

Research Report

on

Mango Farmers' Perception on GlobalGAP and Influencing Factors of Participation

(Case of Mango Farmers of Rajshahi Division, Bangladesh)

Submitted by:

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Dedication

*My parents; whose love, affection and sweat brought me into this life, and
All the farmers around the world who are continuously sweating to feed us all*

Acknowledgement

Through out the whole course modules of MOD my teachers have helped me to learn the needed tools and techniques to conduct this applied qualitative research with professional and ethical outlook. My mentor has helped me to accommodate the challenges and pressures I had been through particularly under the COVID situation. They are the first in my mind to express my gratitude besides my supervisor whose patience and supports moved my works at its quality and uniqueness.

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Under this COVID situation my research team members in Bangladesh has done an almost impossible task of collecting the required data and information from the study areas which are quite far away from their residence and they have taken risks too travelling, interacting at this time of pandemic and taking the pressure of limited time too. I'm invariably grateful to them.

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List of Abbreviation:

BAPA: Bangladesh Agro Processor' Association
 BARC: Bangladesh Agricultural Research Council
 BFFVEA Bangladesh Fresh Fruits and Vegetables Exporters Association
 BSFA Bangladesh safe Food Authority
 BSTI: Bangladesh Standard and Testing Institute
 CR: Conditional Requirement
 DAE: Department of Agricultural Extension
 DAM: Department of Agricultural Marketing
 EPB: Export Promotion Bureau
 FAO: Food and Agricultural Organization
 FGD: Focus Group discussion
 FPMU: Food Policy Monitoring Unit
 GAP: Good Agricultural Practice
 HVM: High Value Market
 HVML: High Value Market Linkage
 KII: Key Informant Interview
 MoA: Ministry of Agriculture
 MoC: Ministry of Commerce
 SHF: Small Holder Farmer
 SSI: Semi Structured Interview
 WIPO: World Intellectual Property Organisation

Abstract

This applied qualitative research was carried out in the prominent mango growing and exporting Rajshahi division in Bangladesh to find out the perception of mango farmers about GlobalGAP and the influencing factors for their participation in the trajectory which is becoming one of the main conditional requirements for high value export markets like EU, US, and UK. Case study approach was utilized and methods like semi structured interviews focus group discussions of mango farmers and key informant interviews of different stakeholders besides desk study was conducted to answer the three research questions. The field works were carried out in the month of July to August in 2020. It is found that there is very low awareness and knowledge among the mango farmers but they have positive perception about GlobalGAP in both of the case areas with comparatively a better picture in Shibganj as many interventions were tried there. Mango farmers expect better price, image and market access for their participation in the GlobalGAP trajectory and even without being fully aware or knowledgeable about many farmers of both of the areas are already implementing some of the requirements of GlobalGAP partially. But mostly untouched areas are water quality and MRL testing. Past and existing collaboration and support are important factors for participation in GlobalGAP trajectory among all the respondents. Lastly some generic and specific recommendations were given for the problem owner DAM and other stakeholders too with indication of future research needs and scope.

**Mango Farmers' Perception on GlobalGAP and Influencing Factors of Participation
(A case study on Mango Farmers of Rajshahi, Bangladesh)**

CHAPTER ONE

1.0 Introduction

The research context alongwith background, problem description, primary problem owner, justification of research is presented here besides objective and research questions.

1.1 Background

Maintaining quality and safety measures like GlobalGAP of agricultural products particularly horticultural products like fresh fruits and vegetables for both the international and local markets is becoming important as Conditional Requirements (CR) day by day as also found by (Dorr, et. al., 2009). Among fruits, mango as a popular commercial product in terms of say acreage has important position in Bangladesh and contributes better for the farmers than cash crops like cereals in terms of market participation as naturally favourable condition exists in Bangladesh.(BSS, 2019); production has grown steadily overtime but export potential is yet to be achieved and one of the reasons identified in low export market participation is non compliance with quality and safety measures like the GlobalGAP.(Mirdha (2016). There have been number of efforts from different stakeholders in the country to develop particularly mango farmers' capacity to participate in the implementation of GlobalGAP (Solidaridad 2017, CDAIS, 2017) but not much effect can be seen or found to be documented.

The research has been conducted to explore why mango farmers of Bangladesh have not been able to take up implementation of the GlobalGAP as expected to meet the conditional requirement of high value market participation that can provide them better income.

1.2 Problem Description:

After banana, mango is the second highest fruit produced in Bangladesh.BBS (2017). Reported by a popular news paper recently, a popular Bangladeshi mango was awarded early this year the GI (Geographical Indication) tag from the World Intellectual Property Organisation (WIPO). The mango is Khirshapat, popularly known as Himsagar. The country can now utilise the opportunities opened to it for exporting this and other mangoes to interested countries. Bangladesh grows around a dozen types of this summer fruit in the country's south-western and northern districts. Daily Industry (May 10, 2020) reported that Mango production was 2.372216 million metric tonnes in FY 2017-18; it was 2.2million metric tonnes in FY 2018-19. This season the production will increase to 23-24 lakh metric tonnes.(The Financial Express, June 5, 2020).

Mango production in Bangladesh has been going through steady growth over the decades and though it is grown all over the country Rajshahi, Chittagong Hilltracts, Khulna region produce the most (BBS 2008, BBS 2017) and after meeting local demand mango is being exported to many countries in EU, Middle East, US, Russia, etc. particularly from the Rajshahi region and mango export is seen as providing better return for the mango farmers (CDAIS, 2017; BSS, 2019).

Present Government of Bangladesh has also attached high importance for the production and export of high value agro-commodities especially horticultural crops through diversification of produces and market promotion as declared in the HORTEx foundation's website and also reflected in the National Agricultural Policy (NAP) 2018. But need for quality and safety measures like GlobalGAP are getting important for not only export markets but also for the local markets as reflected when the Bangladesh Food Safety Authority was established in 2013 and the Food Safety Act was passed in 2015 (bsfa.gov.bd).

On the other hand, the rules of the international markets, like, EU, US, Japan require identification of the actors throughout the value chain so that reasons for any faults identified can be sorted immediately (UNCTAD, 2007). Not only that, the local niche market also favours assured safety and quality of Fresh Mango and they are ready to pay for a premium as revealed in the conversation between the representative of GlobalGAP and managing director of Swapno as mentioned in an interview on the occasion of opening of 60th retail outlet of Swapno in Gulshan, Dhaka that conforms to the GlobalGAP (Swapno and GlobalGAP, 2017).

The export of fresh mango cannot be said to be attaining the potential matching the factor endowments of Bangladeshi fresh mango. Being eight in the mango producing countries in the world, Bangladesh has no significant position in the global export market (Altendorf, 2017), yet which could have added more value not only to the farmers but also to the economy in general. It has been mentioned in many occasions by many of the stakeholders that Participation in Implementation or adaptation of GlobalGAP is important to increase export and mostly to enter the international mainstream markets (Hossain, 2007).

Irrespective of different supports and collaborations at mango farmers' end to increase mango export (Solidaridad, 2017 and CDAIS, 2017) export fluctuates due to unsatisfactory conformance (The Daily Star, 2016). As of June 2017, 30 metric tonnes of mangoes have been shipped to EU countries like Italy, Sweden, Germany and France. An additional 100 metric tonnes of mangoes were supplied to the national retail chains and round the year it was expected to supply around 200 metric tonnes of mango, Solidaridad (2017). The amount of exportable quality mango was expected to be around 100 tonnes of which, at least 50 tonnes were likely to be exported with arrangement of the Department of Agriculture Extension.(The Daily Bangladesh, 2019)

Thus, it was a high time to explore why the Quality and Safety measures like the GlobalGAP has not been picked up yet by the mango farmers of Bangladesh? To look into the pattern of participation of the mango farmers in implementing GlobalGAP and the challenges faced by them particularly in the Rajshahi division as already more than 5 years have passed when the initial efforts were taken by SNV and CDAIS. Also 3 years have passed when supershops like Swapno/ACI Logistics have started their efforts to accommodate LocalGAP in their operations and obviously a majority of their sourced fresh mango will be from that region.

1.3 Problem Statement

DAM as the primary problem owner has informational and knowledge gap on why the mango farmers of Bangladesh have not entered the trajectory of GlobalGAP.

1.4 Objective of the Research

The aim of the research was to explore why the mango farmers of Bangladesh have not entered the GlobalGAP trajectory through focusing on the influencing factors for participation of the mango farmers of Bangladesh in GlobalGAP to fill up the information and knowledge gap of the primary problem owner, the Department of Agricultural Marketing (DAM) so that DAM can take supportive interventions as well as can give policy directions to the relevant government authorities to ensure better and new market participation of mango farmers.

Besides, the research has also focused on the existing collaboration regarding implementation of globalGAP at farmers' end to know the challenges being faced to give policy directions as well as intervention recommendations to Department of Agricultural Marketing (DAM), the primary problem owner.

1.5 Main and Sub Research Questions

MRQ: What are the factors influencing participation of mango farmers of Bangladesh in GlobalGAP Trajectory?

SRQ 1: what is the perception of the mango farmers of Bangladesh about Benefit of GlobalGAP?

SRQ 2: What is the situation of mango farmers of Bangladesh in terms of the livelihood assets level factors as required for implementing GlobalGAP?

SRQ 3: What are the past and existing collaborations influencing participation of the mango farmers of Bangladesh to implement GlobalGAP?

1.6 Context of COVID 19:

We know by now, that the world market has already slowed down and the prices in the major commodity markets are getting low. At local level, farmers are also facing trouble selling their products as there are less numbers of buyers in the markets for the COVID situation. COVID 19 situation inevitably has been influencing both the local and international markets of Mango. It has also influenced the practices of GlobalGAP at the mango farmers' end and this study in general. COVID 19 situation has been taken under consideration in designing the methodology of this study.

1.7 Justification of the research

GlobalGAP requirements are same for the fresh fruits and vegetables thus this study can help develop required policies and project or program level interventions to implement GlobalGAP for other fruits and vegetables too. It can ultimately help new market development for Bangladeshi fresh fruits and vegetables aiming mainstream markets of developed regions and countries like the EU, US, UK, etc., which in turn suppose to contribute in farmers' income and also increased value addition from the agricultural sector as well will minimise trade gaps. In short, export or high value markets linkage(HVML) of agricultural products have potential of multiplier effect that supposed to better the livelihood status of the farmers besides adding value to the overall economy.

This research was also one of the first of its kind in respect of Bangladesh that has explored mango farmers' perception about benefits of GlobalGAP indicating desire to change and also identifying the

influencing factors and supportive or conducive environment relevant for the mango farmers' participation in GlobalGAP. Other relevant government organizations like the HORTEX Foundation, ministry of commerce, EPB who are also working for expanding and diversifying export market for Bangladeshi products supposed to be benefited from the findings to adjust their own policy and program development. International and local NGOs working for poverty alleviation or rural development through market development or value chain approach will also find it relevant and useful to understand the challenging areas the mango farmers confronts with to participate successfully in the GlobalGAP trajectory. Individual large farmers and private companies can be benefitted from firsthand knowledge gained from identified factors of participation and perception of the mango farmers besides, knowing the past and existing collaborations about GlobalGAP in Bangladeshi context. The research communities can identify new areas to conduct future researches.

2.0 Setting the Scene

2.1 Theoretical Basis

The study explored why the mango farmers of Bangladesh could not enter the GlobalGAP trajectory and obviously it tried to explore the reasons or factors that influenced their decision to participate or not thus also of their behavioural change. Thus main theoretical basis of this research was decision theories focused on the influencing factors of behavioural change.

Decision-making process is indeed a cognitive process that covers choosing the appropriate behaviour with a purpose of satisfying a need as soon as it arises and to eliminate accompanying tension (Kuzgun, 1992). But that is more instantaneous and decision-making is also the ability to show behaviours that appeal to the individual's mood and logic and that also ensure individual's social acceptance and attainment of respectable results (Karaçay, 2015) as cited by Kaskaya, Calp, kuru, (2017).

Several factors influence decision making as showed in Juliusson, Karlsson, & Gärling, 2005; and say for past experience, (Stanovich & West, 2008) cognitive biases, age and individual differences (Bruin, Parker, & Fischhoff, 2007), belief in personal relevance (Acevedo, & Krueger, 2004), and an escalation of commitment, influence what choices people make. Individual level factors also influence decision making as found by Dietrich, C. 2010. that age, socioeconomic status (SES), and cognitive abilities influences decision making as cited from de Bruin, Parker, & Fischhoff, 2007; Finucane, Mertz, Slovic, & Schmidt, 2005. Finally, with respect to age, there is evidence to support the notion that older adults prefer fewer choices than younger adults (Reed, Mikels, & Simon, 2008).

But again, as the concern is to take decision to implement some new methods or processes like GlobalGAP it can be paralleled to behavioural change also as new or different processes has to be maintained and thus existing behaviour has to be changed. So, as mentioned before, the theoretical basis also included behavioural change aspects of the mango farmers to participate in implementing the GlobalGAP. Sebstad and Manfre.(2011) showed the influencing factors for certain behavioural change can be the desire to change (influence of other peoples' behaviour, known outcomes, social norms), the know how to change (knowledge, skill), the conducive (or supportive) climate for change (proximity of inputs and services, accessibility to supports), and the rewards associated with the change (rate of return and other benefits). While all of those factors were covered under this study in an adapted way;

they didn't work out on the resource level factors which have been covered also in this study as explained later in details under the influencing factors.

2.2 Key Concepts

2.2.1 Importance of Mango Production and Trade

A number of studies indicate that horticulture provides many developing countries with opportunities for export diversification, poverty alleviation and rural employment (especially for women) (Lumpkin, Weinberger and Moore.2005). Fruit and vegetables also play an important role in nutrition and human health. Nevertheless, diversification into horticultural production is attractive for many poor farmers in developing countries, as it can earn them higher incomes than other agricultural produces like grains, cereals (ibid).

Mango production and trade at all levels (local, domestic and international) generate sizeable benefits and externalities for producers, manufacturers and traders, as well as for rural societies in the producing countries (Calatrava, 2014). Moreover, its benefit to worldwide consumers in health and dietary terms is also well known and it is also one of the main sources of fresh fruits for many poor people in the locality of many developing countries (Calatrava.2014). Thus, maintaining and ensuring the quality and safety of harvested mangoes from the farm until the fruit reaches the consumer should be the prime consideration of all stakeholders in the mango supply chain that will also help in reducing level of post-harvest loss in the supply chain.(Esguerra and Rolle.2018)

2.2.2 GlobalGAP

According to the website of GlobalGAP, GLOBALG.A.P.'s root began in 1997 as EUREPGAP, an initiative by retailers belonging to the Euro-Retail Produce Working Group though as highlighted by Unnevehr,(2003). In 1983, a group of internationally renowned experts convened jointly by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) concluded that "illness due to contaminated food was perhaps the most widespread health problem in the contemporary world," and "an important cause of reduced economic productivity." That actually started the movement towards Global GAP. According to Laforce,(2010); intention of GlobalGAP is to change producers' attitudes towards food production by imposing a performance standard with defined criteria to follow in order to render production processes safe through the application of Integrated Farm Insurance Standard (IFA). The GlobalGAP IFA is a pre-farm gate standard and applies to the whole agricultural production process of the certified product, before the plant is in the ground (seed and nursery control points) to non-processed end product (produce handling control points) which combines all agricultural products into a single farm audit.

Type and Category of GlobalGAP:

The latest version of GlobalGAP is version 3 released in 2009, and in which requirements are categorized according to three levels as shown below.

Level 1 - All farm requirements (AF) – eight elements applicable to all farms.

Level 2 – further categorized into: Crop based (CB) – includes requirements categorized in eight elements for all the crop based primary producers. Livestock based (LB) – includes all primary producers based on livestock rearing. Aquaculture based (AB) has two sets, namely 2007 and 2009.

Level 3 – In each level 2 there are a group of level three sectors.

In category CB there are fruits and vegetables (FV), combinable crops (CC), coffee (green) (CO), tea (TE) and flowers and ornamentals (FO). In category LB there are cattle and sheep (CS), dairy (DY), pigs (PG), poultry (PY) and turkey (TY). In set Aquaculture 2007 there is only salmonids (SN) but in set Aquaculture 2009 there are shrimps (SP), pangasius (PN) and tilapia (TA).

GlobalGAP certification comes in four options;

Option 1: Individual farmers apply for certification under this option.

Option 2: Is a group certification scheme where smallholder farmers form group and obtain certification together.

Options 3 and 4 apply to individuals and groups of farmers respectively who are certified standards benchmarked to GlobalGAP.

For this study, the GlobalGAP for All Farm (AF), Crop Base (CB) and fruits and vegetables (FV) will be considered with any options of the first two (Category 1 and 2) and compliance criteria will follow version 5.1 (latest one available) to identify the influencing factors along the selected compliance criteria.

2.2.3 Influencing Factors of Participation in GlobalGAP:

One thing is obvious that participation in implementation of GlobalGAP will be not one time stand as it will go through stages and after achieving the certification the farmers or the farm has to adhere to the conformance criteria and will be needed to continue maintaining those without interruptions. Thus the title of the study took “trajectory” as to express the continuum compete implementation with certification will obviously go through a feedback cycle of experience about the process and its outcome as actual benefit received in place of perceived benefits.

Regarding the determinants of continued compliance, support from exporters and the scale of the farming operation are the most important factors influencing the renewal of the GlobalGAP certificate. (Holzapfel and Wollni, 2014)

Nuru Islam et al. (2012) stated that reasons for farmers being unable to adopt GAP standard included the lack or scarce access to credit for investment, lack of technical support. Therefore Malaysian GAP certification scheme required to be upgraded, extended and monitored to ensure the quality of the produce. Thus it reflects the influencing factors under Conducive Environment.

As cited by Parikhani, et.al.(2015), in Moradi and Najafabadi (2010) barriers to application of GlobalGAP standard included the institutional structural barriers, attitude and awareness barriers, researches barrier, economic barriers, marketing and trade barriers and private part and mass media barriers.

Among the capacity level influencing factors are 5 Livelihood Assets/Resources; human, physical, financial, informational, and network resources as social (Busch and Bain, 2004; Vorley and Fox, 2004), and natural.

Lack of access to the above mentioned resources and the certification costs can be thought of as major challenges for the Mango farmers. Thus the study looked into these resources base if those are really influencing the participation as point of challenges in maintaining different compliance elements under GlobalGAP as explained later in operationalisation of the CF.

2.2.3.1 Market Participation as Livelihood Strategy and Influencing Factor:

As mainly a commercial product, mango is produced for market participation. As also found by Sylvaine Lemeilleur. (2013) regarding human capital component, that *ceteris paribus*; the number of years that the farmers have been growing mangos significantly increase the likelihood that they will adopt the standard. An extra year of experience would increase the probability of adoption by almost five percent. More-experienced farmers might be more aware of business opportunities and seem to move quicker towards new high-level quality requirements (*ibid.*).

2.2.3.2 Mango Farmer's perception and personal experience as Influencing Factor

Awareness, knowledge and perception about positive benefit of GlobalGAP influence participation in standards like GlobalGAP. Then experience of Participation in Implementation suppose to influence the continuation of the Participation in Implementation in the subsequent seasons and it suppose to act like feedback loop on the farmers' behaviour even if not in short run but obviously would not take either too long. Different categories of influencing factors for better management practices in agriculture found by a meta study conducted by Liu, Bruins, and Heberling (2018) are of Information and Awareness (up to date technical information, sources of information and medium through which received the information), Financial Incentives (access to credit), Social Norms (whether neighbour is practicing something), Macro Factors (geographic location, climate change), Farmers' demographics, knowledge, and attitudes (Age, gender), Farmers' risk and time preferences and uncertainty (attitude towards risk), Farmer's environmental consciousness (awareness of water quality, soil erosion), Characteristics of farm (size, land ownership, etc.), Characteristics of the Practice like mandatory or profitable (*ibid.*).

2.2.3.3 Livelihood Assets/Resources as Influencing Factors:

In fact, compliance with standards like GlobalGAP often requires considerable human assets like Skill to Maintain Records, Skill to maintain safety protocols under GlobalGAP, Skill to use machines and equipments, Informational Resource like Knowledge about requirements of GlobalGAP; physical assets like as technology, machineries, equipments, protected Storage are for Chemical Items (fertilizer, pesticides, etc.), Shaded area for washing and packing personal protective equipments (PPE) etc financial like availability, access to credit informational like market intelligence and knowledge, and network resources like social assets as contract farming agreement, membership in growers organization, trade link, (Busch and Bain, 2004) etc has been considered. Lack of access to these resources and the certification costs are the most common factors explaining the noncompliance of smallholders with standards (like GlobalGAP) as found by Busch and Bain, 2004; and Vorley and Fox, 2004 cited in Lemeilleur. (2013), and mentioned resources as have been considered under this study are explained below. On the other hand it was also found that Mango farming can influence positively on the different livelihood assets as mentioned above. (Rahman, Khatun, and Miah, 2019)

2.2.3.4 Supports and collaborations

As found in many cases, particularly in the developing countries that Participation in Implementation efforts of quality and safety measures were particularly started and sustained with some type collaboration (Nuru Islam et al. 2012). Like in Bangladesh it was started by CDAIS, Solidaridad, and SNV involving of course other relevant private and public organizations as a Multi Stakeholder Process (MSP) (CDAIS 2017, Solidaridad 2017). So availability and accessibility of any such organizational supports were treated as positively influencing Participation in Implementation of GlobalGAP. It considered also accessibility to low cost Credit or Insurance from any NGO/INGO or such development projects or programs from any development partners like FAO, USAID too.

2.2.3.5 Transforming Institutional Structures:

Under this category, basically government support institutions were considered like provision of Training, provision of free or low cost testing service for any requirements under GlobalGAP like PH level of water and soil, and MRL in the produce, etc. The study also considered accessibility to low cost credit or any other materials like fertilizers, machineries, equipments, packaging materials from government organizations, like in case of Bangladesh, HORTEX Foundation, DAM, DAE, BADC, etc. Moreover, any supportive Public-Private and Public-Public collaboration regarding implementation of the GlobalGAP were taken into account too as they are all important (Hossain, 2007) as influencing factors under past and existing support and collaborations.

2.2.3.6 Industry Structure & Collaboration:

Under this category, collaborations from private organizations were considered. Collaborations from organizations like the Traders, Super Markets/Shops, Exporter/Exporting Agent, Agent of any importer, were considered as a positive factor for participation in implementation, which was expected in case of Bangladesh by the chain shops like Swapno, Agora as the secondary sources of information had given the indication. Sometimes the private organizations maintain the yearly certification cost for the farmers and that surely influence Participation in Implementation.

2.2.3.7 Summary of Influencing Factors

Thus the influencing factors were categorised in three groups for this study as Perception Level Factors (awareness, knowledge, perceived positive benefit-rewards, thus covering the factors identified by Sebstad and Manfre.(2011) Desire to change and Incentives), Capacity Level factors (Skill as Know How of implementing the processes of GlobalGAP and Resource Base), and Supportive Environment (supports and collaborations, proximity of Inputs and Services) thus covering the four factors mentioned before in Sebstad and Manfre.(2011). Selected factors under each category were explored to see the situation and challenges mango farmers faced for participating in the GlobalGAP in two case areas; also to reflect if differences exist in the cases.

2.3 Situation of Bangladesh:

Over the last 18 years the country's fruit production has been increased by 11.5 % on average, FAO estimates. It has also been among the top 10 largest countries to yield a number of significant fruits--second in jackfruits, seventh in mangoes, eighth in guavas. Java plum (jaam), litchi, jujube, star fruit

(kamranga), papaya, wood apple, lemon, pineapple, watermelon, lotkon (Burmese grape), custard apple, sapodilla (safeda) and melon are also included on the list of growing fruits. Despite its limited geographical area and burgeoning population, Bangladesh has topped other countries to increase its fruit cultivation land by 10 % per year. There has been a revolution in fruit farming in Bangladesh. Over the years, more and more fruit trees are being planted along roads and in yards. Commercial cultivation has increased over the last 10 years too, Sattar Mandal, former vice chancellor of Bangladesh Agriculture University, told Prothom Alo that fruits have contributed to the country's success in food security and had pushed it six places up in the world hunger index in three years, he added.(Mahmud, 2019).

2.3.1 Production of Mango in Bangladesh

Though it grows almost all over the country, major mango growing regions (Figure:1) are in Rajshahi, Chapai Nawabganj, Nawabganj, Meherpur, Dinajpur, Shatkhira, and Bagerhat. But, the southern part of the country like the Chittagong Hill Tracts areas has also started growing Amropali type of mangoes for last 5 to 7 years. Around 2.4 million tonnes of mangoes



Figure 1: Figure 1 Major Mango Growing Areas in Bangladesh

were harvested in 2017-18. Area under mango production is fluctuated over the last decades whereas total production has been increased in Bangladesh. In 2004-05, mango was cultivated in 25055 hectares of land and yield was 26.43 ton/ha (BBS, 2008). Still then area coverage is being increased continuously with an upward movement of total production as cited by Rahman, Khatun, and Miah,(2019). Currently, there are about 41676 hectares of land occupied with mango orchard and produced about 1288315 ton (BBS, 2017) as cited by Islam et.al. (2019).

2.3.2 Socio Economic Characteristics of Mango

Farmers:

Mango farming is typically a generational and family business in Bangladesh and past studies showed that the

Courtesy: Promoting Mango Trade from Bangladesh to EU Mainstream Market, UNNExT Workshop on Agricultural Trade Facilitation and Business Process Analysis in Bangladesh

mango farmers are of mid aged category have good educational level with around one fifth illiterate in the Rajshahi region. It was also found that most of the respondents (52.5%) had small family size followed by medium family size with 39.6% of respondents. Only 8% of the respondents had a large family size. (Sultana, Chowdhury, Pervez, 2018) So, the average family size was found little higher than the national average of 4.53 (HIES, 2010). No landless farmers were found to be engaged in Mango Production. This is because mango farmers were more prosperous than other farmers in the study areas and the average land size of the mango farmers were higher than the national average (Alam et al. 2017). The relationships of annual mango production respectively with age, education, farm size, land used in mango production, annual income, experience in mango production, experience in agriculture, Extension media contact organizational participation and knowledge on mango production showed a tendency in the positive direction by (Alam et.al 2017). Similarly, the average income is also higher than the national average. Therefore, rice farmers are becoming mango farmers in many districts in

Bangladesh (Dhaka Tribune (2018b) as cited in (Sultana, Chowdhury, Pervez, 2018). Typically, average farm size per household is around 2.20 acre. Farm income of the rural people in general is higher which occupied 64.66% of the total household income than the non-farm income which occupied only 35.34% (Parvin and m. Akteruzzaman, 2012).

2.3.3 Trade of Fresh Mango in Bangladesh

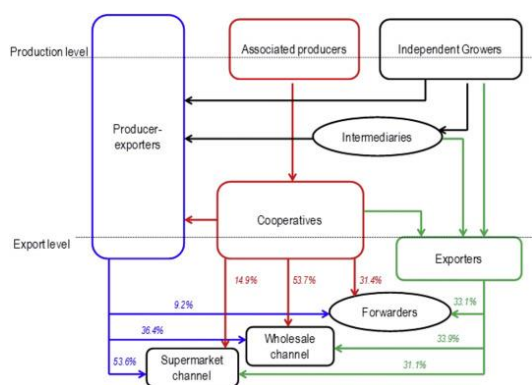


Figure 2: Figure 2 Typical Fresh Mango supply chain

Typically there are Farmers/Growers, Bairal, Faria, Bepari, Wholesaler, Retailer, Export Agents, and Private Exporting Companies involved in the supply chain of Fresh Mango in Bangladesh. As it is a popular fruit, a significant portion of it is consumed locally. The Figure 2 shows typical and hypothetical export supply chain of fresh fruits like Mango in a very simplified manner.

In 2015-16 growing season, almost half of all production came from just two districts, Rajshahi and Chapainawabganj. In the latter, mango is one of the most important cash crops, and in Shibganj sub-district (upazilla), most people are involved in mango production

and trade, with 13,500 hectares producing 120,000 tonnes annually. And the combination of many varieties means that there is supply throughout the whole season from mid-May to the end of September. Many orchards are more than 100 years old. After meeting up the local demands, Rajshahi, nationwide famous for mango production, has been exporting mango to different European countries for the last couple of years.

2.3.4 Past Efforts (Support and Collaborations) on Quality and Safety Measures and Export of Fresh Mango from Bangladesh

Though Bangladesh has been exporting from quite long to the ethnic markets of the developed countries like the US, UK, EU, Middle East, etc. organized export under supervision for ensuring quality and safety requirements of the importing countries is not very long. Particularly for Mango, as reported to Bangladesh Sangbad Sangstha (BSS) by the upazila agriculture officer; export from Bagha upazila in Rajshahi district has been brought under supervision of Hortex Foundation, DAE, and the FAO from 2015 (4 years back from reporting time) by listing 50 orchards after given training on “Production of safe and insecticide free mangoes through best farm management”, which can be termed as a concerted effort to ensure exported mangoes are safe and of good quality(BSS 2019).

As also reflected by numerous reports and stakeholders in different national forums, like Md Muniruzzaman, President of Rajshahi Chamber of Commerce and Industry said all stakeholders including farmers must have to produce good quality mangoes maintaining its highest value if they want to continue mango exports to Europe’s chain shops (BSS, 2019; Solidaridad, 2016). “An additional advantage is that some Bangladeshi mango varieties mature early in the season and therefore could be sold to European consumers before other varieties from competitor countries are made available,” the chamber leader said, (BSS, 2019) and the mango farmers now adhere to harvesting timing according to the timing set by the local administration with help of the agriculture related government organizations, like DAE, BARI etc. (Habib, 2020).

2.3.4 GlobalGAP and Bangladesh

In recent years, some emerging and developing countries have started to develop national standards based on GlobalGAP. This is often done because local retailers also increasingly ask for safe and quality food. These “national” variations on GlobalGAP are often relatively less stringent and therefore are an important stepping stone to realizing compliance with GlobalGAP. The SAARC countries, in cooperation with FAO, are currently working on a SAARC GAP. Bangladeshi actors have confirmed their wish to develop a specific BanglaGAP based on SAARC GAP. This BanglaGAP is currently also under development, and is expected to be presented for approval in 2016. Nowadays, GlobalGAP is one of the key standards for the international market for food. Bangladeshi exporters of high-value food products like fruits and vegetables and seafood therefore will be confronted more and more with GlobalGAP standards, especially when they export to Western markets (Dijk, Herpers and Trijsburg, 2015).

On 18 May 2017, GLOBALG.A.P. made a stop on its global tour to promote good agricultural practices in one of the world’s most densely populated cities and countries: Dhaka/Bangladesh. The event was organized together with the Dhaka Chamber of Commerce and Industry, and facilitated by USAID’s Feed the Future Bangladesh Agricultural Value Chain Project. More than 100 participants from the agriculture and food industry, NGOs and government bodies were informed about GLOBALG.A.P. and its products and services such as Option 2 (group) certification, the localg.a.p. program, the GLOBALG.A.P. Academy or the GLOBALG.A.P. Risk Assessment on Social Practices. The aim of that tour stop was also to start a process that will put Bangladesh and its producers on the map of international retailers as a high-quality export country for fresh fruit & vegetables. In addition, the Bangladeshi retailers ACI Logistics Ltd/Shwapno presented their rationale for becoming a GLOBALG.A.P. member and why they are becoming a program owner for the first localg.a.p. program for fruit & vegetables in Bangladesh.

2.4 Conceptual Framework:

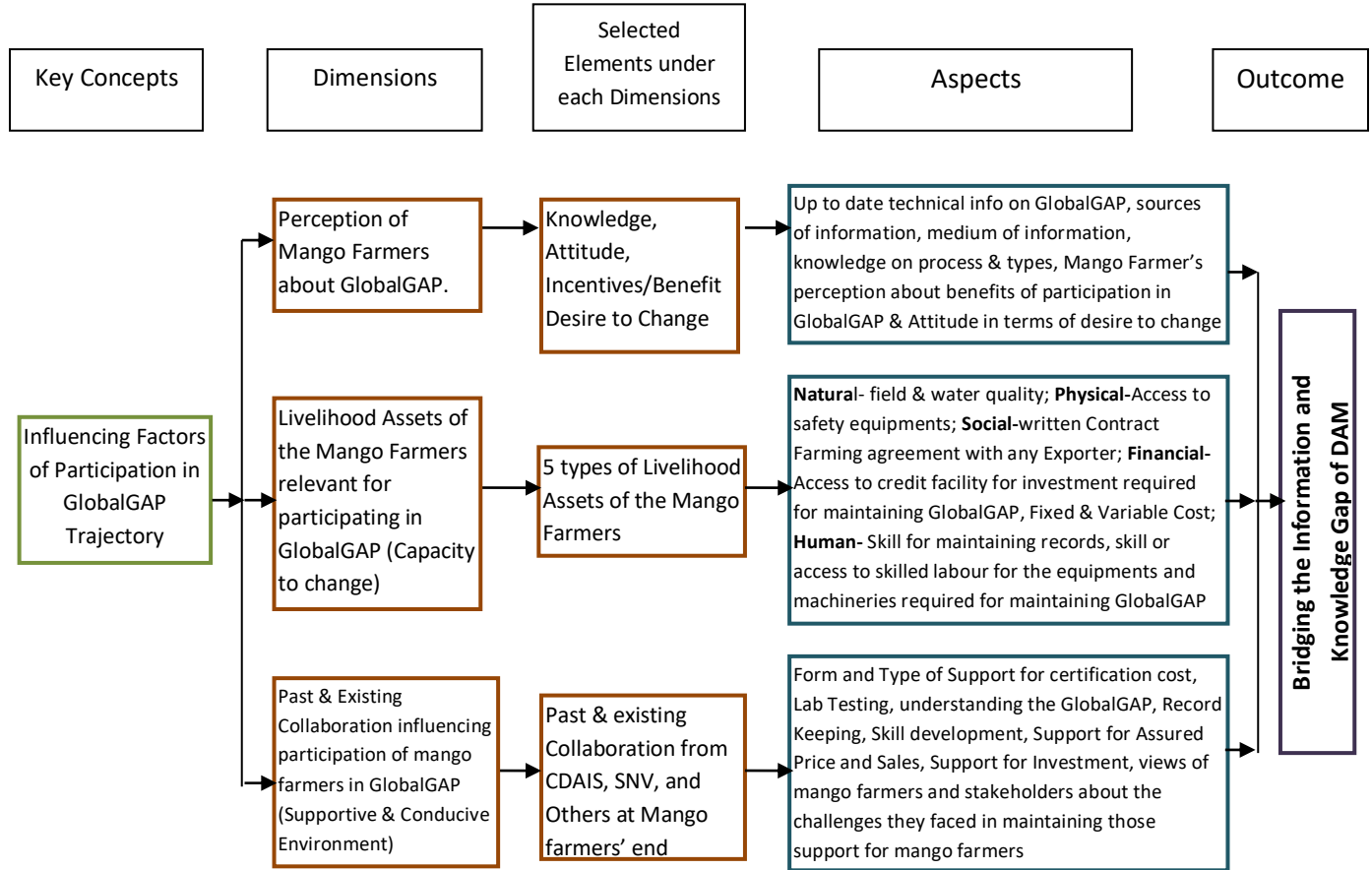


Figure 3: Conceptual Framework

2.4.1 Operationalization:

As the key concept, the reason of why the mango farmers are not participating as expected yet in the GlobalGAP trajectory is focused through the influencing factors. Among all the influencing factors basically the Individual level, Household Level and Macro level factors are selected for the study and focused in the above conceptual framework under the dimensions as to show how the study has dealt with them. Under each of the dimensions mentioned elements were selected.

2.4.1.1 Perception of Mango Farmers about GlobalGAP

First dimension under the above CF is Perception that includes aspects like awareness, knowledge, desire to change, and reward or benefit. Démuth.2013 found following a constructivist approach that perception is the end product of the interaction between stimulus and internal hypotheses, expectations and knowledge of the observer, while motivation and emotions play an important role in this process; while citing perception is thus influenced by a wide range of individual factors that can lead to an inadequate interpretation from Ey-senck, Keane, 2008, 74; that can be paralleled to perception under incomplete information which in reality is the real life scenario also. Perception about any subject or object thus depends not only on the information about that particular thing but also the source of

information and expected or perceived benefit like market access and safe product exports,” “consumer’ health and environment-friendly behavior,” “safe production and public demand,” and “information sharing and strengthening local associations (Borkhani and Mohammadi. 2019). Awareness, Knowledge of GlobalGAP and Perception about its benefit among the mango farmers were explored.

2.4.1.2 Types of Livelihood Assets of the Mango Farmers relevant for participating in GlobalGAP

The second dimension of the above CF is the relevant livelihood assets of mango farmers. As described before, the five livelihood assets of the mango farmers’ household that influence their participation in GlobalGAP trajectory were explored except the natural assets. Among all the checklist of GlobalGAP some “minor must” and “major must” following the latest version of GlobalGAP checklist for fresh fruits and vegetables were selected under the study that has direct implications for different livelihood assets.

This dimension has been explored for the selected aspects under each of the four livelihood assets of the mango farmer’s household except Natural Assets. The selected aspects were for Physical-Access to mobile, safety equipments; Social-written Contract Farming agreement with any Exporter or marketer; Financial- Access to credit facility for investment required for maintaining GlobalGAP, Fixed & Variable Cost; Human- Skill for maintaining records, skill or access to skilled labour for the equipments and machineries required for maintaining GlobalGAP, etc.

2.4.1.3 Past & Existing Collaboration influencing participation of mango farmers in GlobalGAP

As the third dimension of the CF as influencing factor is part of macro environment, transforming institutions, collaborations from development partner, private organizations as part of Supportive and Conducive Environment, past collaborations and industry structure was one of the key focuses of the case study as it wanted to see why even after intervention efforts from CDAIS and SNV no significant improvement have been seen in the mango subsector of Bangladesh in terms of implementation of GlobalGAP among the mango farmers.

Aspects like past and existing support for certification cost, support for Lab Testing, support for understanding the GlobalGAP, support for record keeping, support for skill development, support for assured price and sales were explored under this dimension.

Chapter THREE: How to do it?

3.0 Methodology

This section describes the research strategy, research framework, methods and tools used besides giving the sampling plan and analytical methods utilized and the organization of the research and field works.

3.1 Research Strategy

The study aimed to find out why the mango farmers of Bangladesh has not entered or participated in the GlobalGAP trajectory as expected and dealt with mainly mango farmers' understanding, perception, experiences and views about participation in GlobalGAP as a requirement for better and new market participation. So, though there were some deterministic elements like the required livelihood assets as influencing factors of participation in GlobalGAP but the research mainly focused on (peoples') mango farmers' experiences and challenges they faced in arranging or maintain those assets expressed as their views, perceptions, comments, rankings; thus as per Laws and et.al (2013) the study has used a social constructivism approach utilizing mostly qualitative data too thus has used mainly qualitative research.

As a qualitative research it has utilized mainly case study as research strategy on two selected cases of interventions in Bangladesh relating implementation of GlobalGAP in two of the most popular mango growing areas in Rajshahi division. To ensure authentic and representative data and information, multiple methods and tools were used for data collection as well as for validation and triangulation of the primary data and information collected from individuals and also from group setting, secondary data was used where found available.

The research also utilized extensive desk study under the present COVID 19 situation and basically Research Assistant (RA) and Field Coordinator (FC) were engaged to do the data collection. Some video and audio recording, photography without time and geo stamping were possible to maintain and have been used.

Particularly as the situation really became more severe in the Shibganj area for flood from over rain didn't permit the local research assistants to do field works with physical contacting, telephonic meetings were conducted for the SSI beside many of the KIIs. One FGD was possible face to face the other one was conducted by making group calls

3.2 Research Framework

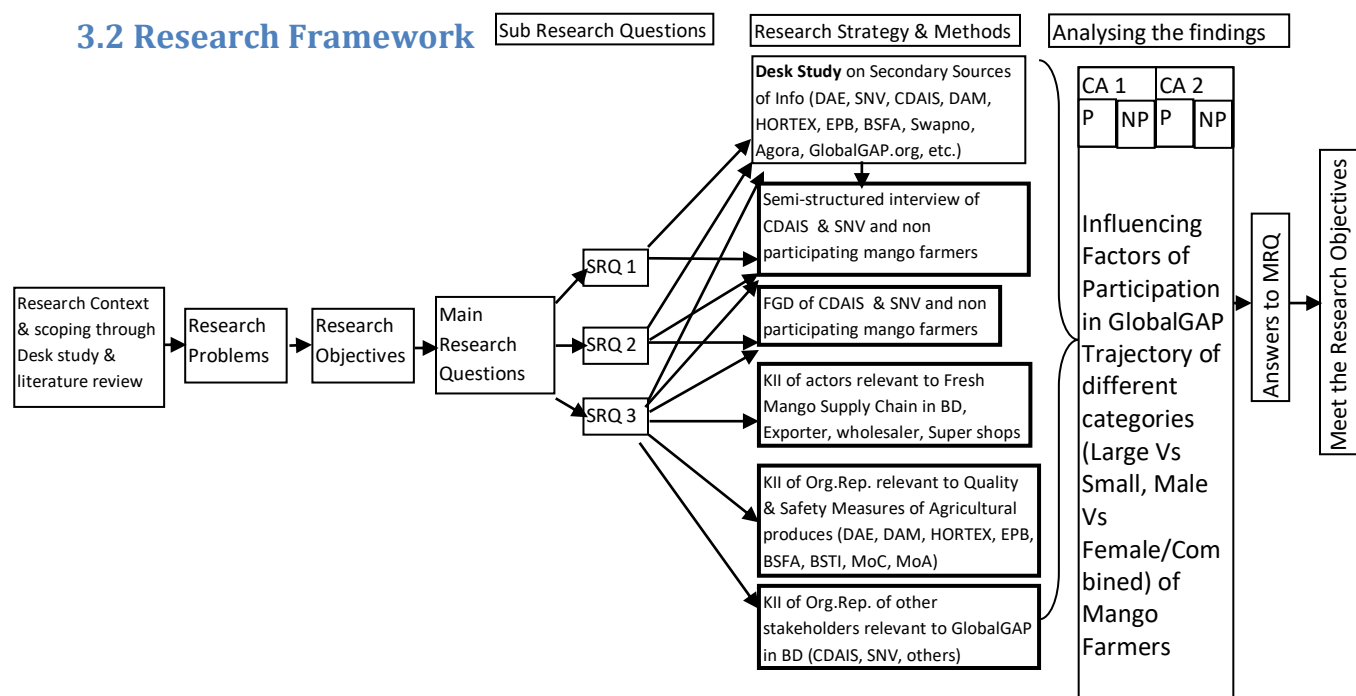


Figure 4: Research Framework

Legends: CA1 and CA2 =Case Area 1 and 2, P=Participant Mango Farmers, NP=Non Participant Mango Farmers. The heavy lined boxes above shows the Case Study part of the Research Strategy.

The above framework reflects the conceptual framework and the indicators under each of the sub research questions (SRQs) are given below.

But some term shall be clarified first, farmer(s), farm, and farming household is used interchangeably depending on the context as in reality the household head of a farming family is normally the farmer and the decision maker of the house too. By “Participant” or “Participating” farmers it is meant the farmers who have participated or covered under any GlobalGAP related programs or interventions previously and the non participants are those who didn’t. Large and small farmers mean large and small farming based on own land size.

Perception: SRQ1: Awareness of Individual Farmer or the Farming Household expressed by the representative’s awareness of the word GlobalGAP, Knowledge about GlobalGAP expressed in terms of its positive benefits for farmers or the farming household, Desire to Change in terms of eagerness to know more and participation in different aspects of GlobalGAP without being aware of it or under limited information,

Livelihood Assets: SRQ2: 4 types of Livelihood Assets except the natural one as described in CF as the second dimension and the indicators were Use of Mobile, Internet, Toilet; Availability, Accessibility, and Adequacy of Financial Credit; Contract Farming Agreement, Membership in Farmers’ Organization, Knowledge and Skill of Utilizing Mobile and Internet for Mango Production and/or Marketing, Skill and

Knowledge of using Fertilizers and Plant Protection Products (PPP) according to prescribed dose, Treatment of Empty Containers of Fertilisers and Chemicals, have been considered.

Supportive Environment: SRQ3: Past and Existing supports and collaborations relevant for implementing GlobalGAP from govt. development partners, NGOs, and Private companies were considered and type of supports, satisfaction over the supports, challenges were explored under this sub research questions that conforms to the third dimensions of the CF.

Some indicators like Age, Education, Experience in Mango Production, Variety and Age of Mango Trees, Own land engaged in Mango Production and Total Land Engaged in Mango Production (that includes leased in land), Involvement of Other Economic Activities, Cultivation Practice of Other Crops, are also considered to see the demographic and socio economic characteristics of mango farmers of the case areas and also to check if they have any influence on the perception, practices, and influencing factors of the mango farmers relevant to GlobalGAP.

3.3 Scope of the research:

The setting was presented for quality and safety measures like GlobalGAP of fresh mango and the literature review has also covered both the local and export market of fresh mango. Though the main focus of the study was on GlobalGAP but other quality and safety measures were found active during the desk study on secondary information and were touched upon too during primary data collection. The focus was on the mango farmers' end and not through out the entire supply chain except the exporters'. Geographically the study covered two selected case areas under Rajshahi division in northern Bangladesh which has been historically the main mango growing region.



Figure 5: Figure 5 Case locations under Rajshahi Division, Bangladesh

Source:
<http://en.banglapedia.org/index.php?title=File:RajshahiDivision.jpg/>

differences in socio economic characteristics of the mango farmers as well as the business conducive

And, not all the compliance criteria of GlobalGAP were considered for selecting the livelihood assets base as influencing factors. The selected criteria have been covered from All Farm (AF), Crop Base (CB) and the specifics for Fruits and Vegetables (FV) criteria as shown in Annex-1 (GlobalGAP, 2017).

3.4 Study Locations:

Two study locations have been selected where SNV and CDAIS had intervened in 2015 regarding GlobalGAP among the Mango Farmers. Both of the locations are major mango growing areas within Rajshahi division which is historically famous for Mango production and also export.

One location is near the divisional headquarter and the other is located near border with India thus showed supposed differences in socio economic characteristics of the mango farmers as well as the business conducive

environment in terms of infrastructure and proximity to main road, market areas, Bank, relevant government offices.

Shibganj upazila has 67,009 households and total area 525.43 km². This upazila is under Chapainawabganj which is called the capital of mango in Bangladesh because it is this summer fruit that mainly sustains the economy of this district. Bagha upazila has 29056 households and total area 184.25 km² and this upazila is under Rajshahi district. (Wikipedia.org)

3.5 Organizing the Research

The research was conducted to fill up the knowledge gap of Department of Agricultural Marketing (DAM) under Ministry of Agriculture as the primary owner with the business allocation for agricultural marketing and agribusiness development of Bangladesh (DAM. 2020). So, DAM with mandate to develop the agricultural marketing system as well as to ensure a better return of the farmers it is logical and important to know why they have not entered or joined the GlobalGAP trajectory yet. Whether they are aware of the benefits of entering the GlobalGAP trajectory? What is the present situation of mango farmers in terms of participation and implementation of the GlobalGAP or any other Quality and Safety standards like the GAP or LocalGAP? To understand what challenges they are facing in implementing GlobalGAP like standards so that areas can be identified where interventions and policy supports can be given.

3.5.1 Data Collection Methods and Tools

The research was a qualitative one utilizing mainly case study as strategy in two most prominent mango growing areas in Bangladesh focusing on the participated mango farmers in CDAIS and SNV initiatives in the selected case areas. As a qualitative study trying to explore into human perception and decision making choices mainly of individual mango farmer and mango farmers as group, associations, organizations other than registered corporate bodies with separate legal entity, thus used mostly qualitative tools and techniques like Semi-Structured Interview (SSI) to collect individual level and Household level data represented by the individual, Key Informant Interview (KII) for stakeholders' views about the past and existing collaboration and challenges they face at mango farmers' end, and Focus group Discussions (FGD) were done to collect group views as well as to dig deeper into the critical issues identified in the SSIs and also KIIs. All the checklists of SSI, FGD, and KII are given in Anexures along with there Bengali version which was actually administered in the field and could vary little with their English counterpart for the Bengali versions were adjusted after testing (Annexure 2.1, 2.2, and 2.3). The study used secondary data and information through desk study to help in triangulation as well as to guide some of the primary data collections through assisting in justifiable sampling as explained under sampling. (Details on Data Collection Methods and Tools-Annexure-3)

3.5.2 Field Work:

One local Field Coordinator (FC) and two Research Assistants (RAs) were engaged. They were briefed about the research objective and the purpose of the field works and the original and translated checklists for the SSI, KII, and the FGD were shared with them using Whatsapp, facebook/messenger, and Video calls. The SSI checklist was tested over phone and adjusted accordingly.



Figure 7: FGD Shibganj



Figure 6: FGD Bagha



Figure 10: SSI Bagha



Figure 11: FGD Bagha



Figure 9: SSI Bagha



Figure 8: SSI Bagha

Primary data collection was done through face to face interactions in Bagha case area but for Shibganj most of them were conducted over phone. Many of the interviews of SSI and KII were done off time as the respondents found convenient to participate. Some photographs, audio, and video recording was possible in some of the SSI and FGD sessions with permissions taken first. During the face to face interview and FGD sessions COVID 19 protocol (social distance) was maintained and the participants were given mask, some photographs are given. The KIIs were done through phone calls and email contacts. No face to face interview for KIIs other than DAE was possible.

3.6 sampling (method and criteria) and sample size

The population of the study were all the mango farmers and their households who produce mainly for market participation and the individual farmer and his/her household was treated similarly here as the mango Farmer. The mango farmers were treated as participant or non participants as to reflect whether they were covered by any previous intervention of GlobalGAP. In case of, participation of both male and female members of a household in mango production the SSI was done together or separately depending on their agreement and convenience but the sample was treated as one.

As qualitative methods like the SSI and FGD were used to access primary data of mango farmers; the sampling method was mainly judgemental (Laws, et.al. 2013) and purposively mixed in the sense that the locations were already selected purposefully for the main Mango Growing and Intervention areas in Bangladesh. Two farmer's lists for the two locations were found from the secondary sources of information from the relevant organizations like the local extension office and mango growers' association. Those lists were used as the basis for selecting respondents for the SSIs. The respondents were selected to accommodate different type of strata like large-medium-small (depending on the land holding size for agriculture and taking official measure of Bangladesh which is upto 2.5 acre for small farmers) and also clusters like male-female, young-old. 5 samples were assumed as to be adequate level of sample size for each category of mango farmers to reach the saturation point of responses particularly regarding the challenges the mango farmers faced in participating in GlobalGAP. Thus for each of the categories (Large, Small, Male, and Female/Combined-4) of respondents considering the participating and non participating (2) status, each of the case areas need a total of 40 ($5 \times 4 \times 2$) samples thus a total of 80 samples for SSI were envisaged. But in reality, a total 32 samples in Bagha and 28 samples in Shibganj were needed to reach saturation point to stop further interview for SSIs of mango farmers. Besides, snow ball approach was also used particularly for selecting participating mango farmers and female (combined decision makers) mango farmers for SSIs.

In the FGDs, 5 to 6 participants were present in each though initial target was 10. Among the expected 32 KII, 20 were being possible to be conducted and also seemed enough to answer the research questions.

For arranging KIIs of different stakeholders like the government officials, Supply Chain (SC) partners and Key Informants of other stakeholders relevant to GlobalGAP for mango, convenience sampling was used based on availability and interest of the respondents to participate. Among the key informants both the local offices and relevant head office representatives were considered depending on the organization as not every organization has field level office. Among local representatives; Local Agricultural Extension Office (DAE), District level DAM office, Management Representative of the farmers' Organizations, Cooperatives, Associations, Representative of the Relevant Trade bodies of the locality, Exporting Agents connected to the mango farmers under study were considered. Whereas, for the head offices under government organizations; BAPA, BSFA, EPB, MoC, MoA, HORTEX Foundation, DAE, DAM, APSU were considered.

3.7 Analytical Method

Collected quantitative data were treated in Excel but only to reflect on the decision points for influencing factors by descriptive statistics like range, average, and mode but not to do quantitative analysis parse for generalization. Qualitative data were mainly coded and categorised using MS Excel and MS Word to answer different research questions as well as to workout a Grounded Theory for non participation of mango farmers in the GlobalGAP trajectory as expected.

3.8 Ethical consideration

In each of the interviews and focus group discussions the respondents were briefed about the purpose of the study and consent to participate was taken verbally. Local cultural practices, traditions and COVID 19 safety protocols were followed in case of Bagha as all the interviews were done Face to Face but in case of Shibganj all the SSIs were conducted over phone. In case of photographs and recording permission was asked prior the interviews.

The first important point of ethical consideration was the timing of interviews with the mango farmers as it was mango harvesting season in Bangladesh. So, not to hamper the basic economic activities of the mango farmers, the timing of the interviews were selected depending on the convenience of the mango farmers. And for some samples, the interviews were conducted after working hours.

3.9 Limitations:

Though every effort was taken to conduct an effective applied qualitative research as per the partial requirement of the academic program of MOD under VHL but it was felt during the field works that a mixed method approach would have been more logical for example to include a cost-benefit analysis given the uniqueness of the research in the context of Bangladesh.

Another point of limitation that was not possible to handle within this research is not to plan to collect the proximity of the mango orchards. It would have been helpfull particularly for the smaller ones as to whther they could be clustered. Better recommendations could have been given for the clustering for developing common infrastructures like Toliets, Washing & Packing Shades, Chemical Storage and Empty Container Disposal to say some though it is mentioned in the recommendation.

Chapter FOUR

4.0 Findings

All the findings provided below reflect 32 samples in Bagha and 28 samples in Shibganj case area if not stated otherwise and are outcome of the SSIs with the mango farmers. Findings under 4.1 are general demographic and socio-economic characteristics of the responding mango farmers. Findings under 4.2 relates to the first dimension of the conceptual framework; perception of the mango farmers about GlobalGAP as well as the first research question that focused on mango farmers' awareness, knowledge, desire to change, benefit, and also experience of implementation of relevant aspects of GlobalGAP. Findings under 4.3 relate to the livelihood assets of the responding mango farmers relevant for participating in the GlobalGAP trajectory as per second dimension of the conceptual framework and the second sub-research question. Findings under 4.4 are from FGDs and focuses on deep probing of relevant issues but data triangulation is also done with information from KII and SSI where relevant. 4.5 present the findings from KIIs on past and existing Collaborations and Supports pertaining to the third or dimension of the conceptual framework representing supportive and conducive environment and third sub-research question. It shall be also understood that all the tables and figures presented here under findings are sourced from field works under this study if not mentioned otherwise. Thus source is not mentioned under each of the tables or figures as is customary.

4.1 Socio Economic Characteristics of the respondents:

4.1.1 Demographics of the respondents:

All the 32 respondents of Bagha and 28 respondents of Shibganj were male and married (with 2 female in shibganj) with an average age of around 48 years in both areas but with higher standard deviation in Bagha and highest age holder also. Shibganj has the lowest age holder. Family and household size is also similar in both areas with higher standard deviation again in Bagha.

Table 1: Demographics of the Responding Mango Farmers (Bagha-Case Area1/N=32)

Statistic	Age	No. of Family Member	No. of HH Member
Average	48.3	4.8	5.7
STD	10.0	1.8	3.0
Minimum	28	2	2
Maximum	73	12	17

Table 2 Demographics of the Responding Mango Farmers (Shibganj-Case Area2/N=28)

Statistic	Age	No. of Family Member	No. of HH Member
Average	47.8	4.4	5.5
STD	8.6	1.0	2.4
Minimum	26	2	2
Maximum	60	6	12

The study found responding mango farmers' family size and household size are quite closer to general characteristics of rural households in Bangladesh in terms of national average of family size in the rural areas (HIES 2010). About family members, it is logical to talk about the range also which is quite large and is also obvious as the mango farmers reflect generations of involvement thus the older respondents have larger family size too. There are also some combined families which are reflected by the number of members of the household in both case areas and which is obviously higher than the family size that again reflect combined family involvement in mango farming.

4.1.2 Age profile of the respondents:

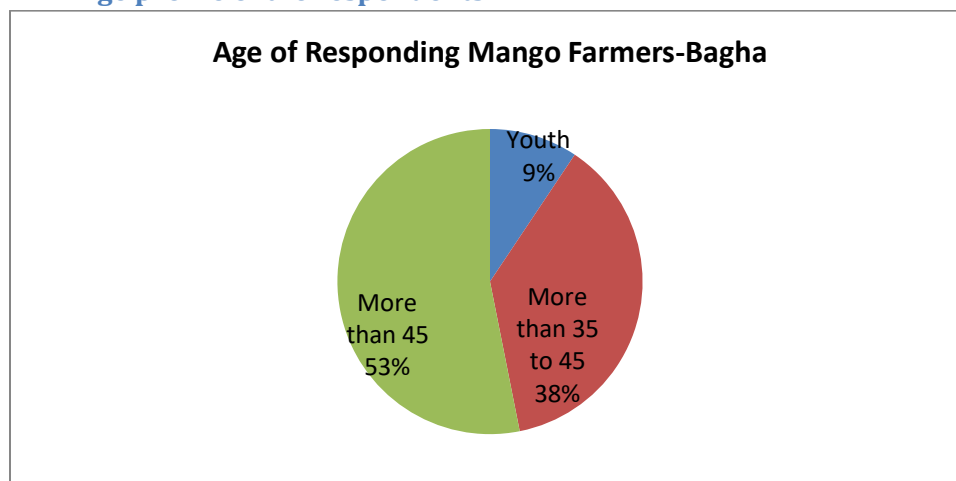


Figure 12: Age of the responding mango farmers-Bagha/N=32

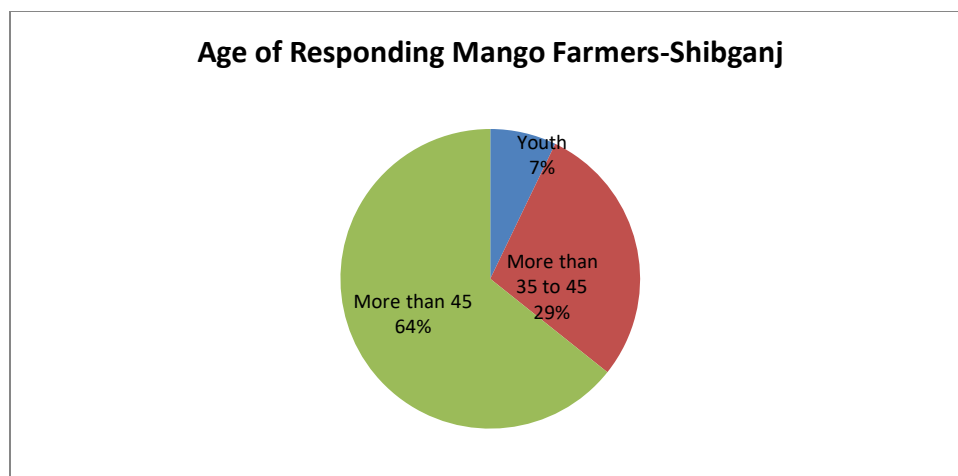


Figure 13: Age of the responding mango farmers-Shibganj/N=28

Most of the respondents were older than 45 years in both of the case areas and youth farmers (below 35 years) are not many as they were below 10% in both case areas. It also reflects that mango operation requires maturity of age to know about the practices though many of those are learnt through family orientation.

4.1.3 Educational Status:

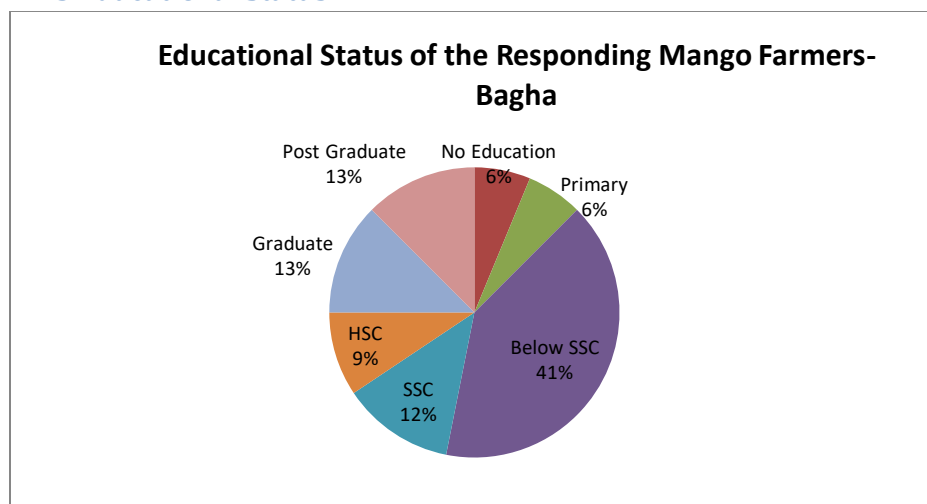


Figure 14: Educational Status of the Responding Mango Farmers-Bagha

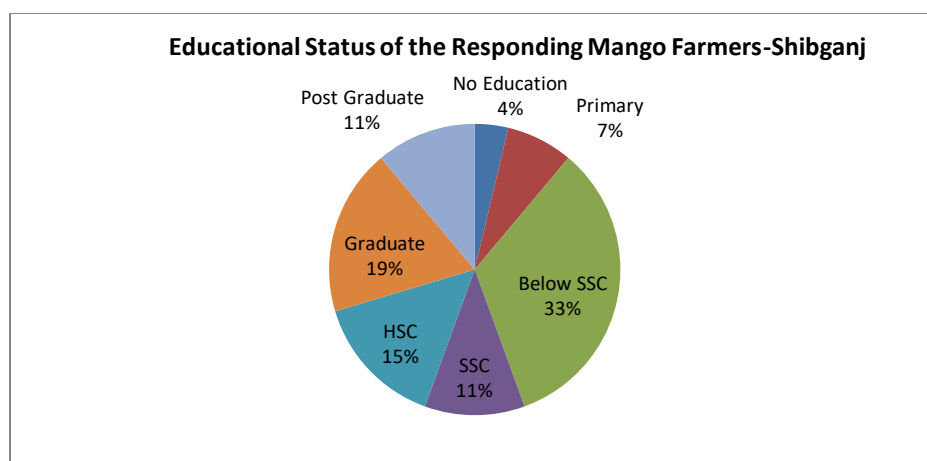


Figure 15: Educational Status of the Responding Mango Farmers-Shibganj

In both of the case areas, most of the Mango farmers are found to have minimum level of education and a majority have above primary education reflected by Below SSC whereas more than one fourth have above college level education reflected by the Graduate and Post Graduate combined (26% for Bagha and 30% for Shibganj). The level of “no education” actually doesn’t mean illiterate rather who didn’t attended formal schooling and it is quite lower in both case areas than the national average of attendance to primary education in rural areas (which is 85% according to Demographic and Health Survey 2007, so 15% for non attendance) and can be taken as the basic level of formal education of people which is still now more among mango farmers of the case areas and also reflects importance of education in both of the case areas.

4.1.4 Land and Land Engagement in Mango Production:

Table 3: Total Own Land, Own Agricultural Land, and Total Land in Mango Production-Bagha/N=32

Statistic	Total Own Land	Total Agricultural Own Land	Total Agricultural Land engaged in Mango Production	Total Mango Land as % of Total Own Agric.Land
Average	4.45	4.06	3.46	85%
STD	6.48	5.94	4.72	80%
Minimum	0.45	0.25	0.25	100%
Maximum	33	30	25	83%

N=32, Land in Acre [100 Decimal=1Acre]

Table 4: Total Own Land, Own Agricultural Land, and Total Land in Mango Production –Shibganj/N=28

Statistic	Total Own Land	Total Agricultural Own Land	Total Agricultural Land engaged in Mango Production	Total Mango Land as % of Total Own Agric.Land
Average	4.03	3.63	3.91	108%
STD	3.34	3.02	4.38	145%
Minimum	0.75	0.60	0.60	100%
Maximum	15.84	13.20	22	167%

N=28, Land in Acre

As commercial activity, from the above tables it can be seen that on all the statistical parameters in both the case areas major portion of land is used in mango production. But Bagha has a lower level of engagement in mango production with own land where it is more than 80% but in case of Shibganj it is more than 100% reflecting respondents of Shibganj are more concentrated in Mango Production involving leased in land than Bagha.

4.1.5 Distance of Responding Mango Farmers from Important Supportive Environment:

The following graphs shows respondents' approximate distance from different important factors that act as supportive environment, like main roads, district centre, market, bank, and relevant government office. The distances were not made of equal intervals neither of comparable intervals as the purpose was to find out the orientation of farmers with the distance which they think of as distant and very close and as can be seen from the graphs of Shibganj, the respondents were more nearby to the Banks, Markets, and govt, offices than the respondents of Bagha. But respondents of both case areas have nearby roads that reflect Bangladesh has already developed good road network even in the rural areas. Here main road actually reflects good conditioned roads that connects to the main markets or district centre which are also normally closely situated in clusters.

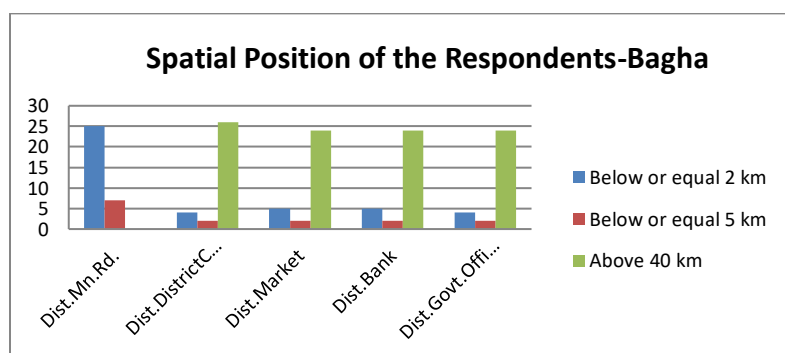


Figure 16 Figure 5: Distance of the Responding Mango Farmers from Important Supportive Environment-Bagha

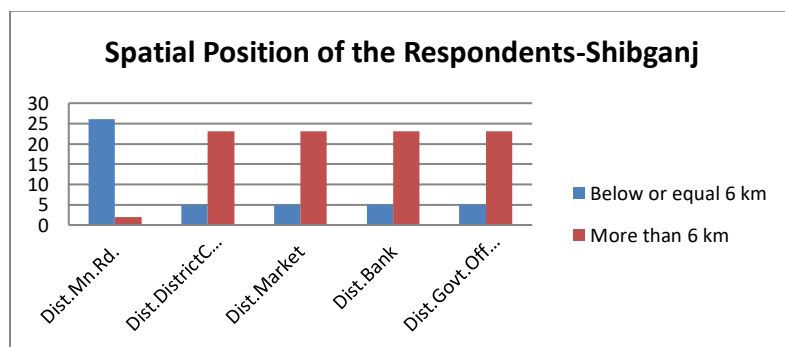


Figure 17: Distance of the Responding Mango Farmers from Important Supportive Environment-Shibganj

As such that most of the other parameters like the distance from Market, Bank, Government Office, and District centres are almost equal in distance and on an average the distance is more than 40 km for at the least 20 respondents out of 32 (more than 50%) in case of Bagha. But as can be seen from the next graph, respondents of Shibganj areas have a better spatial position compared to the respondents of Bagha.

4.1.6 Other Crop Choice of Responding Mango Farmers:

The following graphs shows that in both case areas, almost one third (more than 30%) of the responding mango farmers cultivate other crops besides Mango. This trend is common among both small and large mango farmers who hav responded in both the os the case areas except for small mango farmers in Shibganj (25% of the small mango farmers). The graphs below (Figure 9 and 10) also shows that among other crops prominent are paddy, jute, sugarcane, onion, turmeric, and garlic in Bagha and Sugercane, Garlic, Paddy is prominent in Shibganj with Sugercane leading the other crops as also found out in the FGDs later that it is because of the local brown suger production nearby. Moreover, paddy production is decreasing over time while mango production is increasing over time in both of the case areas over last 10 years as found in FGD also.

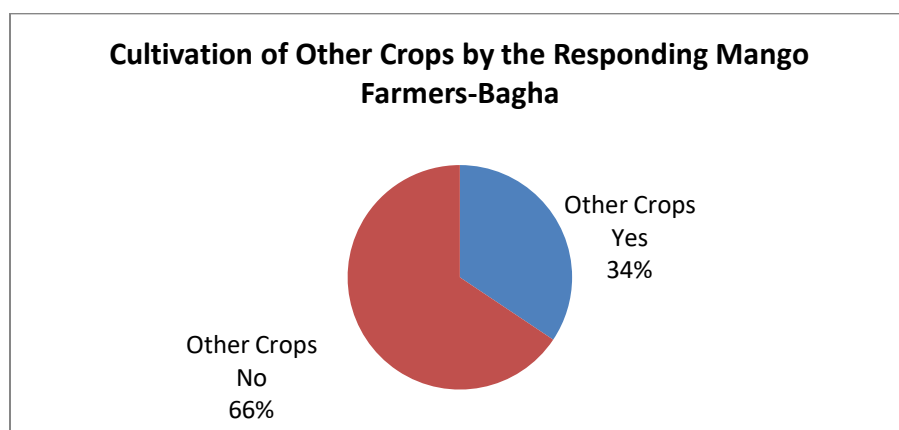


Figure 18: Other Crops Cultivated by Responding Mango Farmers-Bagha

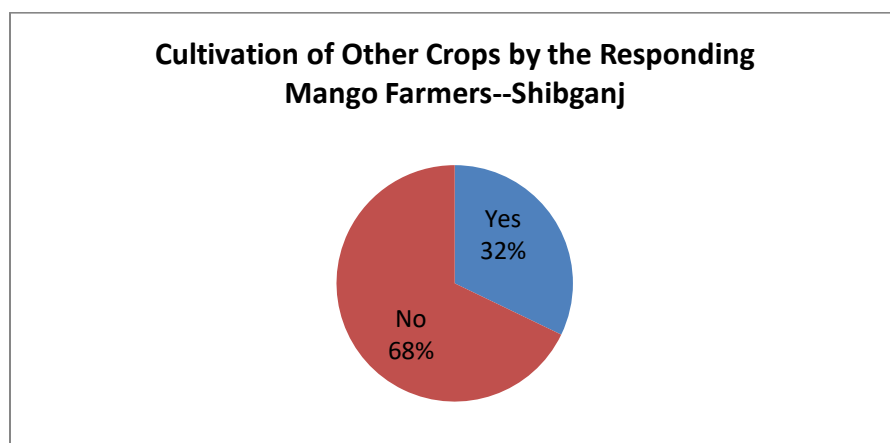


Figure 19: Other Crops Cultivated by Responding Mango Farmers-Shibganj

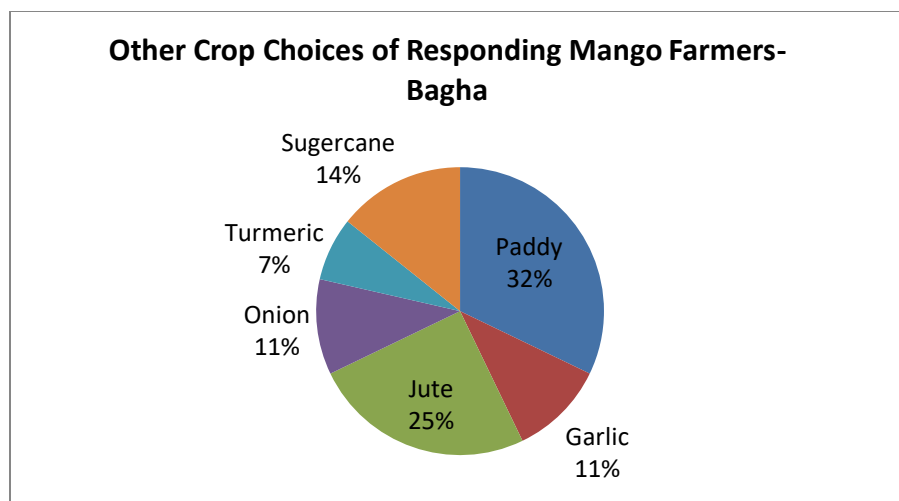


Figure 20: Other Crop Choices of Responding Mango Farmers-Bagha

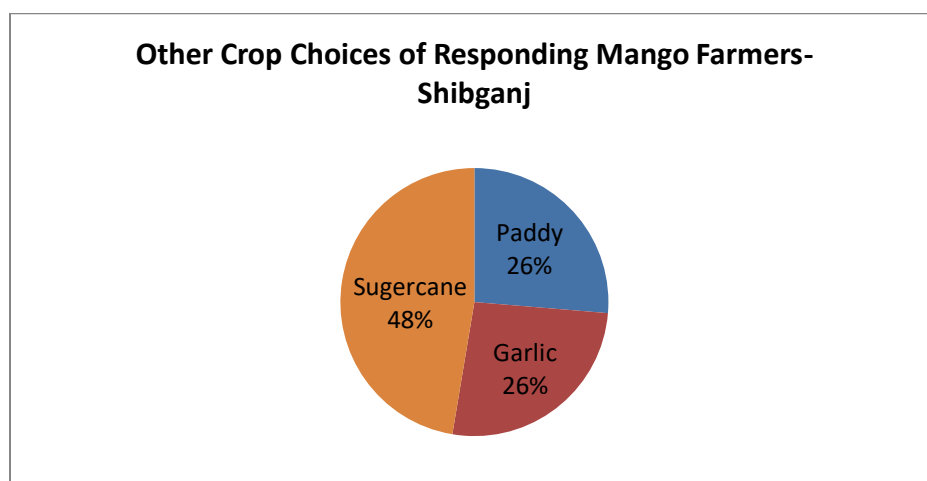


Figure 21: Other Crop Choices of Responding Mango Farmers-Shibganj

4.1.7 Other Economic Activity:

The following graphs reflect other economic activities by the responding mango farmers and it can be seen that though Mango is one of the basic economic activity there are quite half of them also participate in other economic activities.

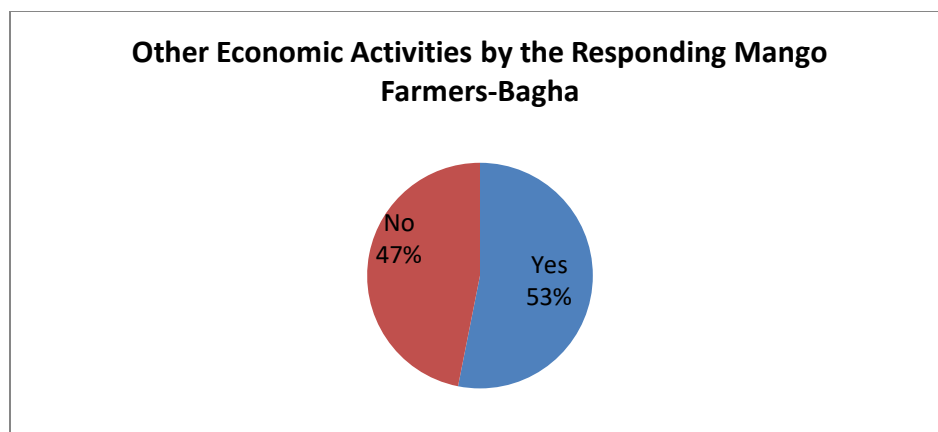


Figure 22: Other Economic Activities of responding mango farmers-Bagha

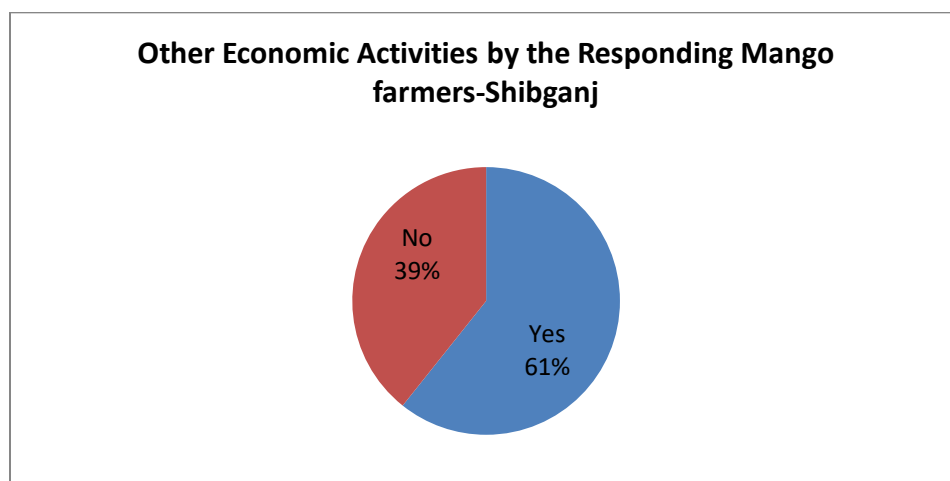


Figure 23: Other Economic Activities of Responding Mango Farmers-Shibganj

In both of the case areas large mango farmers are more (more than 60% of the large mango farmers) involved in other economic activities like job, trading, and other agricultural activities like poultry (prominent in Shibganj) and fisheries (prominent in Bagha) whereas, for responding small mango farmers; the percentage is around 50% in shibganj and less in Bagha.

4.1.8 Mango Production Status of the Respondents:

The following tables shows Share of total yearly Income from Mango (%Incom.M), Experience in Mango Production (M.Experience in years), Own Mango Production Areas, Total Mango Production Areas, Number of Mango Trees, Average Age of Mango Trees, and Total Yearly Production in Metric Tonnes.

Among the trees, there were 100 years old trees (some reported of having trees 120 years old) but those were not included when calculating average age of trees. Also the data of Bagha has one outlier kind of respondent who has very large operation of Mango and it showed a higher average of total yearly production which is also mentioned later.

Table 5 Mango Production Status of the Respondents-Bagha

All Farmers	%Incom.M	M.Experience in years	O.M.P.Area in Acre	T.M.P.Area in Acre	No. M.Trees	Ave.Age.M.T in Years	T.Y.Prod.M in MT
Average	80.2	28.1	3.45	5.86	324.7	33.6	266.1
STD	15.4	8.0	4.73	13.82	884.2	6.3	1304.0
Minimum	60	15	0.25	0.35	25	20	5
Maximum	100	50	25	77.55	5000	45	7400

N=32

Table 6: Mango Production Status of the Large Respondents-Bagha

Large Farmer s	%Incom. M	M.Experience in years	O.M.P.Area in Acre	T.M.P.Area in Acre	No. M.Trees	Ave.Age.M. T in Years	T.Y.Prod. M in MT
Ave	77.7	30.8	6.48	11.68	602.9	36.9	606.8
STD	16.4	8.0	6.36	20.72	1345.1	6.9	2041.8
Ave*	76.9	30.8	5.83	5.95	226.0	36.9	39.3
STD	17.0	9.1	6.23	6.20	255.7	6.9	52.7

N=13 *without 1 outlier (N=31)

Table 7: Mango Production Status of the Small Respondents-Bagha

Small	%Incom. M	M.Experience in years	O.M.P.Area in Acre	T.M.P.Area in Acre	No. M.Trees	Ave.Age.M. T in Years	T.Y.Prod. M in MT
Ave	81.8	26.1	1.38	1.88	134.3	31.3	32.9
STD	14.8	7.9	.58	1.16	214.3	4.7	89.1

N=19

Table 8 Mango Production Status of the Respondents-Shibganj

All Farmers	%Incom. M	M.Experience in years	O.M.P.Area in Acre	T.M.P.Area in Acre	No. M.Trees	Ave.Age.M. T in Years	T.Y.Prod. M in MT
Average	79.1	27.0	3.24	5.17	267.5	34.6	32.6
STD	18.3	8.9	2.59	5.24	354.4	6.8	45.3
Minimum	30	5	0.60	0.60	25	25	4
Maximum	100	45	10.00	22.00	1500	50	210

N=28

There were 5 small farmers who has taken leased land or leased mango garden so there production volume influenced the total yearly production of the responding small mango farmers in Shibganj too.

Table 9: Mango Production Status of the Small Respondents-Shibganj

Small Farmers	%Incom.M	M.Experience in years	O.M.P.Area in Acre	T.M.P.Area in Acre	No. M.Trees	Ave.Age.M.T in Years	T.Y.Prod.M in MT
Ave	77.9	25.0	1.52	1.60	88.0	32.9	12.4
STD	20.4	9.0	0.54	0.72	48.7	4.0	6.3

N=12

Table 10: Mango Production Status of the Large Respondents-Shibganj

Large farmers	%Incom.M	M.Experience in years	O.M.P.Area in Acre	T.M.P.Area in Acre	No. M.Trees	Ave.Age.M.T in Years	T.Y.Prod.M in MT
Ave	80	28.4	4.54	7.85	402.1	35.9	47.8
STD	17.1	8.7	2.77	5.58	423.4	8.2	55.6

N=16

The above tables show experience in Mango Production particularly from the responding mango farmer's involvement in mango production whereas they were reporting family experience is quite longer as it is a generational economic practice of this area. During the SSIs some of the respondents were telling about experience and stories of their family or generations in mango production which can be logical as mentioned earlier about very old mango trees (100 to 120 years old mango trees).

It can be also derived from the above tables of both case areas that there is large variations (larger Standard Deviation-STD than the average) in Own Mango Production Area (O.M.P.Area), Total Mango Production Area (T.M.P.Area), Number of Mango Trees, and Total Yearly Production particularly in Bagha as there was one very large mango farmer among the respondents as mentioned earlier and also shown without his inclusion (the table without the outlier). But variations in yearly production is logical for many other factors including number of trees per a standard area, age of trees, and also normally the total production of a certain tree varies year by year and the farmers reported that if one year a certain tree gives good production probability is that the next year it will produce less.

But there is another issue regarding the area under mango production and number of trees as revealed by the research team members about evidential under-representation in some cases. It was explored further in the FGDs and it was found that there was a fear among some of the mango farmers that government might start imposing tax based on the area and number of mango trees on commercial mango production.

4.1.9 Prominent Variety of Mango:

Among the mango produced in Bagha, Laxman (Laxmanvoge) is the most popular one followed by Asshini among the responding farmers as the following graphs shows but one point of caution is that the Khirsapati and Himsagar is actually same mango thus reflects third major variety among the responding

Farmers in Bagha. In case of Shibganj Khirshapati or Himsagar and Fazli is the most prominent as can be seen from the next graph among the responding mango farmers.

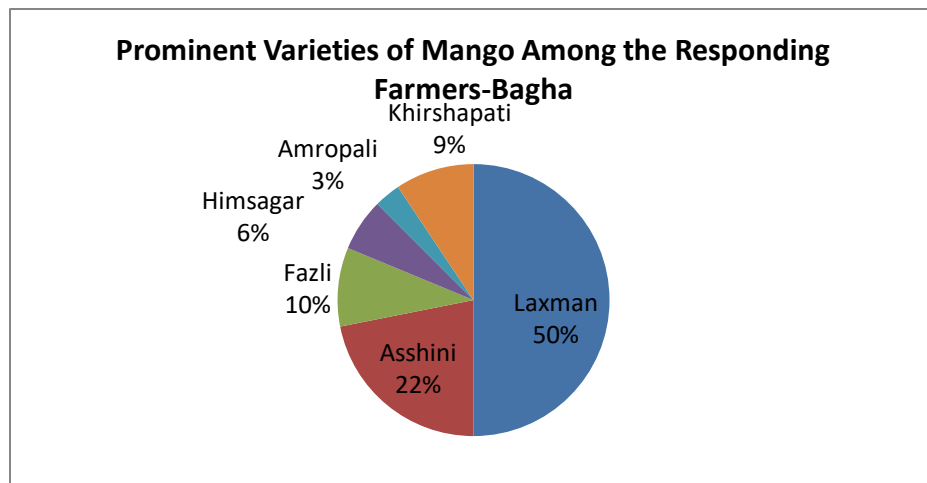


Figure 24: Prominent Varieties of Mango among the respondents-Bagha

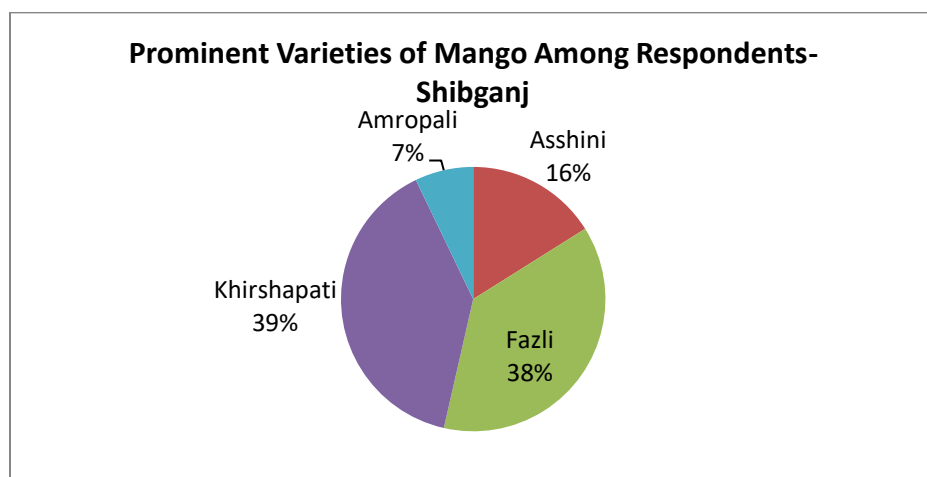


Figure 25: Prominent Mango Varieties among Respondents-Shibganj

4.1.10 Male Vs Female participation in the Mango Production:

The participation of women in mango production and marketing was not separately treated as the idea was to find out males' acknowledgement mainly on the involvement of women. Though all the respondents were male in Bagha and only two female in Shibganj, yet they acknowledge contribution of their female counterpart in the decision making on certain aspects of activities required under mango production and marketing. The following graph shows that almost one third of the respondents have combined decision making practice in Bagha but in Shibganj it is higher. Though there were two female respondents in Shibganj but they are also combined decision makers as their husbands were with them while interviewing over phone.

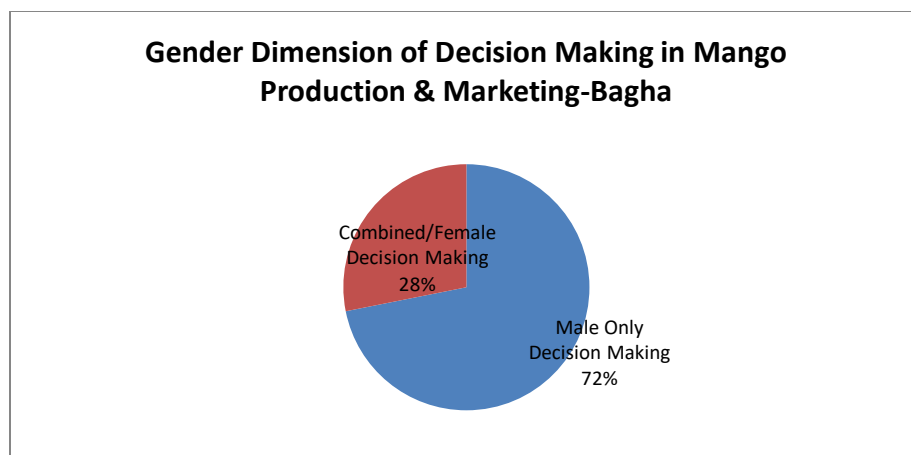


Figure 26: Gender Dimension of Decision Making in Mango Production & Marketing-Bagha

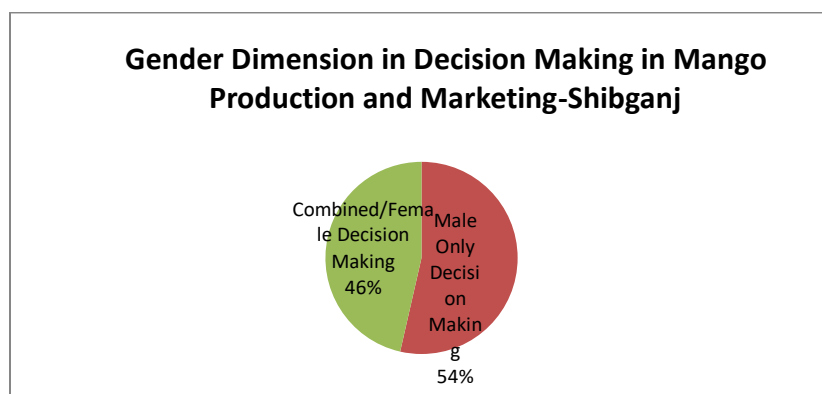


Figure 27: Gender Dimension of Decision Making in Mango Production & Marketing-Shibganj

But more combined decision making is acknowledged by the respondents of the Shibganj area as can be seen from the above two graphs.

Now, the study only focused on whether contribution of the women is recognised not whether they are also benefitted from their involvement in decision making. Moreover, it was found that most of the female contributes in maintaining, hygiene and cleanliness, post harvest management, monitoring of the labours, and also their fooding. Some female were also recognized to be present during contract farming negotiation but the number is really few.

4.1.11 Involvement of Household Members in Mango Production and Marketing:

In case of support activities from households many of the responding farmers acknowledged the contribution of their family members like the Spouse and also the Children as shown in the graphs below both in case of Bagha and Shibganj and Shibganj area showed more participation from household members than Bagha.

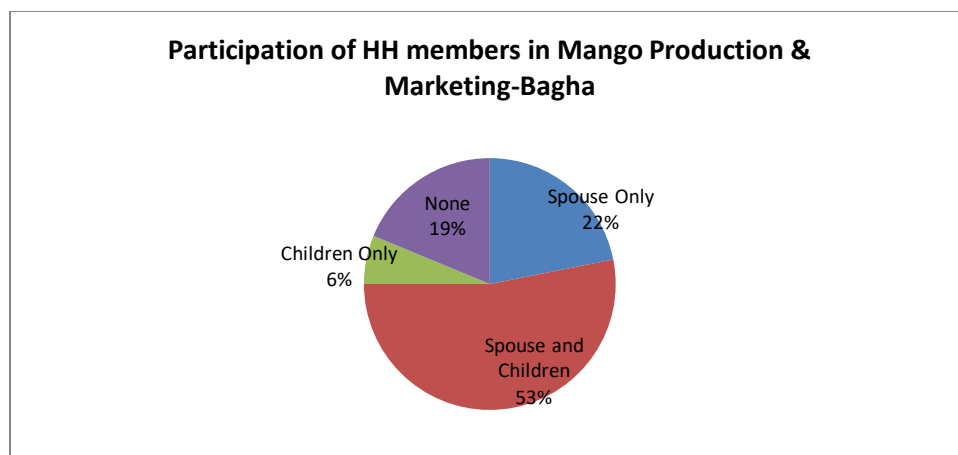


Figure 28: Participation of HH members in Mango Production & Marketing-Bagha

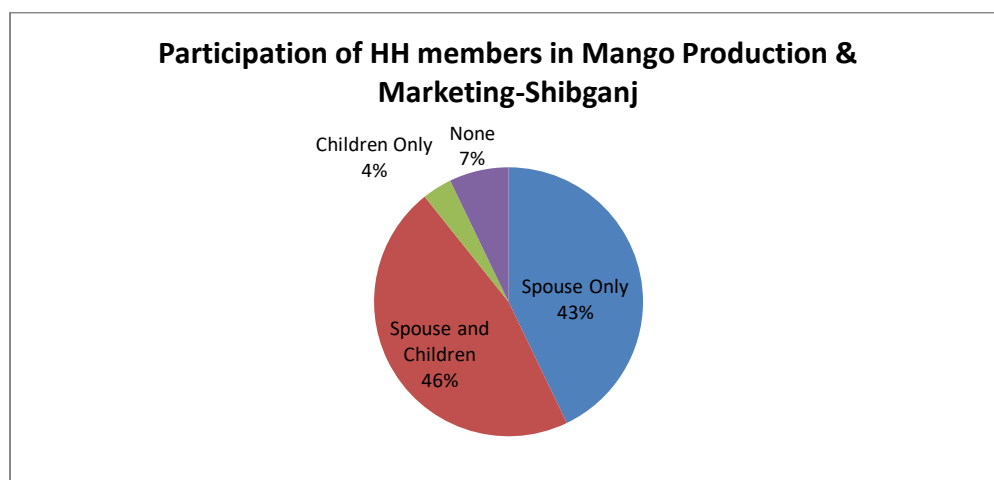


Figure 29: Participation of HH members in Mango Production & Marketing-Shibganj

In summary, it can be said that all the respondents of the mango farms is male dominated meaning all the selected mango farmers (no female mango farmer was found in Bagha and only two were found in Shibganj though they were also engaged alongwith their husband) in both of the case areas were male and it is the main cash crops also. But, in both case areas quite a large number of the respondents were engaged in other economic activities as well as cultivating other crops. But shibganj showed more concentration in Mango Production than Bagha in terms of other crops.

The average age of the respondents both in Bagha and Shibganj was around 48 years (with an standard deviation of around 10 in Bagha and 7 in Shibganj) but mostly the respondents were mid-aged (35 to 45) to older (above 45) and in terms of educational status mostly are educated as below SSC (Class 6 to 10) and SSC above combined is almost 50% of the respondents that denotes quite educated farmers are involved in mango production.

4.2 Awareness, Knowledge, Experience, and Perception about GlobalGAP

4.2.1 Awareness on GlobalGAP

Among the respondents in Bagha very few (16%) heard or knows about GlobalGAP but of course members of the exporters' association who had participated in the FGDs stated clearly that the other members of their association are also aware of GlobalGAP and have some basic knowledge about it. But almost all of them (the association members) expressed need of more information regarding GlobalGAP. As source of information everyone in Bagha mentioned about local extension office and only one case about a development partner.

In case of Shibganj, the scenario is better as almost half (46%) of the respondents are aware of GlobalGAP but again it is may be for there were quite a number of respondents who are members of a farmers' organization. This can also be for this region was selected by several programs which is also confirmed in the FGDs, KIIs (DAE, CDAIS, Solidaridad, HORTEx), and secondary information. Obviously, some (31%) of the respondents were able to mention about development partners as there source of information about GlobalGAP.

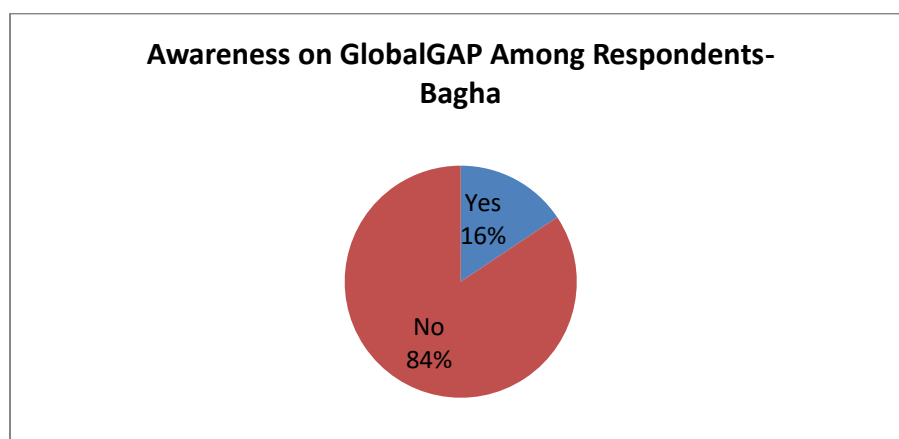


Figure 30: Awareness about GlobalGAP among responded mango farmers-Bagha

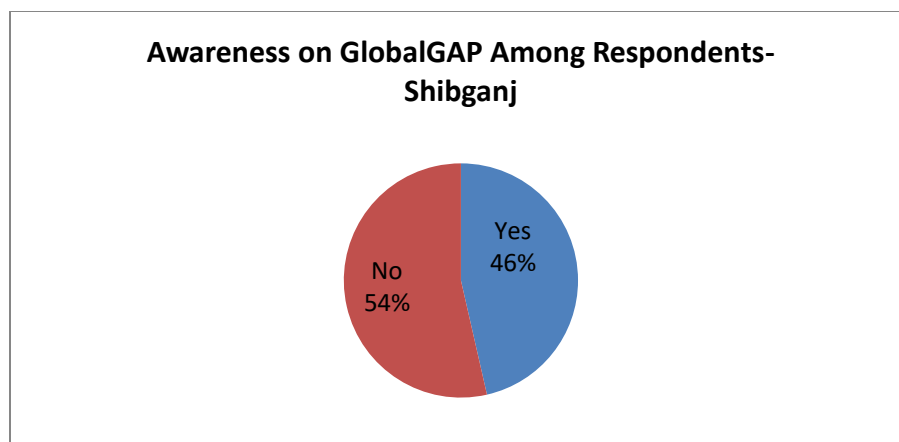


Figure 31: Awareness about GlobalGAP among responded mango farmers-Shibganj

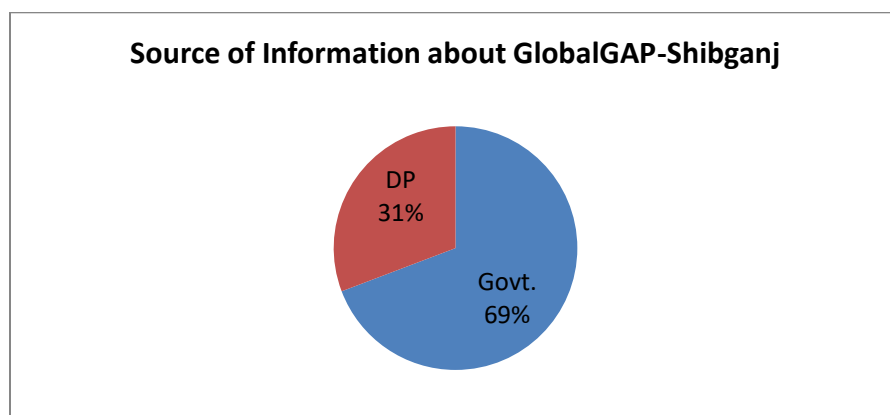


Figure 32: Source of Information about GlobalGAP-Shibganj

4.2.2 Need of Information regarding GlobalGAP

Need of more information reflects eagerness and desire to know as well as knowledge gap of the respondents. Around two thirds of the respondents (66% in Bagha and 71% in Shibganj) expressed need of information regarding GlobalGAP whereas one third in Bagha and one fourth in Shibganj expressed “Don’t Know” which means that they are also not sure whether GlobalGAP will be beneficial for them, which are reflected in the following graphs. Striking is in Shibganj one of the respondents mentioned “no” clearly reflecting kind of reluctance that came from probably demotivation from not getting the expected benefit actually or some other reasons which is also confirmed in the FGDs.

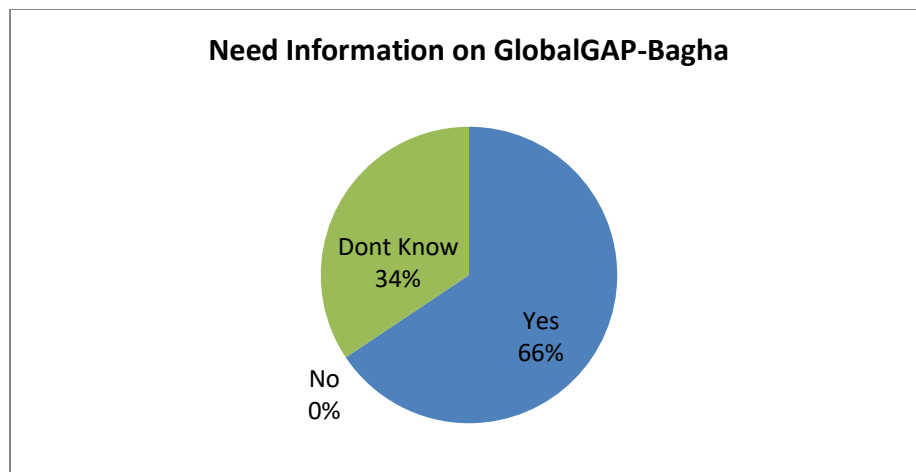


Figure 33: Need of Information about GlobalGAP among respondents-Bagha

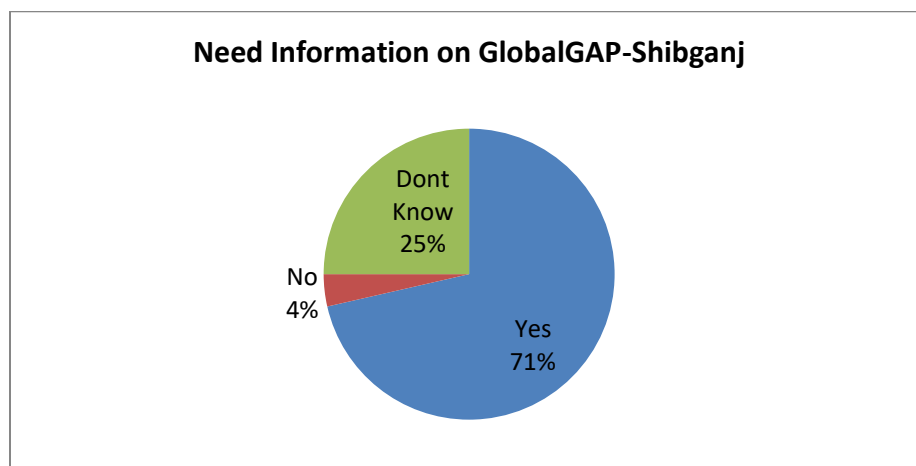


Figure 34: Need of Information about GlobalGAP among respondents-Shibganj

4.2.3 Type of Information needed regarding GlobalGAP:

It actually reflects also some knowledge level of the respondents when someone mentioned that he needed specific information. In the probing questions followed the respondent showed which specific areas they need information about. Three of the respondents actually mentioned about Risk Assessment and MRL in Bagha, and 6 in Shibganj.

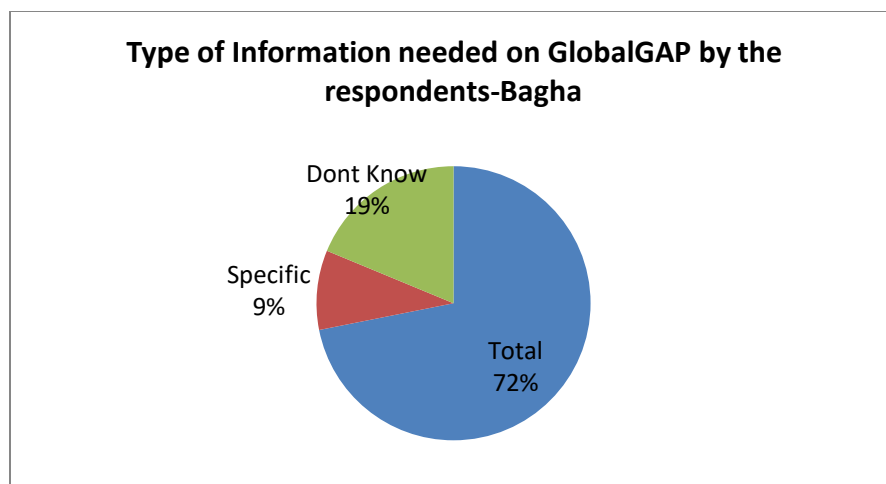


Figure 35: Type of Information Needed on GlobalGAP by the responded mango farmers-Bagha

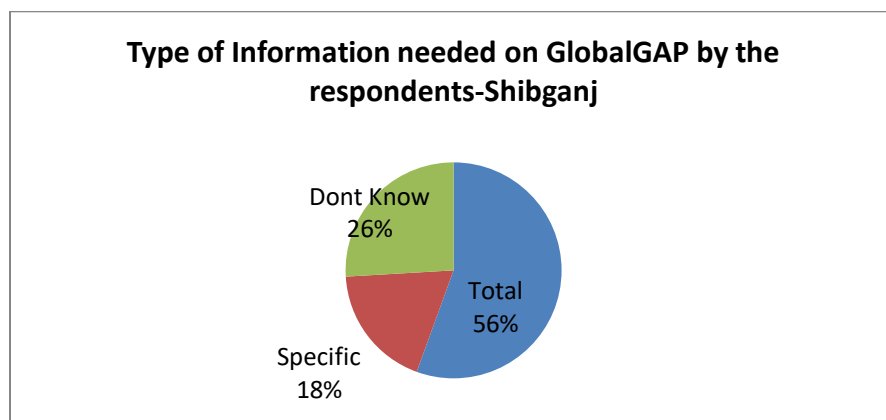


Figure 36: Type of Information Needed on GlobalGAP by the responded mango farmers-Shibganj

In the above graphs (Fig:28 and the above Fig: 30) about Shibganj one particular respondent found to be reluctant about GlobalGAP only for his age and demotivation relating export experience over the past years and his response was coded as “Dont Know” under the Type of Information needed.

4.2.4 Participation in GlobalGAP related previous activities

Participation in GlobalGAP related previous activities express some direct experience about GlobalGAP whether it is awareness building workshop or training or practical exposures. Among the respondents around 10% in Bagha 25% in Shibganj has participated in some previous programs. The number is higher in Shibganj probably because it was targeted specially by several of the past efforts.

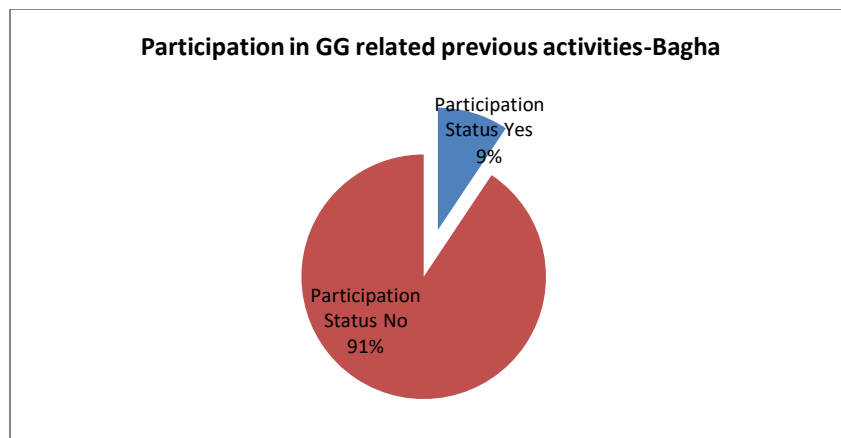


Figure 37: Participation of the respondents in GlobalGAP related previous activities-Bagha

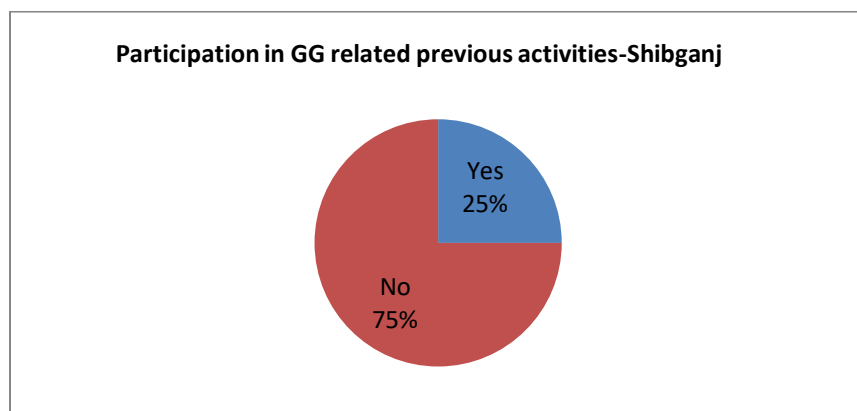


Figure 38: Participation of the respondents in GlobalGAP related previous activities-Shibganj

4.2.4 Overall Perception about GlobalGAP:

Two thirds of the sample responded positively when asked whether GlobalGAP will be beneficial for them but none have said “No” probably again for there is no long term experience in this regard in the case areas neither in Bangladesh in general. One third expressed they “don’t know” again from the lack of knowledge about GlobalGAP.

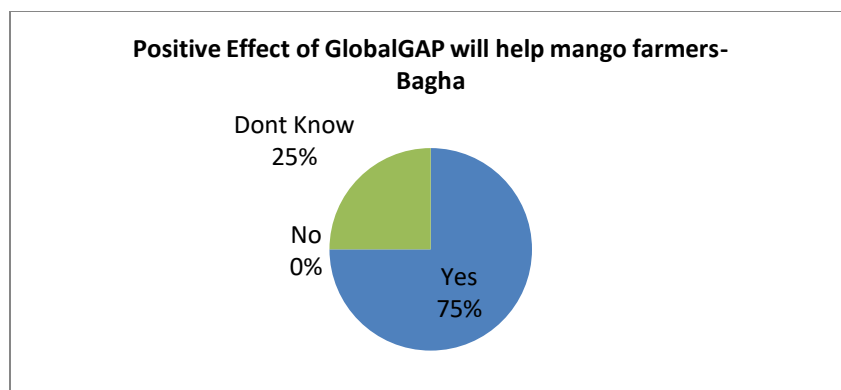


Figure 39: Perception of the responded mango farmers about benefit of GlobalGAP-Bagha

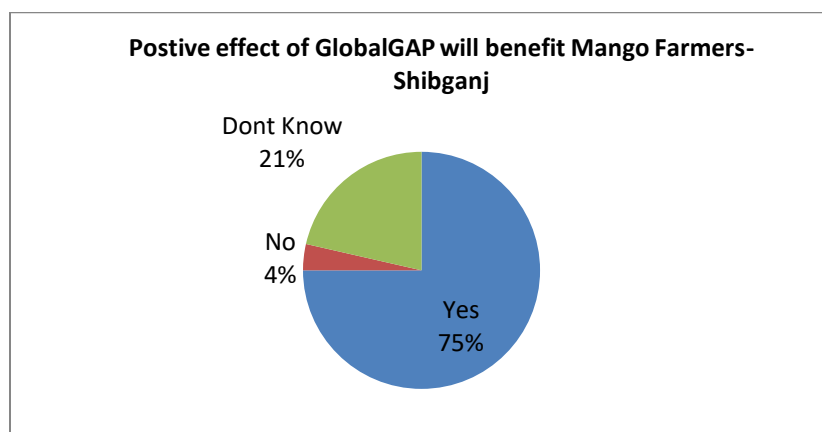


Figure 40: Perception of the responded mango farmers about benefit of GlobalGAP-Shibganj

Responded mango farmers mentioned about, better price, better market access, better image, contribution to the safe food, but also achieving new skills as the benefit of GlobalGAP.

4.2.5 Participation in GlobalGAP or relevant Trajectory:

This section sheds light on the readiness of the responding mango farmers to participate in the GlobalGAP trajectory as it shows their level of participation in GlobalGAP relevant quality and safety measures even they are not adhering directly to the GlobalGAP norms. The areas of participation are given in the subsequent graphs

4.2.5.1 View and Practice of Quality & Safety Issues in general:

A large portion of the respondents in both of the case areas (78% in Bagha and 86% in Shibganj) viewed positively about maintaining quality and safety issues in mango production and marketing irrespective of their ignorance or limited knowledge about GlobalGAP. Many of them do maintain certain aspects of the quality and safety issues that are also relevant to implementation of GlobalGAP as shown below in the graphs on “how far the respondents practice” and termed as “partial” and “total” implementation.

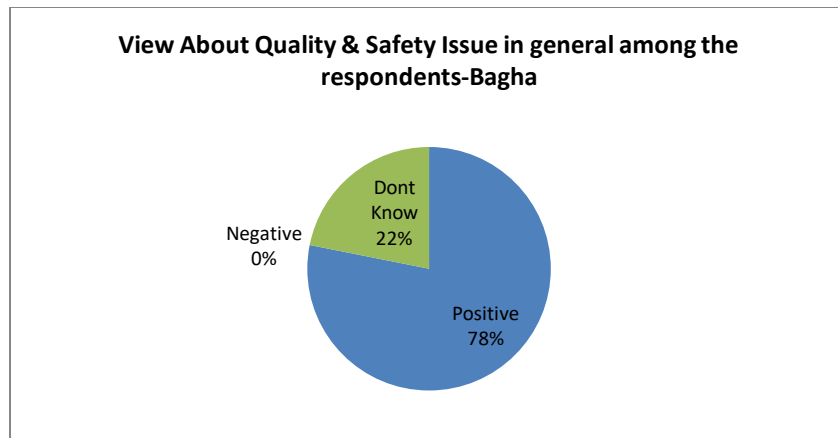


Figure 41: View about Quality & Safety Issues in general among the respondents-Bagha

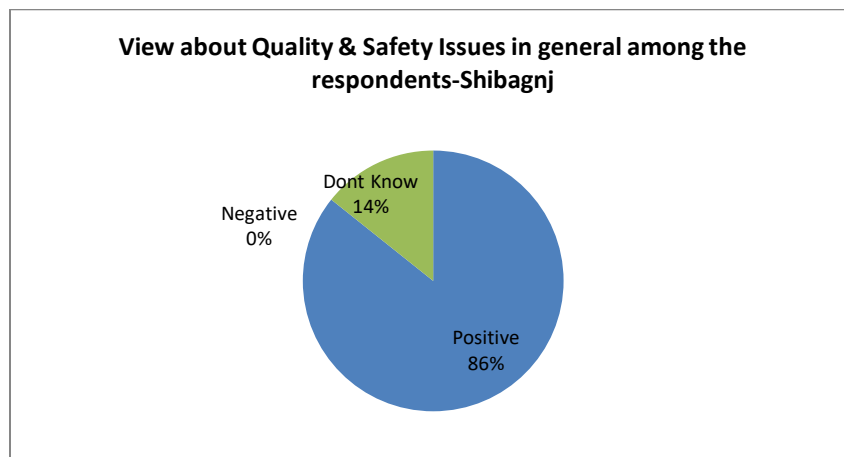


Figure 42: View about Quality & Safety Issues in general among the respondents-Shibagnj

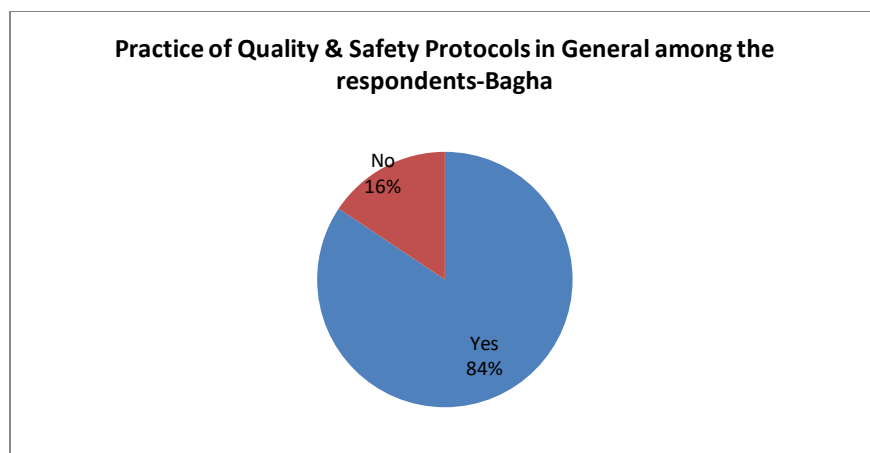


Figure 43: Practice of Quality & Safety Protocols in General among the respondents-Bagha

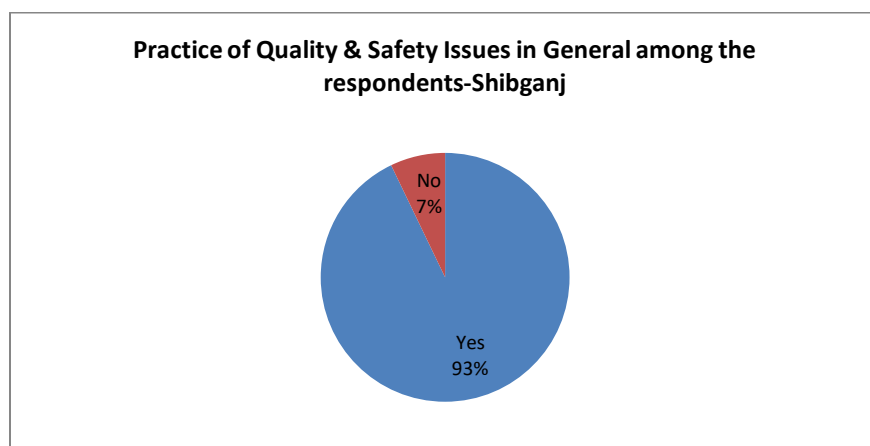


Figure 44: Practice of Quality & Safety Protocols in General among the respondents-Shibganj

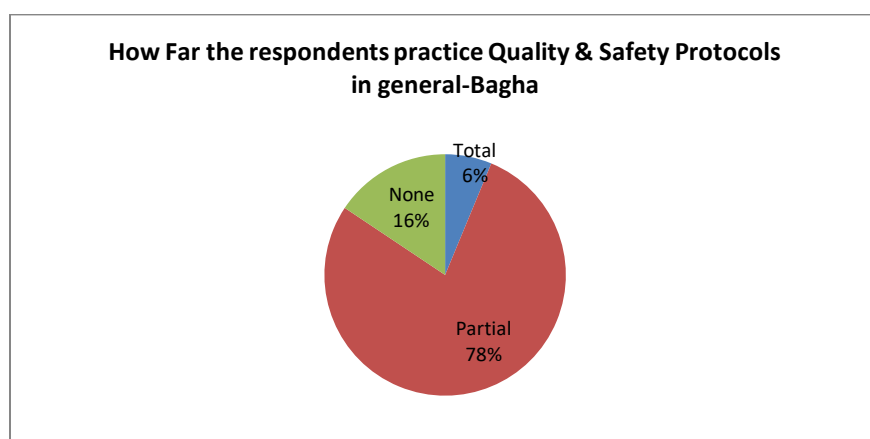


Figure 45: Level of Practice of Quality and Safety measures in general among responded mango farmers-Bagha

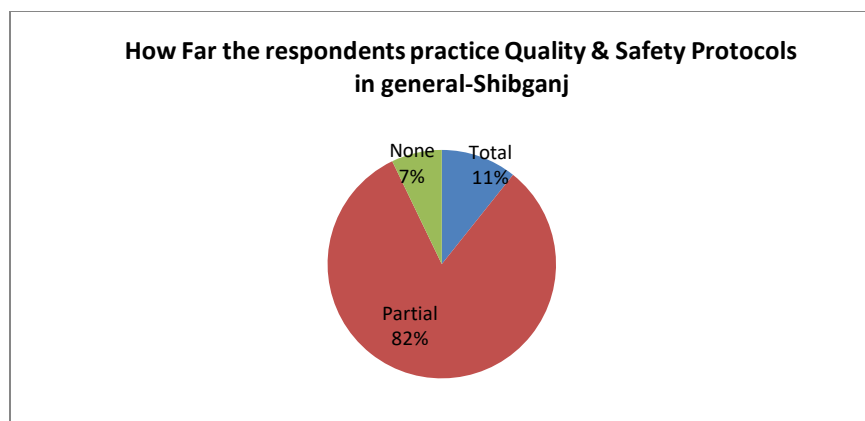


Figure 46: Level of Practice of Quality and Safety measures in general among responded mango farmers-Shibganj

So, the above three graphs combined tell us that a large portion of the responded mango farmers are in fact aware and view positively about the importance and benefits of maintaining different quality and safety issues in general and many (84% and 93% respectively in Bagha and Shibganj) at least responded “yes” whether they practice or not? 7% in Bagha and 11% of the respondents in Shibganj use almost all aspects of quality and safety measures thus they are labelled as “Total” under how far the respondents practice quality and safety measures in general.

4.2.5.2 Data Record and Management:

Though quite a large portion of the respondents (72% in Bagha and 68% in Shibganj) expressed their understanding about the importance of maintaining data records in both case areas but in actuality around 20% in Bagha and 32% in Shibganj maintain data records as shown in the following graphs.

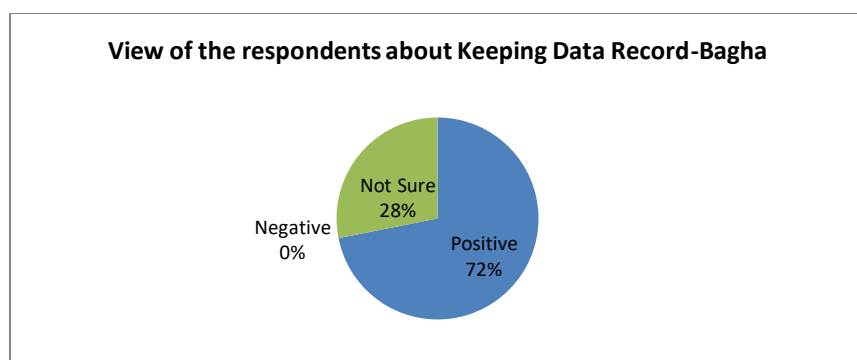


Figure 47: View of the respondents about keeping Data Record-Bagha

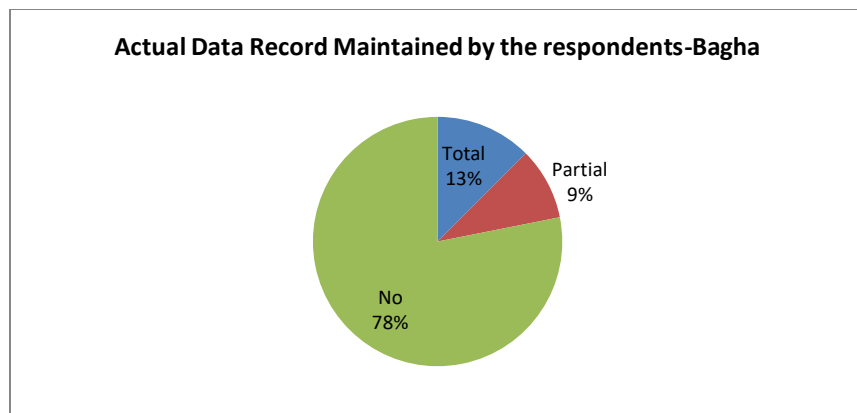


Figure 48: Actual Data Record maintained by the respondents-Bagha

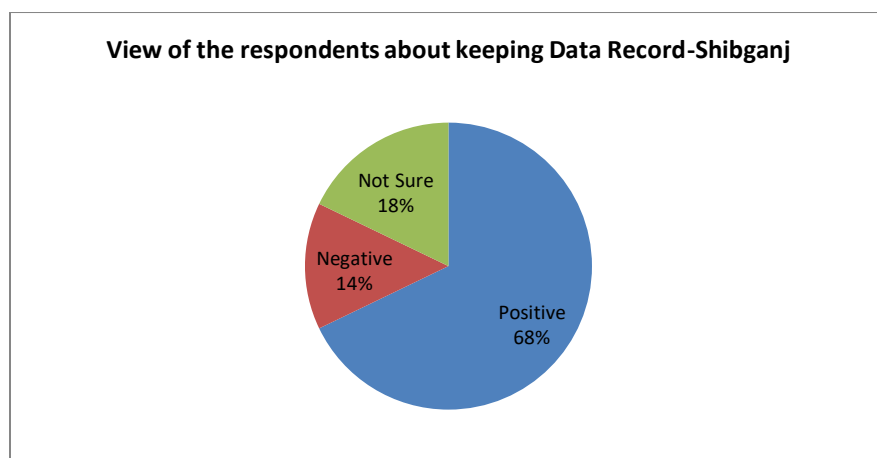


Figure 49: View of the respondents about keeping Data Record-Shibganj

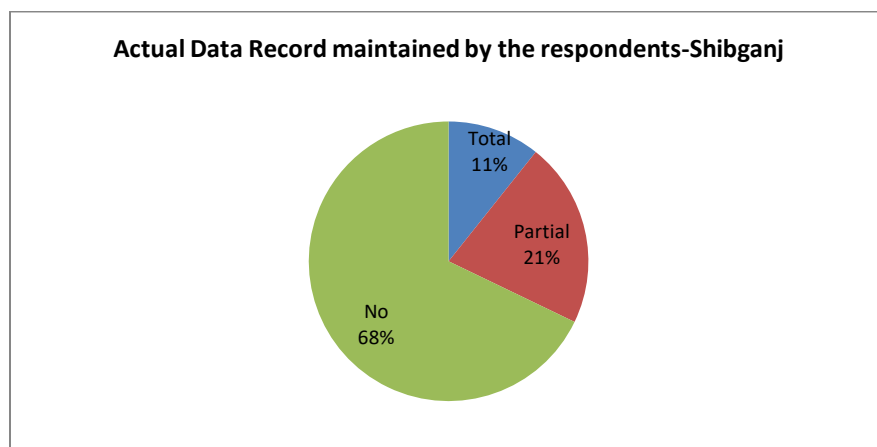


Figure 50: Actual Data Record maintained by the respondents-Shibganj

One surprising fact is the total data record maintaining in Bagha is more than partial data record maintaining which has actually different meaning in the sense that the respondents who has link with exports' association were given log books and they all maintain those and responded as maintaining

total records. On the other hand, lower level of positive response in Shibganj on both aspects about data record seems surprising as on many other parameters shibganj respondents have shown better performance. Probable reason of this seemingly contradictory picture is explained here based on the findings from FGDs of both of the areas. The FGDs revealed a kind of fatigue and frustrations among the responding mango farmers of Shibganj for not having the expected benefits though many times different programs and projects were tried there. All most all of the participants in all of the FGDs showed high optimism about GlobalGAP like standards and export markets but particularly the participants in Shibganj FGDs have gravely expressed concerns that they were motivated and many of them took measures to improve their performances but now they are becoming frustrated. Because it has already changed their habits and increased their costs but the expected benefits are not coming.

4.2.5.3 Fertiliser and Chemical Practice:

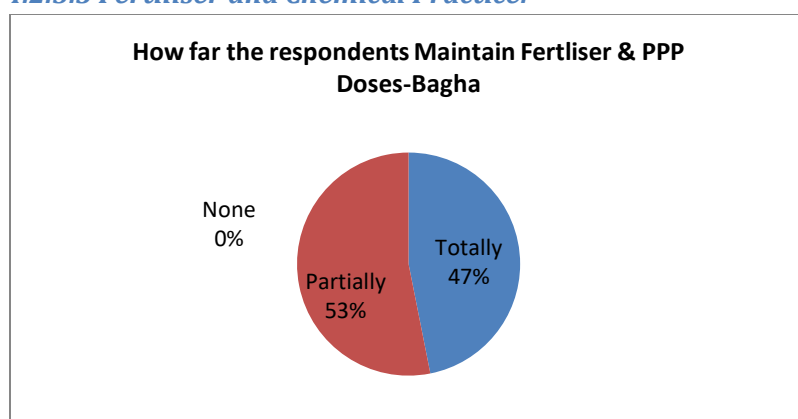


Figure 51: Adherence to doses of Fertiliser & Plant Protection Products (PPP) by the respondents-Bagha

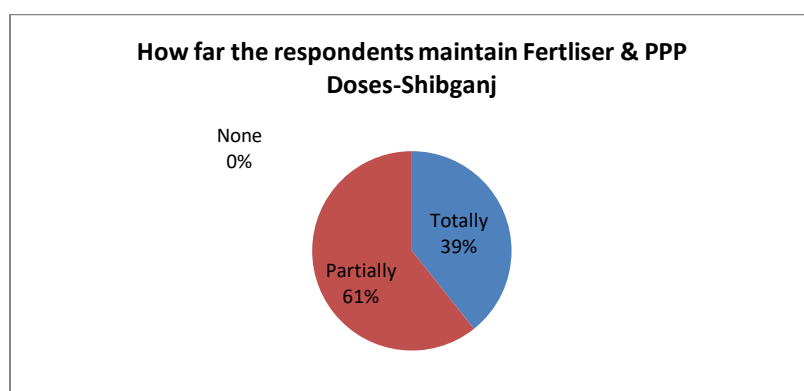


Figure 52: Adherence to doses of Fertiliser & Plant Protection Products (PPP) by the respondents-Shibganj

In both of the case areas, everyone among the responded mango farmers has shown their consciousness about importance of using proper doses of chemicals, insecticide, pesticides, etc but not all of them are yet to maintain totally as shown in the above graphs.

4.2.5.4 Treatment of Empty Containers/Cans of the Chemicals:

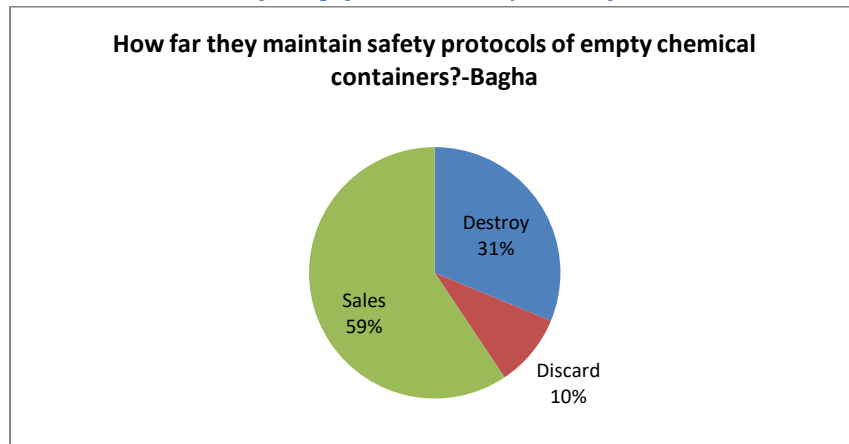


Figure 53: Adherence to Safety protocols of Empty Chemical Containers among respondents-Bagha

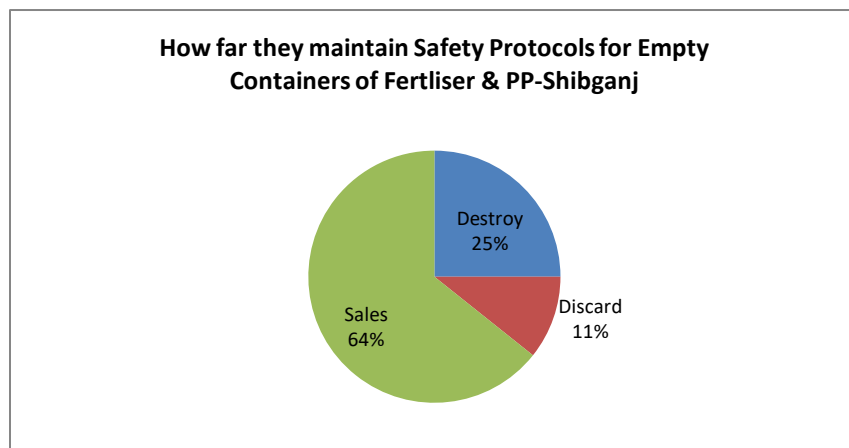


Figure 54: Adherence to Safety protocols of Empty Chemical Containers among respondents-Shibganj

Among the respondents who sales the empty containers can be termed as less conscious about the correct treatment of the empty containers but they explained in the FGD that cleaning is done before selling. And respondents of Shibganj showed more sales of the empty containers than Bagha. And around 10% of the respondents in both of the case areas discard the containers presumably without much treatment and concerns for the environment as well as living beings.

4.2.5.5 Hygiene and Cleanliness:

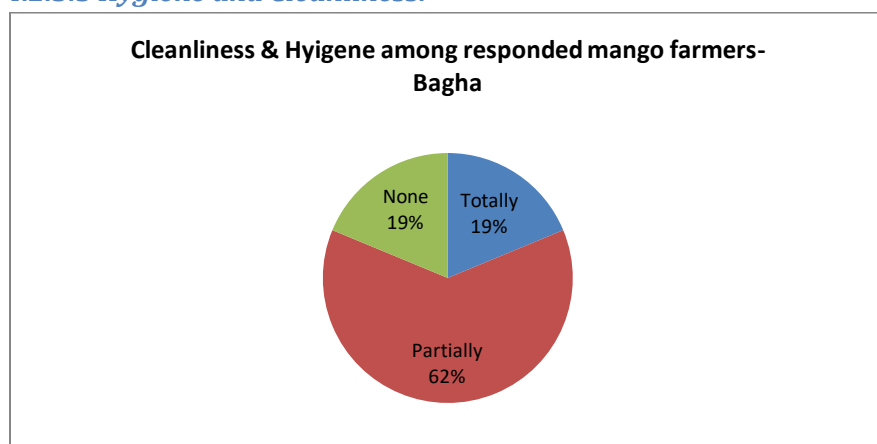


Figure 55: Cleanliness & Hygiene among responded mango farmers-Bagha

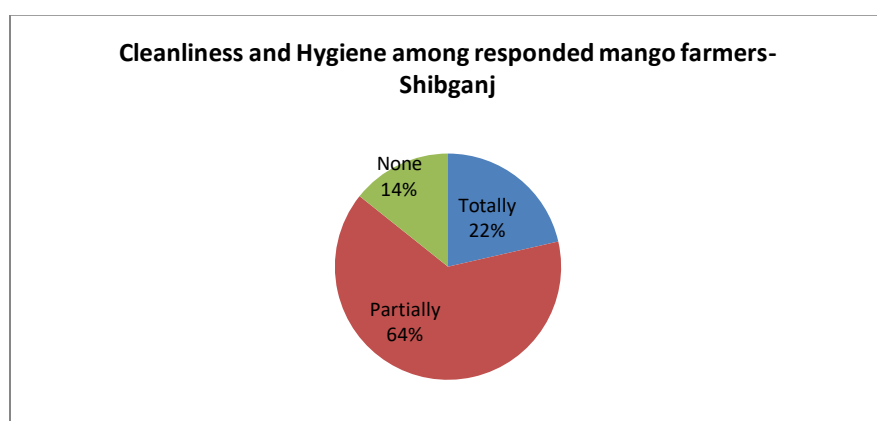


Figure 56: Cleanliness & Hygiene among responded mango farmers-Shibganj

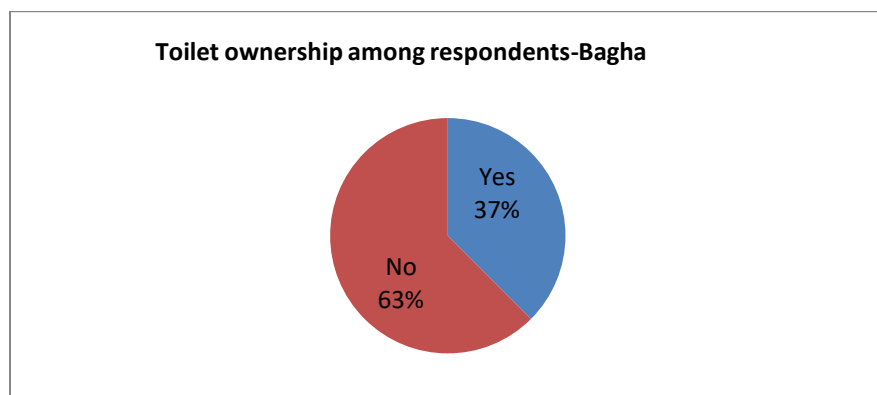


Figure 57: Toilet ownership among respondents-Bagha

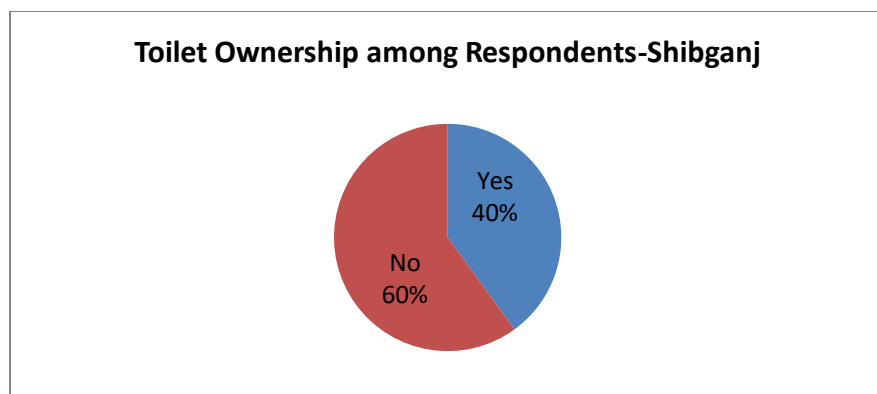


Figure 58: Toilet ownership among respondents-Shibganj

About Hygiene and Cleanliness both case areas showed good performance in maintaining toilets (36% in Bagha and 40% in Shibganj) and water (not shown in the graphs but have higher accessibility in both areas as also required for the orchards, but concerns about water quality was expressed in FGDs) by the responding mango farmers and it is slightly better in Shibganj with less in the “None” category who doesn’t or cannot maintain any cleanliness and hygiene.

4.2.5.6 Quality and Safety in terms of maintaining MRL:

Traditionally many tries to maintain some of the measures of quality and safety but about MRL testing there is none in any of the case areas. So, to conclude on MRL, the certificate holders are aware and also know that the exporters are supposed to test their mangos for MRL. But in reality there is no MRL testing at the farmers’ end, neither there is any lab facility in any of the case areas to test MRL or even Water Quality.

4.2.5.7 Certification:

There is no single GlobalGAP certificate for Fresh Fruits like Mango at the farmers’ end in any of the case areas, but there is probably a group certification under the Mango Exporters’ Association and among the respondents 12% in Bagha and 25% in Shibganj said that they were certified but it was revealed later in the FGDs and KIIs that those were actually Quarantine and Phytosanitary certificates issued by the Plant Protection Wing of the Department of Agricultural Extension within the Ministry of Agriculture for all horticultural crops exported from the country (Hossain, 2007).

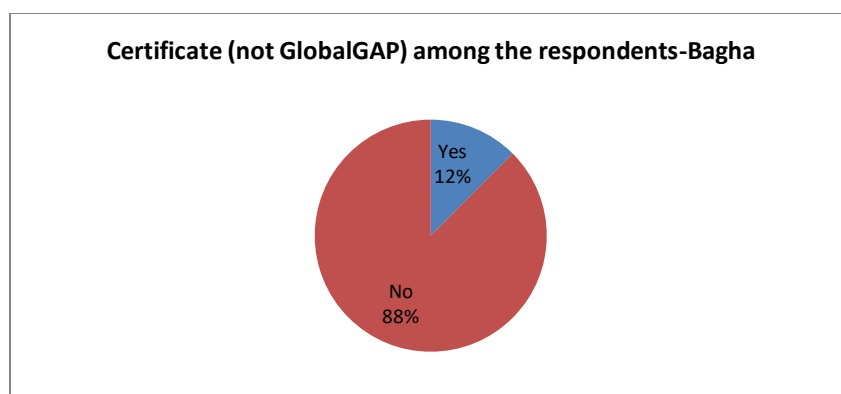


Figure 59: Certificate among the responded mango farmers-Bagha

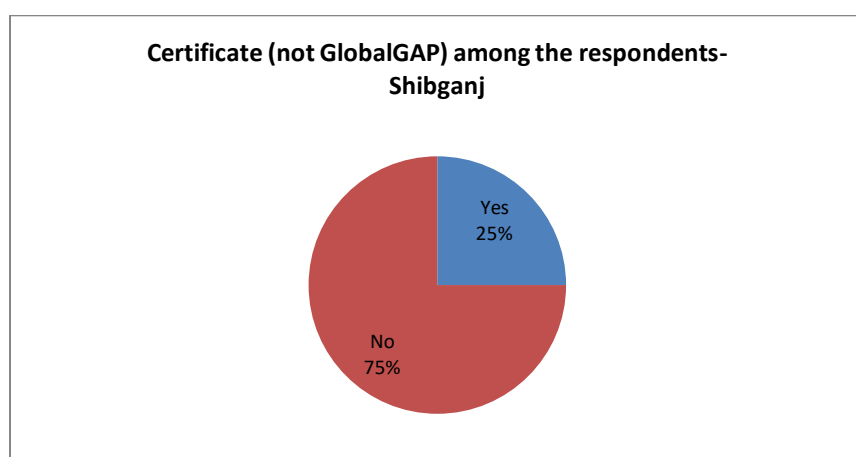


Figure 60: Certificate among the responded mango farmers-Shibganj

4.3 Status of Livelihood Resources of Responding Mango Farmers:

(Among Physical assets Toilet data was collected and shown under Hygiene & Cleanliness under 4.2.5.5)

4.3.1 Availability, Accessibility, Use, and Adequacy of Financial Credit:

In general, there has been quite a development in terms of availability of financial credit and loan facilities from local government and private banks, financial institutions, micro credit programmes of NGOs, but accessibility specifically for mango production is not that good as can be seen from the subsequent graphs on Use of Financial Credit for Mango for both the case areas.

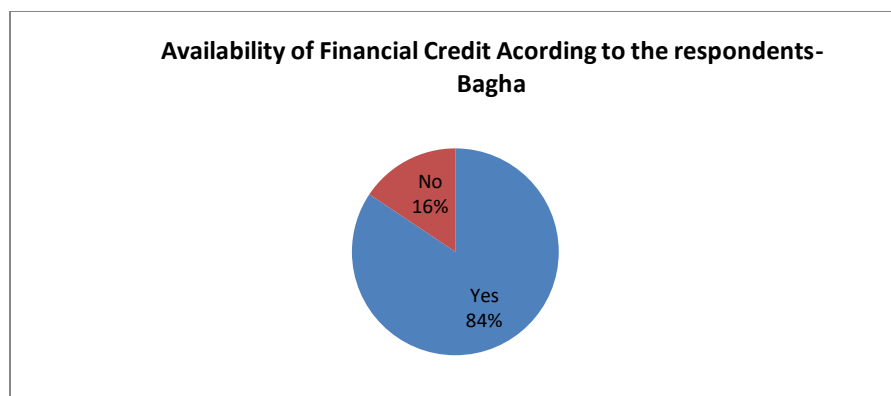


Figure 61: Availability of Financial Credit According to the respondents-Bagha

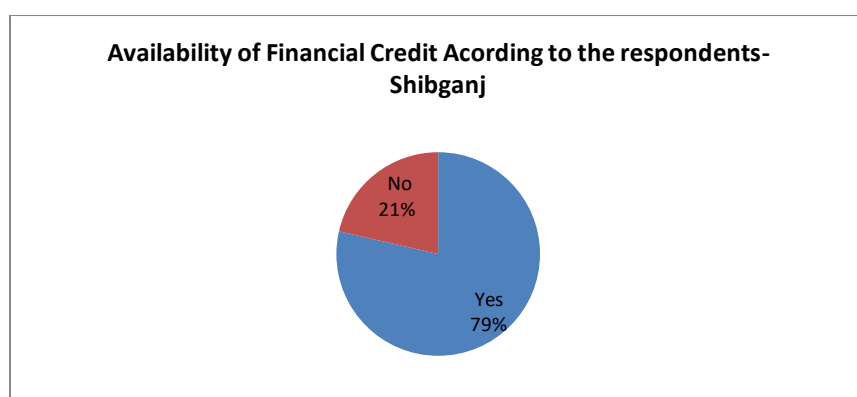


Figure 62: Availability of Financial Credit According to the respondents-Shibganj

Most of the responding farmers agreed that there is financial accessibility but as can be seen from the graphs below; comparatively not many have utilized the credit or loan facilities specifically in Bagha for several reasons described later under discussion.

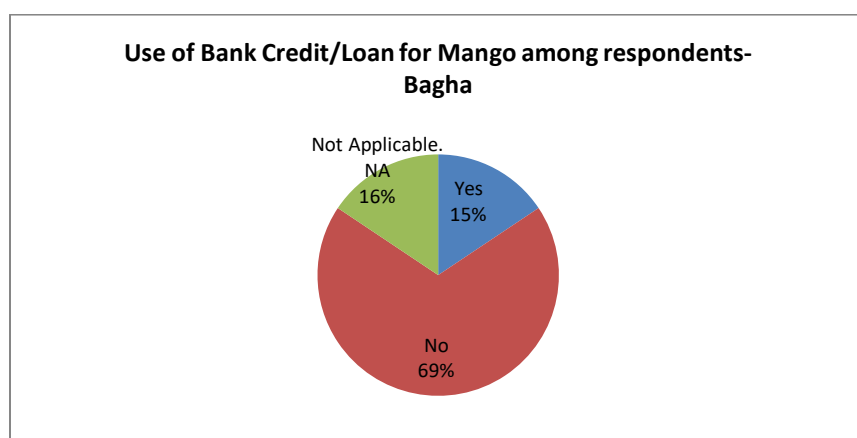


Figure 63: Use of Bank Credit/Loan for Mango among respondents-Bagha

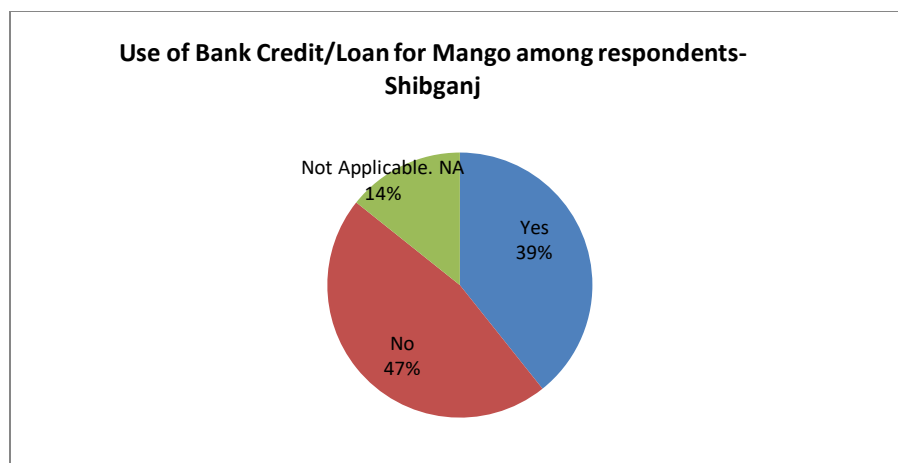


Figure 64: Use of Bank Credit/Loan for Mango among respondents-Shibganj

About adequacy everyone in both the case areas have said that it is not adequate as the loan has an upper limit (like BDT 1,00,000 to 1,99,000 that might stands around approximately 1100 to 2100 Euro), is seasonal and covers different season than mango and cannot be used officially for Mango Production.

4.3.2 Use of Mobile and Internet:

All (100%) the respondents of both of the case areas use mobile and they expressed explicitly that mobile helped them in many ways in mango production and marketing which is detailed in discussion. Almost one third of the respondents use internet but only some uses it for the mango production and marketing in case area Bagha whereas this picture seems comparatively better among the respondents of Shibganj area where more than 50% use internet and also quite a large number among them use internet for Mango production and marketing related purpose.

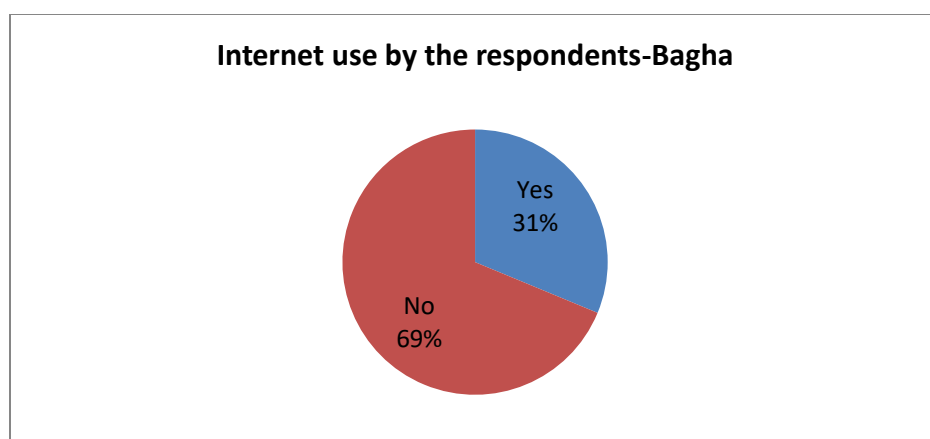


Figure 65: Internet Use by the Responded Mango Farmers-Bagha

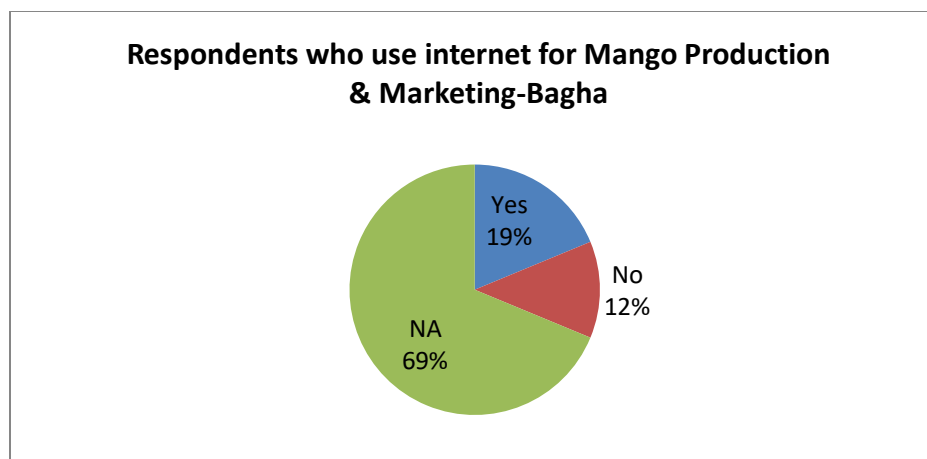


Figure 66: Respondents who use internet for Mango Production & Marketing-Bagha

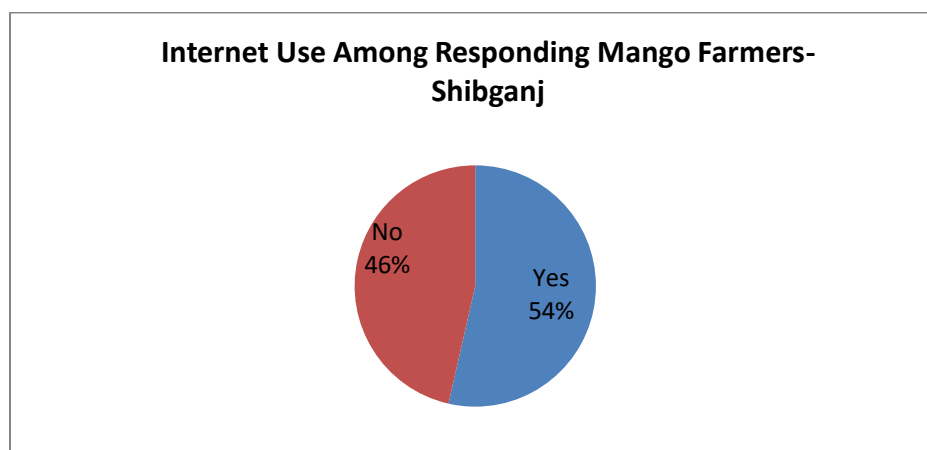


Figure 67: Internet Use by the Responded Mango Farmers-Shibganj

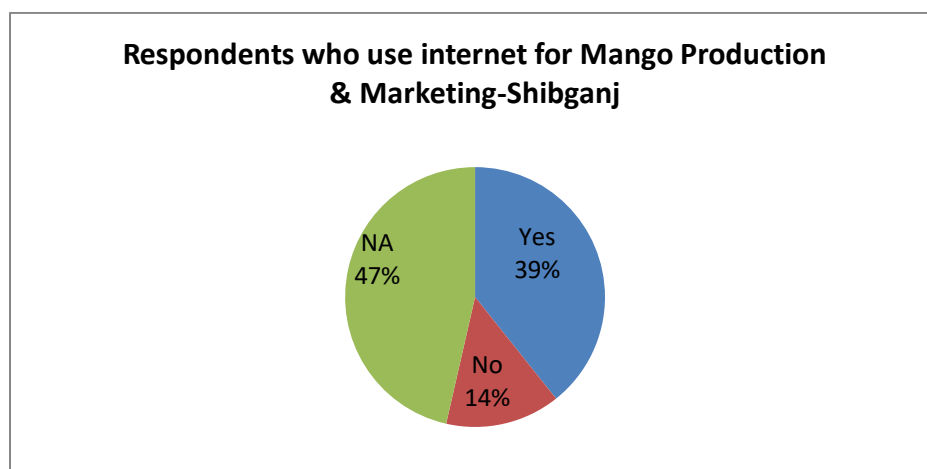


Figure 68: Respondents who use internet for Mango Production & Marketing-Shibganj

4.3.3 Contract Farming Agreement

About one fourth of the responding mango farmers in Bagha and one third in Shibganj have contract farming agreement that can be said as one step for participating in the GlobalGAP trajectory as without confirmed sale with a better price there will be less motivation among the mango farmers to participate in the GlobalGAP trajectory. This particular factor is also important as part of the Social Resource under the Livelihood Assets.

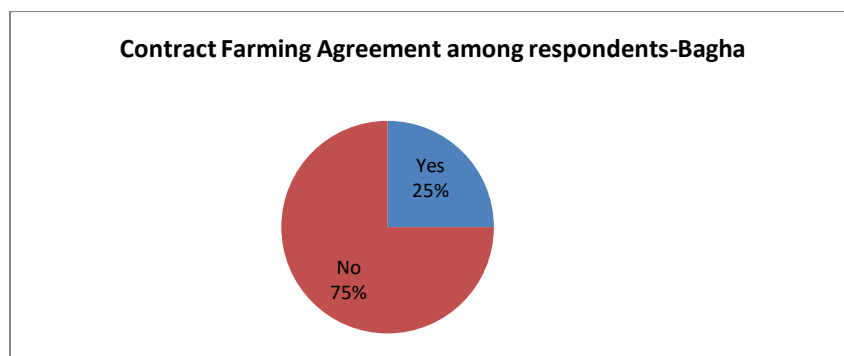


Figure 69: Contract Farming Agreement among respondents-Bagha

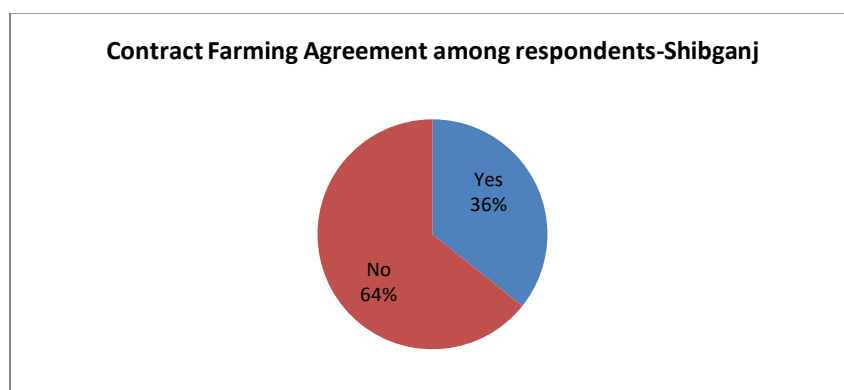


Figure 70: Contract Farming Agreement among respondents-Shibganj

Further on this point, as contract farming is getting popularity in the areas but it has a weakness as found in the FGDs that the contracts mostly are made on company pad or white papers instead of stamp papers which is not enforceable by laws.

4.3.4 Membership in Farmers' Organizations or Associations

But involvement in Farmers' Organization that are supportive for production and marketing were not many (only 12%) in Bagha like Shibganj where almost half (43%) of the respondents are members. It may also reflect that the farmers of Bagha who were linked with the exporter's association were less active in organizational sense than the respondents of the growers' association in Shibganj as the organization is owned by them. And, it should be noted also that to the research team members it seemed that members of growers association in Shibganj were more active and cooperative during the interviews and FGDs than the respondents of Bagha who were registered with the exporter's association which is in Dhaka.

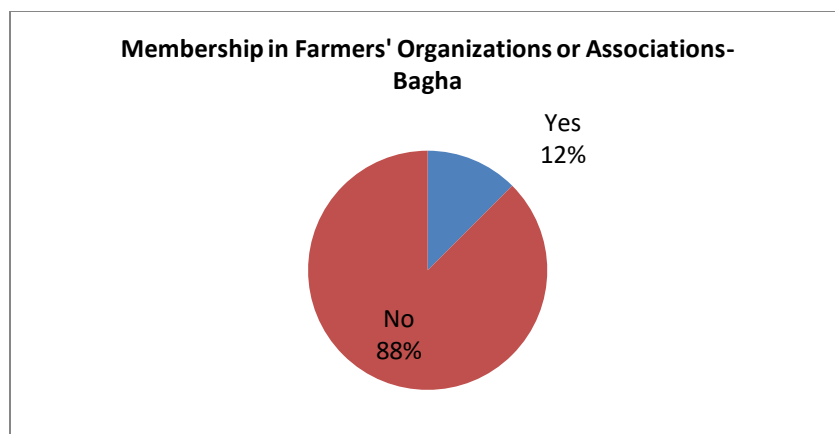


Figure 71: Membership in Farmers' Organizations or Associations-Bagha

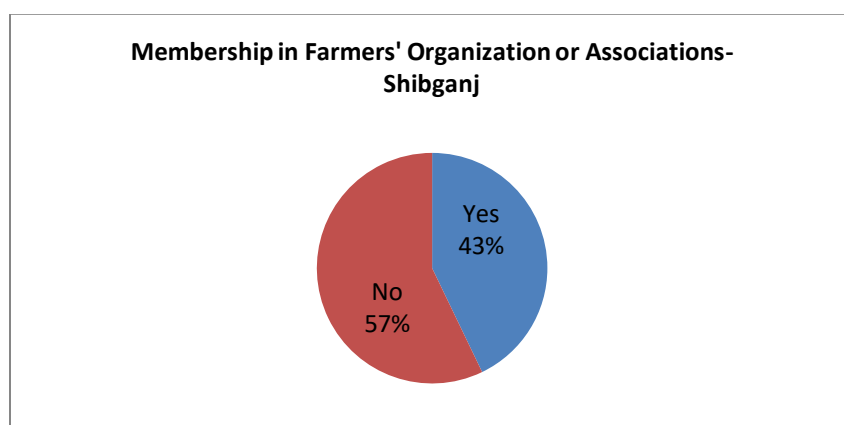


Figure 72: Membership in Farmers' Organizations or Associations-Shibganj

Another contrasting picture was found about female participation in the associations and it was seen that the female in Shibganj areas seems more active as well as more acknowledged by the male counterparts than the Bagha case area about their contribution in mango farming and marketing. But this point can also be a nice area for future studies.

4.4 Findings from the FGDs

4.4.1 Issues and Challenges Faced by the Mango Farmers:

Different issues confronted with and the challenges faced by responding mango farmers in maintaining GlobalGAP or Q&S measures found from SSI and relevant findings from KII are given in the following table as part of data triangulation besides presenting the findings from the FGDs as they are purely also of qualitative nature thus analysis is followed alongside utilizing Grounded Theory (Silverman, 2014).

Findings from FGD and data triangulation for internal validity and deepen understanding is given below (Annexure-4 for Details):

Table 11: Findings from FGDs on Issues and Challenges at Mango Farmers' End-Both Case Areas (Details-Annexure-5)

Points of Discussions	Coding (in vivo coding ¹)	Triangulation with SSI and KII (Internal validity)
Perception about GlobalGAP	It's getting important, for safe food and also good image. Can help in better price and better market. But mostly it helped in skill development and new skill creation*	safe food, good image, better price, better market but mostly skill development and new skill creation are mentioned in several of the SSI in both case areas. KII of the DAE, CDAIS, has given indication of interests of the farmers about GlobalGAP, KII of the local Associations of Mango Farmers in both case areas also showed clear interest and positive perception about GlobalGAP.
Challenges Faced in Record Keeping	Writing is a complicated task, needs support from others, not sure about the purpose, Need some material support. Record keeping is particularly found problematic for the aged and less educated and GlobalGAP may seem complicated to them. But the future generations who are educated and younger might be able to implement GlobalGAP easily.	In the SSI almost three fourth (Bagha) expressed their positive view of record keeping but many mentioned about Low writing skill, means to keeping record as main challenges they face and Record Keeping was found to be taken up less by the respondents in the SSIs too in both of the case areas. In one KII, record keeping and maintenance at farmers end was expressed explicitly as a problem.
Challenges Faced in maintaining Hygiene and Cleanliness	Requirement of additional land as space for building toilet. Requirement of money, Maintaining cleanliness of water, hassle in controlling misuse of soaps.	Land particularly for the small farmers, and money as fixed investment and variable cost for toilet and amenities is mentioned quite often in both case areas during the SSI, KIIs of the local Associations have also pointed out the requirement of extra land for building toilets particularly for the small orchards.
Challenges Faced in maintaining Doses of Chemical and Safety protocols for Fertiliser and Chemical Containers	Inadequate quality monitoring in the market. Demand and Supply gap in local markets, The empty pots are used as means for money. Mental Pressure as fear of contamination remains when burning Need fallow land. The empty containers provide	Inadequate quality monitoring in the market is mentioned Fallow Land is mentioned. Used for some cash and also by children for buying Sweets was mentioned in both case areas during the SSIs

¹ Adapted from Rapley, 2011, P-282, as cited in Silverman, 2014.

	some cash from sale.	
Maintaining Quality and Safety through MRL	Less understanding and No local facility at farmers end.	Whoever knows about MRL mentioned about lack of local facility regarding MRL testing.
Received Supports relevant to GlobaGAP	<p>The interventions or supports are mainly of training and advice. Once some mango bagging, record books, etc. but very limited</p> <p>They needed infrastructural support like cold storage in the locality.</p> <p>Road networks and transportation system is good.</p> <p>Local Administration and the govt were serious about maintaining uninterrupted transportation system in the country in the COVID 19 situation also.</p>	<p>No SSI have mentioned about other supports than training or advice.</p> <p>Only the SSI of the members of the association has reported of material supports like record book.</p> <p>The KII of DAE, HORTEX, DAM, CDAIS, SNV(secondary source), also acknowledged about training and advice as main support. The Govt. Has developed support centres for export in Dhaka,</p>
Role of Farmers' Organization in GlobalGAP	<p>It is viewed more positively by the large farmers in Bagha than the Small Farmers.</p> <p>Dissatisfaction was expressed by the small scale farmers on organization's biased role towards large farmers.</p> <p>But in Shibganj, it is viewed positively by all the farmers except a few who faced grouping or other type of localized problems that might have a link with local politics</p>	<p>CDAIS expressed directly importance of farmer's organization and was successful in a way to developing such organizations in both of the case areas. At least, that was when the organizations were established.</p> <p>DAE and DAM both works around group formations of the farmers and thinks it important to get them organized so that their bargaining capacity in mango value chains is increased. It is also helpful for providing supports and trainings to organize farmers. The organized farmers have better habit of implementing or picking up the advices and suggestions.</p>
Why they cannot participate as expected?	<p>One of the main reasons behind non participation is not earning profit as expected and they believe it depends on the exporters. The exporters make contracts not on Stamp Paper which is not acceptable for legal process if contract is not honoured.</p>	<p>Some of the SSIs have given reasons of profit and market assurance for not participating or continuing GlobalGAP like practices.</p> <p>The KII of the DAE, DAM, HORTEX, BARI, EPB, has mentioned about price and market assurance as one of the challenges. The KII of Exporters' Association accused of non adherence to the quality requirements by the farmers, lack of affordable and easily accessible testing facilities, and mostly low</p>

		capacity of air cargo handling system at the container depot and inadequate logistics throughout the supply chain.
Overall Supports and Collaboration in the past and present	Though on specific interventions as mostly the starting phase they expressed gratitudes and satisfaction for the different programs and projects taken by the government, NGOs, and the development partners. Yet, the mango farmers are actually not very satisfied either as the supports and collaborations didn't sustain neither did they cover all the aspects with required importance. And, in reality some demotivation was felt also among some of the farmers who tried but didn't get the expected benefit. All the supports are not regular.	The KII revealed also not much satisfaction among the stakeholders themselves about the scale of operations and sustainability except Solidaridad, HORTEx on specific supports like organizational development and packaging. Besides Swapno expressed kind of satisfaction for their achievement of only GlobalGAP certificate at retail level for one of their outlet in Glushan, Dhaka.

*Bagging, Fencing, Water Quality Management, Disposal of Empty Chemical Containers/Cans, importance of record keeping (though most of them didn't pick up the record keeping part but they understood the importance of it).

4.4.2 Shining Quotes:

Most of the participating farmers in both of the case areas in the beginning of the conversations about past and existing collaboration and supports, expressed like, *"Obosshoi onek valo kaaj, onek upokaar hoisay, notun jinish shikhtay parsi"*/"Very good works, came to many help, have learnt new things". But when the conversation continued deeper, some of the large farmers in both case areas expressed like, *"Kaajto korlam kintu laavto temon painai, boroncho akhon kisuta khoroch beray gasay"*/"Have worked but didn't got the benefit, rather cost has increased now."

One Large Farmer in Shibganj and some small farmers in both case areas expressed their pessimistic feelings about keeping Data Records, which is actually linked with their frustration about not getting better return for their efforts; like; *"Ki hobay oto kisu likhay rekhe ashol kaaj Jodi naa hoy-Bengali"*/"What it would do to write all those records if we don't get the right thing?"

Some farmers in both case areas irrespective of size expressed about one habit of handling the empty chemical containers as such. *"Bacchara kotkoti monda khaitay chae, naa kortay parina,"*/"Kids want to

buy sweets with the empty containers we can't say no to them". But further probing revealed they do clean the containers before giving them to the kids.

One older and low educated participant in one location (better not to disclose) expressed to one of the research assistant with shyness after the formal group discussions like; *"amnityto kaaj kori kono shomosha nai, kintu atoshob likhetikhe rakha jamela monay hoy, oishob shikkhito amar chay kom boyeshider jonno kora shohoj, amader polapanera boro holay korbay"/"I do the thing no problem, but it is problematic for me to record and write all those things. These are (particularly record keeping) easier for those who are educated and younger than me. Our children will do those in future."*

4.4.3 Ranking of the Critical Livelihood Assets relevant for entering into GlobalGAP

Trajectory:

The following table shows the ranking for different livelihood assets given by different category of mango farmers in the FGDs. Ranking was given from 1 to 5 as least to most important.

Table 12: Ranking of Livelihood Assets by the Mango Farmers-Both Case Areas

Relevant Livelihood Assets	Large Farmers (Participants)	Large Farmers (Non-Participants)	Small Farmers (Participants)	Small Farmers (Non-Participants)	Female & Combined	Total rank
Physical- Infrastructures like Cold Storage, Space for Keeping Empty Containers until destroying Burning Site for Empty Containers	3	4	4	4	3	18
Financial- Bank Credit to maintain both Fixed Cost (FC) and Variable Cost (VC), Availability of Investment for the Fixed Cost Associated with GlobalGAP requirements	3	4	5	5	4	21
Human- Knowledge about GlobalGAP and its benefit, Habit of doing something new, relevant Skill for doing the required, Labour Availability with required skill	4	5	5	5	5	24
Social- Community Cooperation, Community Advice, Membership in Association or organizations, Community traditions, Contract Farming Agreement	5	4	5	3	5	22

From the above table it can be seen that to the small scale farmers all assets are almost very important with a bit less importance given to the physical assets like cold storage as their volume is not that large to require such facilities. But, in overall the most valued resources by all ranking (total) is Human Capital or Assets basically relating knowledge and information regarding GlobalGAP which was also revealed from the SSIs that many expressed eagerness to know more about GlobalGAP.

Second most valuable is the Social Capital in terms of Contract Farming Agreement as well as Membership in Farmers' Organization but also about the links with other organizations like the Exporters' Associations or Importing Agents, or the Processing Industries, Super Markets, etc. It was expressed by many farmers about the weakness in contract management and administration as for them it has limited legal support as most of the agreements are made on company pad or white paper that do not have much legal bindings as explained before. Community collaborations among farmers were also highly regarded as vehicle of spreading or scaling up better practice at mango farmers' end.

Financial Assets or capital is very important for particularly the small farmers for obvious reason of their low financial capacity too. It is also logical that Financial capital is not that very important to the Large farmers particularly the participants.

Among the case areas FGD participants in general ranked the social capital and financial capital lower than the participants in Shibganj area.

4.5 Findings from the KIIs:

The KIIs were mainly conducted to find out the past and existing collaborations and supports from government and development agencies as well as private organizations for Mango Farmers relating GlobalGAP or Q&S measures relevant to GlobalGAP and is shown below. Some sample KIIs are given as Annexure-4

4.5.1 Past & Existing Supports/Collaborations relevant to GlobalGAP for Mango Farmers

Table 13: Findings from KIIs on Support and Collaboration relevant to GlobalGAP

Activities by the organization	Key Informants confirmed of the supports	*Main form of support	**Status of the Collaboration or Support	*** Rating of the Supports/ Collaborations
Informing about GlobalGAP & its benefit	DAE, HORTEX, CDAIS, DAM, Solidaridad, SNV, Swapno	Technical Training to Develop knowledge and Skill, very limited Material Supports	Support ended	3
Mango Production Site Risk Assessment	DAE, HORTEX, CDAIS, Solidaridad, SNV,	Technical Training to Develop knowledge and Skill,	-Do-	2
Record Keeping of Mango	DAE, HORTEX,	Technical Training	Support	2

Production Process	CDAIS, Solidaridad, SNV, Exporters' Association, Swapno, BAPA	to Develop knowledge and Skill, Material Supports	existing in very limited scale (exporters' association, Solidaridad)	
Input Quality Assurance (Fertilizer and PPP)	DAE, HORTEX, CDAIS, Solidaridad, SNV, Swapno, BAPA	-Do-	Support ended	2
Input Dose Specifications (Fertilizer and PPP)	DAE, HORTEX, CDAIS, Solidaridad, SNV, Swapno, BAPA	-Do-	Support Existing (DAE)	4
Input Quality Assurance (Water for production and Post Harvesting Management)	DAE, HORTEX, CDAIS, Solidaridad, SNV,	-Do-	-Do-	2
Output Quality Assurance (MRL Testing and RMS)	DAE, HORTEX, CDAIS, Solidaridad, SNV,	-Do-	-Do-	1
Technical Skill Development for maintaining GlobalGAP	DAE, HORTEX, CDAIS, Solidaridad, SNV, Swapno, BAPA	-Do-	-Do-	2
Developing the Physical Infrastructures like Storage Areas, transport, Cleaning Areas, Toilets, etc.	DAE, DAM, HORTEX,	-Do-	Support Existing in limited Scale (DAM, HORTEX)	2
Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.	DAE, DAM, HORTEX,	-Do-	Support ended	2
Maintaining the Safety and Health of the workers related to the mango production.	DAE, HORTEX, CDAIS, Solidaridad, SNV, Swapno	-Do-	Support ended	2
Maintaining ICT structure required for participating in the GlobalGAP	DAE, DAM	-Do-	Support ended	2
Maintaining ICT connectivity required for participating in the GlobalGAP	DAE, DAM	-Do-	Support ended	2
Developing Farmers' Organization	DAE, DAM, CDAIS, Solidaridad, SNV,	Technical Training to Develop knowledge and Skill,	Support Existing at limited scale (DAE, DAM)	2

Maintaining Membership in formal Organizations	DAE, DAM, CDAIS	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Establishing Contract Farming or Marketing/Sales Agreement	Exporters' Association, DAE, DAM, HORTEX, CDAIS, Solidaridad, Swapno, BAPA	-Do-	Support existing at limited scale (Exporter's association, Swapno)	2
Supporting Labelling and Packaging	HORTEX, DAE, DAM, CDAIS, Solidaridad	-Do-	Support Existing in limited scale (HORTEX, Solidaridad, DAM)	3
Supporting Mango Transportation	DAM, HORTEX, Exporters' Association	-Do-	Support Existing in limited scale (HORTEX, DAM)	3
Supporting Mango Selling	Exporters' Association, HORTEX, DAE, DAM, CDAIS, Solidaridad, SNV,	Technical Training to Develop knowledge and Skill, Material Supports,	Support Existing in limited scale (DAM, DAE, Exporters' Association)	3
Supporting Certification Cost	Exporters' Association, DAE, HORTEX, CDAIS, Solidaridad, SNV,	-Do-	Support ended	2
Supporting Certification Renewal Cost	Exporters' Association, DAE, HORTEX, CDAIS, Solidaridad, SNV,	-Do-	Support ended	2
Auditing Support (Cost or means)	HORTEX, CDAIS, Solidaridad, SNV,	-Do-	Support ended	2
Disposal of empty cans and containers of the chemicals used	HORTEX, DAE, CDAIS, Solidaridad, SNV,	Technical Training to Develop knowledge and Skill,	Support ended	4
Use of protective gears like gloves and masks where applicable	DAE, HORTEX, DAM, CDAIS, Solidaridad, SNV, Swapno	Technical Training to Develop knowledge and Skill, Very Limited Material Supports,	Support ended	2

4.5.2 Main Challenges Faced by the Stakeholders:

The problems and challenges mentioned by the Key Informants of the stakeholders that have been directly involved with GlobalGAP related interventions and support services are shown below grouping them as internal, external at mango farmers' end, and as system constraints

Table 14: Main Challenges faced by the stakeholders as expressed in KIIs

Stakeholders	Challenges Faced Internally	Challenges Faced with Mango Farmers	System Constraints
DAE	Dedicated budget for GlobalGAP, Technical Knowledge, Skill Inventory	Inadequate resources, Reaching the Scale, Monitoring, Language Barrier, Changing the Habits of farmers, Ensuring Fair return for Mango Farmers	Inadequate Coordination, Infrastructures like Cold Storage, LAB, Transport, etc.
CDAIS	Program based intervention, Number of farmers reached, training limited number of human resources of relevant organizations,	Monitoring, Language Barrier, Reaching the small scale farmers	Inadequate Coordination, Infrastructures like Cold Storage, LAB, Transport, etc.
HORTEX	Dedicated budget for GlobalGAP, Technical Knowledge, Skill Inventory	Inadequate resources, Reaching the Scale, Changing the Habits of farmers, Market Access, Ensuring Fair return for Mango Farmers	Inadequate Coordination, Infrastructures like Cold Storage, LAB, Transport, Packaging, Air Freight, etc.
Solidaridad	Limited scale reached, Project level interventions	Making easy to understand the requirements of GlobalGAP at farmers' end, Record Keeping	Failure to ensure buyers' contract are honoured.
BFFVEA:	Limited scale in terms of Financial and Material resources, knowledge and skill about GlobalGAP	Low knowledge, skill, and capacity, Ensuring Fair return for Mango Farmers	Problem at the Airport Cargo Handling Facilities, Price Fluctuations in the International Markets, Q&S requirements like GlobalGAP, and Air Freight
DAM	Inadequate knowledge and Skill relevant to GlobalGAP, Absence of focused regular operations, Absence of Dedicated Budget and Manpower	Reaching the scale, Low capacity, knowledge and skill gap, organizational weaknesses among farmers' organization, Ensuring Fair return for Mango Farmers	Inadequate coordination, Inadequate infrastructure like storages and transport facilities dedicated to export value chains
SWAPNO	Inadequate financial and technical resources	Reaching the scale, low knowledge, skill and inadequate capacity at	Inadequate coordination and collaboration with government agencies,

		farmer's level.	inadequate infrastructures like cold storages
APSU	Inadequate financial and technical resources, Making adaptive GlobalGAP as BanglaGAP*	Making it easy to implement, motivating them to participate	Inadequate coordination, inadequate infrastructure like Cold Storage, LAB facilities,
BAPA	Inadequate focus	Reaching the Scale, Motivating, Monitoring,	inadequate infrastructure like LAB, Cold Storage, Cold Chains,

**BARC is the Focal Point of BanglaGAP development efforts from government side particularly the Ministry of Agriculture.*

So, basically training, awareness building, advocacy, and very limited level of material and financial supports were provided under different interventions and most of them also ended after the projects. But, satisfaction level regarding those programmes and projects particularly the different supports that were provided is not very high reflecting need of further interventions.

Yet, some of the supports continued in very limited scale particularly by DAE, HORTEx, and DAM among government organizations in the areas like, organizing farmers, irregular training, infrastructural development in limited level, Packaging and labelling, Fertiliser doses. Among the development partners Solidaridad and SNV are still active with limited level of operation. Among the private organizations, Exporters' Association, Swapno, and BAPA have some activities regarding contract farming.

Among the major internal challenges inadequate financial and technical resources are common for all stakeholders. At mango farmers' end reaching the scale or mass is a common challenge for almost every stakeholder, besides meeting the capacity requirements, and ensuring fair return for mango farmers. Another important factor as challenge is the inadequate organizing capacity of mango farmers. Among the system constraints, inadequate infrastructures like Cold Storage facilities at local level, transport facilities with cold chain, Cargo handling system at airport were mentioned by many stakeholders besides Air Freight is also mentioned by two of the stakeholders.

4.6 Gender Dimension: Why no Female Mango Farmers?

Another aspect is that the mango farming is found to be male dominant and also all the respondents were found to be married which is somehow connected to becoming real man in the rural context of Bangladesh which stems from cultural orientation as was seen even the youngest respondent is married.

It became obvious to ask about it and the main reason found was nicely embedded in the inheritance laws flowed from cultures deeply rooted in religion both in case of Muslim and Hindus of the country. The inheritance laws though were under revisions like since 2005 in India but in case of Bangladesh it was also found from studies conducted after 2010 that situation in reality didn't improve much (Jinnah, 2013).

Thus the families even with a deceased husband might show temporarily that the female head or the mother is maintaining everything but in case of families with grown up sons, at least in case of economic decisions the authority quickly transfer to the sons or any other males within the close blood relatives of the family.

Chapter Five: Discussions

5.0 External Validity

The discussions followed particularly to validate the research findings presented in the previous section under findings with up-to-date literatures and also secondary data and information where found relevant. The discussions start with general characteristics of the responding mango farmers and mango farming practices of the case areas under section 5.1 and 5.2. It followed the three sub-research questions on subsequent sections from 5.3 and 5.4 covering SRQ1, 5.5 covering SRQ2, and 5.6 covering SRQ3.

5.1 Demographics and Socio Economic Characteristics of Mango Farmers

Average age of the mango farmers found under this study is around 48 years in both case areas which are higher than the findings of Sampa et al. 2019 which was mainly done in Rajshahi including Bagha and Sultana, Chowdhury, and Pervez, 2018 which was conducted in Chapainwabganj including Shibganj area. Both of those studies particularly showed lowest share of respondents with primary level education like the present one except the study of 2018 that showed more (around 20%) non-educated mango farmers which is in contrast to the present study where it is below 10%. However, still now both study showed more than three fourth of the mango farmers are educated thus in way reflects the findings of the present study where it is found to be more than 90% of the respondents have some sorts of education from primary onwards. Average family size found under this study was 4.8 in Bagha and 4.4 in Shibganj which is 4.69 in the study by Sultana, Chowdhury, and Pervez, 2018 and can be said to be similar to this study finding.

5.2 Characteristics of Mango Farming:

Mango farming in both case areas is generational business if the SSI data on experience in mango production is considered which in Bagha was around 30 years for large farmers to 26 years in average for small farmers and showed a range of 15 years to 50 years. In Shibganj, the average years of experience in Mango farming was all together 27 years and ranged from 5 years to 45 years. These findings are almost close to the findings of Sampa et al. 2019 and also Alam et al. 2017 where the observed experience in mango production of the respondents ranged from 4 to 32 years. But the average figures were lower than the present study.

Average land engaged in mango farming found under this study is 3.45 acre in Bagha and 3.24 acre in Shibganj whereas according to Alam et al. 2017; 1.58 hectare or 3.9 acre in average own land is engaged in mango production and Sampa et al. 2019 found 2.0 hectare or 4.98 acre in average land in mango farming.

Over last 10 years in both of the case areas mango farming increased over time as was found from FGDs and validated by Alam et al. 2017 in Dinajpur but also in other areas as reflected from the BBS historical data (BBS, 2017).

The major variety in Bagha was found to be the Laxman, Asshini, and Himsagar but Himsagar/Khirsapat/khirsapati and Fazli in Shibganj. Whereas, Sampa et al. 2019 confirmed about Laxman as the highest cultivated variety in Bagha with some mixed position among the other two

Asshini and Himsagar but all are within the first four varieties. In Shibganj Langra and Fazli is also prominent besides Himsagar or Khirsapati as also confirmed by the study of Sultana, Chowdhury, and Pervez, 2018.

5.3 Awareness, Desire to Change, Knowledge, Attitude, and Benefit:

It is clear that though most of the mango farmers are not aware (only 16% in Bagha and 46% in Shibganj) of GlobalGAP (SSI) yet a good number (66% in Bagha and 71% in Shibganj) of them are eager to know more and many (more than two third in both case areas) understand the importance of maintaining quality and safety of mangoes and most (84% in Bagha and 93% in Shibganj) of them are doing something as per their understanding, skill, and capacity (SSI, FGD, KII) that can be termed as a level of partial participation in the GlobalGAP trajectory that is in contrast to the findings of Hossain (2007). It means though the awareness level about GlobalGAP is still low but got better than more than 10 years back thanks to the different interventions from 2012 by solidaridad and from 2015 by CDAIS, SNV, HORTEX, and DAE that can be the reason behind increased awareness about quality and safety requirements in general. The mentioned factors that shape up perception of the mango farmers is important for implementation of GlobalGAP as reflected in Banzon et al. (2013) where lack of knowledge and awareness of stakeholders and producers is considered major constraint on application of good agricultural practices and also found in the study by Parikhani et al, (2015), as second most important factor. It was found in the FGDs that age and education has some positive relation with participating in the practices like record keeping required for GlobalGAP and which is a must conforming to Dietrich, C. (2010).

5.4 Perception about Positive benefit of GlobalGAP:

It can be said safely that the individual level factors that are mostly dependent on the mango farmers' awareness, knowledge, desire to change and positive perception is in a better state in the context of the selected case areas of Bangladesh. 75% of the respondents in both case areas expressed positive benefits in the SSIs like skill development and new skill creation, good habit, safe food, good image, better price, consumer confidence, better market access as to show positive perception about GlobalGAP. The mentioned benefits were also reflected in the FGDs and KIIs and most important notion was given to better return and image, better market access and skill development for the farmers which are also reflected in Borkhani and Mohammadi (2019).

In absence of prior research or studies specifically about GlobalGAP in the context of Bangladesh no comparison is possible to make but It can be generalised for other areas and other products under fresh fruits and vegetables as the interventions were also targeted for the tomato farmers of the case areas according to even a recent project running in greater Rajshahi area.

But then why they are not participating as expected? The answer is coming-

5.5 Situation of mango farmers of the case areas in terms of livelihood asset level factors

5.5.1 Human Asset:

A good number of mango farmers are educated (more than three fourth in both case areas), has the skill of using mobile (100% in both case areas) which is higher than the national statistics of mobile penetration (more than 97%) in general but internet use (31% in Bagha and 54% in Shibganj) is quite lower than national statistics of 57% according to BTRC Annual Report 2018-2019 (BTRC, 2020). The respondents have long traditional knowledge of mango farming through generational business practices as was found in the socio economic characteristics like experience in mango farming of the responding mango farmers in both of the case areas. Many have also eagerness to know more about GlobaGAP and also some of the required knowledge and skills relevant for GlobalGAP (SSI and FGD) even though they are not totally aware of GlobalGAP and these factors are found important by Banzon et al. (2013) and Parikhani et al, (2015).

5.5.2 Financial Asset:

Specifically, there is no formal Bank Loan or Credit facility for mango farming though there are for spices, lentils, poultry and live stocks. Yet in general both areas expressed highly (Bagha 84% and Shibganj 79%) about availability of financial credit facilities for there are other sources like NGOs and private lenders too. But the accessibility in general was found quite low as the mango farmers did not use much of the credit facilities and use for mango production or marketing was only 15% in Bagha and 39% in Shibganj. Moreover, the agri-loan involves hassle for the farmers in terms of documentations, lobbying, taking support from local political power, and also collateral. So, in terms of availability and accessibility of affordable financial credit specially the mango farmers are facing problems and challenges which is also common for many other farmers and evident in other studies (Ahmed et al. 2017; Alauddin and Biswas, 2014) and news (The Financial Express, 2019). So, it is found to be an important influencing factor for implementing GlobalGAP particularly for the small farmers as also confirmed by Liu, Bruins, and Heberling (2018).

5.5.3 Social Asset:

Among the responding mango farmers 25% in Bagha and 36% in Shibganj have contract farming and only 12% in Bagha and 43% in Shibganj has membership in Farmers' Organization or association as the study found. Not many farmers are organized and there is seemingly local politics playing important role in inclusion of the farmers of different categories like smaller but also large ones. Members of the associations or farmers' organizations (FOs) were in a better position in terms of their understanding and activities relevant to GlobalGAP. Yet the organizations shall be empowered and capacitated in terms of building democratic decision making and transparency as directly expressed in the FGDs ; "they do not call us neither they show any interest for us" small mango farmers when expressing about the role of the associations or farmers' organizations. Moreover, in Shibganj it was also found that the younger brother of the president of the Shibganj Mango Producers' Association is not a member even though he is a large mango farmer and it is surprisingly opposite to what is expected in the context of Bangladesh where nepotism or favouritism (Haque & Mohammad, 2013) is a common problem.

The picture found from literatures also that the FOs are mainly formed with project support from development partners, NGOs, or government and mainly used as vehicle of delivery of services rather as an active role player in achieving sustainable changes in farmers' bargaining and marketing activities. Another critical point was the matter of agreements and contracts with mango farmers are made in company pad or white papers instead of stamp paper which is not legally enforceable. Similar picture is found in the study report by FAO, (2014) relating Farmers' Organization in Bangladesh. But importance of this capital is inevitable and particularly participants of FGDs in Shibganj ranked it highly than Bagha and its importance is also reflected in Busch and Bain, 2004; Vorley and Fox, 2004 too.

5.5.4 Physical Asset:

Mobile use is found unexpectedly higher than national average among the respondents with 100% using mobile for mango production or marketing related issues while Internet use in general was found to be closer to the study results by Yan Zhoua, Nirvikar Singhb, P.D. Kaushik, (2011), but also the national statistics (BTRC, 2020)

Physical land or space and access to water influence participation of farmers in maintaining cleanliness and hygiene, whereas physical space for dumping or burning the empty chemical containers is also important. Among the physical resources toilet is one important but minimum requirement for maintaining cleanliness and hygiene and small farmers understandably have low level of participation in the sense that most of them don't have separate toilet for the labourers. Around 37% in Bagha and 36% in Shibganj have toilet which are a bit lower than the claims made in the Bangladesh Demographic and Health Survey (2014 BDHS) where it is said to be around 45%. But it was also found during the FGDs that closely situated small orchard owners cooperate in this respect that they let others use their common toilet which is also evident in the technical paper by Dr. Suzanne et al. 2011.

From the above discussions it may be said also that positive impact of participation in GlobalGAP trajectory atleast resulted in increased skill and knowledge level for good agricultural practices as well as the mango farmers' organizing capacity and increased bargaining and fall back position position too as can be paralleled to positive impact on livelihood assets of mango farmers from adaptation of new varieties of mango by Rahman, Khatun, and Miah, (2019).

5.5.5 An exceptional factor:

Though natural assets were not covered under the study specifically but while conducting the fieldworks in the second case area; Shibganj it was found during the FGDs that the recent achievement of Geo-Marking or Geographic Indication for a popular mango of the Chapainwabganj (and more specifically of Shibganj) area named Khirshapati or Himsagor (Daily Prothom Alo, 2019), has influenced the farmers' knowledge level and also motivated (FGD Narrative in Shibganj, "this mango has become our pride and we want to uphold this international recognition by practicing international standards," which was given by almost all the participants unanimously) more to pick up GlobalGAP relevant practices more than the Bagha area.

5.6 Past & Existing Support and Collaboration as Influencing Factors:

Training, awareness building, developing farmers' organization was the main interventions and collaboration in was so far tried in the case areas. Presently, another project intervention is going on in Rajshahi division targeting mango and tomato farmers for the processing industry. But there is no continued collaboration from the government or NGO's part. Only collaboration that still now is operating in the case areas is between the Exporters' Association and Shibganj Mango Grower's Association but with mixed experience as par the responding mango farmers. The exporters' association provides the mango farmers log books for record keeping and also ensures sales of mangoes in the season. They ensure timely payment though some of the mango farmers expressed dissatisfaction over the margins they can make through the exporters. Sawpno (Shawpno used synonymously) a private organization claims to continue their support and collaboration with vegetables and fruit producers regarding GAP (The Daily Star, 2020). Importance of collaboration and support is also expressed by Nuru Islam et al. (2012).

The KIIs particularly of CDAIS and Solidaridad, has pointed out about advisory services and indirect financial supports for certification and licensing which are not directly visible to the farmers that reflects some how a communication gap also.

Mango farmers of the producers' group expressed highly about support for organizational development in the FGDs in both case areas but dissatisfaction of the small farmers in Bagha and negative role of local politics in Shibganj was also expressed. The findings of the SSI and FGDs are supported by the organizational information found from KII as well as respective websites like SaFal project which is trying to scale up mango export operation involving three entrepreneurs (Solidaridad, 2017).

Among all the collaborations the weakest one is about MRL testing. But, EU regulations on SPS measures require fresh products coming from abroad to comply with stricter MRL and traceability norms for accessing the EU markets. Regulations came into force from 1 January 2005 and 1 January 2006 respectively (Hossain, 2007).

5.7 Self Reflection as Researcher

5.7.1 The process

Being a government officer of DAM, I was involved directly with market linkage development activities and had emotional attachment for the export market development. Its a common picture in seasons when farmers don't get fair price for particularly perishable products and destroys or left the products in the fields without even harvesting. A drive I felt always to find ways to link them with industry and export market. Mango is my favourite fruit and whenever I visit other countries I used to try whichever mango I find there and even I've tried here in the Netherlands; as usual I find mangoes of Bangladesh are far superior in taste than those are here and Bangladeshi Mangoes shall be available here too.

First of all my previous studies, government job under the Department of Agricultural Marketing (DAM) and previous field works and research experiences were influencing my research design and I was a bit confused about the concept, power and acceptability of Applied Qualitative Research in the context of

my country. But gradually through out the modules from mini research was getting into it and started to feel challenged to comprehend it properly. And as a conscious researcher I had been very careful not to get biased with subjective, emotional, and previous attachment to take neutral notes in my work.

Mango farmers don't have much knowledge or skill of English in Bangladesh; obviously the Bengali language was used in the field works or in case of any conversation online. So, while translating the checklist I found it necessary to articulate the questions carefully and the task was challenging because of exact wordings in Bengali may not be understood by the responding mango farmers. I had to make this point very clear to my field coordinator and research assistants.

Another challenge was assembling the field team from here and briefing them properly. Secondly, the Field Coordinator got sick even before finalising the research assistants and he was supposed to manage them. So, I had to manage the research assistants and engage alternative Field Coordinator. But sadly, he also got sick and found COVID positive when he started the field works. They both took quite a laod irrespective of their illness and contributed a lot to this research. The research assistants as were not form the case areas faced challenge too for the COVID 19 situation. One additional local assistant had to be engaged who helped the Research Assistants in both of the case areas.

5.7.2 The Product and its Quality

One important point of consideration is that the issue of GlobalGAP as a research topic is totally new and unique in the context of Bangladesh yet I felt confident and motivated to fill in the knowledge gap as it is really crucial for my country's need. It was also sensitive to explore why the interventions taken so far couldn't show the results as expected.

I had intended to do the research in another developing country than mine but my supervisor suggested me to look into my own country. Incidentally some bad news from my country caused by the COVID situation has influenced my proposal defence greatly and I had to change my study locations and proposal accordingly to look into the issue of GlobalGAP but from a different angle that my organization as the primary problem owner really needs to know. And, now looking back to the decision and the findings at my hand, I am really grateful to my supervisor for his suggestions. But truly, I had a late start for my field works and troubles were waiting. Besides, I knew I had a tendency of taking too much tasks than normally would be advisable but yet my research topic was unique in my country's perspective and couldn't avoid making it tedious. Yet, I was confident because I am conducting the research in my country than in any unknown context and my fellowship authority was also accommodative to share the cost of fieldworks. So, I managed the extensive workloads engaging three persons as my research team and was able to collect my required data in time.

At the beginning, when my team members told the responding mango farmers about my government identity expecting better cooperation, some of the respondents rather became reluctant to respond and even though they responded but started giving incorrect information that became evident to my team members regarding land size, number of mango trees. Because, as it was found out later that there is a fear among mango farmers that the government may impose tax on mango orchards depending on

number of trees. So, for subsequent samples, the respondents were not told about my government identity if not asked by the respondents themselves.

So, data were accurate to the level of respondents and ofcourse efforts were taken to clarify any aspects. Moreover, not everyone answered each questions, so efforts were also taken to fill in any significant information gaps. FGDs and KIIs were taken not only to take group and stakeholders' view about different research aspects but also to ensure internal validation. So, whenever confusion arose about any data or information, calls were made to the relevant respondents to clarify any confusion. It was difficult in absence of relevant literature in my country's context to validate the findings but at the end other country context and different sources indirectly related with GlobalGAP, GAP, quality and safety of agricultural products in general, mango farming, farmers, rural areas and developmental contexts was found to be usefull.

Among mango farmers in the Bangladesh, Rajshahi division historically represents majority and within this division the selected areas are the most representative in respect of mango farming, farmers, and mango export. The sample size were enough to reach the satuiration point for the relevant research questions thus in terms of representativeness and sample size required for qualitative studies, selected farmers indeed worked out well and I am confident on the resulted product.

5.7.3 What I would have done differently

Though the research was designed and done utilizing a qualitative approach yet the research questions asked for collecting some basic demographics and socio-economic data that gives room for doing quantitative analysis too only with a little larger sample size. And, the issue and it's uniqueness (as no real field study so far was found specifically on GlobalGAP in Bangladeshi context in general late alone mango farmers) really also calls for an cost benefit analysis too. I've restrained myself from doing some further statistical analysis like correlation, Factor Analysis, ANOVA at the least rather workout with % of respondents' answered. Another point of analysis could have been targeted to see livelihood impacts in more details with quantitative data collection as well as economic feedback to the females and household members as to look into livelihood impacts on household as well as gender impact fro participation in the GlobalGAP Trajectory. In a nut shell, this issue in its rudimentary stage should have a mixed method research ncluding both qualitative and quantitative data and analysis.

As I am a government official in the Department of Agricultural Marketing (DAM) my primary problem owner and engaged in development of the agricultural marketing system of the country, I will have ample opportunities to apply my learnings, understandings, and new skills like gained from conducting this applied qualitative research and acting as a facilitator of change too.

Chapter SIX- What We Know Now & Then What?

6.0 Conclusion

The research sub questions are answered first, followed by answers to the main research question and lastly culminating into a grounded theory on why the mango farmers are not participated as expected in the GlobalGAP trajectory even after certain efforts were taken.

6.1 Perception of the mango farmers of Rajshahi, Bangladesh about Benefit of GlobalGAP

Though the awareness and knowledge level about GlobalGAP is quite low among the non participant mango farmers than participant mango farmers, the desire to know is quite high among all of them in both case areas. Experience in terms of partial implementation of GlobalGAP relevant practices are better on aspects like adherence to prescribed fertilizer and plant protection product (PPP) doses, disposal of empty chemical containers, general awareness and practices of cleanliness and hygiene among both large and small mango farmers in both of the case areas but with comparatively a better picture in Shibganj. But, record keeping practice is very low compared to its importance as viewed by the respondents and water quality and MRL testing is almost none in both case areas.

Most of the participating mango farmers have positive perception about GlobalGAP that it would benefit them in terms of better price, image, and market access besides all of them seems pleased at least for they have acquire new knowledge and skill. With a very few exception, everyone is eager to participate in GlobalGAP trajectory provided expected benefits are met.

In short, the first dimension of the CF is found to be in a better position to initiate change among mango farmers in both of the case areas irrespective of their size.

6.2 Situation of mango farmers of Bangladesh in terms of the livelihood assets level factors as required for implementing GlobalGAP

All responded mango farmers in both case areas have low level of relevant skill and knowledge about GlobalGAP as part of human assets and both participant and non-participant mango farmers expressed they need to know more thus showed lower level of knowledge and skill that needs support.

Large farmers have better position mainly in Physical, Financial, and Social assets than the smaller farmers in both case areas for obvious reason of their big asset base- land and financial return from higher production volume that influence also social assets in terms of there inclusion in organizational setting, better bargaining power and fallback position.

Among physical asset, everyone has mobile which is important for technological aspects when implementing GlobalGAP like standards for data recording to traceability but only less than half use internet and using internet for mango production or marketing is very low in Bagha than Shibganj.

Almost one third in both areas have toilets that reflects a better position but of course the small farmers have less for they need extra land to build separate toilet for outsiders besides financial support for the fixed cost involved. All most everyone has own water source but the quality is not assured.

If financial credit is considered rather than mere financial capacity both large and small farmers have actually very low access to available financial credits in both areas.

Though Contract farming is quite common in both of the case areas and can be said to be in a better state yet have one critical weakness. Among social assets everyone is concerned about contracts and agreements made on company pad or white papers without stamp papers that doesn't have much legal basis. About farmers' organization small farmers are more skeptics in Bagha than Shibganj and they suffer from transparency, accountability and inclusiveness. But Growers Association is found to be more active in Shibganj.

6.3 Past and existing collaborations influencing participation of the mango farmers of Bangladesh to implement GlobalGAP

Most of the past and existing supports were for awareness building, training and very limited level of indirect financial and limited level of material supports and they inevitably influenced participation of mango farmers in both of the case areas. Organizational development of mango farmers has influenced the practice relevant to GlobalGAP also.

But most of the supports and collaborations were not adequate to reach many farmers and did not continue for long.

Among the supports and collaborations most successful are Treatment of Empty Fertiliser and Chemical Containers, Packaging and Labelling, and obviously organizational development. The most unsuccessful were regarding the Water quality and MRL testing, and certification of GlobalGAP, and also data record management.

Supports like transport, cold storage and other logistics and infrastructure were very limited and not localised. There is lack of complete collaborations that would help in participating in the GlobalGAP trajectory with certification at the farmers' end.

6.4 Factors influencing participation of mango farmers of the case areas of Bangladesh in GlobalGAP Trajectory:

It shall be mentioned at the outset that no mango farmers (whether participants or non-participants) under the study was found to be completely or totally participating in the GlobalGAP trajectory so the conclusions made here relates partial participation but the recommendations given in the next section aimed complete participation.

Size, Age, and Education can be said to be the intrinsic factor of participation in the GlobalGAP but also influence the perception about GlobalGAP that can become favorable if there is also probable reward or perceived benefit attached to the participation in GlobalGAP.

In general, most important factor of participation in the GlobalGAP trajectory is collaborations and supports and previous attachment with such supports and continuation is influenced by meeting the expected benefit. It is also evident that non participant farmers were motivated from the participant farmers thus community influence is also important factor.

Second most important factor is the positive perception about benefits of GlobalGAP that motivates the farmers particularly the large farmers to implement atleast partially.

Another factor that can be induced from the overall discussions is the readiness in terms of partial participation in different aspects of GlobalGAP. So, any future interventions can easily influence them more as they are already experienced provided the perceived or expected benefit is achieved.

Obviously, different aspects of GlobalGAP were also being implemented by the mango farmers from quite long time like use of recommended doses of fertilisers and chemicals, treatment of the empty containers of chemicals, Cleanliness and Hygiene and important factors were education, age, and size of orchards in terms of both areas and number of trees. And, perceived or expected benefit influenced all the farmers of both the areas too.

6.4.1 Case Area Bagha:

Historical orientation with export market and awareness building through different interventions helped the mango farmers to form link with exporters' association that mostly gave them the confidence to participate in the GlobalGAP relevant trajectory. Among the non participants, depending on their own education, size of operation, age, get influenced by the practices of the participant farmers following desire to change.

6.4.2 Case Area Shibganj:

The second case area showed almost similar pattern with some exceptions for obvious reasons identified in this study. Unlike the first case area mango farmers and also general people became proud of this areas for recently a popular mango of this locality (though also grows in other places but here it grows more prominently) Himsagar or Khirsapat, or Khirsapati, achieved recognition of GeoMarking that really motivated mango farmers of this area to practice more of the different GlobalGAP aspects and they also became more enthusiastic about export market.

But indeed, past collaborations and supports along with the growers' organization influenced in subsequent participation also. The non participants followed the same trend of Bagha.

6.5 The Grounded Theory:

The different level of factors from micro to supportive environment that were found from the study are discussed above which in turn can form the basis of the Grounded Theory for explaining non-participation of Mango Farmers of Bangladesh in GlobalGAP Trajectory irrespective of the interventions and positive attitude and perception of the mango farmers of the case areas.

First of all, the interventions so far implemented for the mango farmers (but also for others like tomato farmers) only included awareness building and training for skill development relevant to GlobalGAP through workshops and training mainly and wasn't continued either for required time period. Entering the GlobalGAP trajectory through practicing the indicated methods and processes require time and certain livelihood resources and many of which are also available (except Affordable and Easily Accessible Financial Products, and strong, transparent, and inclusive Farmers' Organization) at mango farmers' end or can be manageable within short run by government planning.

But to sustain the new practices for continuing GlobalGAP; market and price assurance is also required, which could ensure better margin than before and which is not an easy task either to manage in the global market; more specifically by the mango farmers themselves given their low capacity and language barrier.

Thus it can be said that besides lack of knowledge and skill (which is common for even the participant farmers), uncertainty over market and price assurance (FGD narrative of Large Mango Farmers and Small Mango Farmers in both case areas) has hindered the large mango farmers to enter the GlobalGAP trajectory whereas, for small mango farmers besides knowledge and skill gap it is more for the inadequate financial assets in terms of affordable and easily accessible credit facility from local financial institutions that hindered participation.

“Market and price assurance is a must to ensure sustainable participation of any farmers in GlobalGAP trajectory in the longrun.”

6.6 Recommendation

Based on business allocation and mission of DAM following recommendations are given which are categorised as Shortrun Internal & External, Longrun Internal & External. And also some generic recommendations are given that is applicable to anyone besides DAM trying to intervene regarding GlobalGAP in Bangladeshi context even if those are for other fresh vegetables and fruits.

6.6.1 What DAM should do?

6.6.1.1 Short-run Internal Intervention (Within 1 Year):

DAM shall organize a seminar/workshop to disseminate the research findings of this study among different stakeholders as well as to take feedback on the research findings. (Within 2 months of departmental presentation of the research with internal budget).

DAM shall send a position paper on GlobalGAP to the Ministry of Agriculture based on this research report as well as the feedback from the workshop/seminar. (Within 1 month of the seminar/workshop)

DAM shall initiate a Multi Stakeholder Process (MSP) regarding GlobalGAP as well. (Within two months of the seminar/workshop and completed in 1 year with internal available resources of DAM.)

DAM shall start with setting up a section for dealing with GlobalGAP. (Within one month starting after the departmental presentation of this report.)

DAM shall develop a systemic training plan for GlobalGAP related training targeting farmers and different stakeholders. (Within two weeks after the seminar/workshop and completed within 2 months.)

It shall organize both external and internal formal trainings on different aspects of GlobalGAP for developing knowledge and capacity of own human resources. (Can be initiated after training plan is complete and finished within 6 months given the number of the human resources of the department.)

Design and take approval of a development project relating GlobalGAP

6.6.1.2 Short-run External Interventions:

DAM shall continue providing training on GlobalGAP to the mango farmers as well as supply chain partners. After the training is plan is done under internal intervention it can run for as long as there are interested famers and other stakeholders.

DAM has experience in developing Farmers Group which can be initiated as a regular function to include mango farmers too and shall be extended to include supports services like organizational registration, market intelligence, Contract Farming Agreement Custodian, and value chain development. Starting along the MSP process and continue like training to farmers and other stakeholders.

DAM shall taske initiative for data and record management development among the farmers which is also important for traceability. (within 3 months of the MSP process and can continue as required.)

6.6.1.3 Long-run Internal Intervention:

Implement a development project on GlobalGAP that supports capacity and skill development of internal human resources as well. (3 to 5 years)

Increasing Manpower to tackle the vast field works required for participating in the implementation of GlobalGAP. (1 to 3 years.)

Incorporate GlobalGAP under the existing Act on Agricultural Marketing 2018 to give a legal basis of implementation support and monitoring. (1 to 2 years.)

6.6.1.4 Long-run External Intervention:

Develop National Consortia of Growers' Organizations of mango farmers. (2 to 3 years)

Implement the development project on GlobalGAP.

6.6.2 Generic

The following are to guiding the project design of DAM as mentioned under the longterm external interventions.

Knowledge and awareness building on GlobalGAP is required for not only Mango Farmers but also for many other stakeholders as their knowledge and understanding level cannot be said to be satisfactory and the information shall be passed in local language that will sustain more of the learning.

Risk Assessment, Record Keeping, Auditing, Water quality management, and MRL testing require more interventions in terms of capacity development as well as Financial and Material support.

Contract farming and marketing agreements shall be made on stamp papers to give it legal bindings for all the parties involved.

Closely situated small mango farmers shall be grouped to create common physical facilities like toilets, cleaning and packing shades, disposal grounds or corners.

Organizational development for growers shall be more focused on making the organizations democratic and transparent as well as inclusive to ensure participation of small mango farmers.

To ensure participation of the mango farmers in the GlobalGAP trajectory any future interventions regarding GlobalGAP should accommodate market linkage and market promotion activities as well as financial support for continued participation of the mango farmers. Thus any future intervention shall include a business model to ensure cost coverage of the participating farmers in GlobalGAP trajectory.

7.7 Areas that requires further research:

Conduct a mixed method research to include Cost benefit analysis for mango farmers regarding GlobalGAP

Impact assessment of participation in the GlobalGAP trajectory on household and gender

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Annexure-1

Selected Compliance criteria for Connecting to Livelihood Assets Requirements as Resource Capacity

All Farm Base Compliance Criteria Relevant to Livelihood Assets Requirements:

No.	Area of Focus	Control Point	Selected Compliance Criteria for the Study	Level
AF. 1.1.1	Site History	Is there a reference system for each field, orchard, greenhouse, yard, plot, livestock building/pen, and/or other area/location used in production?	Compliance shall include visual identification in the form of: - A physical sign at each field/orchard, greenhouse/yard/plot/livestock building/pen, or other farm area/location; or - A farm map, which also identifies the location of water sources, storage/handling facilities, ponds, stables, etc. and that could be cross-referenced to the identification system. No N/A.	Major Must
AF. 1.1.2	Site History	Is a recording system established for each unit of production or other area/location to provide a record of the livestock/aquaculture production and/or agronomic activities undertaken at those locations?	Current records shall provide a history of GLOBALG.A.P. production of all production areas. No N/A.	Major Must
AF. 1.2.1	Site Management	Is there a risk assessment available for all sites registered for certification (this includes rented land, structures and equipment) and does this risk assessment show that the site in question is suitable for production, with regards to food safety, the environment, and health and welfare of animals in the scope of the livestock and aquaculture certification where applicable?	A written risk assessment to determine whether the sites are appropriate for production shall be available for all sites. It shall be ready for the initial inspection and maintained updated and reviewed when new sites enter in production and when risks for existing ones have changed, or at least annually, whichever is shorter. The risk assessment may be based on a generic one but shall be customized to the farm situation. Risk assessments shall take into account: - Potential physical, chemical (including allergens) and biological hazards - Site history (for sites that are new to agricultural production, history of five years is advised and a minimum of one year shall be known) - Impact of proposed enterprises on adjacent stock/crops/ environment, and the health and safety of animals in the scope of the livestock and aquaculture certification.	Major Must
AF. 1.2.2	Site Management	Has a management plan that establishes strategies to minimize the risks identified in the risk assessment (AF 1.2.1) been developed and implemented?	A management plan addresses the risks identified in AF 1.2.1 and describes the hazard control procedures that justify that the site in question is suitable for production. This plan shall be appropriate to the farm operations, and there shall be evidence of its implementation and effectiveness.	Major Must
AF. 2.1	Record Keeping	Are all records requested during the external inspection accessible and kept for a minimum period of two years,	Producers shall keep up-to-date records for a minimum of two years. Electronic records are valid and when they are used, producers are responsible for maintaining back-ups of the information.	Major Must

		unless a longer requirement is stated in specific control points?	For the initial inspections, producers shall keep records from at least three months prior to the date of the external inspection or from the day of registration, whichever is longer. New applicants shall have full records that reference each area covered by the registration with all of the agronomic activities related to GLOBALG.A.P. documentation required for this area.	
AF 3.2	Hygiene	Does the farm has a documented hygiene procedure and visibly displayed hygiene instructions for all workers and visitors to the site whose activities might pose a risk to food safety?	<p>The farm shall have a hygiene procedure addressing the risks identified in the risk assessment in AF 3.1. The farm shall also have hygiene instructions visibly displayed for workers (including subcontractors) and visitors; provided by way of clear signs (pictures) and/or in the predominant language(s) of the workforce. The instructions must also be based on the results of the hygiene risk assessment in AF 3.1 and include at a minimum</p> <ul style="list-style-type: none"> - The need to wash hands - The need to cover skin cuts - Limitation on smoking, eating and drinking to designated areas - Notification of any relevant infections or conditions. This includes any signs of illness (e.g. vomiting; jaundice, diarrhea), whereby these workers shall be restricted from direct contact with the product and food-contact surfaces - Notification of product contamination with bodily fluids - The use of suitable protective clothing, where the individuals' activities might pose a risk of contamination to the product. 	Minor Must
AF 3.3	Hygiene	Have all persons working on the farm received annual hygiene training appropriate to their activities and according to the hygiene instructions in AF 3.2?	An introductory training course for hygiene shall be given in both written and verbal form. All new workers shall receive this training and confirm their participation. This training shall cover all instructions defined in AF 3.2. All workers, including the owners and managers, shall annually participate in the farm's basic hygiene training.	Minor Must
AF. 4.1.3	Workers' Health, Safety And Welfare- Health and Safety	Have all people working on the farm received health and safety training according to the risk assessment in AF 4.1.1?	There shall be evidence of instructions in the appropriate language and training records. Producers may conduct the health and safety training themselves if training instructions or other training materials are available (i.e. it need not be an outside individual who conducts the training). No N/A.	Minor Must
AF. 4.2.2	Workers' Health, Safety And Welfare- Training	Do all workers handling and/or administering veterinary medicines, chemicals, disinfectants, plant protection products, biocides and/or other hazardous substances and all workers operating dangerous or complex equipment as defined in the risk analysis in AF 4.1.1 have evidence of competence or details of other such qualifications?	<p>Records shall identify workers who carry out such tasks, and can demonstrate competence (e.g. certificate of training and/or records of training with proof of attendance). This shall include compliance with applicable legislation. No N/A.</p> <p>For aquaculture, cross-reference with Aquaculture Module AB 4.1.1.</p> <p>In livestock, for workers administering medicines proof of adequate experience is also required.</p>	Major Must

AF. 4.3.2	Workers' Health, Safety And Welfare-Hazards and First Aid	Are potential hazards clearly identified by warning signs?	Permanent and legible signs shall indicate potential hazards. This shall include, where applicable: waste pits, fuel tanks, workshops, and access doors of the storage facilities for plant protection products/fertilizers/any other chemicals. Warning signs shall be present and in the predominant language(s) of the workforce and/or in pictograms. No N/A	Minor Must
AF. 4.3.4	Workers' Health, Safety And Welfare-Hazards and First Aid	Are first aid kits available at all permanent sites and in the vicinity of fieldwork?	Complete and maintained first aid kits (i.e. according to local recommendations and appropriate to the activities being carried out on the farm) shall be available and accessible at all permanent sites and readily available for transport (tractor, car, etc.) where required by the risk assessment in AF 4.1.1	Minor Must
AF. 4.3.5	Workers' Health, Safety And Welfare-Hazards and First Aid	Are there always an appropriate number of persons (at least one person) trained in first aid present on each farm whenever on-farm activities are being carried out?	There is always at least one person trained in first aid (i.e. within the last 5 years) present on the farm whenever on-farm activities are being carried out. As a guideline: one trained person per 50 workers. On-farm activities include all activities mentioned in the relevant modules of this Standard.	Minor Must
AF. 4.4.1	Protective Clothing/equipments	Are workers, visitors and subcontractors equipped with suitable protective clothing in accordance with legal requirements and/or label instructions and/or as authorized by a competent authority?	Complete sets of protective clothing, which enable label instructions and/or legal requirements and/or requirements as authorized by a competent authority to be complied which are available on the farm, utilized, and in a good state of repair. To comply with label requirements and/or on-farm operations, this may include some of the following: rubber boots or other appropriate footwear, waterproof clothing, protective overalls, rubber gloves, face masks, appropriate respiratory equipment (including replacement filters), ear and eye protection devices, life-jackets, etc. as required by label or on-farm operations.	Major Must
AF. 4.5.3	Worker Welfare	Do workers have access to clean food storage areas, designated rest areas, hand-washing facilities, and drinking water?	A place to store food and a place to eat shall be provided to the workers if they eat on the farm. Hand washing equipment and drinking water shall always be provided	Major Must
AF. 6.2.2	Waste And Pollution Management, Recycling And Re-Use-Waste and Pollution Action Plan	Is the site kept in a tidy and orderly condition?	Visual assessment shall show that there is no evidence of waste/litter in the immediate vicinity of the production site(s) or storage buildings. Incidental and insignificant litter and waste on the designated areas are acceptable as well as the waste from the current day's work. All other litter and waste shall be cleared up, including fuel spills.	Major Must

Crop Base Compliance Criteria Relevant to Livelihood Assets Requirements:

No.	Area of Focus	Control Point	Selected Compliance Criteria for the Study	Level

CB. 3.7	Planting	Does the producer keep records on seed/planting rate, sowing/planting date?	Records of sowing/planting, rate/density, and date shall be kept and be available.	Minor Must
CB. 4.1.1	Fertilizer Application Advice on Quantity and Type of Fertilizer	Are recommendations for the application of fertilizers (organic or inorganic) provided by competent and qualified persons?	Where the fertilizer records show that the technically responsible person determining quantity and type of the fertilizer (organic or inorganic) is an external adviser, training and technical competence shall be demonstrated via official qualifications, specific training courses, etc., unless employed for that purpose by a competent organization (e.g. official advisory services). Where the fertilizer records show that the technically responsible person determining quantity and type of fertilizer (organic or inorganic) is the producer or designated employee, experience shall be complemented by technical knowledge (e.g. access to product technical literature, specific training course attendance, etc.) and/or the use of tools (software, on farm detection methods, etc.).	Minor Must
CB. 4.2.2	Records of Application	Application dates?	The exact dates (day, month and year) of the application are detailed in the records of all fertilizer applications. No N/A.	Minor Must
CB. 4.2.3		Applied Fertilizer Types?	The trade name, type of fertilizer (e.g. NPK), and concentrations (e.g. 17-17-17) are detailed in the records of all fertilizer applications. No N/A Applied fertilizer types?	Minor Must
CB. 4.3.6	Fertilizer Storage	Not together with harvested products?	Fertilizers shall not be stored with harvested products.	Major Must
CB. 6.2	IPM	"Prevention"?	The producer shall show evidence of implementing at least two activities per registered crop that include the adoption of production practices that could reduce the incidence and intensity of pest attacks, and thereby reducing the need for intervention.	Major Must
CB. 6.3	IPM	"Observation and Monitoring"?	The producer shall show evidence of a) implementing at least two activities per registered crop that will determine when and to what extent pests and their natural enemies are present, and b) using this information to plan what pest management techniques are required.	Major Must
CB. 7.2.1	Plant Protection Materials	Are the persons selecting the plant protection products competent to make that choice?	Where the plant protection product records show that the technically responsible person making the choice of the plant protection products is an external qualified adviser, technical competence shall be demonstrated via official qualifications or specific training course attendance certificates. Fax and e-mails from advisers, governments, etc. are permissible. Where the plant protection product records show that the technically responsible person making the choice of plant protection products is the producer or designated employee, experience shall be complemented by technical knowledge that can be demonstrated via technical documentation (e.g. product technical literature, specific training course attendance, etc.).	Major Must

CB. 7.6.1	Maximum Residue Level	Can the producer demonstrate that information regarding the Maximum Residue Levels (MRLs) of the country(ies) of destination (i.e. market(s) in which the producer intends to trade) is available?	The producer or the producer's customer shall have available a list of current applicable MRLs for all market(s) in which produce is intended to be traded (domestic and/or international). The MRLs shall be identified by either demonstrating communication with clients confirming the intended market(s), or by selecting the specific country(ies) (or group of countries) in which produce is intending to be traded, and presenting evidence of compliance with a residue screening system that meets the current applicable MRLs of that country. Where a group of countries is targeted together for trading, the residue screening system shall meet the strictest current applicable MRLs in the group. Refer to Annex CB. 4 Residue Analysis.	Major Must
CB. 7.9.3	Empty Plant Protection Product (PPP) Container	Are empty containers kept secure until disposal is possible?	There is a designated secure store point for all empty plant protection product containers prior to disposal that is isolated from the crop and packaging materials (i.e. permanently marked via signage and locked, with physically restricted access for persons and fauna).	Minor Must
CB. 7.9.4	Empty Plant Protection Product (PPP) Container	Does disposal of empty plant protection product containers occur in a manner that avoids exposure to humans and contamination of the environment?	Producers shall dispose of empty plant protection product containers using a secure storage point, a safe handling system prior to the disposal, and a disposal method that complies with applicable legislation and avoids exposure to people and the contamination of the environment (watercourses, flora and fauna). No N/A.	Minor Must
Fruits and Vegetable Base Compliance Criteria Relevant to Livelihood Assets Requirements				
FV 4.1.1	Water Quality	Is there evidence of a risk assessment covering the microbiological quality of the water used in all pre-harvest operations?	A written risk assessment of microbiological quality of the water is conducted. It includes water source, proximity to potential sources of contamination, application timing (growth stage of the crop), application method, and placement of application (harvestable part of the crop, other parts of the crop, ground between crops, etc.).	Major Must
FV 5.1.5	Harvest and Post Harvest	Are signs that communicate the primary hygiene instructions to workers and visitors, including at least instructions to workers, to wash their hands before returning to work clearly displayed?	Signs with the main hygiene instructions shall be visibly displayed in the relevant locations and include clear instructions that hands shall be washed before handling produce. Workers handling ready to eat products shall wash their hands prior to start of work, after each visit to a toilet, after handling contaminated material, after smoking or eating, after breaks, prior to returning to work, and at any other time when their hands may have become a source of contamination.	Major Must
FV 5.1.6	Harvest and Post Harvest	Are smoking, eating, chewing and drinking confined to designated areas segregated from growing areas and products?	Smoking, eating, chewing and drinking are confined to designated areas away from crops awaiting harvest and are never permitted in the produce handling or storage areas, unless indicated otherwise by the hygiene risk assessment. (Drinking	Major Must

			water is the exception).	
FV 5.2.1	Sanitary Facilities	Do harvest workers who come into direct contact with the crops have access to appropriate hand-washing equipment and make use of it?	<p>Wash stations shall be available and maintained (hand soap, towels) in a clean and sanitary condition to allow workers to clean their hands. Personnel shall wash their hands prior to start of work; after each visit to a toilet; after handling contaminated material; after smoking, or eating; after breaks; prior to returning to work; and at any other time when their hands may have become a source of contamination.</p> <p>Water used for hand washing shall at all times meet the microbial standard for drinking water. If this is not possible, sanitizer (e.g. alcohol based gel) shall be used after washing hands with soap and water with irrigation water quality.</p> <p>Hand-washing stations shall be provided inside or close to toilet facilities. No N/A.</p>	Major Must
FV 5.2.3	Sanitary Facilities	Do workers handling the product on the field or in a facility have access to clean toilets and hand-washing facilities in the vicinity of their work?	<p>Hand washing facilities, containing non-perfumed soap, water to clean and disinfect hands, and hand-drying facilities shall be accessible and near to the toilets (as near as possible without the potential for cross-contamination). Workers shall wash their hands prior to start of work; after each visit to a toilet; after using a handkerchief/tissue; after handling contaminated material; after smoking, eating or drinking, after breaks; prior to returning to work; and at any other time when their hands may have become a source of contamination. When handling takes place in a facility, toilets shall be maintained in a good state of hygiene, and shall not open directly onto the produce handling area, unless the door is self-closing.</p>	Major Must

Annexure-2.1

(First draft)

SSI Checklist (Participants & Non Participants in CDAIS or SNV initiatives)

Interview Date and Time:

Interview Location:

CDAIS & SNV Participation Status: (Yes/No)

If Yes, which of them or both of them (CDAIS/SNV/Both)? Or, Others?

HH Address:

Contact no:

Address of the Mango Garden (If not same as above):

Distance from nearest Main Road (in k.m.):

Distance from the District Sadar/Centre (in k.m.):

Distance from nearest Market (in k.m.):

Distance from nearest Bank (in k.m.):

Distance from nearest Govt. Organization (in k.m.):

First Part- General Socio-Economic & Demographics

1.1.1 Gender of the Respondents: (M/F)

1.1.2 Marital Status of the Respondents: (Unmarried/Married/Divorced)

1.1.3 What is the age of the respondents (In years around to exclude the months)?

1.1.4 What is the level of education of the respondent?

1.1.5 What is the number of family members of the respondent (Including Respondent)?

1.1.6 What is the number of Household Members? (All living in the household Including Respondent)

1.2.1 What is the total land area owned by him/her (excluding any leased/rented land)?

[There can be local units of land measures so conversion shall be noted. Own land would mean land in his/her name or in his/her family's name in case owned by family and shall be noted]

1.2.2.1 Do you grow other crops than Mango? (Y/N) 1.2.2.2 If Yes, Rank main three:

1.2.3.1 Are you involved in other economic activities besides agricultural production? (Y/N)

1.2.3.2 If Yes, What is that? (Open ended), 1.2.3.3 what is its economic contribution to your total yearly income? (In approximate percent)

1.3.1 For how long you are involved in Mango Production (in years)?

1.3.2 What is the size of your own mango garden (mango production area excluding leased/rented in)(In Hectares or decimal)?

[There can be local units of land measures so conversion shall be noted. Own land would mean land in his/her name or in his/her family's name in case owned by family and shall be noted]

1.3.3 What is the size of your total mango garden (mango production area including leased/rented in)(In Hectares or decimal)?

[There can be local units of land measures so conversion shall be noted]

1.3.4.1 How many trees there are under your mango production?

1.3.4.2 What is the average age of your mango trees?

1.3.4.3 What are the varieties of your mango trees and approximate yearly production?

Variety of mango trees	% of Total mango trees	Approximate Yearly Production (in MT*)
Langra		

Himshagar		
Amropali		
Fazli		
Khirshapati		
Others (mention name)		

[* Local unit like Mound can be used but has to be converted into MT]

1.3.5 Where or to whom do you sale how much of your mangoes?

Where or to whom?	% of total mango production

1.3.6 Where do you want to sell your mango? Local or Export Market (Desire to change)

1.3.7 Who make most of the decisions in your household about mango farming and marketing?

1.3.8.1 Who else of the households is directly involved in the mango farming/production and marketing beside the respondent? 1.3.8.2 Particularly who does what; only if women/female is found to be involved? [Please segregate specific tasks regarding mango production and marketing performed by male and female of the HH]

1.3.8.2 (Put Tick) [this question shall be tried separately for the female and male respondents of the same household]

Task Name in Mango Production to Marketing	Performed by Male	Performed by Female	Paid or not paid
Land Preparation			
Sowing/Planting			
Weeding			
Irrigation/Watering			
Fertiliser and PPP Application			
Bagging			
Guarding			
Harvesting			
Carrying			
Washing			
Grading			
Packing			
Transporting			
Promoting			
Selling			
Contract Negotiation			
Labour Handling			
Site cleanliness and Hygiene Maintenance			
Record Keeping			
Sign Design and Development			
Supervision			

1.3.9.1 Does he/she have access to financial Credit? 1.3.9.2 What do you use the financial Credit for? 1.3.9.3 Is the financial access adequate? 1.3.9.4 Have you faced any challenges in managing the Credit?

1.3.9.5 Have you used any Credit facility for mango production and marketing?

1.3.10 Does he/she have any contract farming agreement with anyone?

1.3.11 Does he/she have membership in any farmers' organizations?

1.3.12 Does he/she have membership in any other type of organizations that helps in mango production?

1.3.12 Does he/she have membership in any other type of organizations that helps in Bargaining for better marketing of the mango?

1.4.1 Do you use Mobile? From When? How it helps you in Mango production and marketing?

1.4.2 Do you use Internet? From When? How it helps you in Mango production and marketing?

Second Part: (SRQ 1.1)

2.1 Do you know about GlobalGAP? (Y/N)

If “No”, go to Question 2.16.1

2.2 From where you became aware of GlobalGAP? (Open ended)

2.3 How far you know about GlobalGAP? (Open ended)

2.4 What medium and language he/she received the information in? Hard cope/Electronic; English/Bengali

2.5 What is his/her view about completeness (very comprehensive to too limited), ease of understanding (very easy to very hard)? (5 point scale)

2.6 Does he/she think of need of more information on GlobalGAP? (Y/N)

2.7 What type of information he/she lacks regarding GlobalGAP? (Open ended)

2.8 What does he/she think about positive benefit of GlobalGAP? (Open ended)

2.9 What does he/she think about negative effects of GlobalGAP? (Open ended)

2.10 Why did he/she try to participate? (Open ended)

2.11 Why he/she did not try to participate?(Open ended-to non participant only)

2.12 Does he/she want to continue participating in globalGAP? (Y/N)

2.13 How satisfied he/she was to participate in the GlobalGAP? (Very satisfied to Not At All; 5 point scale, participants only)

2.14 How does he/she feel about the processes of GlobalGAP? (Complex or Easy; 5 point scale)

2.15.1 What is your view about the importance of quality and safety in mango production and marketing?

2.15.2 Do you practice any quality and safety measures? (Y/N)

If Yes, 2.15.2.1 Please describe what you do?

2.15.2.2 What resources you need to maintain the above?

2.15.2.3 What Challenges you face in managing the resources?

2.15.2.4 What support or collaborations there are to meet your need?

If No, to 2.15.2> 2.15.2.5 Please tell why you don't do anything regarding quality and safety measures in Mango Production and Marketing?

Third Part: (SRQ 1.2 and SRQ 1.3)

Site Management & Record Keeping:

3.1.1 What is the view of the respondent about maintaining data records of the mango production? What level of Data records the respondent maintains?

3.1.2 What resources he/she needed to manage the data records?

3.1.3 What challenges he/she faced in maintaining the data records?

3.1.4 What Collaborations or support there are about maintaining data records and from whom? (CE-Conducive Environment)

Hygiene and Cleanliness

3.2.1 What level of Hygiene and Cleanliness (In terms of toilet and washing facility) the respondent maintains?

3.2.2 What resources he/she needed to manage the Hygiene and Cleanliness?

3.2.3 What challenges he/she faced in maintaining Hygiene and Cleanliness?

3.2.4 What Collaborations or support there are about Hygiene and Cleanliness and from whom? (CE-Conducive Environment)

Fertilizer & Hazardous Material Application and Safety

3.3.1 Does the respondent maintain prescribed level of fertilizers and Plant Protection Products (PPP)?

3.3.2.1. What resources he/she needed to manage the Fertilisers and PPP?

3.3.2.2. What resources he/she needed for managing the empty containers of the PPP?

3.3.3 What challenges he/she faced in maintaining safety regarding the hazardous materials?

3.3.4 What Collaborations or support there are about Fertilisers and PPP management and from whom? (CE-Conducive Environment)

Product Quality and Safety Concern

- 3.4.1 Does the respondent maintain prescribed level of Maximum Residue Level (MRL) of chemical in Mango production?
- 3.4.2 What resources he/she needed to manage the MRL level of chemical in Mango or the Residue Management System (RMS)?
- 3.4.3 What challenges he/she faced in maintaining the MRL?
- 3.4.4 What Collaborations or support there are about managing MRL and from whom? (CE-Conducive Environment)

Certification:

- 3.5.1 Have you received certification of GlobalGAP ever? If Yes, When? If no>3.5.6
- 3.5.2 What resources you needed to achieve this certification?
- 3.5.3 What challenge you faced in achieving this certification?
- 3.5.4 What collaboration or support you received and from whom? (CE-Conducive Environment)
- 3.5.5 Are you continuing certification of GlobalGAP through renewal?
- If 'No' to Q.3.5.1>3.5.6 Why didn't you get the GlobalGAP Certification?

Part Four (SRQ 1.3)

- 4.1 Please identify any collaborations or supports on following aspects you can remember or still having and comment on their status.

Support Areas	*Main form of support	**Status of the Collaboration or Support	*** Rating of the Supports/ Collaborations	Collaboration or Support From Whom
Informing about GlobalGAP & its benefit				
Mango Production Site Risk Assessment				
Record Keeping of Mango Production Process				
Input Quality Assurance (Fertilizer and PPP)				
Input Dose Specifications (Fertilizer and PPP)				
Input Quality Assurance (Water for production and Post Harvesting Management)				
Output Quality Assurance (MRL Testing and RMS)				
Technical Skill Development for maintaining GlobalGAP				
Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.				
Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.				
Maintaining the Safety and Health of the workers related to the mango production.				
Maintaining ICT structure required for participating in the GlobalGAP				
Maintaining ICT connectivity required for participating in the GlobalGAP				
Developing Farmers' Organization				
Maintaining Membership in formal Organizations				
Establishing Contract Farming or Marketing/Sales Agreement				
Labelling and Packaging				
Mango Transportation				
Mango Selling				
Certification Cost				
Certification Renewal Cost				
Auditing Support (Cost or means)				
Disposal of empty cans and containers of the chemicals used				
Use of protective gears like gloves and masks where applicable				

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*Main form of support= Direct Financial, Indirect Financial, Technical Training to Develop knowledge and Skill, Material Supports, Support to test quality of inputs or outputs, Support to Maintain Agreement, Support to be member to Formal Organization,

**Status of the Collaboration or Support= Support ended, Support Continued Existing, Support Started, Support Coming Soon

*** Rating of the Supports/Collaborations = Not Satisfactory At all = 1 to Very satisfactory = 5

4.2 Please rate the following stakeholders from 1 to 5 on the following parameters where 1 reflect lowest level and 5 reflect highest level

Parameters	Government Sector	Private Sector	Development Partners & NGOs
Trusting on Information Provided on GlobalGAP			
Easiness of Information Provided on GlobalGAP			
Role in Making Understanding about GlobalGAP easy			
Effectiveness of Training provided on GlobalGAP			
Adequacy of Training Provided on GlobalGAP			
Effectiveness of Technical Assistance for Implementing GlobalGAP			
Effectiveness of Financial Assistance for Implementing GlobalGAP			
Effectiveness of Material Support for Implementing GlobalGAP			
Satisfaction level regarding Technical Assistance for Implementing GlobalGAP			
Satisfaction level regarding Financial Assistance for Implementing GlobalGAP			
Satisfaction level regarding Material Support for Implementing GlobalGAP			
Challenges faced to work with regarding GlobalGAP			

Name and Signature of Interviewer:

Annexure-2.2

First Part: Organizational and respondent profiling:

Name of the Organization:

Type of Organization:

Year of operation/from when it is in operation:

Main organizational mandate/mission/objective relevant to Mango production, marketing and export:

Organizational relevance to GlobalGAP:

Name of the respondent:

Designation of the respondent:

Gender of the respondent:

Years of engagement/Experience in the present organization:

Involvement with Mango production, marketing and export:

Involvement with GlobalGAP:

Second Part: SRQ 1

1.1 What is your view about the importance of quality and safety measures in mango production and marketing?

1.2 What is your view about positive benefit of GlobalGAP? (Open ended)

1.3 What is your view about negative effects of GlobalGAP? (Open ended)

Questions for the Solidaridad, SNV, CDAIS, HORTEX, and DAE:

1.4 What is your experience in dealing with GlobalGAP at mango farmers' end?

1.5 What activities the organization had taken so far relevant to GlobalGAP?

1.6 What support or collaborations relevant to GlobalGAP your organization has provided to meet mango farmers' need? [Please comment on the existing, past, and/or future supports or collaborations relevant to GlobalGAP at mango farmers' end from your organization.]

Activities by the organization	*Main form of support	**Status of the Collaboration or Support	*** Rating of the Supports/ Collaborations
Informing about GlobalGAP & its benefit			
Mango Production Site Risk Assessment			
Record Keeping of Mango Production Process			
Input Quality Assurance (Fertilizer and PPP)			
Input Dose Specifications (Fertilizer and PPP)			
Input Quality Assurance (Water for production and Post Harvesting Management)			
Output Quality Assurance (MRL Testing and RMS)			
Technical Skill Development for maintaining GlobalGAP			
Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining the Safety and Health of the workers related to the mango production.			
Maintaining ICT structure required for participating in the GlobalGAP			
Maintaining ICT connectivity required for participating in the GlobalGAP			
Developing Farmers' Organization			
Maintaining Membership in formal Organizations			
Establishing Contract Farming or Marketing/Sales Agreement			
Supporting Labelling and Packaging			
Supporting Mango Transportation			
Supporting Mango Selling			
Supporting Certification Cost			
Supporting Certification Renewal Cost			
Auditing Support (Cost or means)			
Disposal of empty cans and containers of the chemicals used			
Use of protective gears like gloves and masks where applicable			

*Main form of support: 1 = Direct Financial, 2= Indirect Financial, 3=Technical Training to Develop knowledge and Skill, 4=Material Supports, 5=Support to test quality of inputs or outputs, 6=Support to Maintain Agreement, 7=Support to be member to Formal Organization,

**Status of the Collaboration or Support: 1= Support ended, 2=Support Continued Existing, 3=Support Started, 4=Support Coming Soon

*** Rating of the Supports/Collaborations = Not Satisfactory At All = 1 to Very satisfactory = 5

(If they do not do anything) Please tell why you don't do anything regarding quality and safety measures in Mango Production and Marketing?

How satisfied you are with the activities of your organization relevant to the GlobalGAP? (Very satisfied =5 to Not At All=1; 5 point scale)

What resources your organization needed to maintain the above activities relevant to GlobalGAP?
What Challenges you face in managing the resources?

[Record the narratives and probe through the following questions/NA if done online]

Third Part: SRQ 2

2. What are the main resources the mango farmers require in implementing GlobalGAP?

Resource Types	Financial	Human	Social	Physical
Descriptions				

Hints: Physical (Building or physical structures like sheds, toilet, drainage, etc., Physical Sign Posts, equipments, tools, machineries, transports, etc.), Financial (Money and Credit facilities for Investment in Physical Structures, maintaining Operating Expense, Availing and Continuing Certification, etc.), Human (Education, Awareness, Knowledge, Skill, Attitude), Social (Written Agreement for Contract Farming and/or marketing, selling, Membership in Cooperatives or Farmers' Organization, Membership in Other Type of Organizations, Affiliation to Local Pressure Groups, etc.).

What are the main challenges the mango farmers face in implementing GlobalGAP?

Fourth Part: SRQ 3

3. What problems/challenges your organization faced in implementing the supports at (mango) farmers' end? (Use only the relevant rows and add new ones at the bottom)

Activities by the organization	Problem 1	Problem 2	Problem 3
Informing about GlobalGAP & its benefit			
Mango Production Site Risk Assessment			
Record Keeping of Mango Production Process			
Input Quality Assurance (Fertilizer and PPP)			
Input Dose Specifications (Fertilizer and PPP)			
Input Quality Assurance (Water for production and Post Harvesting Management)			
Output Quality Assurance (MRL Testing and RMS)			
Technical Skill Development for maintaining GlobalGAP			
Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining the Safety and Health of the workers related to the mango production.			
Maintaining ICT structure required for participating in the GlobalGAP			
Maintaining ICT connectivity required for participating in the GlobalGAP			
Developing Farmers' Organization			
Maintaining Membership in formal Organizations			
Establishing Contract Farming or Marketing/Sales Agreement			
Supporting Labelling and Packaging			
Supporting Mango Transportation			
Supporting Mango Selling			
Supporting Certification Cost			

Supporting Certification Renewal Cost			
Auditing Support (Cost or means)			
Disposal of empty cans and containers of the chemicals used			
Use of protective gears like gloves and masks where applicable			

Annexure-2.3

(First Draft)

General guideline for the FGD and Checklist:

As mentioned before, all the mango farmers that had participated or were covered by the CDAIS and/or SNV, or any other will be treated as participating and the others as non-participating farmers. The FGDs will be conducted on the participating and non participating mango farmers separately in each area and comprised of 10 farmers in each. A total of 4 FGDs will be conducted in two areas.

All the participants of FGDs will provide some socio-economic data including basic demographics and household data. Though the FGDs will be conducted separately for the participating and the non participating mango farmers most of the checklist can be aimed at both the participants and non participant mango farmer otherwise it is mentioned along the questions.

FGD will mainly focus on the response differences among different groups like large, small, and female or combined farmers and discussions over critical issues already found from SSI to identify differing views as well as consensus.

Please explain the purpose of the interview and read aloud the data protection and anonymity commitment to all. Organize the sitting arrangement maintaining safety protocol (social distance of 1.5 metres and wearing masks) under COVID 19 situation.

Venue:

Date & Time:

Participants' Profile:

Sl. No. + Name	HH Address	Contact no	Education (highest level achieved)	Gender (M/F)	Age in years	Size of Farm in hectares (Large and Small)	Collaboration status (SNV/ CDAIS /HORTEX/ DAE/DAM/ Others/Non)	Group & Participant Code (LM/LF+M/SM/SF+M with addition of Y for younger or equal to 35, O for older than 35* years of age)+P/NP+ SL.No.

(According to the National Youth Policy 2017 of Bangladesh, 35 years is the demarcation point for defining Youths in general)

Group Code Explanation: Large Male-LM/ Large Female-LF or Large Female+ Male-LFM/Small Male-SM/Small Female-SF or Small Female+ Male-SFM

P/NP= Participating or Non Participating Mango Farmers

Example1: LMYP1 (To reflect First Participant of the category of Large Male and Old Participating Farmer)

Example2: SFMYNP2 (To reflect Second Participant of the category of Small Female+ Male or combined decision maker type and Young Non Participating Farmer)

Participants' Profile:

Group & Participant Code	Access to Credit for Mango Production and Marketing	Use of Mobile and Internet in Mango Production and Marketing	Membership in Farmers' Organization	Membership in other type of Organizations	Does any female of HH involved in at any stage of production to marketing of mango (Y/N)	If Yes, What they do?

SRQ 1:

Group & Participant Code	1.1 From When and whom they became aware of GlobalGAP?	1.2 How do they view necessity of GlobalGAP (Y/N)	1.3 Why Yes (Benefit)	1.4 Why No (Problem)	1.5 Where do they sell their mangoes now?	1.6 Where do they want to sell their mangoes?

SRQ 2:

Group & Participant Code	2.1 What they are maintaining presently in terms of GlobalGAP or relating GlobalGAP?	2.2 What resources are required to maintain GlobalGAP (or the relevant activities)	2.3 Ranking of the Resources in terms of importance	2.4 What challenges they face managing the resources	2.5 Ranking of the challenges they faced in terms of criticality

Hints for 2.2 Resource categories: Natural (Land, Soil quality, Water and water quality, Climate & Environment, etc.), Physical (Building or physical structures, Physical Sign Posts, equipments, tools, machineries, transports, etc.), Financial (Money and Credit facilities for Investment in Physical Structures, maintaining Operating Expense, Availing and Continuing Certification, etc.), Human (Awareness, Knowledge, Skill, Attitude), Social (Written Agreement for Contract Farming and/or marketing, selling, Membership in Cooperatives or Farmers' Organization, Membership in Other Type of Organizations, Affiliation to Local Pressure Groups, etc.). So try to identify the resources as per the categories.

SRQ 3:

Please identify any collaborations or supports on following aspects you can remember or still having and comment on their status.

Group & Participant Code	Relevant Support Areas	*Main form of support	**Status of the Collaboration or Support	Collaboration or Support From Whom
	Informing about GlobalGAP & its benefit			
	Mango Production Site Risk Assessment			
	Record Keeping of Mango Production Process			
	Input Quality Assurance (Fertilizer and PPP)			
	Input Dose Specifications (Fertilizer and PPP)			

	Input Quality Assurance (Water for production and Post Harvesting Management)			
	Output Quality Assurance (MRL Testing and RMS)			
	Technical Skill Development for maintaining GlobalGAP			
	Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
	Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
	Maintaining the Safety and Health of the workers related to the mango production.			
	Maintaining ICT structure required for participating in the GlobalGAP			
	Maintaining ICT connectivity required for participating in the GlobalGAP			
	Developing Farmers' Organization			
	Maintaining Membership in formal Organizations			
	Establishing Contract Farming or Marketing/Sales Agreement			
	Labelling and Packaging			
	Mango Transportation			
	Mango Selling			
	Certification Cost			
	Certification Renewal Cost			
	Auditing Support (Cost or means)			
	Disposal of empty cans and containers of the chemicals used			
	Use of protective gears like gloves and masks where applicable			

*Main form of support = Direct Financial, Indirect Financial, Technical Training to Develop knowledge and Skill, Material Supports, Support to test quality of inputs or outputs, Support to Maintain Agreement, Support to be member to Formal Organization,

**Status of the Collaboration or Support= Support ended, Support Continued Existing, Support Started, Support Coming Soon

Please identify any collaborations or supports on following aspects you can remember or still having and comment on them.

Group & Participant Code	Relevant Support Areas	Problems they faced to maintain those collaborations or availing the supports?
	Informing about GlobalGAP & its benefit	
	Mango Production Site Risk Assessment	
	Record Keeping of Mango Production Process	
	Input Quality Assurance (Fertilizer and PPP)	
	Input Dose Specifications (Fertilizer and PPP)	
	Input Quality Assurance (Water for production and Post Harvesting Management)	
	Output Quality Assurance (MRL Testing and RMS)	
	Technical Skill Development for maintaining GlobalGAP	
	Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.	
	Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.	
	Maintaining the Safety and Health of the workers related to the mango production.	
	Maintaining ICT structure required for participating in the GlobalGAP	
	Maintaining ICT connectivity required for participating in the GlobalGAP	
	Developing Farmers' Organization	
	Maintaining Membership in formal Organizations	
	Establishing Contract Farming or Marketing/Sales	

	Agreement	
	Labelling and Packaging	
	Mango Transportation	
	Mango Selling	
	Certification Cost	
	Certification Renewal Cost	
	Auditing Support (Cost or means)	
	Disposal of empty cans and containers of the chemicals used	
	Use of protective gears like gloves and masks where applicable	

Please use separate sheet of paper for the different groups of farmers like Large Male Farmers/Small Farmers/Female and/or Combined Farmer for Ranking

Relevant Support Areas	Ranking by Large (Male) Farmers	Ranking by Small (male) Farmers	Ranking by Female & Combined Farmers
Informing about GlobalGAP & its benefit			
Mango Production Site Risk Assessment			
Record Keeping of Mango Production Process			
Input Quality Assurance (Fertilizer and PPP)			
Input Dose Specifications (Fertilizer and PPP)			
Input Quality Assurance (Water for production and Post Harvesting Management)			
Output Quality Assurance (MRL Testing and RMS)			
Technical Skill Development for maintaining GlobalGAP			
Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining the Safety and Health of the workers related to the mango production.			
Maintaining ICT structure required for participating in the GlobalGAP			
Maintaining ICT connectivity required for participating in the GlobalGAP			
Developing Farmers' Organization			
Maintaining Membership in formal Organizations			
Establishing Contract Farming or Marketing/Sales Agreement			
Labelling and Packaging			
Mango Transportation			
Mango Selling			
Certification Cost			
Certification Renewal Cost			
Auditing Support (Cost or means)			
Disposal of empty cans and containers of the chemicals used			
Use of protective gears like gloves and masks where applicable			

Please rate the following stakeholders from 1 to 5 on the following parameters where 1 reflect lowest level and 5 reflect highest level

Rating by Large Male Farmers/ Small Male Farmers/Female and/or Combined Farmer

	Government Sector	Private Sector	Development Partners & NGOs
Trusting on Information Provided on GlobalGAP			
Easiness of Information Provided on GlobalGAP			
Role in Making Understanding about GlobalGAP easy			
Effectiveness of Training provided on GlobalGAP			
Adequacy of Training Provided on GlobalGAP			
Effectiveness of Technical Assistance for Implementing GlobalGAP			
Effectiveness of Financial Assistance for Implementing GlobalGAP			
Effectiveness of Material Support for Implementing GlobalGAP			
Satisfaction level regarding Technical Assistance for Implementing GlobalGAP			
Satisfaction level regarding Financial Assistance for Implementing GlobalGAP			
Satisfaction level regarding Material Support for Implementing GlobalGAP			
Challenges faced to work with regarding GlobalGAP			

Annexure-3

Sub question	Type of Information needed	Source of information	Method to use to access information	Tools*	When	Data processing
SRQ 1: what is the perception of the mango farmers of Bangladesh about Benefit of GlobalGAP?	1.1 Secondary data and info like; List of mango farmers, participants of CDAIS and SNV, and also from DAE to find out the non participants 1.2 Primary data like; up to date technical info on GlobalGAP at farmers' end (like knowledge on process & relevant types of GlobalGAP), sources of information, medium of information, Perception about benefits of participation in GlobalGAP, Attitude and desire to participate	1.1 Secondary Sources like organizational documents of Mango Growers' Association and DAE Rajshahi Office was found available and was primarily used for sampling and contacting. 1.2 Selected mango farmers for primary data relevant to 1.2	1.1 Reviewing and Screening secondary information and documents	Online and offline (by RA if situation permits) search for Secondary data and information.	Desk Study Starts after approval of the final proposal- 10 days	List of farmers was used to select farmers who had participated with CDAIS and SNV and who didn't and from the list sampling was done for other tools like the SSI and the FGDs for mango farmers.
			1.2 Semi Structured Interview (SSI)	Face to Face or Online interview using Semi-structured interview checklist and guideline for primary data	SSIs were conducted from August 10 th till 20 th , 2 Weeks	Collected data and information from the SSI were categorised and coded to answer 1.1.2 which was related to the individual level factors like Awareness, knowledge and perception about benefits of GlobalGAP among mango farmers of the case area.
Sub question	Type of Information needed	Source of information	Method to use to access information*	Tool	When	Data processing
SRQ 2: What is the situation of mango farmers of Bangladesh in terms of the livelihood assets level factors as required for implementing GlobalGAP?	Data and information on following livelihood assets required for maintaining GlobalGAP at farmers' end-2.1 Natural- field & water quality; 2.2 Physical-Access to safety equipments; 2.3 Social-written Contract Farming agreement with any Exporter/agent; 2.4 Financial- Access to credit	Mango farmers of Study locations (CDAIS & SNV Participants and non participants) for primary data and Secondary sources like Records and Documents with Mango Farmers (if any), GlobalGAP docs,	Desk study	Online and offline search for Secondary data and information.	After approval of the final proposal- 10 days	Secondary data and information was used to cross check/validate/triangulate primary data from SSI and FGD where possible on probable assistance received by the mango farmers from different stakeholders regarding identified livelihood assets relevant to GlobalGAP

	facility for investment required for maintaining GlobalGAP, Fixed & Variable Cost; 2.5 Human- Skill for maintaining records, skill or access to skilled labour for the equipments and machineries; sources of the selected assets; relevant challenges faced by the mango farmers to arrange and maintain the selected livelihood assets; Ranking of the different Assets by the Mango farmers based on their Importance and Criticality	CDAIS, SNV, HORTEX, EPB, MoC, MoA, and DAE documents, records, etc.	SSI	Face to Face or Online interview using Semi-structured interview checklist and guideline	SSIs were conducted from August 1 st till 10 th , 10 days	Data have been categorised according to qualitative and quantitative nature and also according to the type of livelihood assets besides ranking of the livelihood assets
			FGD	Face to face group discussion using FGD guideline and checklist	FGD were conducted from August 11 th till 15 th , 5 days	Categorised and Coded summary of statements on influencing factors and challenges. FGD data were used to find agreement and disagreement between groups on importance, challenges besides validating relevant data from Desk and SSI (say for example cost, price, or value related data and information on selected livelihood assets) by group comments.
Sub question	Type of Information needed	Source of information	Method to use to access information*	Tool	When	Data processing
SRQ 3: What are the past and existing collaborations influencing participation of the mango farmers of Bangladesh to implement GlobalGAP?	Data and information on past and existing supports and challenges in sustainability of the supports related to like; field and safety management, certification cost, support for lab testing, support for understanding the GlobalGAP, support for record keeping, support for skill development, support for assured price and	HORTEX Foundation, DAE, EPB, MoC, MoA; CDAIS, SNV; and BFFVEA, Swapno, Agora documents and records of secondary data and information; mango farmers, and key informants of relevant government & private (like channel	Desk Study	Online and offline (by RA if situation permits) search for Secondary data and information.	Desk Study Starts after approval of the final proposal- 10 days	Secondary data and information were used to cross check/validate primary data from SSI and KII where possible on past and existing collaborations relevant to GlobalGAP at mango farmers' end

	sales from 3.1 Govt., 3.2 Pvt. 3.3 Others	partners or actors/operators) organizations and other stakeholders	SSI	Face to Face or Online interview using Semi-structured interview checklist and guideline	SSIs were conducted from August 1 st till 10 th , 10 days	Individual Mango Farmers' knowledge and views on the past and existing collaborations for GlobalGAP were categorised and coded to reflect on the conduciveness of environment for implementing GlobalGAP at mango farmers' end.
			FGD	Face to face or online group discussion using FGD guideline and checklist	FGDs were conducted from August 1 st till 10 th , 10 days	Categorised and Coded summary of statements on past and existing collaborations and challenges faced to sustain those collaborations. FGD data were used to find differences in opinions among different types of mango farmers, agreement, and disagreement on importance, challenges relevant to the past and existing collaborations. Data were categorised to see if any difference exist between individual and group perceptions about challenges.
			KII	Face to Face and Telephonic Interview using KII guideline and Checklist. But many of them were also done through emails.	KIIs were conducted from 25 th July till August 15 th , 21 days	Collaborations were categorised and coded according to their criticality from stakeholders' point of view as influencing factors of participation for the mango farmers in GlobalGAP, and also based on status of the collaborations.

Annexure-4.1 (HORTEX Foundation)

Guideline for the Key Informant Interview (KII):

Relevant organizational heads or representatives defined by the head will be interviewed but under present COVID 19 situation any reasonably representative human resources of officer or manager level of the organization can be interviewed for convenience. The interview will be conducted to get insight of the organization's understanding, attitude, involvement, and collaborations or supports already in place for implementing GlobalGAP at mango farmers' end. The interview will also try to elicit the resources required and challenges the organizations faced in supporting the mango farmers in implementing GlobalGAP.

First Part: Organizational and respondent profiling:

Name of the Organization: Hortex Foundation

Type of Organization: Not for Profit Organization

Year of operation/from when it is in operation: 1993

Main organizational mandate/mission/objective relevant to Mango production, marketing and export:

Market intelligence support

Organizational relevance to GlobalGAP: Export promotion

Name of the respondent: Mitul Kumar Saha

Designation of the respondent: Assistant General Manager

Gender of the respondent: Male

Years of engagement/Experience in the present organization: 10

Highest level Education: MS

Involvement with Mango production, marketing and export: 6

Involvement with GlobalGAP: 6

Second Part: SRQ 1

What is your view about the importance of quality and safety measures in mango production and marketing? Highly important

What is your view about positive benefit of GlobalGAP? (Open ended) Ensure quality, safety & nutrition of the produce, develop consumer confidence, good environment, farmers welfare, workers safety

What is your view about negative effects of GlobalGAP? (Open ended) Required financial investment and technical support

Special Questions for the Solidaridad, SNV, CDAIS, HORTEX, and DAE:

What is your experience in dealing with GlobalGAP at mango farmers' end?

What activities the organization had taken so far relevant to GlobalGAP?

Developed Master Trainer of DAE, BARI, BARC, Hortex Officials, lead trainer of DAE & Solidaridad

Officials, lead trainer of farmers and some value chain actors like transporters, nursery owner

How satisfied you are with the activities of your organization relevant to the GlobalGAP? (Very satisfied to Not At All; 5 point scale) Not at all

What resources your organization needed to maintain the above activities relevant to GlobalGAP?

Financial and technical

What Challenges you face in managing the resources? Mainly financial limitation, very few resources

[Record the narratives and probe through the following questions]

Third Part: SRQ 2

What are the main resources the mango farmers require in implementing GlobalGAP?

Resource Types	Financial	Human	Social	Physical
Descriptions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Hints: Physical (Building or physical structures like sheds, toilet, drainage, etc., Physical Sign Posts, equipments, tools, machineries, transports, etc.), Financial (Money and Credit facilities for Investment in Physical Structures, maintaining Operating Expense, Availing and Continuing Certification, etc.), Human (Education, Awareness, Knowledge, Skill, Attitude), Social (Written Agreement for Contract Farming and/or marketing, selling, Membership in Cooperatives or Farmers' Organization, Membership in Other Type of Organizations, Affiliation to Local Pressure Groups, etc.).

What are the main challenges the mango farmers face in implementing GlobalGAP?

Lack of financial capability, awareness, contract farming, market access, commitment, coordination with the exporters

Fourth Part: SRQ 3

What support or collaborations relevant to GlobalGAP your organization has provided to meet mango farmers' need? [Please comment on the existing, past, and/or future supports or collaborations relevant to GlobalGAP at mango farmers' end from your organization.]

Activities by the organization	*Main form of support	**Status of the Collaboration or Support	*** Rating of the Supports/ Collaborations
Informing about GlobalGAP & its benefit	Technical Training to Develop knowledge and Skill, Material Supports	Support ended	2
Mango Production Site Risk Assessment	Technical Training to Develop knowledge and Skill, Material Supports	Support ended	2
Record Keeping of Mango Production Process	Technical Training to Develop knowledge and Skill, Material Supports	Support ended	2
Input Quality Assurance (Fertilizer and PPP)	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Input Dose Specifications (Fertilizer and PPP)	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Input Quality Assurance (Water for production and Post Harvesting Management)	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Output Quality Assurance (MRL Testing and RMS)	Technical Training to Develop knowledge and	Support ended	2

	Skill, Material Supports,		
Technical Skill Development for maintaining GlobalGAP	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Maintaining the Safety and Health of the workers related to the mango production.	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Maintaining ICT structure required for participating in the GlobalGAP	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Maintaining ICT connectivity required for participating in the GlobalGAP	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Developing Farmers' Organization	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Maintaining Membership in formal Organizations	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Establishing Contract Farming or Marketing/Sales Agreement	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Supporting Labelling and Packaging	Technical Training to Develop knowledge and Skill, Material Supports,	Support Continued Existing	3
Supporting Mango Transportation	Technical Training to Develop knowledge and Skill, Material Supports,	Support Continued Existing	4
Supporting Mango Selling	Technical Training to Develop knowledge and Skill, Material Supports,	Support Continued Existing	4
Supporting Certification Cost	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Supporting Certification Renewal Cost	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Auditing Support (Cost or means)	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2
Disposal of empty cans and containers of the	Technical Training to	Support ended	2

chemicals used	Develop knowledge and Skill, Material Supports,		
Use of protective gears like gloves and masks where applicable	Technical Training to Develop knowledge and Skill, Material Supports,	Support ended	2

*Main form of support= Direct Financial, Indirect Financial, Technical Training to Develop knowledge and Skill, Material Supports, Support to test quality of inputs or outputs, Support to Maintain Agreement, Support to be member to Formal Organization,

**Status of the Collaboration or Support= Support ended, Support Continued Existing, Support Started, Support Coming Soon

*** Rating of the Supports/Collaborations = Not Satisfactory At all = 1 to Very satisfactory = 5

(If they do not do anything) Please tell why you don't do anything regarding quality and safety measures in Mango Production and Marketing?

What problems/challenges your organization faced in implementing the supports at (mango) farmers' end? (Use only the relevant rows and add new ones at the bottom)

Activities by the organization	Problem 1	Problem 2	Problem 3
Informing about GlobalGAP & its benefit			
Mango Production Site Risk Assessment			
Record Keeping of Mango Production Process			
Input Quality Assurance (Fertilizer and PPP)			
Input Dose Specifications (Fertilizer and PPP)			
Input Quality Assurance (Water for production and Post Harvesting Management)			
Output Quality Assurance (MRL Testing and RMS)			
Technical Skill Development for maintaining GlobalGAP	Lack of Finance	Lack of technical expert	Commitment
Developing the Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining Physical Infrastructures like Storage Areas, Cleaning Areas, Toilets, etc.			
Maintaining the Safety and Health of the workers related to the mango production.			
Maintaining ICT structure required for participating in the GlobalGAP			
Maintaining ICT connectivity required for participating in the GlobalGAP			
Developing Farmers' Organization	Lack of coordination	Registration at Cooperative Dept.	Monthly Savings for sustainability
Maintaining Membership in formal Organizations			
Establishing Contract Farming or Marketing/Sales Agreement	Commitment		

Supporting Labelling and Packaging	Finance		
Supporting Mango Transportation	Limited reefer truck		
Supporting Mango Selling	Market intelligence		
Supporting Certification Cost			
Supporting Certification Renewal Cost			
Auditing Support (Cost or means)			
Disposal of empty cans and containers of the chemicals used			
Use of protective gears like gloves and masks where applicable			

Annexure-5

Point of Discussion	Selected Transcriptions	Key Words & Labelling	Coding (in vivo coding ²)	Triangulation with SSI and KII (Internal validity)
Knowledge and Perception about GlobalGAP	<p>(Both case areas- Large/Educated) Obosshoi dorkari, Eta sara chola jabena, (Small/Less educated), Thik sure naa, amader ki upokaray ashbay?</p> <p>(All-both case areas) Akhon aar shudhu utpadon korlei hobena, taa nirapod hotay hobay, etay koray shomman baray, valo daam, valo bazaar paoar kotha,</p> <p>(Both Case areas All farmers): jodio besh kisu jinish agay thekei kortam kintu onek kisu akdom notun koray shiksi abong amader notun dokkhota toiri hoisay</p>	<p><u>It's a Must; we cannot do without it; Not sure what benefit it would bring?</u></p> <p>Only producing would not be enough now, <u>it has to be safe</u>. By doing this <u>Good Image</u> is created. It supposed to help in <u>getting better price, better market</u>.</p> <p>Though many of the steps and processes of GlobalGAP they were used to maintain already but many other new things they have learnt and not only <u>skill is developed</u> but also <u>new skills are created</u>.</p>	<p>It's getting important, for safe food and also good image. Can help in better price and better market. But mostly it helped in skill development and new skill creation*</p>	<p>safe food, good image, better price, better market but mostly skill development and new skill creation are mentioned in several of the SSI in both case areas. KII of the DAE, CDAIS, has given indication of interests of the farmers about GlobalGAP, KII of the local Associations of Mango Farmers in both case areas also showed clear interest and positive perception about GlobalGAP.</p>
Challenges Faced in Record Keeping	<p>(Bengali in English letters) (Small and less educated) Uff! Ato data lekha jamela; Amar Lekah pora jana kom; data record rekhey</p>	<p><u>Oh! Writing so many things is a complicated task,</u></p> <p><u>What is the benefit of keeping so many data</u></p>	<p>Writing is a complicated task, needs support from others, not sure about the purpose, Need some material support.</p>	<p>In the SSI almost three fourth (Bagha) expressed their positive view of record keeping but many mentioned about Low writing skill, means to</p>

² Adapted from Rapley, 2011, P-282, as cited in Silverman, 2014.

	<p>thik ki hobay?</p> <p>Oh! (Large)Writing so many things is a complicated task, What us the benefit of keeping so many data records about mango trees in the garden? Amarto ashob likhe rakhar jaega nai</p>	<p>records about mango trees in the garden? I don't have much of <u>writing skill</u>, I do not have the means like <u>record books</u>, I don't have the <u>means to keep</u> the records.</p>	<p>Record keeping is particularly found problematic for the aged and less educated and GlobalGAP may seem complicated to them. But the future generations who are educated and younger might be able to implement GlobalGAP easily.</p>	<p>keeping record as main challenges they face and Record Keeping was found to be taken up less by the respondents in the SSIs too in both of the case areas. In one KII, record keeping and maintenance at farm end was expressed explicitly as a problem.</p>
Challenges Faced in maintaining Hygiene and Cleanliness	<p>(small) Oto jaegaa nai jay alada koray toilet banabo, taka laagay,</p> <p>(All) Eta khub dorkar, paanito asay kintu poriskaar kototuku?</p> <p>(Large-Bagha)shaban rakhli shudhu shudhu nosto koray?</p>	<p>We don't have so much extra space <u>space</u> and <u>money</u> to build toilet. We have water but whether it is <u>clean enough</u>? It is <u>important</u></p> <p>If we keep soaps they are used <u>extensively</u>?</p>	<p>Requirement of additional land as space for building toilet. Requirement of money, Maintaining cleanliness of water, hassle in controlling misuse of soaps.</p>	<p>Land particularly for the small farmers, and money as fixed investment and variable cost for toilet and amenities is mentioned quite often in both case areas during the SSI, KIIs of the local Associations have also pointed out the requirement of extra land for building toilets particularly for the small orchards.</p>
Challenges Faced in maintaining Doses of Chemical and Safety protocols for Fertiliser and Chemical Containers	<p>(All-Both Case Areas) Nokol oshuday bazaar vorti, quality thik nai? Shobshomoy proyojon moto paoa jaenaa, (some from both case areas irrespective of size) khali pot bachca raa niay kotkoti khae mana kortay parinaa, (All-both case area) puraey feli kintu voi laagay, matitay putbo tao</p>	<p><u>Many Fraudulent chemicals</u> are in the market, so <u>quality cannot</u> be ensured sometimes, <u>Availability</u> problem exists, The <u>children wants</u> the empty pots <u>to buy sweets</u>, cannot say no, try to burn but <u>fear of getting contaminated</u>, put it under the soil but <u>where to find</u> such <u>fallow land</u>? <u>Sells</u> the</p>	<p>Inadequate quality monitoring in the market. Demand and Supply gap in local markets, The empty pots are used as means for money. Mental Pressure as fear of contamination remains when burning Need fallow land. The empty containers provide some cash from sale.</p>	<p>Inadequate quality monitoring in the market is mentioned Fallow Land is mentioned. Used for some cash and also by children for buying Sweets was mentioned in both case areas during the SSIs</p>

	jaegaa laagay, khali patro poriskar koray bikri kori, kisu taka paoa jae,	empty containers <u>after cleaning them properly for some money</u>		
Maintaining Quality and Safety through MRL	(Small and Less Educated) Valovabay beparta janina asholay, Support thaklay to kortam, Porikkha korar jaegaa to ekhanay nai, roptanikarokrai muloto koray, Bagging kortay jaya bipoday poresi	<u>Inadequate Local support</u> for MRL testing, <u>Mainly done by the exporters</u> ; Mango Bagging created problem for some customers	Less understanding and no local facility at farmers end otherwise it could have been implemented better.	Whoever knows about MRL mentioned about lack of local facility regarding MRL testing.
Received Supports relevant to GlobaGAP	(Both case area-All mango farmers) Muloto proshikkhon aar kisu upodesh. Majhay majhay Buddhi poramorsho, Temon kisuto painaa. Obossho ekbaar bagginger kisu material paoa gesilo. Ekhanay trade center kortay bollam tara korlo Dhakar kasay. Oboshsho poribohono baa rasta ghatar beparay shorkarer proshongsha kortei hoy. Jamon CORONA kaalay sorkari proshashon valo kaaj korsay	<u>Mainly training and advice</u> is received. Sometimes <u>suggestions and tips</u> . <u>Not many things as support</u> . Oh! Once we received some <u>bagging for mangos</u> . We <u>requested for a trade centre with cold storage</u> but they have built it near Dhaka. But we have to <u>praise the govt. About road networks and transportation</u> . As under this COVID situation the <u>administration took it seriously</u> so that the <u>transport system operates without any hamper</u> .	The interventions or supports are mainly of training and advice. Once some mango bagging. They needed infrastructural support like cold storage in the locality. Road networks and transportation system is good. Local Administration and the govt were serious about maintaining uninterrupted transportation system in the country in the COVID 19 situation also.	No SSI have mentioned about other supports than training or advice. Only the SSI of the members of the association has reported of material supports like record book. The KII of DAE, HORTEX, DAM, CDAIS, SNV(secondary source), also acknowledged about training and advice as main support. The Govt. Has developed support centres for export in Dhaka,
Role of Farmers' Organization in GlobalGAP	(Small Farmers in Bagha) amader kotha unader monay thakay naa.	What is the benefit of becoming member? they <u>don't remember us-small</u>	It is viewed more positively by the large farmers in Bagha than the Small	CDAIS expressed directly importance of farmer's organization and was

	<p>Sodossho hoye laav ki? (Large Farmers in Bagha) Khubi dorkari, amra shongothito naa thaklay onek shomossha. Etay koray Amder ekta jor thakay.</p> <p>(Largh & Small Farmers in Shibganj) Onek upokar hoy, bishesh koray amader ekta jor thakay, paroshporik help hoy. Organized naa hoye upae nai, amader kotha amaderi vabtay hoy.</p> <p>(Female farmers in Shibganj) Amra moner jor pai, kono shomossha holay amra ekshathay mokabila kortay pari.</p> <p>(One particular large farmer in Shibganj-non member) amar kasay jamela monay hoy, tasara doladoli valo laagay naa,</p>	<p>farmers Bagha</p> <p><u>Very important</u>, if we are not organized we face many problems, we <u>gain some strength</u> by it-Large farmers, Bagha.</p> <p>It <u>helps in many ways</u>, particularly <u>it gives us strength</u>. We have to <u>think about ourselves</u> and there is <u>no way but to get organized</u>-Large and Small farmers in Shibganj.</p> <p>We get some <u>mental strength</u>, <u>we can solve problems</u> together-Female Farmers, Shibganj</p> <p>It <u>seems like trouble</u> to me sometimes as I <u>don't like grouping</u>-One particular Large non member farmer in shibganj.</p>	<p>Farmers. Dissatisfaction was expressed by the small scale farmers on organization's biased role towards large farmers. But in Shibganj, it is viewed positively by all the farmers except a few who faced grouping or other type of localized problems that might have a link with local politics</p>	<p>successful in a way to developing such organizations in both of the case areas. At least, that was when the organizations were established. DAE and DAM both works around group formations of the farmers and thinks it important to get them organized so that their bargaining capacity in mango value chains is increased. It is also helpful for providing supports and trainings to organize farmers. The organized farmers have better habit of implementing or picking up the advices and suggestions.</p>
Why they cannot participate as expected?	<p>(All most All of both case areas) Prothomoto taka laagay abong ekbar shuru korar por profit valo naa holay tokhon khoroch bere giay jamela hoy.</p> <p>(Large-both case areas) Profit ashanorup naa hoar pesonay exporter der</p>	<p>It <u>requires money</u> and once we start if we cannot get <u>right profit</u> then the <u>increased cost creates problems</u> for us.</p> <p>For <u>profit it depends</u> on the <u>exporters</u> and as they <u>make contract</u> on their <u>company pad</u> or <u>white</u></p>	<p>One of the main reasons behind non participation is not earning profit as expected and they believe it depends on the exporters. The exporters make contracts not on Stamp Paper which is not acceptable for legal</p>	<p>Some of the SSIs have given reasons of profit and market assurance for not participating or continuing GlobalGAP like practices.</p> <p>The KII of the DAE, DAM, HORTEX, BARI, EPB, has mentioned about price and market assurance as one of the</p>

	<p>karon asay; Profit hoynaa karon amader shathay exporterder chukti hoy oder pad e baa shada kagojay, kajei oitar aingoto vitti thakay naa karon sheta stamp paper e noy. One large less educated mango farmer: amnitayto kaaj kori kono shomosha nai, kintu atoshob likhetikhe rakha jamela monay hoy, oishob shikkhito amar chay kom boyeshider jonno kora shohoj, amader polapanera boro holay korba.</p>	<p><u>paper which doesn't have any legal basis</u> as it is not on Stamp Paper.</p> <p><u>Doing the thing is no problem</u>, but it is <u>problematic to record and write</u> all those things. These are (particularly <u>record keeping</u>) <u>easier</u> for those who are <u>educated and younger</u> than me. <u>Our children</u> will do those <u>in future</u>."</p>	<p>process if contract is not honoured.</p> <p>Record keeping is particularly found problematic for the aged and less educated and GlobalGAP may seem complicated to them. But the future generations who are educated and younger might be able to implement GlobalGAP easily.</p>	<p>challenges to ensure continued participation in GlobalGAP. The KII of Exporters' Association accused of non adherence to the quality requirements by the farmers, lack of affordable and easily accessible testing facilities, and mostly low capacity of air cargo handling system at the container depot and inadequate logistics throughout the supply chain. Record Keeping was found to be taken up less by the respondents in the SSIs too in both of the case areas. In one KII, record keeping and maintenance at faremrs end was expressed explicitly as a problem.</p>
Overall Supports and Collaboration in the past and present	<p>Most of the participating farmers in both of the case areas in the beginning of the conversations about past and existing collaboration and supports, expressed like, "Obosshoi onek valo kaaj, onek upokaar hoisay, notun jinish shikhtay parsi" But when the conversation</p>	<p><u>Very good work</u> and came to <u>many help</u>, have <u>learnt new things</u>.</p> <p>Have <u>worked</u> but <u>didn't get the benefit</u>, rather <u>cost</u> has <u>increased</u> now. And the support and collaboration is <u>not regular</u></p>	<p>Though on specfic interventions as mostly the starting phase they expressed gratitudes and satisfaction for the different porgarms and projects taken by the government, NGOs, and the development partners. Yet, the mango farmers are actually not very satisfied either as the</p>	<p>The KII revealed also not much satisfaction among the stakeholders themselves about the scale of operations and sustainability except Solidaridad and HORTEx on specific supports like organizational development among mango farmers and packaging. Besides Swapno expressed kind of satisfaction for their achievement of only</p>

	<p>continued deeper, some of the large farmers in both case areas expressed like, "Kaajto korlam kintu laavto temon painai, boroncho akhon kisuta khoroch beray gasay" (All in both areas) Kintu regular support paoa jae naa</p>		<p>supports and collaborations didn't sustain neither did they cover all the aspects with required importance. And, in reality some demotivation was felt also among some of the farmers who tried but didn't get the expected benefit. All supports do not sustain either</p>	<p>GlobalGAP certificate at retail level for one of their outlet in Glushan, Dhaka.</p>
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