuracy of recommendations they provide to the customers, they have fared reasonably well in accurate knowledge dissemination. Major improvements were noticed in case of trained retailers in the area of disease management, with more than 9 in 10 retailers providing accurate information to the farmers. Fertilizer application and dose is a major area where there is much room for improving the accuracy of service. However, compared to pre-project period the improvements in most areas is noticeable. Project Farmers were generally satisfied with the support received from the retailers and three quarters of them were content with the technical accuracy provided by the retailers. However satisfaction level with non-project farmers was moderate, thus this is an area where input retailers can try to improve their service provision. However, what is notable is that the greater integration of input retailers in the overall market system and how well they are now interacting with farmers, GoB line departments and private sector companies.



Aquaculture sector findings

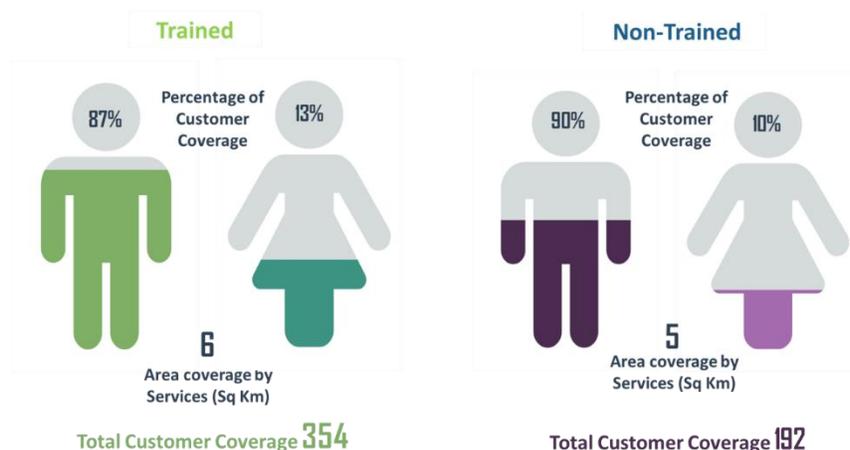
3. AQUACULTURE SECTOR FINDINGS

The project intervention in aquaculture identified and supported input retailers, patilwala, nursery owners and worked extensively with fish & shrimp farmers. Private extension agents have been delivering inputs and technical advisory services as embedded to the producers, but their knowledge on production technologies, business modalities, business services and practice were in need of improvement on the basis of farmers’ requirement. The following sub chapters would evaluate the knowledge and performance level of each of the private extension service providers, along with evaluation of their services from their service recipients, i.e. the farmers. The objective is to develop a better understanding of the progress made by the Aquaculture sector extension agents due to project interventions.

3.1. Service Provision

Area coverage & customer base

Input retailers were asked about their service coverage area and their present customer base. The figure beside depicts the survey results. Survey data reveals that input retailer’s market reach is mostly within 5-6 km and around half of their customers are regular and repeat customers. Currently trained input retailers are



currently trained input retailers are serving 354 customers on average, out of which 13% are women. On the other hand non-trained retailers are serving 192 customers on average, out of which 10% are women.

Type of services provided

The input retailers were found to be providing a variety of services to the farmers, including a whole host of embedded services such as advice on use of aqua chemicals, feed application, disease management and remedial action, etc. The figure below depicts the discussion above:

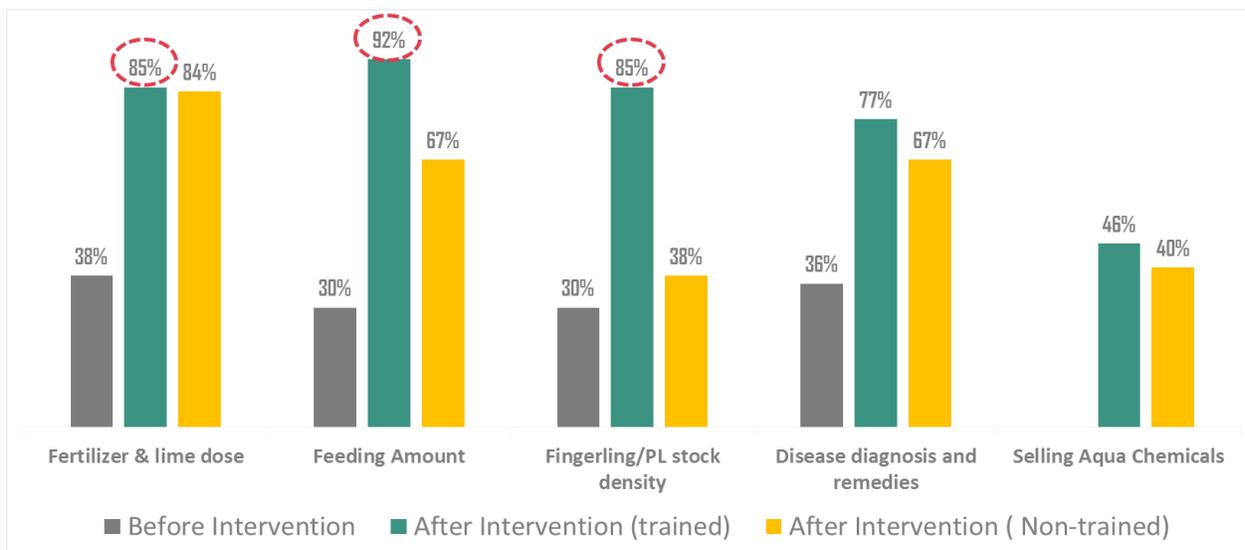
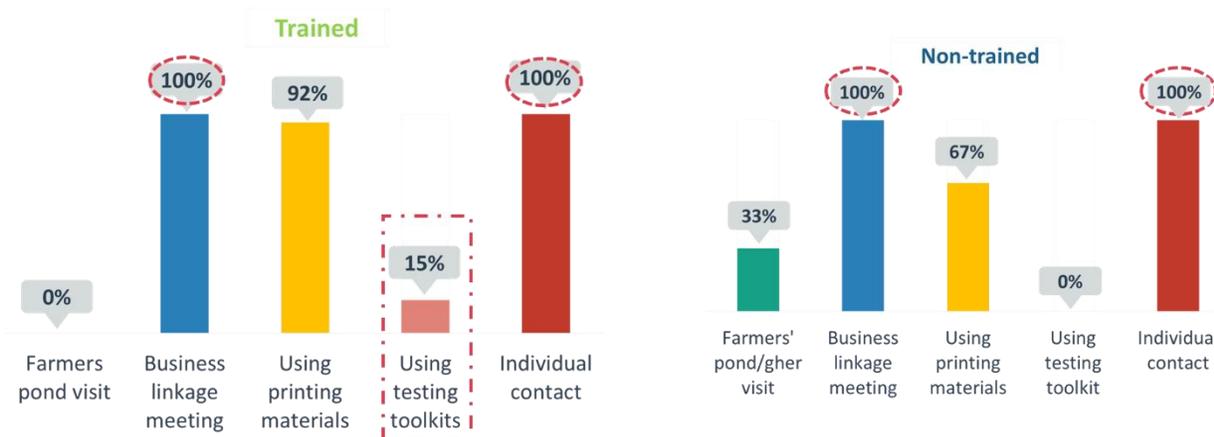


Figure 10 Service provided to farmers in last 2 years (as % of input retailers)

From the figure above, it is seen that input retailers were quite active selling products and providing information to the farmers at the same time. Both trained and non-trained retailers were rendering similar services. Deeper insights revealed that they provide additional counselling to farmers in the hope that they can retain more customers and also obtain new customers through their courteous approach to their problems. The retailers also mentioned that method of their service delivery to the farmers as depicted in the following diagram:



From the figure above, it is seen that business linkage meetings, use of printed materials and individual

Figure 11 Method of service provision by retailers (as % of retailers)

contact over phone or face to face are the major mediums of service delivery for the retailers. It is interesting to see that none of the trained retailers making farmer pond/gher visits. Deeper insights revealed that since the retailers have to sit in their shops most of the time to attend to customers, it is not possible for them to leave their shop unattended and visit farmer ponds/ghers. It was also notable to see high percentage of retailers using printed materials, leaflets, booklets etc. to reach out to customers.

Data revealed that nice visualizations and detailed instruction written in the booklets makes them useful and farmers like to have a copy of something they can refer to when they are in their fields or homes.

Field data also revealed that all the retailers had conducted meeting with farmer producer groups and were hugely benefitted due to the meetings. The figure below depicts the results:

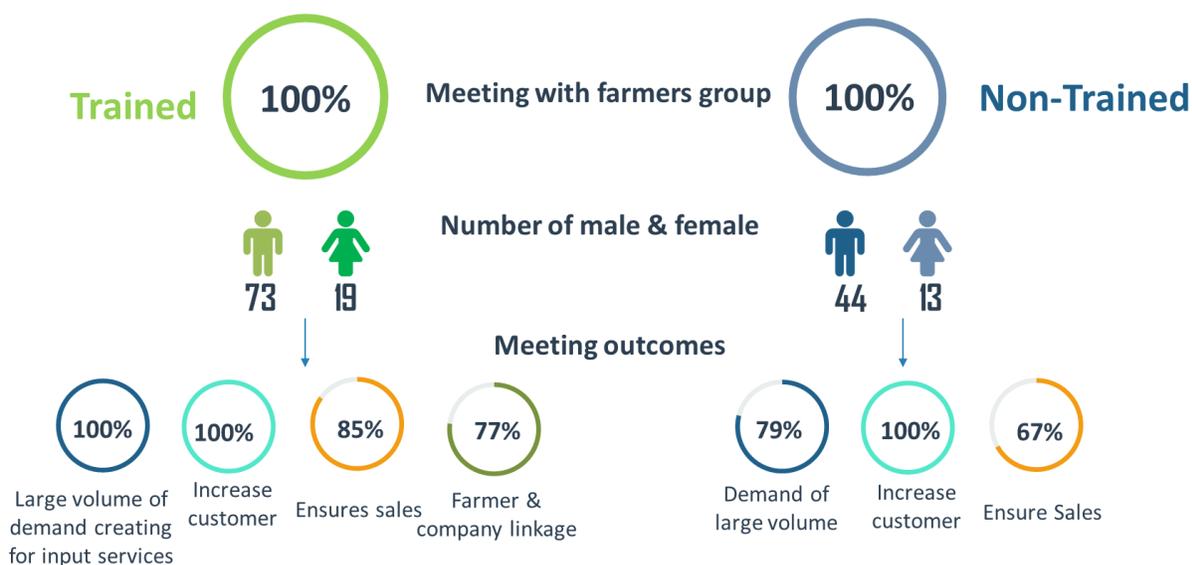


Figure 12 Meeting with farmers and outcome of meetings (as % of input retailers)

From the figure above, it is seen that the meetings resulted in increase in demand for their products and subsequent increase in customer numbers. Thus the input retailers benefitted enormously from association with the project, which enabled them to tap into a large customer base.

On the other hand, **data from farmers** were also collected, evaluating the service provision of the service providers. Besides receiving core services of input supply, they also received embedded services from the input retailers as depicted in the table below:

Table 3 Farmer’s receiving embedded services from the input retailers (as of % of farmers)

Input Retailer	Project		Non Project	
	Project	Non Project	Project	Non Project
Advice on Feed application methods and rate	65%	48%	65%	48%
Advice on drug application dose	52%	29%	52%	29%
Advice on Lime application dose	77%	68%	77%	68%
Advice on Fertilizer application dose	71%	55%	71%	55%
Advice on Fingerling/PL stocking density rate	58%	32%	58%	32%
Advice on Disease diagnosis & remedies	68%	39%	68%	39%

From the table above, it is seen that most of the project farmers were receiving various embedded service from the input retailers which are crucial for their farming endeavor. In comparison, lower percentage of non-project farmers were receiving embedded service from input retailers.

Farmers were also asked about how they were receiving the service provision from the private service providers. The figure below depicts the results:



Figure 13 Method of receiving extension service provision by farmers (as % of farmers)

From the figure above, it is seen that project farmers were mostly receiving the service through farm visits and more notably from linkage meetings. It is not surprising to see that only 6% of the non-project farmers mentioning that they attended linkage meetings and met input retailers. Personal face to face contact and mobile phone communication was also a very prominent source.

Furthermore, survey data also revealed that 94% of the project farmers attended meeting with private service providers whereas only 32% of the non-project farmers attended meetings with private service providers. Thus there is a clear difference in the amount of exposure that the project farmers received, compared to non-project farmers. Thus, it is not surprising that most of the project farmers mentioned many associated due to attending the meetings at depicted in the figure below:

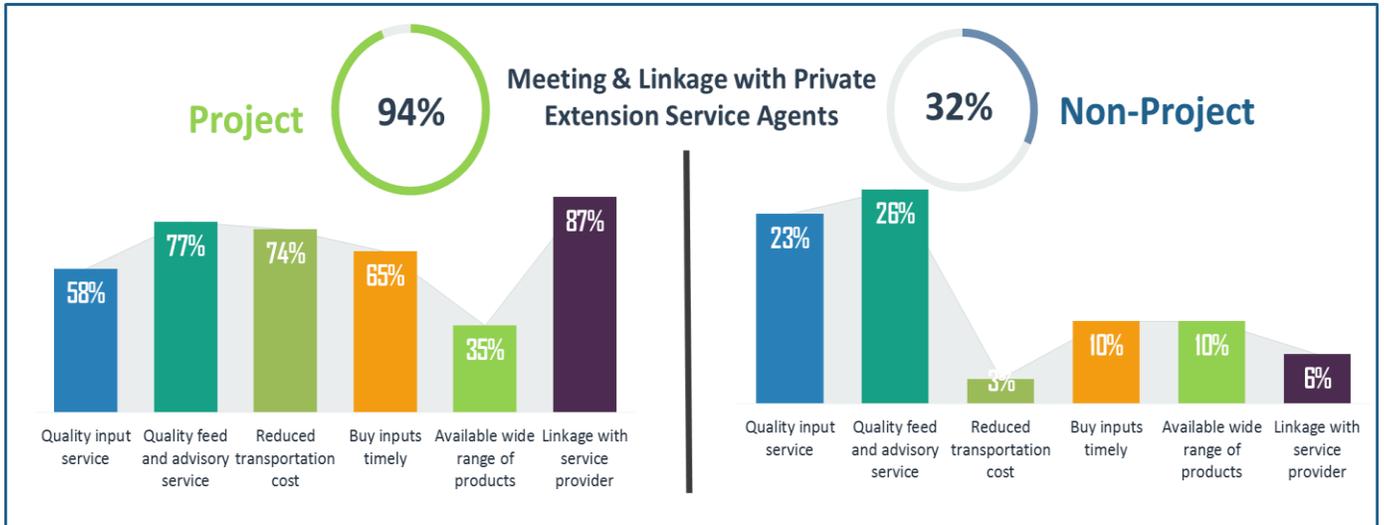


Figure 14 Meeting of farmers with private extension service agents and meeting outcomes (as % of farmers)

Data from FGD with fish/shrimp farmers also revealed that they depend on the input retailers for many types of support. Most farmers mentioned about having access to good quality input such as fish feed, lime, fertilizer, fish medicine, etc from the input retailers. Some input retailers also provide water testing service, identify fish diseases and provide treatments. Input retailers often extend credit to the farmers which is very helpful for them.

3.2. Technical Authenticity/Accuracy of Service

Farmers are very much dependent on input sellers and other service providers for sourcing input and also for valuable advice and counselling. Thus the scope of the research was to see the accuracy of the information that the input seller was providing to the farmers. The figure below depicts the accuracy of service provision. It is worthwhile mentioning that the responses collected from the input retailers were compared with standard practices and it was determined how accurate the responses of the retailers were compared to standard practice. The standard was set after discussion with industry experts and literature review.

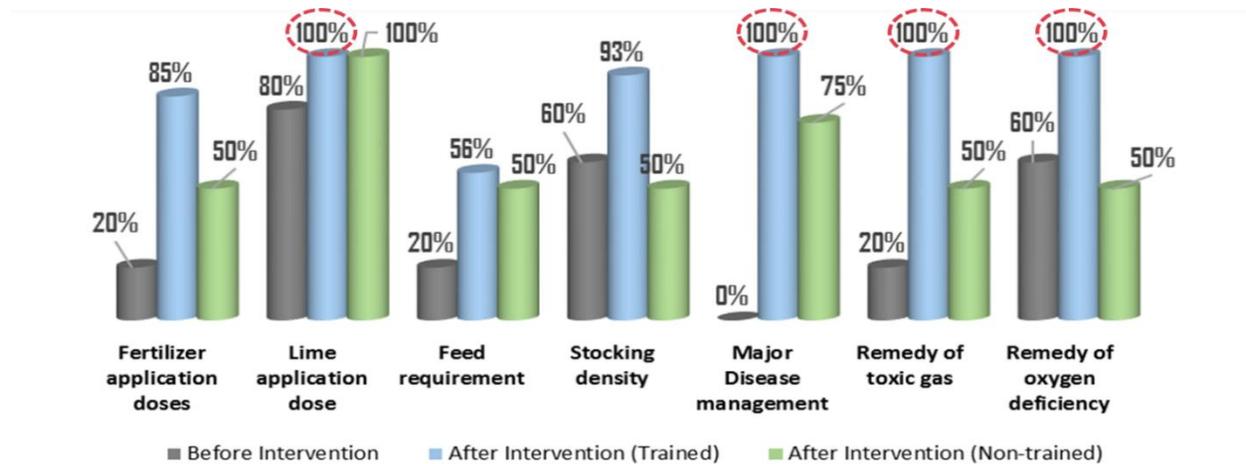


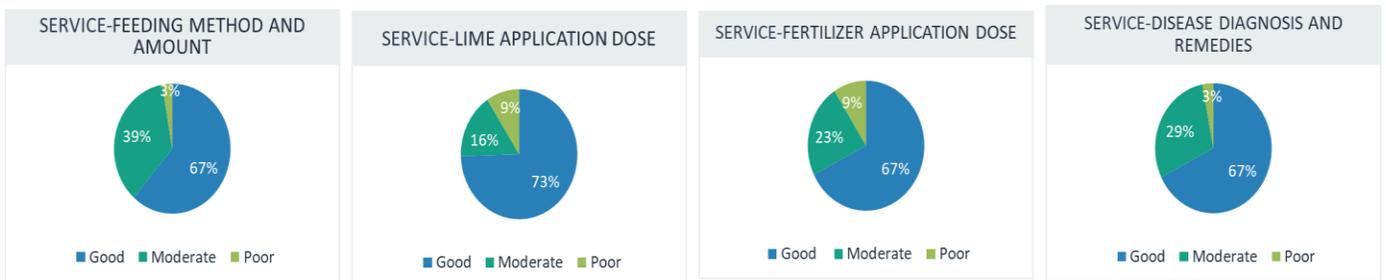
Figure 15 Accuracy of service provision (as % of providers)

From the figure above, some interesting observations can be deduced. The accuracy level in terms suggesting dose for fertilizer and lime application for pond gher preparation shows that majority of trained input retailers providing correct recommendation to the farmers. Non trained retailers also showed good knowledge about this issue though there is room for improvement in the case of TSP recommendation.

In the case of stocking density, it was seen that majority of the trained input retailers suggesting correctly for fingerling stocking in pond and most of them got it right in the case of bagda/shrimp PL stocking. However, non-trained retailer’s performance was not quite impressive as trained retailers, though in overall context no so disheartening. In case of feed management, it was seen that more than half of the trained retailer gave the correct recommendation to the farmers when it came to feeding practice for white fish, whereas in the case of shrimp feeding practice, most of them were partially correct. However, non-trained retailers were not providing correct information when it came to shrimp feeding practice, however overall 50% of them were passing accurate information for the farmers. Thus there is much room for improvement here for non-trained retailers. In case of disease management related recommendations, the trained farmers were providing accurate information in the case of white fish, whereas half of the non-trained farmers were providing accurate information. In case of shrimp, both trained and non-trained retailers seemed to have the right answer to the farmer’s queries. The most important observation from the diagram above is the noticeable improvement compared to pre project phase. Noticeable strides have been made in terms of disease management advisory service for both trained and non-trained retailers.

Farmers were also asked to comment on the accuracy and usefulness of the service received from the private service providers. The figure below depicts the results:

Opinion Regarding the Usefulness of the Technical Information -Project Farmers



Opinion Regarding the Usefulness of the Technical Information -Non-Project Farmers

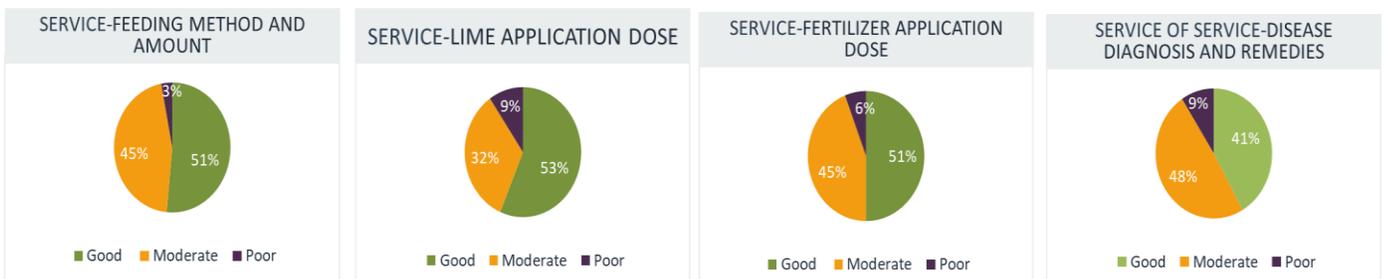


Figure 16 Project & non-project farmer’s perception about usefulness of service from input retailers (as % of farmers)

From the figures above, it is seen that most **project farmers** have expressed satisfaction over the accuracy of the service provided by the input retailers on issues that are pertinent for them. From FGD data too, it was seen that Majority of the farmers think they get good services from the input retailers, with only a few exception who felt their services are of moderate quality. Most of the farmers think that their advice on lime application dose and fertilizer application doze is very good. Fish production has increased by following their advice, quality of the water was also good as they applied proper dose of lime and fertilizer. There was no gas in the water and death rate of fish was also low. There were less diseases in fish. Thus farmers appreciated the advice on feeding method and stocking density.

Data gathered from **non-project farmers** revealed that most farmers rate the service of the input retailers on a moderate level with around 1 in 10 farmers mentioning the accuracy of service was really poor.

Project farmers also mentioned that the linkage meetings really helped them to get to know the input retailers better, who in turn provided them discounts, credit facilities and also gave best quality information as much as possible. Since they were part of a large group, retailers behaved cordially with them and tried to help them as and when possible.

3.3. Linkages & Communication

One of the overarching objectives of the project was to ensure that there is visible linkage between the service providers and farmers, which would be beneficial for both parties. Similarly, it was envisaged that linkage should also exist between private and public service providers, so that the former can benefit from the latter's resources and counselling.

Survey data revealed that all of the trained input retailers had linkages with DoF and 1 in 3 non-trained input retailers had managed to forge linkages with DoF. However, no linkages were seen between the retailers and research institutes such as Bangladesh Fish Research Institute (BFRI). A good proportion of input retailers were also connected with the private sector companies such as ACI, Mega Feed, Bayer Corp. Norico etc. These linkages really helped the retailers to improve their business performance through receipt of quality information and services. The figure below depicts the services they have received as a result of those linkages:

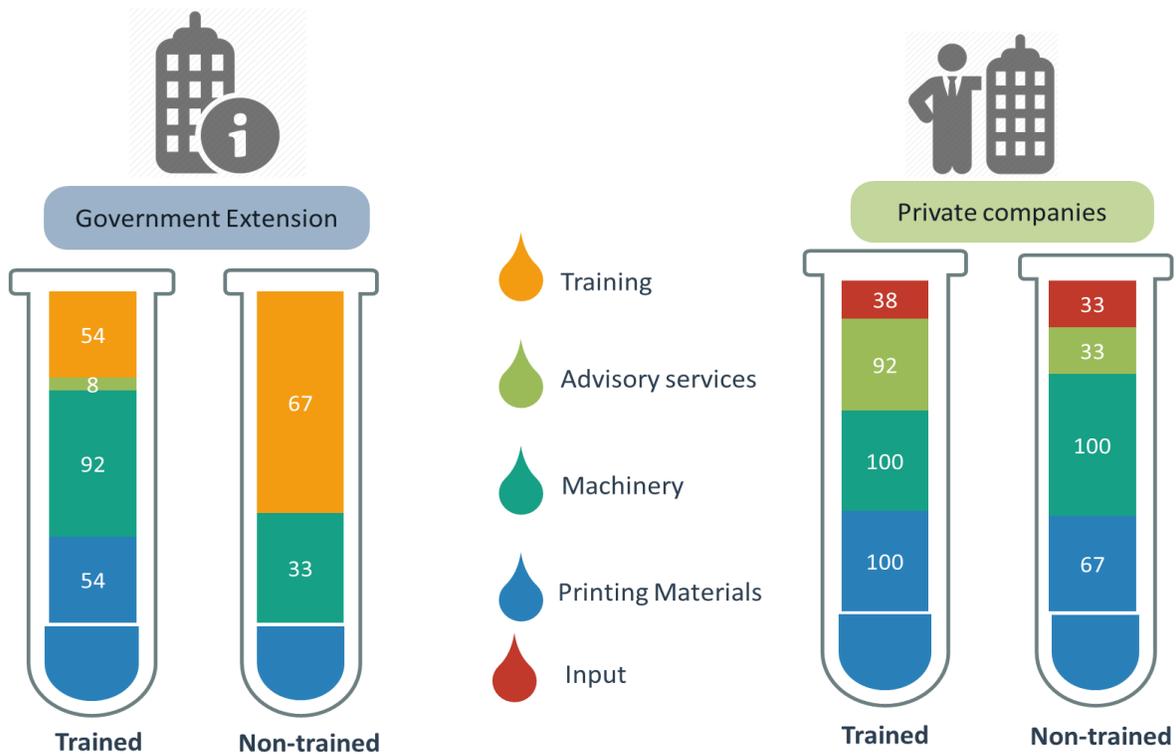


Figure 17 Services received from public bodies and private companies as a result of linkages (as % of input retailers)

From the figure above, it is seen that input retailers reaped many benefits due to association with public and private sector entities. From DoF, they received training, printing materials and technical support. From the private sector, they sourced inputs and received advisory service and leaflets, posters, banners.

3.4. Business Growth

The input retailers who were associated with the project were benefit due to this fruitful association as they saw their customer numbers increased compared to 2 years back, as well as notable improvements in their revenue.

Trained retailers increased their customer base by around 50%, whereas non-trained retailers increased their customer base by 26%. The average revenue almost doubled for the trained retailers whereas, non-trained retailers also saw appreciable gains in their revenue compared to 2 years back. The figure below depicts the survey results:

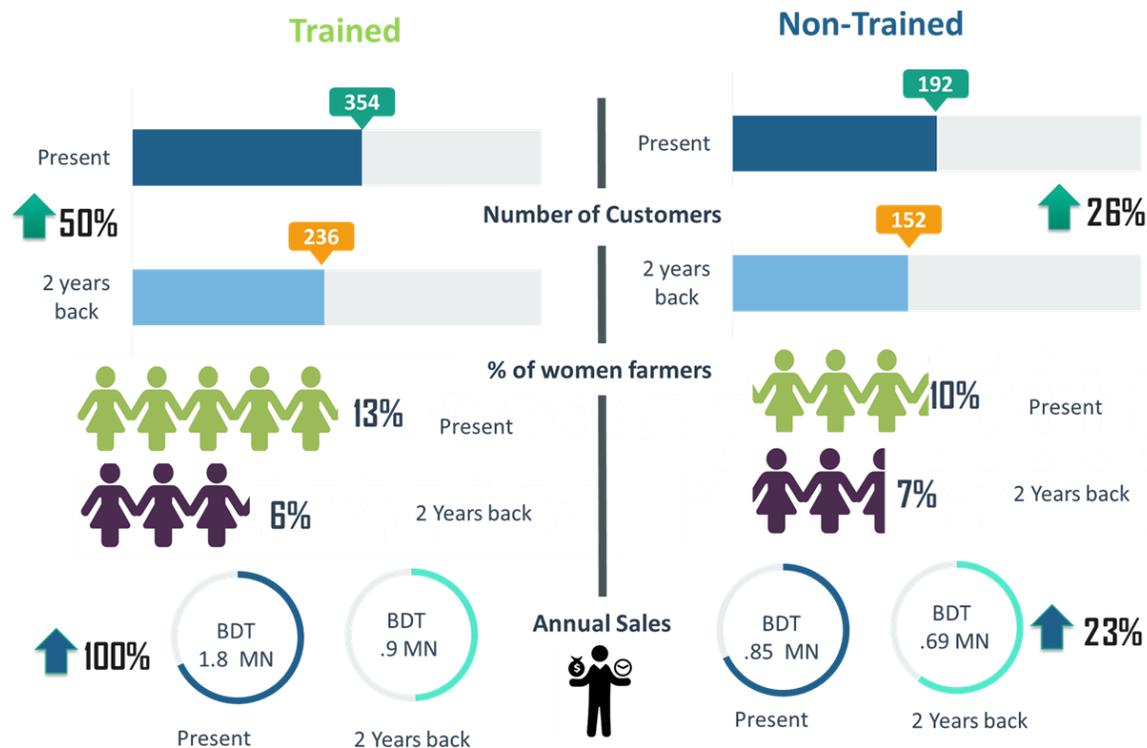


Figure 18 Business and revenue growth compared to last 2 years (as % of input retailers)

The retailers attributed many reasons for their improved business performance as depicted in the table below:

Table 4 Reasons behind improved business performance (as % of input retailers)

Reasons for improved performance	Trained	Non Trained
Provided better advisory service	85%	50%
Selling of quality input	92%	83%
Selling wide range of inputs	54%	0%
Providing buy back services	62%	0%
Reasonable price of input or services	77%	33%
Registration from Govt.	85%	0%
Business linkage meeting with farmers' group	85%	0%
Linkage with company	62%	33%

However some retailers did opine that doing business is becoming tough since the number of input retailers in village level is sprawling, faster than market growth. Thus it would be a challenge to maintain business growth and there is greater need for innovation and improvements in service quality, to survive in the market.

3.5. Lessons learnt from involving with project and recommendations from actor

The input retailers mentioned about various benefits and lessons learned due to their association with the project. They mentioned about improvements in their business planning capacity and increase in their business volume and profitability due to various linkage initiatives from the project. As a result of knowledge increase at their end, they are much better equipped to serve the needs of the farmer's better which would lead to further business development.

They requested the GoB line department to work more closely with farmers and educated them about proper input usage. They also urged them to give more technical support for farmers in the area of soil testing and disease identification. The input retailers also mentioned that although they are well versed about technical issues about white fish cultivation, they need more training on cultivation techniques and disease management of shrimp and prawn. They also advised the input companies to produce good quality fish feed which ensures proper nutrition for the fish. The price of fish feed is also a headache for them and it should be reduced for the benefit of the farmers. Finally they hoped that farmers apply the knowledge they gain from training/workshops and farmers should also take advice from retailers and DoF officials as and when required, instead of applying their own knowledge. Farmers are way too cost conscious and they should be willing to spend a little extra to buy good quality inputs.

3.6. Conclusion

There has been visible positive changes in the market system, with greater linkage and connectivity with input retailers and farmers. Input retailers have not only increase their customer numbers but there is tangible impact in their revenue growth as well. They have also managed to add to their repertoire of service compared to before and are more active in advisory service. They got more involved with farmers through business linkage meetings which led to business growth for them. In the area of technical accuracy, there were notable improvements in their performance compared to pre-project period. The accuracy level in terms suggesting dose for fertilizer and lime application for pond/gher preparation shows that majority of trained input retailers providing correct recommendation to the farmers. In areas of stocking density and feed management and disease management, majority of retailers were giving accurate information to farmers. The major improvement areas seems to be in the area of feed management where half of the providers were still not providing accurate information to the farmers. In areas of disease management the performance of the trained retailers was quite good with non-trained retailers closely following behind. Around three in four project farmers acknowledged that input retailers were providing useful and accurate information, whereas non-project farmers were more reserved in their appreciation of the performance of the input retailers. The input retailers also showed great drive to improve their business performance as evidenced by increased linkage with government extension service and private companies. As a result of those linkages they got exposed to training opportunities which enhanced their skill and knowledge further. Thus the retailers were very much part of the wider market system and were doing their part efficiently, in an increasingly integrated market system.



Livestock Sector Findings

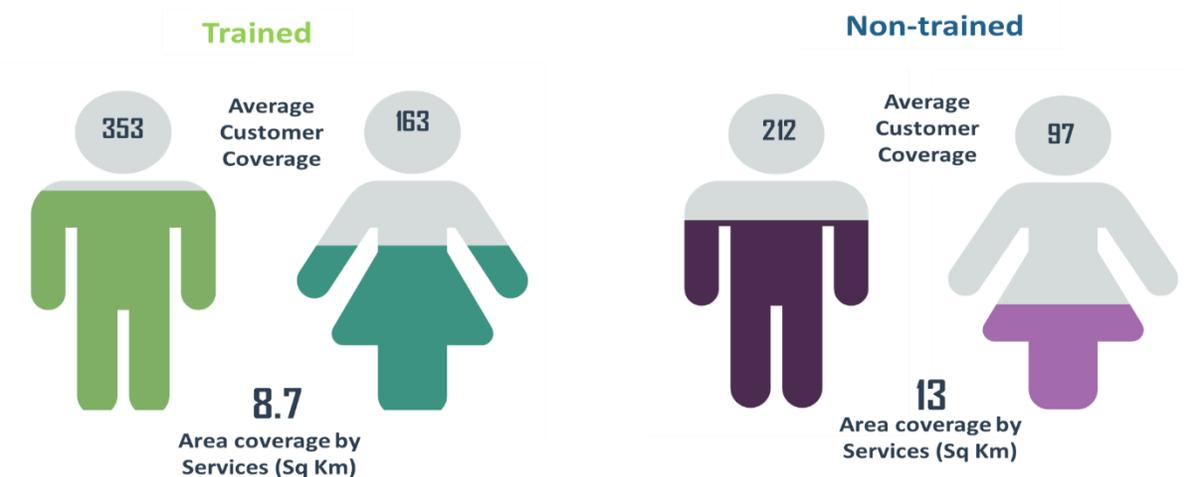
4. LIVESTOCK SECTOR FINDINGS

The project intervention in the livestock sector focused on capacity development of farmers and public and private extension agents, promoting improved livestock management practices, linkage building among the farmer groups and input-output market actors, strengthening access to service through ICT etc. The private extension agents identified in the livestock sector were input retailers, Local service providers (LSP)-livestock and Artificial Insemination Service provider or AI worker. Private extension agents have been delivering machineries, vaccinations, testing on various diseases and their doses and few technical advisory services as embedded to the livestock farmer. Input suppliers and Local Service Providers (LSP) are the primary contacts at field level who provide inputs like feed, vaccines, medicines and advisory services (as embedded) to the livestock farmers. They also provide primary treatment, vaccination, de-worming and AI services for livestock. The LSPs are well connected with input retail shops and the company representatives as well. Some of them maintain communication with DLS for technical information and vaccination. The price of AI is unaffordable for some of the farmers and few farmers in the qualitative interviews reported the need of increased technical expertise among the service providers. The following sub chapters would evaluate the knowledge and performance level of each of the extension service providers, along with evaluation of their services from their service recipients, i.e. the farmers. The objective is to develop a better understanding of the progress made by the livestock sector extension agents due to project interventions.

4.1. Service Provision

Area Coverage & Customer Base

Area coverage denotes the radius of the service delivery area for the retailers. Survey data shows that retailers in general have their customer base spread out to 8-13 kilometers from their base. Furthermore, the average customer coverage is 353 males and 163 females for the trained input retailers which is comparatively higher than the non-trained input retailers. Thus it shows that the input retailers are localized traders and have a relatively small working area and mostly fixed set of customer.



Type of service provided

Input retailers were asked about what type of services they have been providing to the farmers in the last 2 years. The figure below depicts their responses:

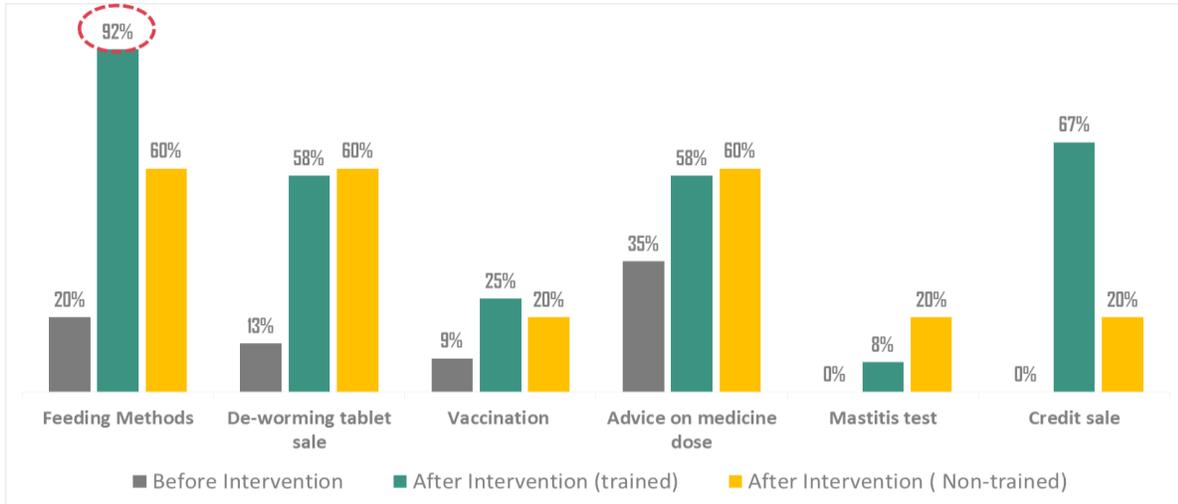


Figure 19: Service provided to farmers in last 2 years (as % of input retailers)

The figure above depicts the range of services that the input retailers have provided or added to their service list in the last 2 years. It was seen that most trained input retailers are providing most of service to the farmers and notably, all the non-trained retailers were providing varied service to their customers. In retrospect, the range of services provided by the input retailers is quite diverse and points to improvement in their scope of business. Especially there is a low percentage of service provided in mastitis testing for non-trained retailers which has scope of improvement with linkages of private sectors such as ACI. However in all of the service provision there has been a significant increase from the pre-project period both trained and non-trained input retailers. Credit sale and mastitis testing are two new added service provisions which were not provided before. The FGDs entailed depicted that training and linkages with private and public extension service providers and farmers group helped the input retailers to expand their service provision and business.

The input retailers also mentioned the process through which they provided the services. The diagrams below depicts their service provision methods:

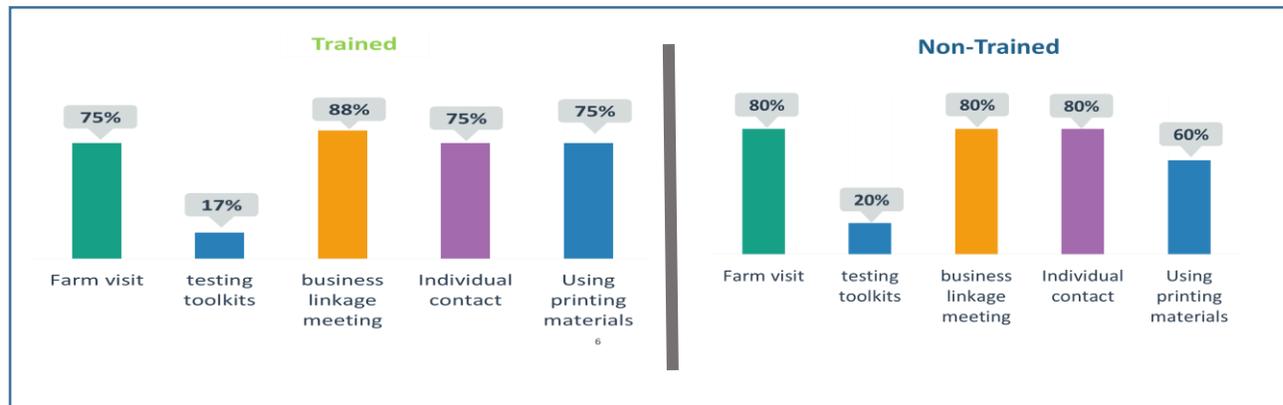


Figure 20: Method of service provision by retailers (as % of retailers)

The figure above shows that trained retailers mostly preferred business linkage meeting, farm visit, printed materials and individual contact as the most preferred method. Both the trained and non-trained groups had less usage of testing toolkits to provide services. The fact that trained retailers had relatively more access to FPG meetings and greater exposure to the input company representatives accounted for them being more prone to attend farmer’s fields and attending linkage meetings.

In fact, survey data revealed that all the trained input retailers conducted meeting with farmer’s group and 80% of the non-trained retailers also conducted meeting with farmers. The figure below depicts the discussion made above:

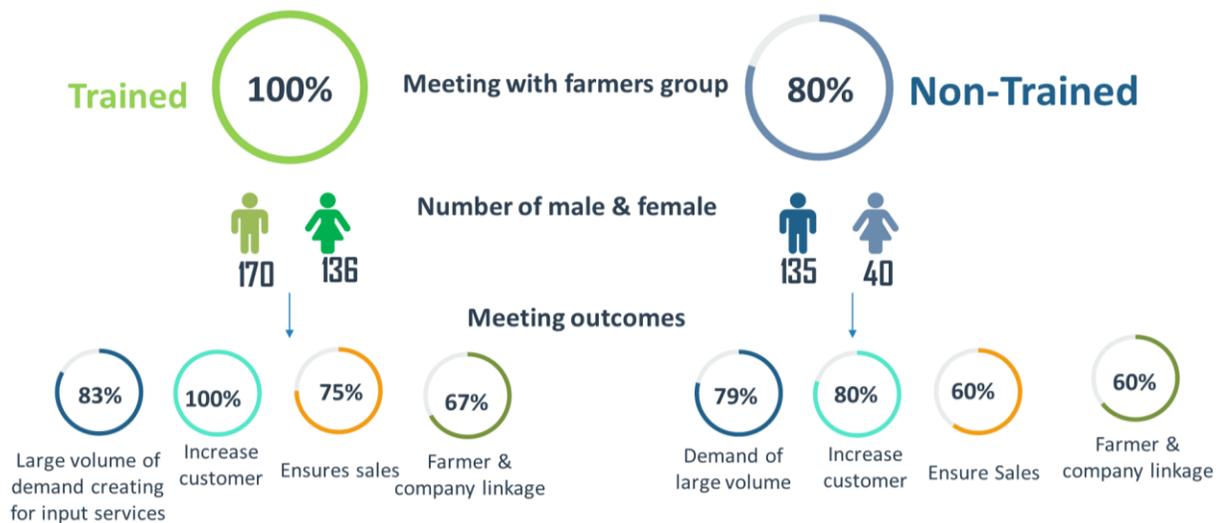


Figure 21: Meeting with farmers and outcome of meetings (as of % of input retailers)

The figure above also gives some additional insights about the outcome from those meetings. The results show that the meetings were highly beneficial for the retailers as they saw increased customer acquisition and surge of demand. Most of the trained and non-trained retailers mentioned about receiving greater

demand for their products and actually managing to sell greater quantities of input as a result of conducting meeting with farmers.

Data from farmers revealed that 84% of the project farmers mentioned about getting service from input retailers through farm visits and 88% of them get service through linkage meetings with them. 74% of the farmers mentioned that they got the services through the printed materials (poster, banner etc). The figure below depicts the discussion made above:

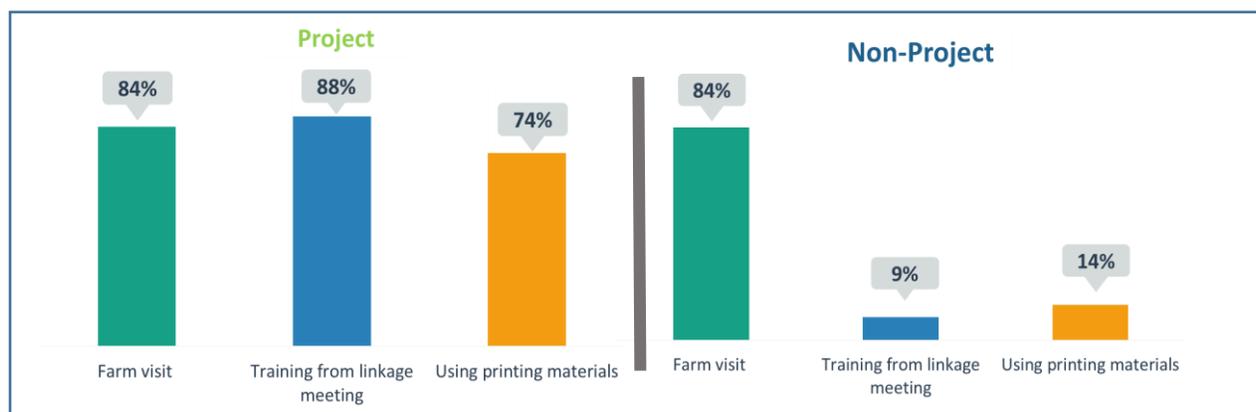
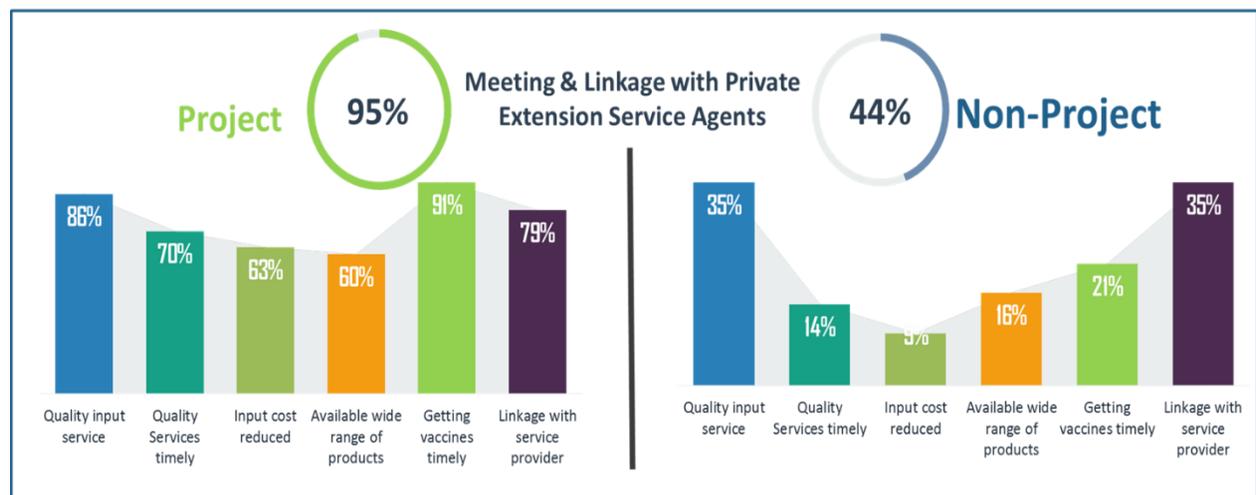


Figure 22: Method of receiving extension service provision by farmers (as % of farmers)

From the figure above, it is seen that non-project farmers were not very connected with their input retailers through any other medium except farm visit. Input retailers don't organize the linkage meeting



that often, nor do they use printed materials. Thus project farmers have been facilitated well in terms of linkage building with the input retailers. In fact, data reveals that only 44% of the non-project farmers actually conduct any sort of meeting and sitting with their input retailers. The figure below depicts the results:

Figure 23: Meeting of farmers with private extension service agents and meeting outcomes (as % of farmers)

Data from figure above reveals the glaring differences with **project and non-project farmers**. As a result of frequent meeting with input retailers, the project farmers got a lot of benefits such as access to quality inputs, timely access to inputs, reduction in transportation cost and access to a wide range of products. However, non-project farmers were lagging behind quite significantly in those aspects. However the qualitative interviews with the farmers suggested improvement for the timely service and maintaining the market rate of the products.

4.2. Technical Authenticity/Accuracy of Service

The farmers have high expectations from input retailers about the quality of products and also quality of information that they provide, as embedded service. One of the important objectives of the project was to ensure that input retailers provide accurate information to the farmers on issues pertaining to livestock services. The figure below depicts the accuracy of services rendered by the retailers on various livestock practice issues: It is worth mentioning that the responses collected from the input retailers were compared with standard practices and it was determined how accurate the responses of the retailers were compared to standard practice. The standard was set after discussion with industry experts and literature review.

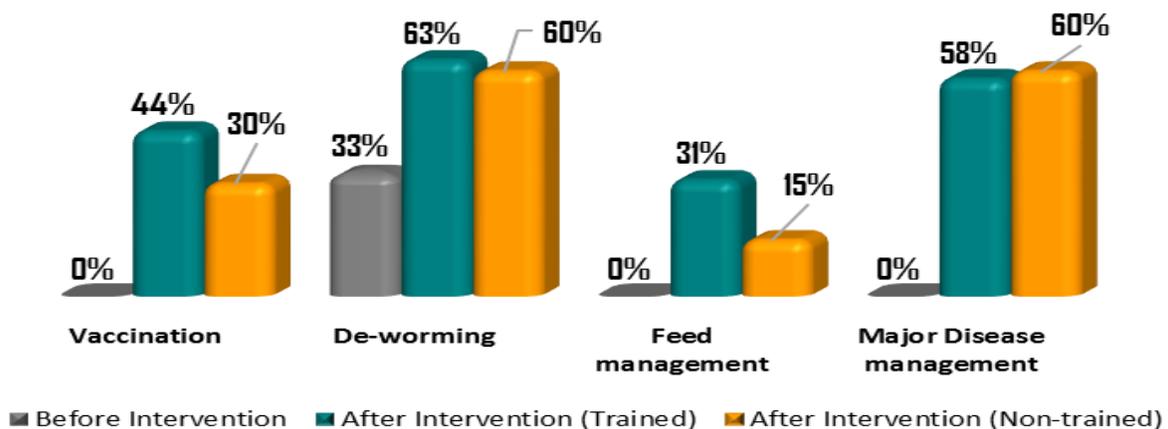


Figure 24: Accuracy of service provision (as % of providers)

From the figure above, we can see clear improvement in performance of input retailers compared to pre-project period. In all pertinent areas, the retailers have made notable strides such as in case of vaccination, deworming, feed management and disease management. However, there is room for improvement in the case of feed management advices. Noticeably, non-trained retailers are not lagging far behind the trained input retailers in most areas. Detailed information can be found in the annex.

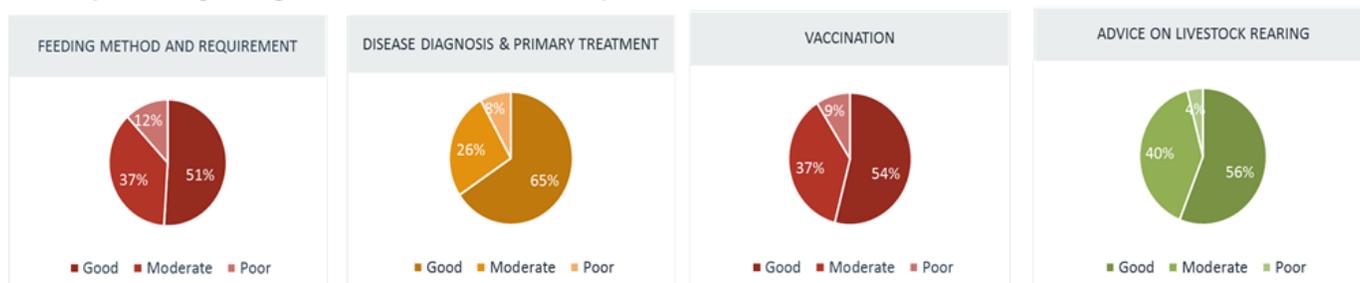
Discussion **with farmers** also revealed their perception of the service received from input retailers, as depicted in the diagram below:

Figure 25 Project and Non-project farmer’s perception about accuracy of service from input retailers (as % of farmers)

Opinion regarding usefulness of the service provision-Project



Opinion regarding usefulness of the service provision-Non-Project



From the diagram above, it is seen that most project farmers had high opinion of the services provided by the input retailers regarding issues that are pertinent for the retailers. FGD with livestock farmers also revealed that the farmers can have vaccination schedule timely and treatment is easier to avail however some minor moderate and poor recommendations point out the affordability of the price from the input retailers, including option to buy in credit. Farmers also opined that technical accuracy of the information received in moderately good, though there are room for improvement. In general there is room for improvement for the feed management process.

From the figure above, it is seen that satisfaction level about the accuracy of service from input retailers is visibly low in non-project group, as compared to project group. Thus it is plausible to say that business linkage meetings and trainings developed better understanding between project farmers and input retailers, whereas non-project farmers could not build a solid relationship of trust with their input retailers; thus the notable variance in the response of the two groups.

4.3. Linkages & Communication

One of the major goals of the project was to ensure that all the actor within the market system are interacting and collaborating with each other, with a view for mutual benefit. Additionally strong linkage between actors fosters innovation and growth for all the actors. Thus input retailers were asked whether they have forged linkages with other stakeholders; which would not only benefit their business but also improve their service quality for farmers.

Survey data revealed that all the input retailers (trained and non-trained) had linkages with Government livestock office and 42% of the trained input retailers had linkages with ACI. Most Input retailers had linkages with input companies with ACI and Renata being the notable companies. Detailed information about linkages have been provided in the annex. Survey data also revealed the type and range of services that the retailers were receiving as a result of those linkages from both GoB line departments and private companies, as depicted in the diagram below:

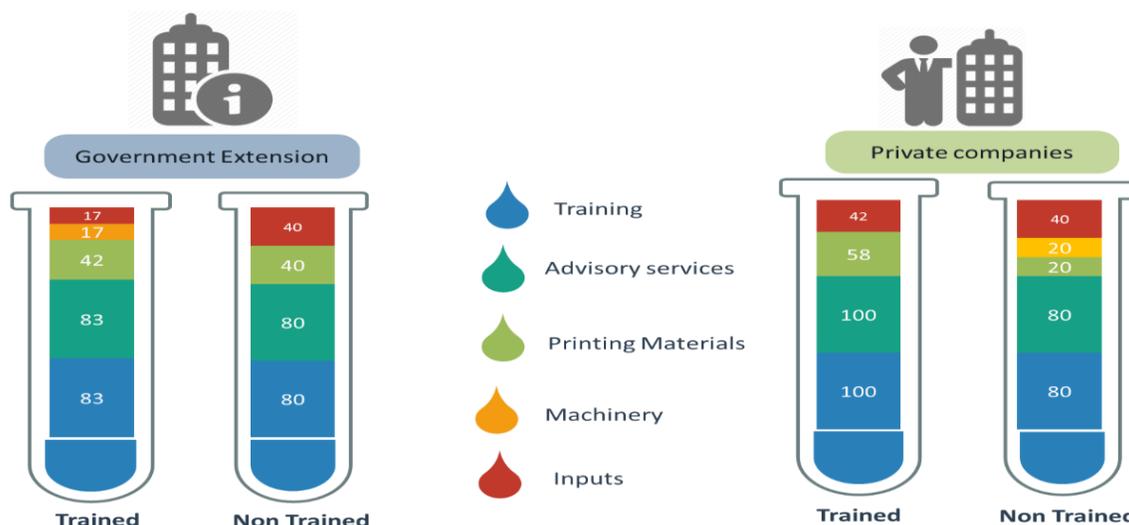


Figure 26 Services received from public bodies and private companies as a result of linkages (as % of input retailers)

The diagram above shows that both trained and non-trained retailers were receiving various types of services from government and private sources, such as machinery and equipment, inputs, printed materials (poster, leaflet, booklet, etc), advisory services, and training. It is notable to see that relatively small percentage of retailers actually received training from GoB line departments and input companies, also most of them did not receive advisory services from them which complements the need for training to some extent.

4.4. Business Growth

Market development approach understands that in order to ensure sustainability of any intervention, the relevant market actors' needs to be sufficiently motivated to continue providing the service, after project completion. Thus input retailers got associated with the project with a long term benefit in mind, in terms of business growth the profitability. Survey data shows that compared to 2 years back, there has been visible improvement in the performance of the input retailers, as evidenced by the diagram below:

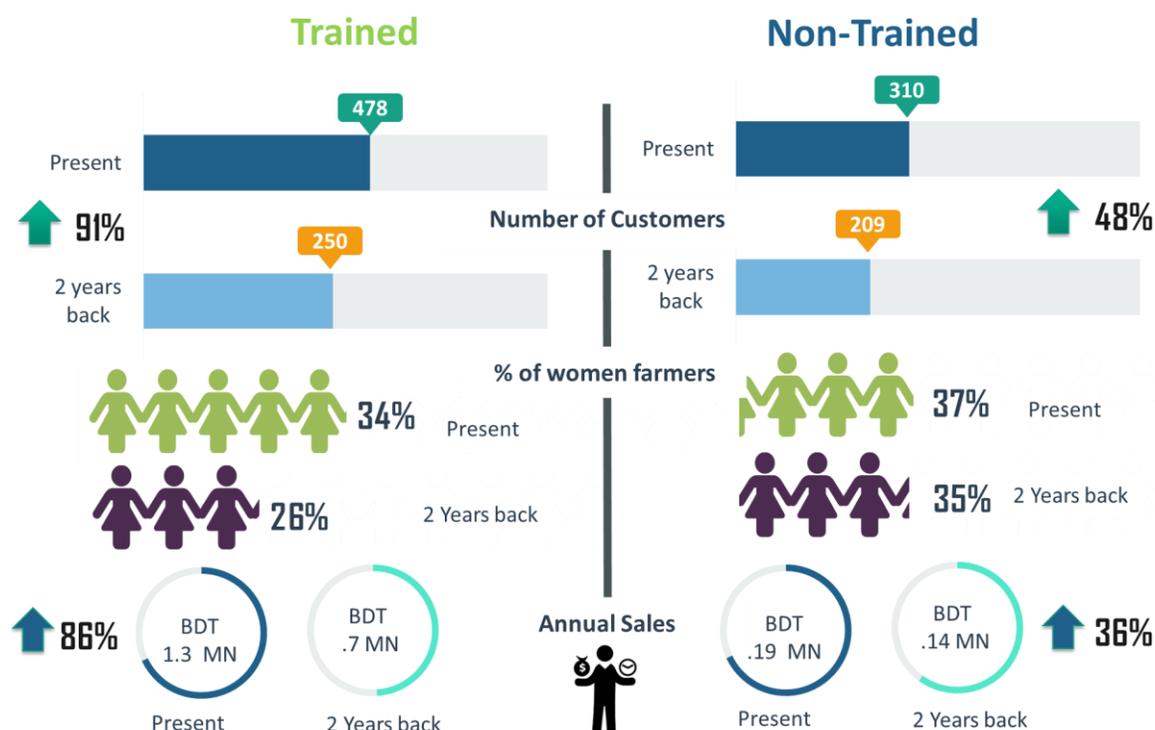


Figure 27: Business and revenue growth compared to last 2 years (as % of input retailers)

The figure above shows both trained and non-trained retailers have made good advancement in their customers growth compared to 2 years back, including acquisition of more women customers than before. In case of trained retailers, it was seen that they saw around 86% business growth in sales whereas non-trained retailers saw 36% business growth in sales.

The main reasons for improvement in their business performance was mentioned by the input retailers, which has been captured in the table below:

Table 5 Reasons behind improved business performance (as % of input retailers)

Reasons of increasing the number of customers	Trained (%)	Non-Trained (%)
Better advisory service	100%	80%
Selling quality inputs	83%	100%
Wide range of inputs	83%	80%
Providing buy back services	100%	60%
Reasonable price of inputs	67%	40%
GoB registered business	50%	20%
Business linkage meeting with farmers' groups	83%	60%
Better linkage with company	83%	40%

From the table above it is seen that a multitude of factors contributed to the better performance of input retailers but mostly better advisory services, selling of quality input, wide range of inputs, providing buy back services, better linkage with farmers contributed to their higher business performance.

4.5. Lessons learnt from involving with project and recommendations

The input retailers mentioned about various benefits and lessons learned due to their association with the project. They mentioned about improvements in their business planning capacity and introduction to service provision through ICT devices. Some of them opined that ICT based services will be the thing of the future and thus they were excited to learn about it. The association also helped them to increase their business volume and profitability due to various linkage initiatives from the project. As a result of knowledge increase at their end, they are much better equipped to serve the needs of the farmer's better which would lead to further business development. The retailers reported in the FGD that now they have increased connections with all the service providers, they can purchase on credit, they are now equipped with more technical expertise from the linkages with private services and public extension services.

The retailers also put forward some suggestions for various actors of the market system. The input retailers suggested to arrange training to increase the technical expertise. The farmers had suggested to use modern instruments. Moreover the farmer suggested to have manufacturing and expiry date clearly written on the labels of the products. All in all there was an improved performance the business in terms of profit and increased customers. Plausible reasons to explain the reason is to increased farm visits by input retailers and training of the business linkage meeting.

4.6. Conclusion

There has been visible positive changes in the market system, with greater linkage and connectivity with input retailers and farmers. The farmers also reported to have quality inputs and timely services from the input retailers. In case of technical accuracy, it was seen that trained providers were providing accurate information about deworming schedule but had lack of knowledge about the frequency of de-worming. There was also lacking in knowledge and understanding about concentrate feed and fodder requirement from both trained and non-trained retailers. Regarding vaccination schedule of FMD, Anthrax, BQ and HS, it was seen around 50% of the trained retailers had adequate knowledge, whereas around 3 in 10 non trained retailers had adequate knowledge. In case of disease management, input retailers showed decent aptitude in proper diagnosis, though there is room for improvement. However, such deficiencies can be rectified with further training and sensitization. Overall, the farmers were content with their service delivery and service quality of the input retailers. Furthermore, there was sustainable linkages created between the input retailers and private companies and government extensions service providers. Furthermore, we see that retailers and farmers are working more closely with each other than before. Moving forward, the providers need to engage with more farmers and strengthen the linkage with government and private sector bodies. They also need to fine tune their technical acumen further to better serve their customer.

PERFORMANCE ASSESSMENT OF PUBLIC EXTENSION SERVICE PROVISION

5. PUBLIC EXTENSION SERVICE (CROP)

The Department of Agricultural Extension (DAE) has been working with the mission to provide efficient and effective needs based extension services to all categories of farmer, to enable them to optimize their use of resources, in order to promote sustainable agricultural and socio-economic development. The Sub Assistant Agriculture Officer (SAAO) the field level staffs of DAE who play an integral role to fulfill the objectives under Upazilla Agricultural Officers. Some major responsibilities of agriculture extension officer include building relationships with the farmers and maintain it, to encourage and facilitate them to be self-reliant through sensitization, capacity building and linkage facilitation.

The AESA project has been working to strengthen the capacity of the Agricultural extension service providers to facilitate and ensure improved advisory service to the farmers in the project areas. The project identified the public extension agents designated for the project FPGs and arranged various skill development activities to improve the quality of extension service in the project areas. Initially, a training need assessment has been conducted to identify the soft skill and technical training needs of the field level extension agents to make the interventions more effective.

The following section will evaluate the progress of the project and identify the opportunities to strengthen the public extensive service in better way.

5.1. Service provision

The quantitative survey was carried out among 60 agriculture officers (UAO & SAAO). The survey reveals that on an average a public extension service agent serves more than 2,000 farmers among which almost 85% of them are men.

The service area of these service agents usually cover 8 square kilometers on an average. So far, close to 600 SAAOs have received knowledge and skill development Training in agricultural and cross cutting issues such as climate change adaptation, ICT in agricultural adaptation, gender and nutrition, market information, supply chain in agriculture, seed and crop production technology, soil health management and post-harvest technology.

The survey conducted with the SAAO reveals that many of them have incorporated extended and improved services in addition to their regular services within the project period. The figure given in the following page depicts that most of them (98%) are disseminating diversified services like disseminating nutrition messages to their service area. Other major diversified service include advice on adaptation of

climate change in Jute, Chilli and Mung Bean Cultivation, provided by 90% of the SAAOs. More than 80% of the surveyed SAAO have included majority of the areas as a part of their advisory services. Among all the improved services provided to the farmers, advisory service on market information is adopted by lesser number of the public extension agents (70%).

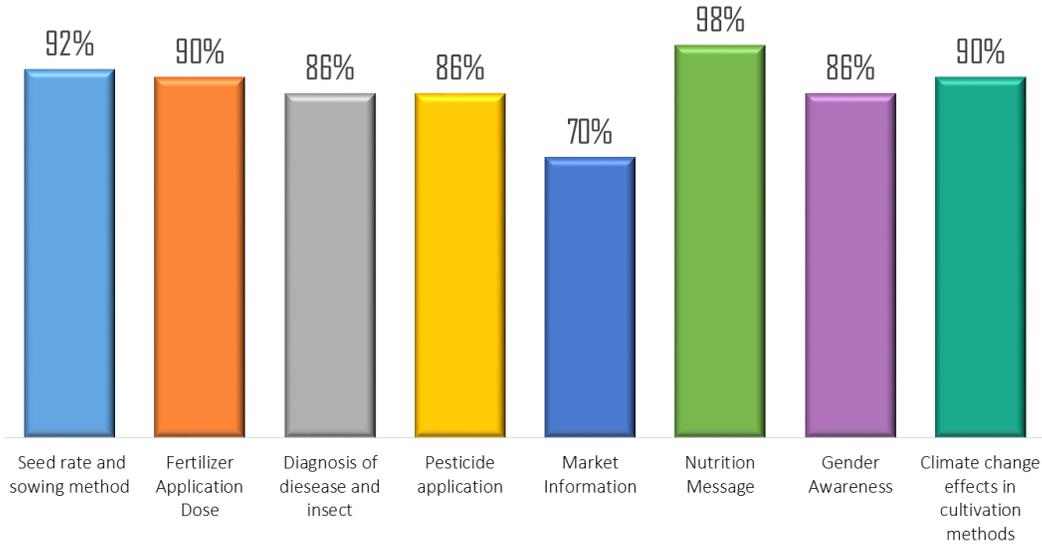


Figure 28 % of Public Extension Service Agents (Crops) added improved services in the last two years

The survey and the FGD from the farmers reveals that there is an area of improvement in the diversified services implementation by the SAAOs. Only 5% of the farmers in the project area says that they have received nutrition message services other than crop production services. Service received on market information, climate change is 62% and 49% respectively by the project farmers which is comparatively lower compared to the agriculture extension agent' data on improved services provided above. The non-project farmers' response in this area is very low, i.e. 13% and 7%. This reveals project's effectiveness in improving public extension service in the intervention area. 64% of the farmers have also received other services from them. These are, helping farmers to get agricultural loans, inspire them to use ICT apps and inspire them to cultivate vegetables in the pond area. The figure below captures the discussion made:

Services Received From SAAO

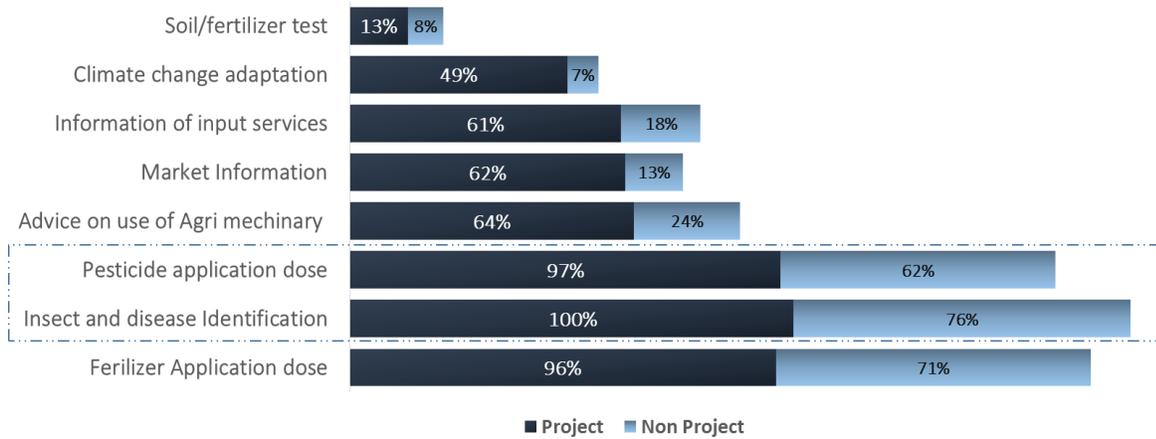


Figure 29 Services received from SAAO (as % of farmers)

According to the project farmers, 100% and 97% of the public extension agents are providing services regarding insects and disease identification and pesticide application dose. The SAAO is also providing services regarding fertilizer application dose, soil/fertilizer test, climate change adaptation, market information. In all of the aspects the project farmers received significantly more percentage of services than the non-project farmers.

The figure below delineates the means to provide service provision by public extension services, divided as per demo and non-demo upazilas.

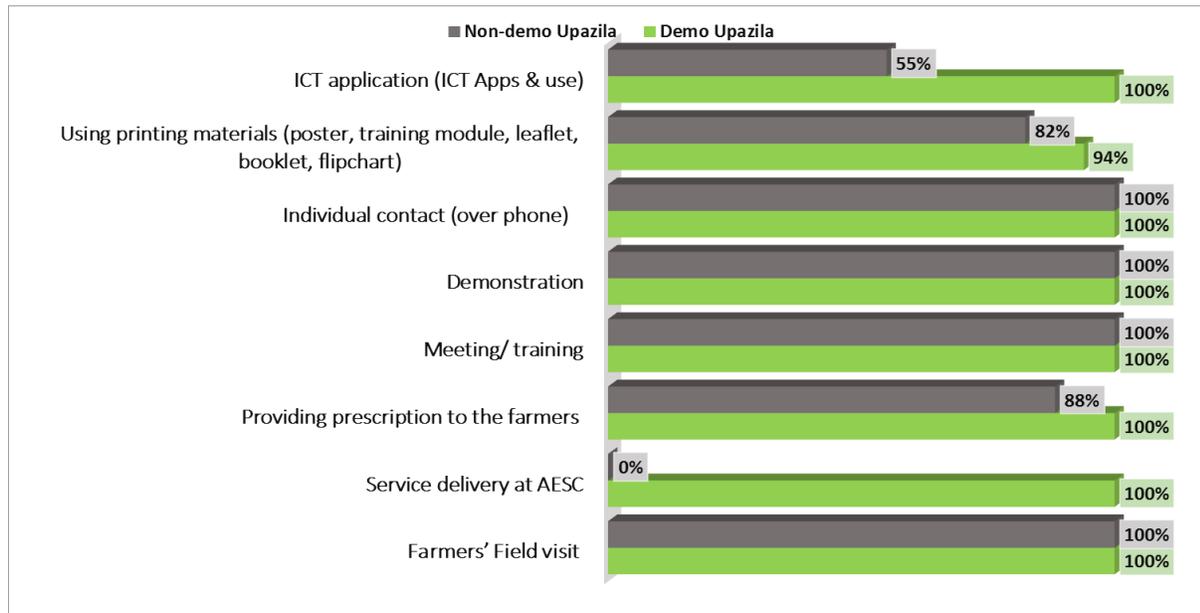


Figure 30 % of Public Extension Service Agents (Crops) using different means to provide improved services to the farmers

The project worked concentrated comparatively greater efforts in the four demo upazillas (Barisal Sadar, Faridpur Sadar, Kalia, Chougacha) than the non-demo upazillas (Goalundo, Amtoli, Charfasson, Kaliganj, Dakope), in that Agricultural Extension Service Centers (AESC) were established in the demo upazillas and field forces in the demo upazillas received additional support from the project such as motorcycles and so on. However both the demo and non-demo upazilla). SAAOs has been working to provide service as effectively as possible through the project facilitation. Along with conducting field visits they now use various means to communicate with the farmers. The major mode of communications to provide service is field visits, Individual contact through mobile phone, demonstration and linkage meeting/training. It is notable to see all demo upazila extension officers were using ICT tools to disseminate information whereas just over half of the non-demo upazila officials were well versed in using ICT tools. Notably, all the demo upazila officials rendered services through the AESC.

The famers who participated in the FGD also confirmed the fact that they identified crops diseases with a mobile based ICT application (Zanala Apps), they can call the SAAO when required and they also use ICT apps for field comparison. Some of the farmers have not availed any ICT based services as they cannot use smartphone and some of them have not felt the need to use it. The project and non- project farmers were asked about the ICT service and 86% of the project farmers said that they are receiving ICT based service which is 36% in the non-project farmers.

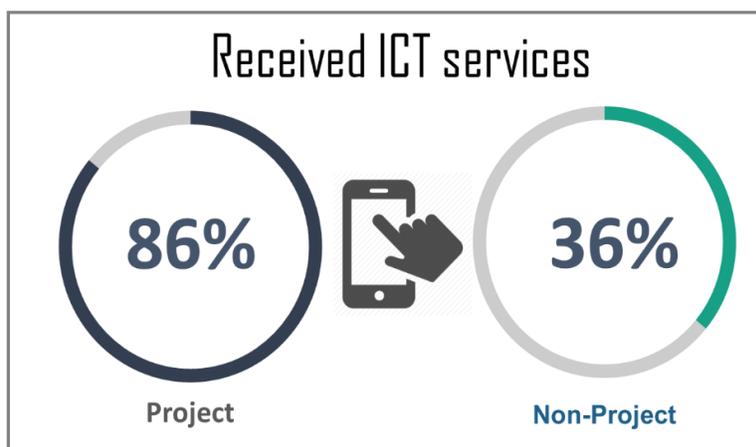


Figure 31 Percentage of project and non-project farmers who have received ICT based Services from SAAO

In order to increase service outreach for the farmers, the field extension agents inspire farmers to use modern techniques, motivate them to use ICT Apps and provide mobile services, visit fields regularly, distribute leaflets, arrange multimedia shows, visit demo plots and show them seed preservation technique. The SAAOs also facilitate and support private sector providers such as input retailers, tillage, and irrigation and spray service providers to provide quality service in many ways. **Input retailers** are facilitated with adulteration free quality fertilizer. They inspire the retailers to sell good quality and unexpired products, create linkage with dealers, retailers and Faria/small trader. They conduct anti-adulteration campaign to ensure good quality inputs for the farmers. They provide tillage service providers machines from the DAE. They provide advisory services and sensitize them on available private and public services. SAAOs give advice to **spray service providers** on right amount for spray and make them understand the importance of proper wear during spraying. They deliver leaflets, arrange group meetings on pesticide application methods and techniques. They also provide them subsidized and improved

agricultural materials. The **irrigation service providers** receive advice on irrigation techniques and management and on issues like how to build “Pacca” canal from the SAAO. The SAAO also provided them project provided agricultural materials. They create linkage between irrigation service providers and FPGs.

They also facilitate services for private companies of seed and fertilizers to ensure quality input services for the farmers. The support for the private companies by the agricultural extension agents include: Distribution of Improved BADC and climate resistant seeds, leaflets, arranging group purchase and sale, dissemination through loud speaker and video show, registration of production and sale, seed testing and treatment, monitoring and visit, facilitate business linkage between farmers and companies, update seed demands. SAAO facilitated input provision such as organic fertilizer and motivated manufacturers/distributors to produce and distribute organic fertilizers. They motivate the companies to sell product at affordable price and mandate clear product labeling.

5.2. Linkages and Communications:

The public extension agents have linkage and communications with different actors as influencer and facilitator to provide quality input services to the Mung Bean, Chili and Jute farmers.

PERCENTAGE OF PUBLIC EXTENSION SERVICE AGENTS (CROPS) HAVING LINKAGE AND COMMUNICATION WITH DIFFERENT SOURCES

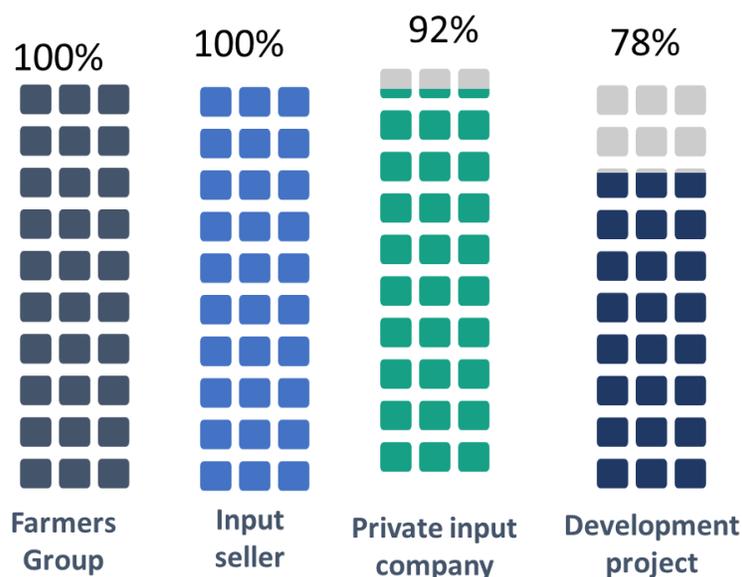


Figure 32 % of Public Extension Service Agents (Crops) having Linkage and Communication with different sources

Almost all the SAAOs have linkage with the input sellers. Majority of the SAAO have good communication and linkage with the FPG, group leaders and private service providers. 78% of the SAAO have linkage with development projects and development organization. However, their communication with SRDI (Soil Resource Development Institute) and other research organization is not as high as the other actors. The

graph above indicates that the project has contributed in strengthening linkage with them for market penetration and outreach.

Increased communication and linkages with the aforementioned actors have helped the SAAO in many ways. Private Extension Agents, Development organizations and Farmer's Group leaders have supported the public agents to improve their outreach to a great deal. The business linkage meeting, promotional campaigns have helped to maintain the synergy and achieve the public extension services' objective. 97% of the public extension agents have received updated technology and information dissemination service from capacity building sessions from the private companies. More than 90% of them have been benefitted by the farmer group leader as they helped in organizing fair, facilitate meeting due to improved communication. 93% of the public extension agents used printed materials like posters, banners, leaflets received from private companies. The detailed figures are given in the annexure.

5.3. Outreach Evaluation:

The AESA project has been effective in strengthening value chain as 98% of the surveyed SAAOs serve 38% more male farmers and 20% more female farmers from 2 years before . According to the SAAO, increased awareness level of farmers, improved physical (roads) and communication, usage of Information technology and Mobile apps has helped to improve outreach.

Survey data also revealed **that 98% of the SAAOS** mentioning that their client numbers have increased compared to last 2 years. The underlying reasons for this increase are manifold, however, some reasons surfaced such as improvement in the training facilities, demo plots, capacity building through farmer producer group, regular communication and relationship building through personal visits and increased participation of women in value chain are the major reason for increased number of farmers in taking agricultural services.

5.4. Lesson Learnt:

The extension agents have learnt a lot of new things by being associated with the project. They now know the use of ICT and Mobile Apps, how to effectively deliver services to a group of farmers, how to conduct demo plots, value chain and 5 key improvement techniques for Jute. They have also learnt about cross cutting issues like gender equality.

5.5. Suggestions and Recommendations by the Public Extension Service Agents:

The surveyed SAAO have the following suggestion for different actors in the value chain to improve further and able to provide better services to the farmers:

For Government Line Agencies (DAE):

The Department of Agricultural Extension can take the following initiative to strengthen the situation further:

- Regular Soil and Water Testing
- Arrange more trainings for the SAAO
- Promote their services in the social media

- Supply adequate amount of modern inputs in the market
- Increase field level staff for smoother delivery of services
- Increase more service in the field level
- Install more demo plots in the remote areas
- Focus on more linkage building activities with private organizations
- Arrange transport to ease commute and field visits to remote places.

For Private sector companies:

According to the surveyed public extension service agents the input manufacturing can do the following for improved services to the farmers:

- Provide modern agricultural inputs at affordable price
- To produce good quality and adulteration free products
- Arrange input wise usage training for the farmers
- Work in collaboration with DAE

For Private Service Providers:

For private service providers their suggestions are as follow:

- To supply good quality agricultural inputs at affordable prices for the farmers
- Conduct regular farm visit
- On time services to farmers
- Visit demo plots
- Conduct more training with them on own initiative

For Development Organization/Project:

The public extension agents want the project:

- To continue the existing projects efficiently
- To arrange group training on improved technology
- Start project on acid and salt resistant crops
- To arrange season wise training for farmers

For Farmers:

For the farmers the surveyed extension agents have suggested the following:

- Avail more Training on ICT usage and implement them in their daily lives
- To maintain regular contact with Government Extension Agents
- To cultivate and market crops in group
- To have proper knowledge on input usage
- Follow the cultivation method learned from training
- To actively participate in field days.

6. PUBLIC EXTENSION SERVICE – AQUACULTURE

Department of Fisheries (DoF) have been working for the development of aquaculture with a group of dedicated employees. Its mandate is to disseminate improved aquaculture technologies through advice and demonstration and to extend extension advisory services to the local stakeholders. The Upazilla Fisheries Officers work in the sub-district level along with Fisheries officers to achieve maximum outreach. AESA project organized capacity building training and activities for the field level extension service officers to facilitate and strengthen extension service capacity. This section will focus on the progress and improvement assessment of public extension service agent in aquaculture sector.

6.1. Service Provision:

On an average, a public extension agents Serve 4,600 farmers among which 73% is men. S/he covers 37 square kilometer area for service on an average. After collaborating with the AESA project and participating in project trainings the fisheries officers have improved their services and added many wings. All of them has included advice on nursery management, fingerling stocking, high yield shrimp and disease diagnosis in their service. 40% of the surveyed aquaculture public extension agents are yet to incorporate market information service in their list. The figure below depicts the range of services rendered by the field level fisheries officers.

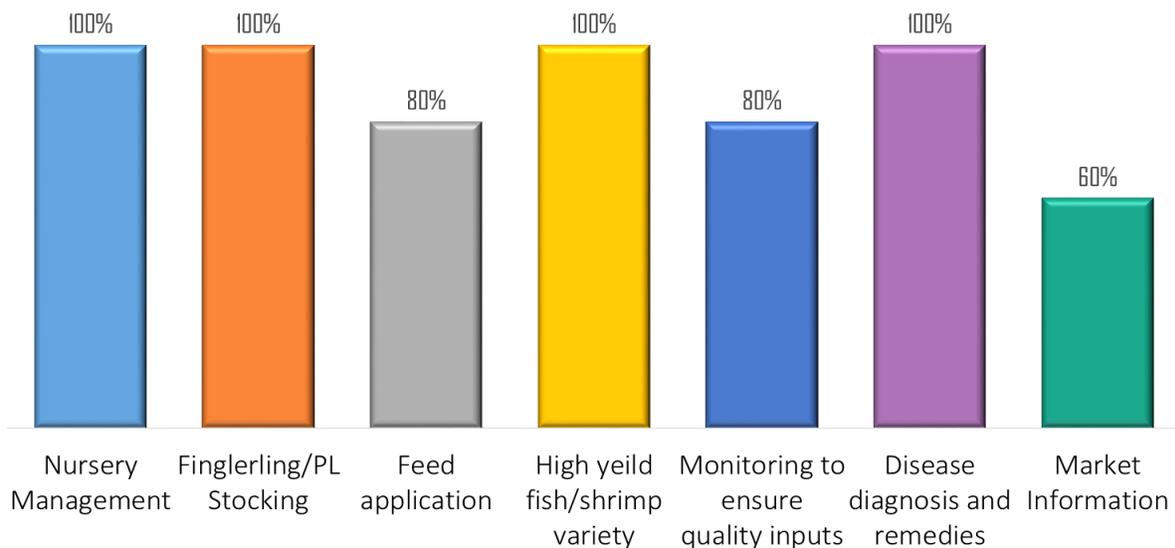


Figure 33: Type and range of Service provided to farmers (as % of extension service officials of DoF)

The survey with both the project and non-project farmers reveals that 97% of the project farmers have received fertilizer and lime application dose advice from the UFO, AFO or FA.

In all other aspects such as advice on stocking, lime application, nursery management, feeding practice etc., it was seen that greater percentage of project farmers were receiving information and advisory

services compared to non-project farmers. FGDs revealed that project farmers mentioned about improvement of the linkage between them and the extension service officials which led to them receiving greater range of services compared to non-project farmers. The table below depicts the discussion made above:

Table 6 % of Project and Non-Project Farmers who take different services from the public extension agents (as % of farmers)

PUBLIC EXTENSION AGENT	Project	Non Project
Advice on safe use of chemicals in aquaculture	61%	19%
Nursery management advice	74%	26%
Advice on fingerling/PL stocking density	90%	32%
Advice on fertilizer application dose	97%	35%
Advice on lime application dose	97%	26%
Advice on Feed application	87%	35%
Information on high yield fish/shrimp variety	65%	26%
Advice on disease diagnosis & remedies	35%	16%
Market information	39%	16%
Information on Climate Change adaptation (salt tolerant fish species, early information on flood etc.)	61%	19%
Testing service (Water & Soil)	19%	6%
Nutrition message	26%	3%

In other areas also such as climate change, market information, information of shrimp/fish yield has gap with availability and accessibility. Services are available to the officers but the farmers have availed a lot less than that. Though all the extension agents are providing the advisory service on disease diagnostic & remedies, only 35% of the project farmers have availed it from them. Non-project farmers in the non-project areas seem to have less access to the public extension agents as per the survey data. This indicates project training and linkage has strengthened the service than before.

From FGD data it was seen that some farmers could not avail the various services mentioned above provided due to some underlying reason such as unavailability of field agents. However the figure beside depicts that that 74% of the project farmers said that they are receiving services through ICT mediums, which is 36% in the case of non-project farmers.

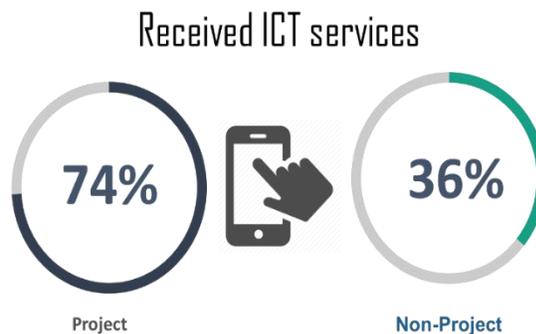


Figure 34 % of Project and Non-Project farmers received ICT based services from public extension service agents (Aquaculture)

The public extension service agents under DoF provide their services to the farmers in many ways. The service providers provide services in different ways. The graph depicted below indicates all of them

provide advisory services through demonstrations. Printing materials, farmer pond visit, training or meeting.

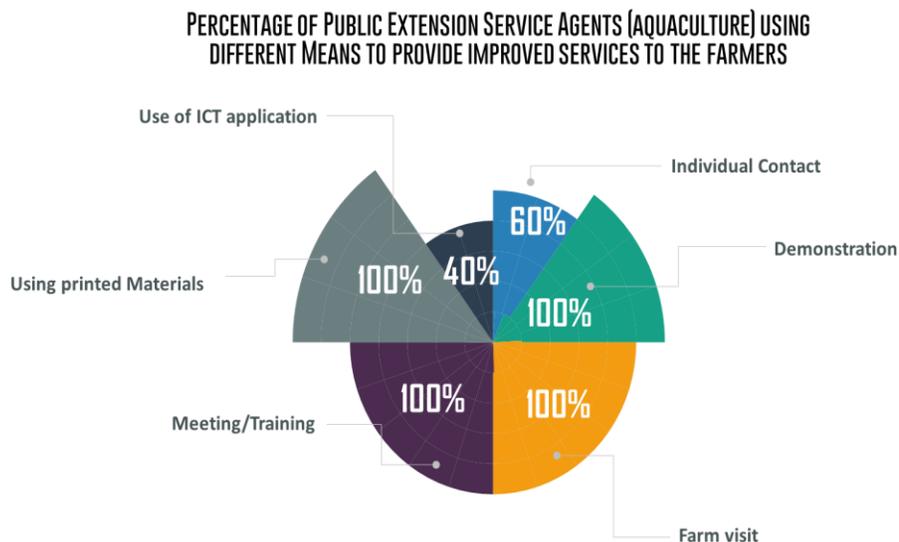


Figure 35 % of Public Extension Service Agents (Aquaculture) using different means to provide improved services to the farmers

The figure above shows all the agents are providing services through demonstration, farm visit, meeting/training and printed materials. However, there is still 60% of the public extension agents who are not using ICT mediums to render service, which is much higher compared to crop and livestock sector agents. There are also scope of improvement to enhance outreach through personal contact over phone as 40% of the service providers are not doing it at this moment as many officials are reluctant to share their phone numbers with farmers as they tend to call them several times within a day. However, the public service providers have been trying to increase outreach in the following ways:

- Increasing personal contact with the farmers
- Increasing promotional activities like video shows
- Increase quality of their service and providing advice on modern fish farming techniques
- Organizing fish day or week
- Providing trainings on aquaculture
- Creating fish farmer group

In addition to providing advisory services to the farmers the public extension service agents also facilitate different private service actors in providing quality input services to the fish farmers. The input sellers arrange quality input and training for farmers. The nurserers facilitate the virus free PL nursing and training on nursing techniques. Patilwalas delivers quality fingerling to the farmers.

They also provide support to the private input companies to facilitate and ensure quality input services to the farmers. The public extension agents test the quality of the feed. They provide the feed producers with the list of farmers. They also mandate them to provide good quality inputs and advise them to

provide limited dose of medicine to the farmers. The public service providers run promotional campaigns to apply right amount of lime and fertilizer. Thus they influence the value chain through facilitating different actors and enhance service quality for farmers.

6.2. Linkage and Communication

The public extension services agents have linkage with different actors which helped them to develop their knowledge base, improve their technical acumen and their outreach to the farmers. By participating project trainings and seminar, the UFO FO have built relationship with different market drivers. The diagram below shows the type of actors with whom the extension officials have created linkage:

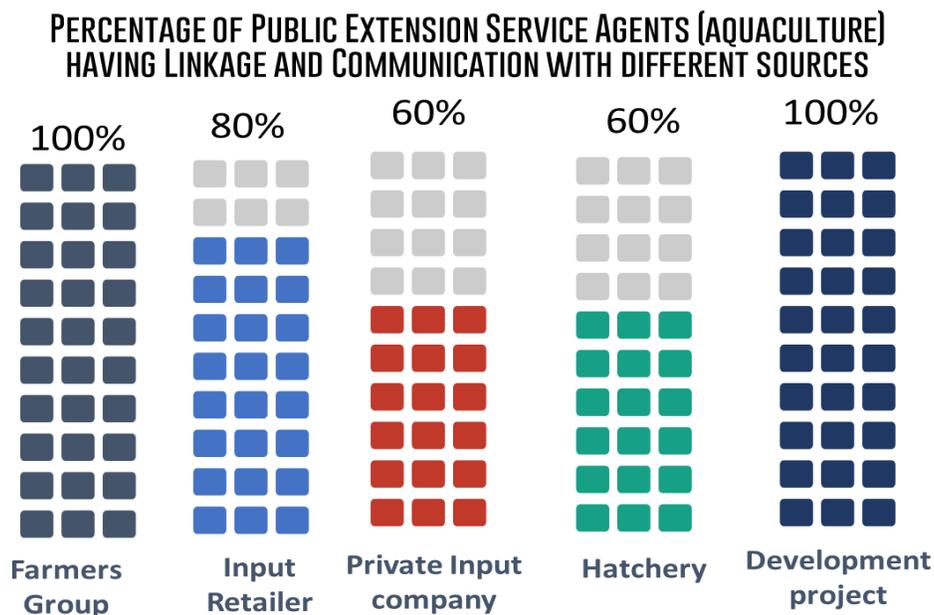


Figure 36 % of Public Extension Service Agents (Aquaculture) having Linkage and Communication with different sources

The graph above shows that all the sample surveyed has linkage with farmer’s group, group leaders and projects. Majority also have linkage with the Input Retailers. There is scope for improvement in linkage with hatchery as 40% of the public extension service agents have no linkage with them.

The public extension service providers have been benefitted from the linkage and communications with different market actors. The main objective of the public service agents is to ensure quality service and maximum outreach for the farmers in their assigned areas. The linkages have helped them to achieve their objectives in many ways.

The linkage with private companies have helped public extension service agents to provide updated information. All of them now use printing materials, 60% of them could supply quality inputs through private companies. All the public service providers arrange trainings, meetings and national fish week with the farmer leader linkage. Majority of them (80%) have benefitted in organizing demonstration. The linkage with the farmers’ leaders have helped them to increasing outreach. Their linkage with private

service providers have also helped in improvement of service for the farmers. All of them can organize meeting, demonstration and farmers' field day and provide timely advisory services to the farmers. 80% of them use the linkage in disseminating improved technology information. The detailed information and figures are given in the annex.

According to all the surveyed UFO FO the project has helped them to develop their skills and built their capacity in providing improved advisory services. The project also helped them in increasing outreach.

Increased Outreach

According to the survey with the UFO and FA the number of farmers receiving their services has increased in the last 2 years. Now, they serve 32% more male farmers and 17% more female farmers. They think that the farmers' service coverage has increased due to field level trainings, awareness building through modern promotional campaigns and for organizing field day. They also think that union wise listing of the farmers has also helped in increased outreach.

6.3. Lesson Learnt & Recommendations from extension service actors

The AESA project has helped them to improve their service quality and enhance outreach through capacity building. They got to learn new things from the project. They are as follows:

- They have learnt how to provide **ICT applications** for better service delivery
- They have learnt to provide services in to a **group of farmers**, as compared to individual farmers. This actually saves their time a lot.
- They have learnt these from the training provided by the project and from participating in **Fish week**.

6.4. Suggestion by Public Extension Service Agents (Aquaculture)

The surveyed fisheries officers have suggested some activities or intervention for all the major actors in strengthening advisory services for the farmers. The suggestions by them are provided below:

For Government line agencies (DoF):

- Arrange Soil and Water testing to benefit the farmers
- Organize trainings on regular basis
- Disseminate information through promotional campaign on Media outlets like TV, Radio
- Supply adequate modern inputs
- Continue supporting various developmental projects
- Increase resources in the field level

For Input Manufacturing Companies:

- They should not supply harmful chemicals for fish cultivation to the farmers
- They should supply good quality inputs at a fair price

For Private Service Providers: they suggested the private service providers to supply good quality PL/Fingerling that are virus free.

For Development Organizations:

- The AESA project should be continued
- They can form more farmer groups and increase their scope of work.

For the Farmers:

- They should use new and modern technique for cultivation
- They should regularly communicate with the Fisheries Officers
- They should follow the techniques accordingly that they have learnt from the trainings

6.5. Recommendations by the farmers for the public extension service agents in fisheries:

94% of the surveyed farmers in the project area thinks that the public extension service agents for fisheries have become more enthusiastic in rendering services to them compared to before. 84% of the farmers think that they now received more effective advisory services (refer to annex). They have received less diversified services compare to regular shrimp/ fish related services. The farmers have the following recommendations for the betterment of the service quality:

- To recruit more field based officers for improved coverage
- To make them better versed on technical issues through training, so that they can properly provide services to the farmers.
- To provide them with more printed materials and arrange more demos
- Increase government monitoring and control over input providers, so that they get good quality input and animals
- Maintain a fixed date for providing service.
- Allocate loan for farmers with low interest rate.
- They can provide at least 1 set of soil and water test instrument to their farmer's leader so that they can test their water and soil on regular basis.
- The officers should visit the Shrimp ponds in their respective areas.

7. PUBLIC EXTENSION SERVICE (LIVESTOCK)

Department of Livestock Services (DLS) has employed sub-district wise field level staffs (VFA,ULA, FA-AI) for the improvement of cattle wealth, prevention and control of animal disease, dairies management of cattle farms, artificial insemination, merchandise livestock inputs through advisory services and field level interventions. The AESA projects conducted training for the field level public extension agents (VFA, FA-AI) for their capacity building and information sensitization through cross communication on animal act, vaccination and diseases management and how they can seek each other's support to synergize and strengthen their present value chain in providing improved input services to the livestock farmers. The project also involved Upazila Livestock public service agents in capacity building training of private extension agents which was arranged in collaboration with private companies to strengthen coordination with Govt. line departments and also to aware them on how they should act. The extension agents provide service to both Dairy and Bull Fattening Farmers.

This section of the report will depicts graphs and analysis the progress of public extension service agents for livestock after the AESA project intervention in terms of providing services to their designated farmers.

7.1. Service Provision

The scenario of the livestock farmers in terms of gender is quite the opposite from the other types of farmers. The public extension agents of livestock serve 8,000 farmers on an average among which 62% are female farmers. Male farmers are less involved in livestock farming as livestock is reared within the Household and women are heavily involved.

They provide diversified services to the farmers which are depicted in the figure below:

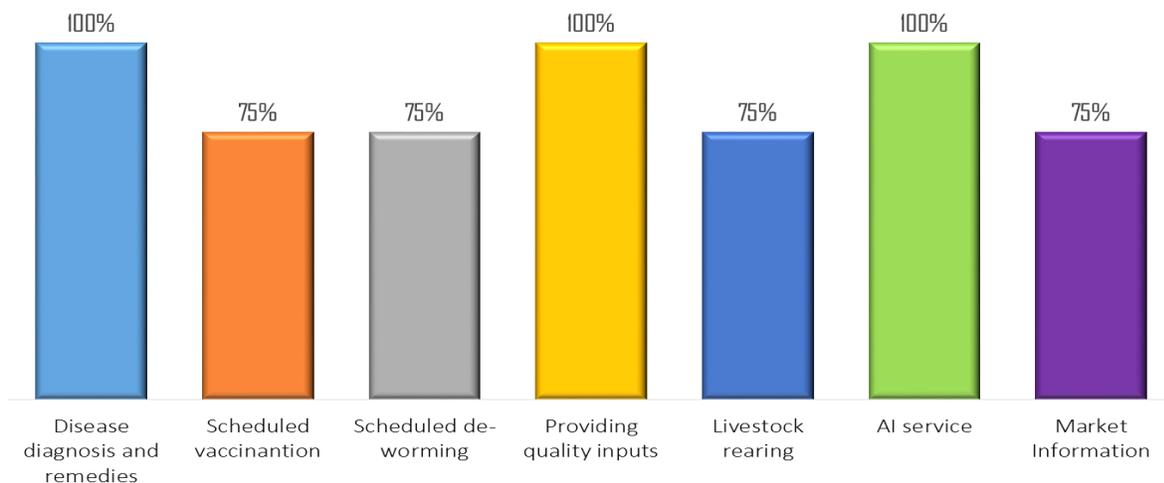


Figure 37 Percentage of Public Extension Service Agents (livestock-VFA, ULA,FA-AI) providing improved services

It shows that 75% of the extension agents have added scheduled vaccination and de-worming services under their service provision. All the livestock extension agents provide AI service, advice on usage of quality inputs and disease diagnosis and remedies for the farmers.

To verify the data provided by the livestock agents, livestock farmers were also asked what type of service they have received from government livestock extension agents in the last 2 years. The table below depicts the results:

Table 7 % of Livestock Farmers taking services from the public service agents (as % of farmers)

Usually received services from Govt. Livestock agents /Veterinary Surgeon/ Field Assistant	Project	Non-Project
Vaccination & vaccination schedule	91%	51%
De-worming support	91%	65%
Disease diagnosis & treatment	74%	35%
Advice on feeding method	74%	47%
Artificial Insemination services	74%	51%
Fodder seed/cutting and advice on cultivation method	47%	12%
Advice on livestock rearing	65%	35%
Information on quality input sources	40%	5%
Getting market information	35%	5%
Advice on climate change adaptation (e.g. using fan & bedding in cattle shed, wearing clothes, saline tolerant fodder cultivation, de-worming, cattle breed, etc.)	19%	-
Testing services	7%	5%
Nutrition messaging	42%	9%

The above table shows the services that farmers usually avail from the public extension agents and it is seen that they do not avail diversified services as much such as advice on climate change adaptation and disease testing support. Most of them take regular livestock related services from them. The percentage of farmers availing services in the project areas is higher compared to the non-project farmers. It indicates project's contribution in building service capacity of the public extension agents.

In addition to that 77% of the farmers have received ICT based services from the extension agents. Whereas 40% of the non-project farmers have received ICT based services from the public extension agents that indicate project contribution in building awareness among farmers about ICT based services.

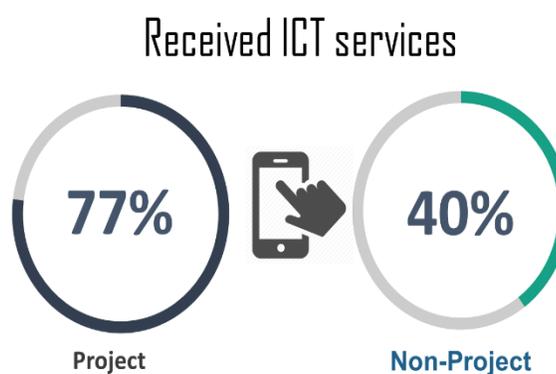


Figure 38 % of Project and Non-Project famers received service from Public Extension Service Agent (Livestock)

Some of the underlying reason on the service demand supply gap have been identified from the FGD conducted among the livestock farmers:

- In Jessore none of the farmers have availed ICT based services as it is not available there yet
- The officers are not always available during office hours
- the charge for treatment of animals is high in some instances
- As there are scarce field staff, their field visits are not adequate to meet the demand
- They are not available during holidays
- One VFA is designated to 3 unions. So, it is not possible for him/her to pay regular field visits.

The service quality can be enhanced on a greater level in the aforementioned factors is addressed by the appropriate authorities.

The public extension agents use various ways to provide their services. They are as follows:

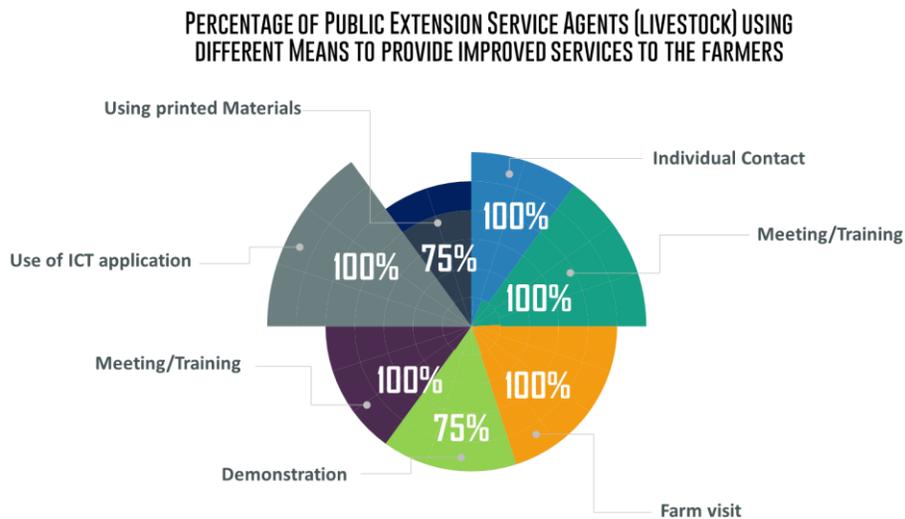


Figure 39 % of Public Extension Agent (livestock) using different ways of providing services

The figure above indicates that all the extension agents provide their services through ICT application, linkage meeting and campaigns. Many of them also provide services by maintaining personal contact (through phone and face to face) and using printed materials. Demonstration is another way of providing service to the farmers.

The public extension agents put continuous efforts to increase outreach for the betterment of the farmers. They perform various activities such as organizing seminars, video shows, distribution of leaflets and posters. They arrange trainings for the farmers and manage the field schools of the farmers.

They also facilitate and provide support services to the **private extension service providers** of the livestock in various way. The public service agents facilitate supply of good quality medicine and feed to the input retailers. They provide information and advisory services to improve their service delivery to the farmers. Public service extension agents provide service through mobile phone for the LSPs, they strengthen the LSP visit and provide cattle health card for farmers. They also arrange good quality medicine for them and inspire them to provide service in a group. They also supply high quality bull semen to the AI workers, advice on semen transportation and preservation.

The public extension agents also facilitate support for the private companies to ensure improved service for the livestock farmers. They facilitate them through regular visit to the farmers and inform them about the feeds. They disseminate information on the features and qualities of the feed to the farmers and advise them on usage. They advise the feed companies on using Information technology and arrange seminars and meetings. They advise the medicine and vaccine providers for to produce and distribute good quality medicine and vaccines. They monitor and restrict distribution of adulterated medicines in the market. They advise on verification of the quality of the medicines. Furthermore, they provide prescription to the farmers which can be availed from the medicine providers. They sensitize private sector companies or AI firms on how to preserve semen in the nitrogen gas in correct method along with information to improve product quality. They inspect the quality of the semen and advise the farmers to buy good and improved quality semen from the companies.

The support activities and advisory services to different market actors provided by the public extension agents have helped the farmers in increasing their productivity to a great extent. The training and seminars conducted by AESA project has helped them to build linkage with the private companies and service providers and helped smoother the facilitation process.

7.2. Linkage and Communication:

PERCENTAGE OF PUBLIC EXTENSION SERVICE AGENTS (LIVESTOCK) HAVING LINKAGE AND COMMUNICATION WITH DIFFERENT SOURCES

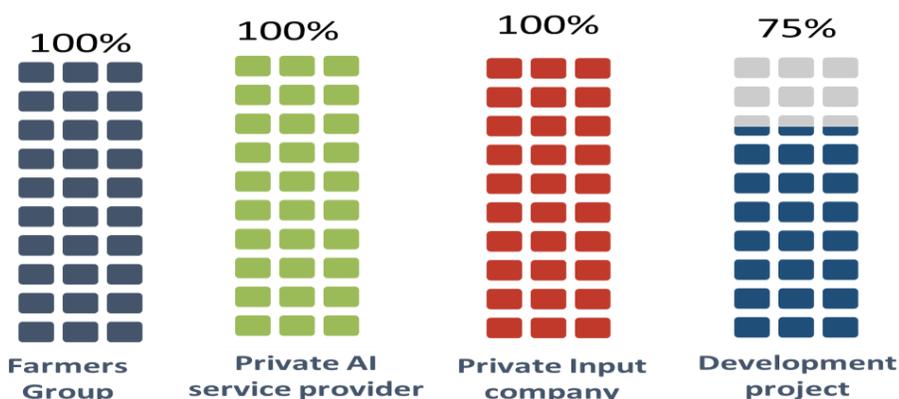


Figure 40 % of Public Extension Agents (Livestock) having linkage and communication with different source

The figure depicts that all of the public extension agent has linkage with input companies, farmer group, and private AI service provider. 75% of the public extension agents had linkage and communication with the development project activities. They have good linkage and communication with various market actors to influence them in improving service quality for the farmers.

The linkage and communications with different market actors have benefitted the public service agents in different ways. 89% of the public service agents have received updated information technology from the private companies. 67% has used their printing materials. The percentage of public extension agents to increase supply of quality inputs to the private companies is a little less which can be improved with further linkage. 89% of the public extension agents in the survey have availed increased outreach from the project and Farmers' group leaders' linkage. There can be a scope for improvement in the private service providers' linkage where only 56% of the public agents utilize disease diagnosis services. The detailed figures are given in the annexure.

7.3. Outreach Evaluation

In the last two years the service coverage for livestock farmers has increased to a great extent. The public agents now serve 48% more male farmers and 52% more female farmer than before according to the survey. This data also indicates increased awareness and accessibility of farmers in availing services from the public service agents. It also shows a positive trend on cross cutting issue like gender equality in farming. According to the survey information the reasons for **increased outreach** are the following:

- Cow fattening training in groups has covered more farmers
- Increased personal relationship with the farmers also contribute to the outreach
- they have got more exposure through the USAID funded AESA project
- The group seminars also helped in this regard
- The loan facility for self-employment has also increased outreach
- Usage of information technology
- Participate in field days

7.4. Lessons Learnt & Recommendations:

The public extension agents have learnt various things for capacity building with the help of the project. They are informed about different topics, developed skills in livestock rearing. They have received training on ICT, gender and nutrition. They have also build capacity in supporting a group of farmers at the same time. The project has helped them in changing point of views regarding services and work as a team.

7.5. Suggestions by the Public Extension Agents

The public extension agents from the survey have provide some actor wise suggestions to improve the present situation and further strengthen the value chain for Dairy and Meat.

For Government Line Agencies (DLS):

- Increase the human resource
- Provide training to change mentality of the extension workers on improved quality service
- Arrange training on different topics
- Increase farm visit
- Arrange vaccination campaign
- Perform different days Like Field Day
- Improve relationship between government agencies and projects
- Prepare and distribute quality inputs

For Input Companies:

- To manufacture good quality cattle feed
- Deliver products on time to the dealers
- Market good quality products
- Distribute inputs through A-Card
- Print manufacturing and expiry date clearly on the product label

For Private Service Providers:

- To provide on time service at affordable price
- More skill development training for the LSP and AI workers

For Development Organization:

- To increase project duration
- To ensure cattle feed selling at fair price
- Increase the existing project area coverage to reach more farmers
- Sensitize the public extension agents on the effectiveness and objective of the project
- Increase fund for the project
- Ensure proper planning and implementation of the project
-

For the Farmers:

- The farmers should be inspired more on purchasing good quality feed
- They should be motivated to use ICT
- They should communicate more
- There should be more trainings for them

7.6. Recommendations from the farmers:

From the livestock farmers' survey, it has seen that the public extension agents are more enthusiastic in rendering service to them. 88% of the project farmers has agreed to that which is 44% higher than the non-project farmers (Refer to Annex). Some of the farmers are receiving diversified services like climate

change (19%) and nutrition message (42%). The farmer's perception towards public extension agents have changed positively within the last two years. The farmers in the project areas have provided some recommendation for the Government line agencies to perform even better in providing advisory services to the livestock farmer. They are as follow:

- They can increase their human resources to provide better service
- Make service available 7 days a week
- Arrange good quality semen
- Arrange government leaflets and posters
- Recruit 2 workers per union and disseminate their monthly visit schedule
- Decrease vaccination price
- They can provide medicine received from DLS for free
- They can provide vaccination from Government in the villages.
- There should be 1 VFA and 1 LSP per union

7.7. Conclusion

The AESA project has contributed in the improved service quality of the public extension services in crop, fish and livestock sectors. Their capacity building training has sensitized the public agents on various new topics and farming practices. The refresher training and ICT based training has made their services more efficient. Information on cross cutting issues have helped them in diversifying their services. Farmers are availing more ICT based services from them. There are some farmers who are reluctant to use ICT but the number of farmers who are availing ICT based services and adopting modern farming practices from the public agents are increasing gradually. If the project carries out more similar interventions with bigger area coverage then the value chain will be stronger by covering maximum outreach. The public extension agents are the influencer of the market and a strong support system for the farmers to have improved input services. The AESA project has strengthened the overall value chain by facilitating collaboration between private and public extension service agents as well linkage of the latter with farmers and private companies.

8. RECOMMENDATIONS

8.1. Private Extension Service Provision

Some of the major recommendations put forward by farmers and government extension service officials for private extension providers have been appended below:

- Encourage providers to work more closely with non-project farmers;
- Improve accuracy of service to non-project farmers;
- Arrange more meeting with farmers on own initiative and if possible, form farmer groups of their own to whom they will impart training and knowledge and in return will ensure guaranteed sale.
- Arrange more Demonstrations with farmers;
- Encourage providers to provide more services through ICT mediums;
- Encourage farmers more to adopt ICT technologies and improve the trust of farmers on use of ICT technologies;
- Providers need to be more proactive to forge linkages with govt. extension.
- Extend credit service provision on easy terms for poor and marginal farmers

8.2. Public Extension Service Provision

Some of the major recommendations put forward by farmers and private extension service officials for government extension service providers have been appended below:

- Increase number of Agricultural Extension Service Centers for increased accessibility;
- Focus more time and training initiatives for poor and marginal farmers.
- Conduct regular refresher training to improve ICT knowledge and skills;
- Advanced training on better use of multimedia to disseminate information to farmers;
- Presentation skill development to address large group or crowd of farmers;
- Agents should focus more on group based dissemination to save time and avoid duplication of effort;
- Visit areas as per pre-planned schedule to ensure greater coverage and efficiency of service;
- Work more closely with private extension service providers regarding disease identification and management;
- Increase market monitoring to tackle malpractice such as pushing and soaking (for shrimp and prawn) and spread of low quality inputs;
- Ensure market price stability for the final products.