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## **Good Practices for Family Poultry Production**



### **Development of Value Chain: An Effective Way of Profitable Duck Farming in Haor Areas of Bangladesh**

by

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The purpose of the International Network for Family Poultry Development (INFPD) is to share information about poultry production among scientists, researchers, policy makers, educationists, students and development workers and to promote the cause of family poultry production.

Good Practices of Family Poultry Production (GPFPP) are "practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products" (FAO COAG 2003 GAP paper). Sharing information about "Good Practices for Family Poultry Production" that are successfully implemented in countries, regions or development projects is an important objective of the INFPD so that these practices can be replicated in different region based on the farmers' demand.

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## **1. INTRODUCTION**

Poultry is an integral component of the farming system in Bangladesh. Before the nineties of the last century, backyard poultry farming system was the main source of poultry meat and eggs in Bangladesh, but since the mid nineties with the development of commercial broiler and layer farming in the country, a major portion of poultry meats and eggs are being supplied by these commercial farms. The current production of animal proteins is not enough to meet the national demand and there is good evidence for a huge deficit of animal proteins in Bangladesh. The average annual per capita availability of meat in Bangladesh is only 9.12 kg against the required amount of 43.25 kg; the share of poultry meat is only 1.9 kg. The annual per capita availability of eggs is about 36 against the required amount of 104 (Saleque, 2010). Presently there are six Grand Parent Stock farms in Bangladesh. Every week 5.5 to 6 million broiler Day Old Chicks (DOC) and 0.5 million layer chicks are being produced from 82 Parent Stock farms in the country. The growth of commercial chick farming is impressive but duck farming which is an important component of the poultry, in the country was not given enough attention. Geographical advantages like natural feed resources, abundant water for swimming, tolerable temperatures etc. have made especially the North-Eastern part of Bangladesh suitable for duck farming. Ducks contribute about 22 to 25 percent of the total annual egg production, but their contribution remains constant throughout the years. The water basins and the southern delta may be used effectively for increasing duck production in the country ( Huque *et al.*, 2011).

Despite tremendous opportunities of duck farming in the Haor areas, a wet land ecosystem (also known as back swamp) in North-Eastern Bangladesh, they have remained unexplored so far. The main obstacles in developing commercial duck farming are lack of improved duck varieties, shortage of vaccines, traditional feeding practices, inadequate duck healthcare supports, unavailability of capital for farming and improper marketing facilities for the farm products and overall lack of effective value chain from production to marketing. In such a situation, development of effective value chain and small support to the duck farmers' from the government and/or from non government organizations (NGOs) would help to encourage and develop profitable duck farming. This will ultimately result in a revolutionary change in poultry production to meet the protein demand, generate employment opportunities for the local communities and as a whole help to achieve economic development in the country.

## **2. JUSTIFICATION OF DUCK FARMING IN HAOR AREAS**

Heavy rainfall in the upstream of neighboring upland countries causes flash flood in the Haor basin. Almost every alternate year unpredictable floods inundate the Haor areas and damage crops by submerging the agricultural fields. The extent of crop damage in the year of 2010 has crossed all the previous records; the Government has estimated that about 30,000 hectares

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boro (rice growing season from November to April) cultivated area were ruined. The total amount of economic loss in 2010 was much higher as the flood hit just prior to the boro harvesting season. At that time BRAC was trying to find ways how these flood-devastated people can be supported to achieve sustained livelihoods. A number of field visits and surveys at the devastated area revealed that duck farming and fishing could be an important means of livelihoods. However, fishing is merely a seasonal business which can be practiced only during few months of the year while during the rest people remain unemployed. On the contrary, there is enormous scope to develop myriads of commercial duck farms in the Haor basin. Availability of natural feeding sources for ducks and a history of duck farming in the Haor area were the reasons to think about duck farming development activities in this area.

One of the main constraints of duck farming in Bangladesh is the lack of pure, upgraded duck breeds. During the last two to three decades the government duck breeding stations have been producing and supplying ducklings of the Khaki Campbell, and Jinding (for egg purpose) and Muscovy breeds (for meat purpose). The number of ducklings produced is very low and not sufficient to meet the demand of the country. The demand for ducklings of commercial duck farms is basically being met in the whole country by the 'Rice husk hatcheries' which are operating discretely at duck farming potential areas in the country. A Survey by the Borgachashi Unnayan Project (Tenant Farmers Development Project), of BRAC showed that about 125 'Rice husk hatcheries' are producing in three districts (Netrakona, Kishoregonj and Sunamgonj) approximately 1.5 million ducklings annually. An unknown number of ducklings are also being produced by farmers through a traditional egg hatching system. These ducklings that are hatched with the traditional system at farmers' houses are basically meeting up the demand of backyard duck farms at the household level.



The ducklings which are produced in the 'Rice husk hatcheries' are basically crossbreds of Khaki Campbell, Jinding and deshi (native) varieties. In the entire Haor belt there are no Grand Parent Stock and Parent Stock farms of these breeds to maintain the breed purity. Farmers are producing eggs at

their farms and supplying the same eggs to local markets for both table and hatching purposes. Different breeds are being kept in the same flock and often a proper male-female ratio is not being maintained. As a result the fertility rate of eggs used by these hatcheries varies from 55 to 70 percent, and sometimes below 50 percent and the production rate of the farms remains unpredictable. Farmers often experience an extremely low production at their farm and this is primarily due to inferior quality of the ducklings that are supplied by the hatcheries.

In this regard the non government development organization BRAC has taken a number of initiatives in the year 2010 and is committed to uphold these activities to develop profitable duck farming in Bangladesh. The objectives of the initiatives are to underpin the livelihood opportunities of the farmers (employment generation, increase productivity, sales and income), promotion of commercial duck farming, capacity building of the farmers and effective market linkage through value chain development.

**The focus of this GP note is on the development of effective value chains with different interventions for sustainable and profitable duck farming**

### **3. SITUATION ANALYSIS IN HAOR AREAS**

The Haor basin in the North-Eastern zone of Bangladesh is an internationally important wetland ecosystem, which is located in the Sunamganj, Habiganj and Moulvibazar districts and the Sylhet Sadar Upazila. The Kishoreganj and Netrokona districts outskirt the core Haor area. The total area of the Haor-type wetland ecosystem in Bangladesh is 80,000 square kilometers. The core Haor area, alternatively referred to as the Haor basin or the Sylhet basin, is estimated to spread over an area of 25,000 square kilometers (IUCN, 2007). The Haor basin is bordered by the hill ranges of India- Meghalaya in the north, Tripura and Mizoram in the south, and Assam and Manipur in the east. The basin extends north to the foot of the Garo and Khasia Hills, and east along the upper Surma Valley to the Indian border. It includes about 47 major Haors and some of 6,300 beels (Wet land) of varying size, of which about 3,500 are permanent and 2,800 are seasonal. (Bennett *et al.*, 1995)

It is customary for almost every family in the Haor region to own few ducks (5 to 100), especially during the rainy and autumn season when water surrounds the localities and natural feeds like different kinds of snails, fish, pests and water hyacinth become available. These ducks are reared in a scavenging system and additional feed like rice polish, boiled potatoes, rice grains etc. is only supplied for a short period of the year. The commercial duck farms also operate with a scavenging system. Usually they keep between 200 and 500 ducks and move routinely from one place to another, the frequency of moving and distance from home depends on the availability of natural feeds for the ducks.

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Farmers move with their flocks toward deep seats of Haors and stay there from January until May. Sometimes between March and April the natural feeds become scarce and additional feeds would be required, which often hampers egg productions. During the period from June until August when Haors become flooded the farmers move back towards Haor peripheries, as natural feeds become available there. In search of natural feeds farmers sometimes move 20 to 30 kilometers from their house to stay beside the local water bodies. Starting about mid September until mid December natural feeds for ducks become extremely scarce and additional feed supplementation is required. During this period egg production almost stops and farmers who are not able to supply additional feed to their ducks due to financial limitations are compelled to sell their flocks and again buy pullets or laying ducks at the beginning of the next season.

### **Characteristics of duck farming in the selected areas**

There are mainly two types of duck farmers: backyard farmers and commercial farmers. According to experiences of the authors the backyard farmers keep 2-19 ducks, with the marginal farmers among them keeping only 2-7 ducks and the small farmers keep 8-19 ducks. The commercial farmers have 20-200 ducks if they are medium scale and if they have more than 200 ducks they are considered large. However, there are even farmers having more than 1500 ducks.

- Farmers rear ducks mainly for egg production.
- In the selected region, the total number of duck farmers has been increasing over the years.
- The predominant duck breeds among the large farmers in the selected areas are Khaki Campbell, Jinding and indigenous. The Khaki Campbell and Jinding are mainly used for egg production. Small farmers have less preference for specific breeds; they mainly keep indigenous (deshi) birds.
- The price of duck eggs varies from season to season. Ducks lay egg between its two moulting (feather changing) periods, February to March and September to October. During the two peak laying seasons the production is high but farmers get a lower price for eggs during the hot season from March to July.
- About seventy percent of the total production of eggs is sold to Dhaka and other urban regions. The rest are consumed locally.
- There is a four tiers market system for egg trading: Paikers/local traders/buyer → Small trader/buyer → Large trader → Wholesalers (Arotdar) → Egg Retailers

A baseline survey was carried out by BRAC in 6 upazilas of the Sunamgonj, Netrakona and Kishoregonj district. These upazilas and unions were selected purposively based on the assumption that they are areas with highest concentration of commercial duck farming. The villages within each union were also selected purposively. Out of the 45 unions and 1202 villages in these 6 upazila, 24 unions and 198 villages were surveyed. The survey revealed that a total number of 2182 farmers were rearing at least 20 ducks and among them 1152 farmers were rearing at least 100 ducks. The result also showed that most of the farmers were rearing ducks for laying purpose and only few for meat purpose. About 125 farmers in three areas of Modon, Tarail and Derai upazilas have duck hatcheries. These 'Rice husk

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hatcheries' are producing about 1.5 million ducklings annually, meeting the local demand for ducklings, as well as demand of other parts of the country.

<b>Name of area</b>	<b>Unions (Surveyed/Total)</b>	<b>Villages (Surveyed/Total)</b>	<b>Farmers having ≥ 20 ducks</b>	<b>Farmers having ≥ 100 ducks</b>
Kolmakand Netrakona	6/7	79/283	326	246
Modon Netrakona	3/10	43/144	533	216
Mohangonj Netrakona	6/8	9/183	331	239
Derai Sunamgonj	4/9	25/238	413	250
Taherpur Sunamgonj	3/4	36/249	294	126
Tarail Kishoregonj	2/7	6/105	285	75
<b>All</b>	<b>24/45</b>	<b>198/1202</b>	<b>2182</b>	<b>1152</b>

BRAC has found that due to the geographical advantages almost every family is rearing ducks in the entire Haor region. BRAC divided its value chain analysis into two parts; first the core opportunities of interventions were identified and then the problems which were hindering the market growth in the selected areas.

### **3.1 Opportunities**

#### **Involvement of large number of people**

About 80 percent of the inhabitants of the selected areas rear ducks and most of them are poor. There are both large scale farmers and small scale farmers. There are people who also keep ducks at their backyard farms; the number of ducks at these backyard farms ranges from 8 to 100 which require marginal investment, minimal care and attention. Incomes from selling eggs and ducks to the farias (middle men/traders), local marketers uplift their family income which meets their livelihood expenses.

#### **High growth potential, opportunity for increased income**

Most households rear ducks mainly for egg production. About 85 percent of them are either unaware or reluctant to use a better technology of duck rearing. So there is a high potential for improvement and growth in the selected areas. There are opportunities for both horizontal and vertical growth in this sub-sector. Horizontal growth means an increase in the number of duck farmers and an increase in number of produced ducks. Vertical growths mean better productivity in term of egg production and weigh gain. Currently duck farmers achieve with traditional rearing method a production of 80 to 120 eggs per year and bird. Traditional duck rearing method means use of indigenous breeds and no use of supplementary feeding which is leaving the ducks to fend by scavenging in the areas



surrounding the farm houses. Ducks from high yielding breeds and fed with balanced food will lay about 220 to 300 eggs per year. This will definitely increase the income of duck producers.

### **Demand-Supply gap**

Eggs are in good demand. All the eggs that come from the major duck producing areas to major arots (whole sale markets) of Dhaka are readily sold to consumers through other bulk sellers and retailers. A market survey, that was conducted in Tejgaon, Dhaka (wholesale market for duck eggs), revealed a high demand for duck eggs.

### **Easy to enter the business**

With a small investment it is easy to start a business of duck rearing with 5 to 10 ducks at the household level. The required inputs which include ducklings or hatching eggs, a hen for hatching and a small cage or box for keeping the ducks are available locally at a negligible cost.

### **Gender issues**

Women have the biggest role in taking care of the ducks in the backyard duck farming system, sometimes with the involvement of children. The involvement of men is limited by selling eggs to the local markets. In case of commercial duck farming men are more involved as the nature of farming requires the farmers to stay and move outside their house. However, a baseline survey conducted by BRAC showed that farms having up to 100 ducks are basically owned by women and about 30 percent of the farms having more than 100 ducks are also owned by women, even though women have limitation to go the Haors with their flocks by themselves.

## **3.2 Constraints**

The problems that are seriously hindering the growth of duck farming enterprises in the selected areas include the following:

### **High interest rates of microcredit providers (locally called Dadon) seriously limit the market access of duck farmers**

Duck farming requires some capital investment. Despite the abundant natural feeds and the scavenging farming system, financial capital is required to purchase ducklings, pullets or laying ducks, drugs, vaccines etc. Hatchery owners often also face shortage of required capital and as a result they produce fewer ducklings than demanded. In the Haor areas few scheduled banks and microfinance institutions are operating. Support from formal institutional financing is less than the demand of duck farmers and a majority of farmers are not able to get loan supports from formal financial institutions as they are not able to fulfill the necessary collateral requirement. Apart from formal financing sources the most important alternative way of financing in the Haor region is Dadon (local money lenders, they lend money for short time at a very higher interest rate). The common practice in the region is lending money early in the duck

production season with the condition that farmers are bound to sell their products (eggs, ducks) to the lenders during the whole season and pay back at the end of the season 1.5 or 2 times of the loan amount (locally called 'dera shud' or 'duna shud'). The consequence of this lending practice is shocking because farmers are bound to sell their production at prices that are much lower than the regular prices which they might get from retailers or wholesaler in the market.

### **Duck healthcare**

Farmers' lack of knowledge of diseases of ducks leads to high mortality rates and thus lowering household income. Mortality rates of ducks due to disease outbreak (primarily due to duck plague and duck cholera) are around 30 percent at the Haor region (according to author's observation). Farmers that are lacking sufficient knowledge of disease management; prevention and control are always threatened by the risk of disease outbreak. In the Haor region there is also lack of duck healthcare services from certified, skilled and experienced veterinarians. Moreover, limited opportunities for communication between the flocks located deep inside the Haor region and veterinary offices are also constraints for providing service by the Government or NGOs. There are no large investors or private companies that are service providers for the duck farmers in Bangladesh. So the Government is still the only supplier of important duck vaccines all over the country. During earlier works in the Haor region BRAC found shortage of vaccine supply from government sources and there were also gaps in the vaccine supply chain. Middlemen were dominating the vaccine supply chain and due to lack of knowledge many farmers were administering vaccines at a higher dose than required. They thus wasted vaccines while at the same time many more farmers' were not getting the required vaccines for their farms.

### **Lack of collective bargaining power**

Even though people in the Haor region are involved with duck farming since long, they were weak in collective bargaining with the local egg traders and middlemen. In other words the value chain exerting power was very low for the farmers as they are shackled by the local lenders.

### **Lack of knowledge of duck farming**

Duck farmers take it for granted that their ducks will be fed by nature with whatever quantity of eggs they will get. They have no knowledge of the requirement of balanced diet for ducks, the amount of protein, mineral, salt, fiber, etc., which would increase the productivity of their flock. Strategies for development of the value chain have been set in such a way that the duck farmers in the selected areas will increase their production by 40 percent, increase sales by at least 40 percent, increase income by 30 percent and increase employment by 20 percent by the year 2012.

## **4. GOOD PRACTICE AND HOW IT WORKS**

BRAC identified that a value chain development for duck rearing/farming could be an effective way of supporting pro poor development in the Haor areas. Through careful selection, analysis and development of a duck value chain it is possible to identify market based solutions which can be used to assist the poor.

### **Low interest financing**

By providing low interest microfinance BRAC has broken the shackle of local money lenders and brought a revolution in the duck farming business in the Haor areas. Efforts are made to reach even the poorest farmers who are unable to take loans from formal institutions. BRAC is offering loans to the farmers with 10 percent (flat rate) annual interest rate which is much lower than what is locally available from other financing sources. The loan is free from collateral and the processing time is less than five (05) days. The range of duck farming loans offered by the Agriculture & Food Security Program of BRAC is BDT<sup>1</sup> 10,000 to 100,000 (~120-1200 USD). The loan is very easy to get with flexible repayment and with minimum terms and conditions. Another important feature of the duck farming loan to Haor areas is that it is provided through door to door service just in time when farmers need it.



### **Loans free from preconditions**

In the past farmers were bound to sell their produce at lower prices than the regular market prices to the preselected traders to fulfill the conditions of the dadon providers. As BRAC provides loans without any given condition about selling produce to any selective person the farmers can now purchase inputs and sell their produce to anyone at the local market at competitive prices. The initial BRAC survey showed that there was a price difference of about BDT 0.5/egg between the prices offered locally by the selected egg buyers (usually nominated by the local lenders) and the regular market price.

### **Linkage of farmers with the traders**

To ensure fair prices, BRAC linked the duck farmers to the big traders in the big markets of other regions. BRAC listed 86 big traders from different

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<sup>1</sup> 1 USD ≈ 83 BDT

markets of different regions and made available their contact information to the duck farmers. Now, farmers can get updates of the prices from different markets using their mobile phone which helps them to compare the prices and sell their produce at competitive prices. The survey revealed that farmers sold the eggs at BDT 350 to 500( \$4.4 to 6.2) per 100 eggs to the local market in 2010, whereas at the same period eggs price at urban retailers in Dhaka was around BDT 700 to 850 (\$8.75 to \$10.6) per 100 eggs. One year after the survey in November 2011 local prices increased to between BDT 750 (\$9.4) and 820( \$10.25) per 100 eggs while the urban price was BDT 800 to 900( \$10 to 11.25). Increased inflation rate in the country may be one of the reason behind this increase in eggs prices, but fact is also that in the period from July 2010 to November 2011 egg prices at farmers' gate increased by about 100 percent whereas at urban retailers in Dhaka by only about 15 percent. This implies that elimination of middlemen's role in the local market resulted in a positive impact on duck farming value chain. Prices of live ducks did not increase at the same level. The primary cause may be that the selling of live ducks for meat purpose in Haor region is by number and not by weight. It is expected that introduction of a weight based selling system would result in fairer prices for farmers' produce.

### **Collective bargaining power**

Although there are large numbers of farmers in the Haor areas they operated individually and therefore their collective bargaining power was very low. The provision of loans by BRAC is always combined with the formation of village organizations (VO) which have monthly meetings. During these meetings of the VOs, BRAC is providing counseling and training to achieve common action and to develop a cooperative sense among the farmers. Using the power of being united, farmers started selling jointly in the market and due to large number of eggs exerted the power of bargaining.

### **Ensuring vaccine availability**

Duck farmers in the Haor region did not have sufficient knowledge of disease management. They did not know the symptoms of duck diseases and were unable to decide what to do and had to contact the Upazila Livestock Hospital for advice. The survey found no local medicine manufacturer producing any vaccines. The government allots vaccine to upazilas based on the requisition of the Upazila Livestock Officer. However, the supply from the central depot is always insufficient to meet the demand in the Haor region. In particular the Duck Plague vaccine become short in supply from March to July. Considering the existing scenarios, BRAC made contacts with the Department of Livestock Services (DLS) and District Livestock Offices to prioritize the selected areas for vaccine supply as these are intensive duck farming areas and made partnerships to provide on time vaccine delivery through the Upazila Livestock Offices. After one year of BRAC interventions it was found that the supply of duck vaccines to the Haor region increased and farmers were getting the required vaccines.

### **Improving information dissemination through feed sellers**

Commercial duck farmers usually provide concentrate feed to the ducklings during the first 35 days of life. Feed sellers are usually in contact with them during this period whereas the remaining production period they are not in contact with them and farmers rarely fed balanced concentrate feed to their ducks, rather sometimes provided only rice and mashed potatoes. That was not sufficient anyway; therefore the feed sellers play a vital role in disseminating information about simple feeding and management techniques to the farmers and encouraged them to adopt it for better productivity of ducks. Due to adopting of these techniques, productivity of ducks increased.

### **Training for farmers and local hatchery owners**

Extensive training on modern duck farming, vaccination, different diseases of ducks and hatchery management practices were provided to the farmers and local duck hatchery (Rice husk method) owners. Experts were hired to conduct the trainings and convenient on and off the farm training venues were selected. Training session also included multimedia presentation on modern farming practices.

### **Formation of producer group**

In past, the duck farmers in the Haor region did not buy ducklings from hatcheries, as they had duck eggs from their previous flock. They also bought eggs from neighbors, local markets and used chickens to hatch. The duck farmers have been facilitated to form groups so that they can have access to better hatched ducklings. Also marginal farmers did not use medicines and vaccines for their ducks. Using the groups they are able to buy medicines and vaccines jointly that is cost effective and in turn very beneficial to them.

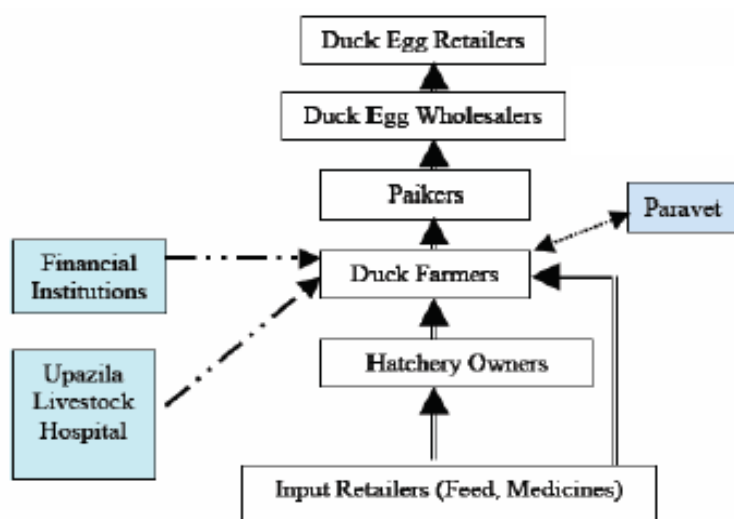


Figure 1: Poultry Farming Value Chain (Forward and Backward Linkage)

### **Backward and forward market linkages**

Backward linkages support includes supply of ducklings and pullet ducks, feed supply, vaccine supply and technical or duck healthcare services. Forward linkages support includes the marketing of farm products like eggs and live birds for meat purpose. BRAC locally arranged a number of farmers' meeting with the objectives of informing duck farmers about the commercial hatcheries, feed companies, available sources of pharmaceutical products, live bird sellers and large traders in their locality. BRAC also provided addresses and mobile phone numbers of these market players to the farmers. In this way BRAC developed the backward and forward market linkages with duck farmers.

## **5. MONITORING AND EVALUATION**

The operation of the profitable duck farming development activities was done at target areas from BRAC local offices. Now the BRAC head office is in continuous contact with the field offices. To evaluate the quality of operational activities a monitoring team was deployed by the project itself. Moreover, continual monitoring was conducted by the BRAC Monitoring Department to ensure that the proposed services are delivered properly.

## **6. REPLICATION AND SUSTAINABILITY**

The value chain development activities were implemented to focus on the prospects and potential for developing duck farming activities in the North-Eastern zone of Bangladesh. Before launching this innovative project BRAC was a bit skeptical about the chances for operational success. Disrupted communication, regional vulnerability of facing recurrent natural calamities and cultural differences of local communities with other part of the country made BRAC to step forward cautiously. However, organizational commitments of BRAC and welcoming attitude from its stakeholders toward initiatives of supporting duck farmers helped to achieve considerable success. Based on its success, BRAC is planning to scale up the model at other lower parts of Bangladesh and also to other countries where BRAC is operating and where opportunities of different levels of duck farming are yet to be fully discovered.

The operation is very cost effective as it is the community that broadens the concept. Farmers and other community members are actively involved in the total value chain. They knew about their responsibilities and learnt different management techniques provided by BRAC. Once the linkages have been established and farmers adopt the practices which they learn, they can get profit from the venture. Therefore other organizations can easily replicate the model based on their operational capacities.

## **7. FUTURE NEEDS AND PLANS**

The model of this value chain should be replicated in other areas with an effective plan and utilizing the lessons learned from the project. In addition, refresher training courses should be arranged from time to time in the previous areas for the community members to address their problems. Besides these, village based group (VO) need to be further strengthened to monitor and gear up the whole activities for a long term success.

## **8. CONCLUSION**

The optimum utilization of unexplored opportunities for commercial duck farming at Haor areas in the North-Eastern part of the country can turn the area into a prime source of supplying poultry meat and eggs. This can also results in an improvement of livelihoods, employment generation and ensure food security. Profitable duck farming can also promote women empowerment as women are much involved with duck rearing. Through the development of this value chain linked to agricultural financing, BRAC has endeavored to facilitate better duck farming so that farmers in the Haor region can get competitive benefits through breaking the shackle of middlemen in marketing their produce.

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