Good Practice Code: BDGP01

Good Practice Note

Mitigating Diseases and Saving Valuable Assets

REGION : South Asia
COUNTRY : Bangladesh
DISTRICT : 49

SOUTH ASIA
Pro Poor Livestock Policy Programme
A joint initiative of NDDB and FAO

GOOD PRACTICE OWNER and GOOD PRACTICE CHAMPIONS

A **GP Owner** is a person/group of individuals and/or institution that plays a crucial role in the GP. Thus, a GP owner understands all the ins and outs of the GP and is often the initiator of GP.

Others involved in the Practice (not considered GP Owners) may be invited to assist in the filtering and writing process. Such persons, who have insights into what makes the GP pro-poor, are better-positioned to help influence policies. Thus, with their thorough understanding of the GP, they (as an individual or as a team) can function as **GP Champions.**

Mitigating Diseases and Saving Valuable Assets

Poultry Vaccinators Delivering Services to Doorstep of the Poorest in Bangladesh

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Contents

Acknowledgements

Identification of Good Practices (GPs) goes hand in hand with developing an understanding of pro-poor livestock development, building capacity in documentation and the use of simple tools to sensitize actors, build coalitions and influence policy formulation and implementation.

Through a fairly rigorous and iterative process, the SA PPLPP team developed a set of guidelines* for identifying and preparing GP Notes. Step by step, teams in Bhutan, Bangladesh and India made considerable progress in identifying and capturing potential GPs on various themes – 'Smallholder Poultry', 'Small Ruminants' and "Livestock and Common Property Resources' - related to poor livestock keepers.

The concept for this Good Practice (BDGP01) came up in the Workshop on Story Telling held in Dhaka in March 08 for mid level officials of BRAC, partnering institution of SA PPLPP. One of the stories drafted by a participant was seen as a potential Good Practice and it was agreed that Pankaj Kumar Paul, Dr Harun Ur Rashid and Dr MA Saleque would draft a GP Note. The first draft Good Practice note was forwarded to SA PPLPP by BRAC in April 2008. Since the draft GP note had substantial information, the authors were invited to participate in the Learning Event 1**; the event was seen as an opportunity for the GP owners and the GP champions from the three countries to come together and along with senior experts in the sector, interpret and analyse the GPs identified. The GP note underwent a thorough peer review and the authors were motivated to redraft it as per the comments and feedback received. The second draft was received in the month of July '08. The draft was internally reviewed, edited by Dr Mamta Dhawan and Sheila Koyyana and presented as a third draft to Management Board Meeting. It was realized that the GP note still lacked quantitative data and cost benefit analysis. More field visits by Monirul Hasan in Bangladesh ensured that data was collected and analysed for the fourth draft that was received in October 08. This draft was sent for review by experts in this field and feedback was provided to the authors. Finally, the fifth draft had all the quantitative as well as qualitative data and it had also incorporated technical aspects of the vaccines. This version was received in December 08. Although the GP went back and forth many times between the Regional Office at Delhi and BRAC, it got strengthened every time. It was also realized that drafting of GP notes needs a lot of effort by technical experts as well as one writing it. Dr. Mamta Dhawan (SA PPLPP) and Ms. Shefali Misra (SA PPLPP) conducted internal research and formulated the sixth draft. Finally, Lucy Maarse (SA PPLPP) prepared the seventh and final draft. Many persons have contributed to this Good Practice Note and each input, howsoever small, greatly strengthened this document.

Although it took a year from submission of first draft to final version, it was a learning process for all those who contributed and it helped them to develop a thorough understanding of the GP. They can all now be rightly called GP Champions!

* Concerned guidelines are available at: http://sapplpp.org/mainpage-information-hub

** Proceedings of the Learning Event "Small Scale Poultry Production", 7th - 9th May 2008 available at: http://sapplpp.org/informationhub/learning_event_small_scale-poultry-production-proceedings

1. Introduction

1.1 Poultry sector in Bangladesh

Bangladesh with a total land area of 147,570 square kilometers is one of the most densely populated countries in the world. Its total population is about 140 million people, most of whom (85%) live in rural areas. The population density in Bangladesh at 1075 people per Km2 is also among the highest in the world. Corresponding to the high human population density, the poultry density is equally high at 1194 chicken (1460 per Km2 including ducks) (Dolberg, 2008). According to Bangladesh Economic Review 2008, 40.4% of the country's population lives below the poverty line and approximately 20% of the population fall under the ultra-poor poverty bracket. Land - the single most important resource in rural areas, is distributed very unequally with 59% of households owning less than 0.20 hectare of land, 32% owning less than 1 hectare and only 9% owning more than 1 hectare of land (DLS, 2008). Women are a particularly disadvantaged category given their high mortality rates, low literacy, poor health conditions and limited access to employment (Saleque, 2007).

Economic growth in Bangladesh in the 1970s was 1-2% which rose to 3-4% in the 1980s, 4-5% in the 1990s to over 5% in the years after 2000, implying steady economic development over the years, irrespective of the political turmoil that the country has gone through (Rahman, 2006). Growth in the livestock sector has also been consistent in Bangladesh[1]. In 2004-05 the growth rate in GDP for livestock was the highest at 7.2% compared to other sub-sectors at 0.2% for crops and 3.7% for fisheries. Poultry is a major contributor to this growth. This upward trend is attributed to increases in income, rising population, and urban growth which are resulting in higher demand of poultry products. An estimation of Asian Development Bank shows that the commercial poultry sector in Bangladesh grew by 20% annually up to 2007 and supported 5 million people directly and indirectly through 150,000 commercial farms (ADB, 2007).

Table 1: Local Poultry Population (in millions)

Particulars	Year						
	2000	2001	2002	2003	2004	2005	2006
LAYER							
Parent Stock	145	236	370	138	344	212	282
DOC per year	13,050	21,240	33,300	12,420	30,960	19,080	25,380
DOC per week	250	408	640	239	595	367	488
BROILER							
Parent Stock	750	1,062	1,382	1,952	2,358	2,292	2,745
DOC per year	90,000	100,359	116,000	163,968	164,148	192,528	288,225
DOC per week	1,730	1,929	2,230	3,153	3,156	3,702	5,542

Source: Saleque, 2007

Further, the number of indigenous (*desi*) chicken birds is estimated to have increased by about 6.7% and by 2.4% in duck each year over the period 2000 – 2006 as is shown in Table 2.

[1] National Livestock Development Policy, Ministry of Fisheries and Livestock, 2007

Table 2: Local Poultry Population (in millions)					
Particulars	*2000-2001*	*2001-2002*	*2002-2003*	*2003-2004*	*2004-2005*
Chicken	142.68	152.24	162.44	172.63	183.45
Ducks	33.83	34.67	35.54	36.40	37.28
Source: DLS, 2008					

Box 1: Snapshot of Poultry Production Systems in Bangladesh

1. Traditional rural backyard scavenging system (Sector- 4A)

This is often just called 'Scavenging' or the 'traditional' poultry system. The word 'scavenging' is at times replaced by 'free range'. In this system indigenous birds are maintained by the female members and children of the family and fed on household waste and crop residues. The rural households keep poultry with an average of 6.8 birds per holding. These birds lay 40-60 eggs in a year, have brooding characteristics and weigh around 1-1.5 kg at the end of the production cycle. They fetch better price than broiler in the market.

2. Semi scavenging system (Sector- 4B)

This is an improved version of the traditional system wherein vaccinations and /or supplementary feed and /or improved birds are introduced. It is often called 'improved traditional' or 'improved free range' while in Bangladesh it is called 'Semi-scavenging' system. Many HHs have adopted the practice of rearing improved birds and provide night shelter and vaccinations for them.

3. Small scale commercial poultry production system (Sector: 3)

A system wherein improved birds (layers, broilers) are kept under full confinement and their numbers are less than 500 is classified as small scale commercial. The birds are purchased from breeding companies and their products are sold commercially. In Bangladesh two exotic breeds, namely Rhode Island Red (male) and Fayoumi (female) are usually crossed at the parent poultry farms and their first offspring, locally called as Sonali are reared in this production system.

4. Commercial farming System (Sector: 2)

This system is patronized mostly by the private sector. In Bangladesh, usually a unit of 501-5000 is considered as medium and more than 5000 are called large farms (Saleque, 2007). As shown in the Table 3 Small scale commercial is the most widespread, while only 4% keep more than 4000 birds.

For analytical purposes, FAO and OIE have identified four main production poultry systems (See Annexure 1 for classification) of which sector 3 'Small-scale confined' and sector 4 'The Village or Backyard System' typically represent smallholder poultry production practiced in Bangladesh.

Table 3 shows that nearly half of the commercial farms fall in sector 3 with units ranging from 200 – 500 birds.

As early as the 1970's, smallholder poultry was identified as a tool for poverty reduction in Bangladesh and poultry programmes were developed and widely implemented given the socio-cultural acceptability of the occupation in the country. A number of surveys of different poultry projects in Bangladesh indicated that the program participants had benefited in terms of income, consumption, nutrition and empowerment (BRAC Report, 2000). The poultry sector today offers great

Table 3. Size of commercial farms	
Number of birds	**Percentage of farms**
200 – 500	48%
501 – 1000	26%
1001 – 3000	22%
>3000	4%
Source: Saleque, 2007	

rural employment opportunities in Bangladesh as more than 80% of the households' rear poultry, while fewer households keep goats and cattle (Dolberg, 2003). Households owning no land or less than 0.2ha of land, own more than 50% (Jabbar, 2007) of the total poultry population. Small holder poultry production also has a strong co-relation with poverty reduction and women's empowerment, with almost all rural families keeping 10-20 chicken, duck or pigeons that are reared mainly by women in scavenging conditions (Saleque, 2001). The poultry sector thus happens to be one of the prime components of the total livestock population as a result of which, poultry constitutes 14 percent of the total value of livestock output. According to the South Asia Enterprise Development Facility, the current market size of the poultry industry is $1 billion (Raihan, 2008).

II. Background

2.1 The Prevalence of Poultry Diseases

Although poultry rearing is very popular in Bangladesh, the losses incurred due to high mortality rate of poultry (35% to 40%) resulting from both diseases and predators were limiting rearers from realising the full potential of this activity. The most prevalent poultry diseases were Newcastle Disease (Ranikhet Disease), Fowl Pox, Fowl Cholera, Fowl Typhoid, Coccidiosis, Infectious Bursal Disease (Gumborro), deficiency diseases and worm infestations. In view of this, the DLS recommends administration of Baby Chick Ranikhet Disease Vaccine to first week and 21 day old chicks to maintain the immunity level of chicks up to 2 months of age. DLS also prepares Ranikhet Disease Vaccine from live mesogenic M (Mukteshwar) - strain of NDV to be administered intramuscularly at day 60 and repeated at every 6 months interval (Begum et al 2006). Besides the Government, other private companies also sold vaccines. However, despite the availability of vaccines, while large scale, medium and some of the small scale commercial poultry farms had their own vaccination schedule and vaccination was done by themselves or professional veterinarians, the birds reared in the traditional rural backyard system, semi-scavenging system did not have their own vaccination programme and thus suffered the highest burden of mortality.

To address this gap, in 1983, the Bangladesh Rural Advancement Committee (BRAC) initiated a poultry vaccinator programme in collaboration with the Government with an aim to prevent poultry from contracting common diseases through vaccination and dissemination of information to rearers.

2.2 The Bangladesh Poultry Model

The Bangladesh poultry model (see stakeholders in Annexure 2) is perhaps the most widely known poultry based development experience the world over. It evolved out of a joint venture between the DLS and World Food Programme's Food-Aid project. BRAC joined the initiative to first provide credit support to the poultry model during the years 1983-1986 and then up-scaled its association. The model combined a holistic package of technical training, credit and market linkages and emphasised promotion of backyard poultry to target the poorest female headed households. It targeted poor households (owning less than half acre land) and organised them into village groups, provided supply of inputs services, production support, supervision and monitoring to build poultry based livelihoods. Each component of the system aimed to engage women from poor households and created provisions for necessary organisational support.

This Good Practice highlights how an innovative Government – Civil Society collaboration overcame service delivery limitations through an alternative animal health delivery channel. Here poultry vaccinators reached out to the doorsteps of women poultry rearers in each district of Bangladesh and managed to reduce mortality, enhance poultry ownership, increased incomes and became a viable employment option for thousands of vulnerable women who are today not only competent vaccinators respected and appreciated in their communities, but also poultry extension workers.

III. Key Elements of this Good Practice

3.1 Origin

The DLS with only four field staff and one Livestock Officer deployed at each sub-district having to provide livestock services to about 200,000 poultry and 50,000 cattle and sheep, was suffering obvious limitations of human power and outreach at the onset of the initiative. Around 40,000 households reside in an Upazila (sub-district) keeping approximately 5 poultry birds per household, in an area of 300 sq km and the reality was that the department was unable to extend its services beyond 10 km of area (Rahman, 2003). Since it was logistically getting impossible for Government staff to deliver essential vaccination services to all birds, building capacity amongst individuals to engage them as poultry vaccinators became vital. BRAC thus initiated the first poultry vaccinator pilot in Manikganj district in 1985 to test the feasibility of a decentralized service delivery model based on building local capacities. Success in the pilot project ensured its replication in 49 districts of Bangladesh (See District wise Vaccinator deployment in Annex 03). Herein, the Government came in with its resources and technology and NGO-BRAC came in with its network and outreach to create a decentralised poultry vaccination initiative.

The overall aim of the Poultry Vaccinator Program was **'to enhance service delivery in poultry sector through empowerment and training of rural women who could also diversify their income and employment through the initiative'.** Its sub-objectives were:

I) to prevent poultry from contracting common diseases through regular vaccinations, thereby reducing mortality;

ii) to mitigate poverty of the rural poor by improving their expertise to be self employed in poultry related activities;

iii) to disseminate information on critical issues like Avian Flu.

Box 2: Placing Development in their Own Hands

– Dr Md Dewan Zahid Hossain recounts the vaccinators journey

When I saw women sitting huddled on floor waiting for the training to begin, I was bemused! Their faces were veiled and I wondered how one could train them on something as technical as vaccination, disease and first-aid. I was very skeptical of the programme's success. Today when I look back, I have to admit that I was proved wrong. Not only could these semi literate women learn the basics of preventive and curative poultry medicine, they also showed keen interest in learning about sanitation, women health, education etc. Today they are very important members of our organisation whose efforts have reduced both morbidity and mortality in poultry in the community.

To deliver animal health services to poultry keepers at their doorsteps, poultry vaccinators are selected from amongst women members of BRAC Village Organisations (VO). These **women** are trained to provide vaccination services, extension work, give technical advice and some basic treatment to the poultry birds in their community. All the households of the community can avail the services of these poultry vaccinators at a nominal fee.

In retrospect it might sound simple, but as can be learnt from Dr. Md. D.Z. Hossain, who is one of the long standing senior employees of BRAC, the veterinarians were pretty skeptical initially. The promising results[2] of the pilot stage made these professionals overcome their resistance.

The system of selection is also decentralised wherein VO's suggest names of members who are found suitable for the post of vaccinator. These names are discussed in the VO meetings

[2] Annexure 7 shows the impact obtained within one year of introducing the poultry vaccinator.

and consensus is reached on the most eligible candidate. **Widows, destitute and married women with smaller family size between the age group of 25-45 years who are permanent residents of the village, having motivating capacity and social acceptability** are given first preference. Unmarried girls tend to leave their parental home once they get married and therefore are not considered for the position. Women having some basic reading and writing abilities are also preferred so that they may learn technological aspects related to immunisation, diseases and bio security. The tireless efforts put in to select this category of women, has given them a chance to overcome societal resistance and become financially strong professionals and skilled entrepreneurs.

Box 3: Maleka Living the Poultry Vaccinator Dream

Maleka Begum came in contact with BRAC some 28 years ago. She was a young housewife struggling to make both ends meet as her husband's salary was not sufficient to take care of her joint family of 7. She made Bamboo fences to earn a supplementary income. Maleka joined BRAC's adult education classes which helped her to seek more information on other BRAC activities.

Maleka trained as a poultry vaccinator against her husband's wishes and additionally began rearing poultry. Since then she has been providing animal health services to the fe/male farmers in and around her village. She is responsible for taking care of 300-400 houses and charges BD Tk 1/- per poultry vaccination. She is able to earn BDT 1000/-to 1200/- per month. Her husband acknowledges her work and is proud of her.

Through her savings she has managed to buy a cow and contributed to sending her son-in-law to Libya in search of livelihood.

Interestingly, previously when BRAC worked with male vaccinators, a number of them dropped out for better paying jobs. As a result, it was decided to train only women. Other agencies also had similar experience with male vaccinators where the attrition rate went up to 80%. However, even today in spite of motivation, close supervision and monitoring of performance, on an average 2.5% woman still dropout every year due to migration, social causes and economic up-gradation.

Table 4: Drop-out rate of Poultry vaccinators for period 2004-2008

Particulars	Year				
	2004	2005	2006	2007	2008
Newly selected	576	547	1347	1650	1063
Drop-out	495	427	447	471	463
Net No. of Poultry Vaccinator*	17100	17220	18120	19299	19899
Drop-out rate (%)	2.9	2.5	2.6	2.6	2.4

Poultry vaccinators are given a 5 days non residential induction training on poultry vaccination at the BRAC office on management and basic treatment, prevention and control of poultry diseases (See modules in Annexure 4). Though trainings are technical and have a strong practical component with demonstrations, trials and field visits; they are participatory and designed for non-literate and semi literate people and are delivered by BRAC and DLS staff. After completion of the training, the poultry vaccinators are provided a free starter kit that comprises a bag, thermos, gloves and disposable plastic syringes. Vaccines are distributed every week by the DLS through BRAC and dates for distribution are specified to the vaccinators in advance. From the production site at Mohakhali, Dhaka to the remote delivery sites, maintenance of the cold chain remains the top-priority to maintain maximum efficacy of the vaccine.

Refresher trainings are also organised every month and serve as an important **interface to exchange experiences** between vaccinators and BRAC field offices and **create a platform to address emerging issues** of importance such as building awareness about bio-security and knowledge of extension tools[3]. The attendance rate in these refreshers is more than 90%. The development of the Poultry Program's training and support methodology has been an iterative process, based on many years of experiences and feedback from beneficiaries and field staff. To develop a vaccinator, a package inclusive of training, technical support and starter is required as an initial investment. The all **inclusive costs** incurred in training **one poultry vaccinator is Tk 750,** which does not take into account investments that go into conducting refresher courses.

Finally, although these vaccinators are not provided with certificates at the end of any training, the practice is endorsed by the GOB. Their status is somehow reflected through Article 21 of Animal disease and Quarantine Act-2003 that permits vaccinators to perform vaccination and primary/basic treatment of animals/birds; however they can only treat animals/birds under the direct supervision of a registered veterinarian. (See details of the act in Annexure 5).

After a vaccinator has undergone necessary training they are given the responsibility of specific villages/clusters. She collects vaccines from BRAC offices every week at a fixed price and administers the same as per schedules (see Schedules in Annexure 6). During vaccination, it is mandatory to use distilled water to dilute vaccines. Further, all live vaccines are used within 30 minutes of reconstitution. To reduce contamination of the environment by the live virus, a sheet of paper is spread on the floor. Proper post vaccination disposal of vials and other materials used in vaccination is also carried out and record keeping at all stages of vaccinations is compulsory. As part of their responsibilities, the poultry vaccinator maintains strong linkage with the Upazila Livestock Office to provide feedback on vaccinations carried out, vaccines used and also seeks advice on poultry related issues. In case of sudden/unexplained mortality the poultry vaccinators also carry dead/diseased birds for referral to either the BRAC Lab or the Government Veterinary hospital. The BRAC area office regularly monitors vaccination records, effects of vaccination, disease outbreaks, poultry deaths and related causes etc. Apart from immunizing poultry, the vaccinators also carry out extension work wherein rearers are advised to implement good poultry rearing practices like providing adequate heating and ventilation, offering good-quality feed and water, using proper medication, efficient disposal of dead birds and composting or deep stacking manure and litter. The poultry vaccinators thus play a very strong role in **bridging the knowledge gap** between the technologies available at BRAC, the DLS and the poor poultry keepers. The minimum tasks and corresponding targets of a poultry vaccinator are presented in Table 5.

Table 5: Overview of Poultry Vaccinators Tasks and Targets

S.No	Tasks	Targets
1	- vaccinate birds before 8 am	- vaccinate more than 500 birds per month
2	- collect/receive vaccines from BRAC office	- maintain protocols
3	- attend monthly refresher course	- increase knowledge and discuss field experiences
4	- maintain cold chain	- as per standards set
5	- place demand for vaccines and medicines	- in prescribed simple format
6	- provide basic preventive and curative health services	- sell medicines worth at least Tk 150/- every month
7	- report difficulties faced/seek assistance	- unusual mortality reported immediately
8	- earn a decent income through these activities	- earn more than Tk 500/- per month

[1] 10 Dose - wastage

[3] At regular intervals one new aspect of extension is taken up such as how to use a poster, or to organize a group meeting, or preparing a demonstration etc.

Furthermore, ever since **Bird Flu hit the country**, the role of poultry vaccinators has gained further importance. Under the umbrella of various NGO's and collaborative activities with DLS the vaccinators have developed strong skills in working with diseased birds and are aware of protocols to respond to bird flu outbreaks. The vaccinators carry out regular surveillance through their interactions with poultry rearers (Rahman, 2008) and are thus critical information providers. In bird flu endemic areas, **poultry vaccinators** play a **crucial role** at the community level in

i) promoting appropriate bio security measures,

ii) creating overall awareness of the disease,

iii) timely reporting of suspected cases and

iv) playing a coordinating role in case of outbreak.

3.2 Structure and the People Involved

This Good Practice grew out of a semi-scavenging poultry programme initiated in the 1970s by the Department of Livestock Services (DLS) and BRAC as well as other NGOs with support from both bilateral and multilateral donors that aimed to use poultry as a tool to reduce poverty among landless women. Through implementation and trying to turn problems into opportunities, the erstwhile programme evolved into the now famous 'Bangladesh Poultry Model'. The common feature of this poultry system of production, supply and services is that the requirements for services and inputs have turned into opportunities for people (Dolberg, F. 2004).

BRAC today has established sound working relationships with all these stakeholders including private companies and research institutions. The DLS on its part has surpassed its limitations by joining hands with NGO's to work synergistically and use each others strengths to increase outreach and impact. Figure 1 shows the relationship between various actors involved in the Good Practice as well as benefits accrued from the collaboration.

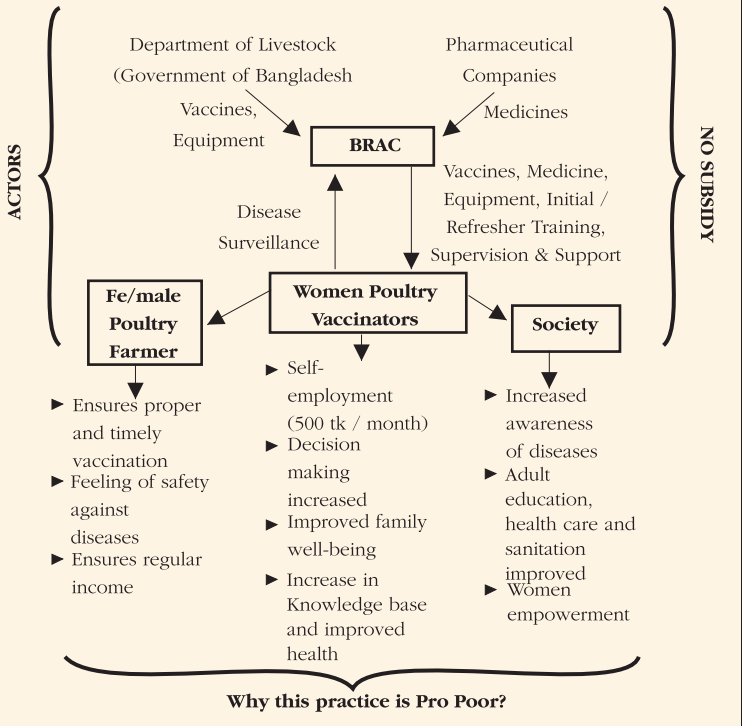
Box 4: Poultry Vaccinators provide critical information on Bird Flu

- Information related to bird flu.
- Importance/harmful effects of bird flu.
- How it is transmitted.
- Role of migratory birds.
- Role of wet markets.
- Measures to be adopted for personal hygiene.
- Hygienic/disposal procedures.
- Preventive medications for human and vaccines for birds.

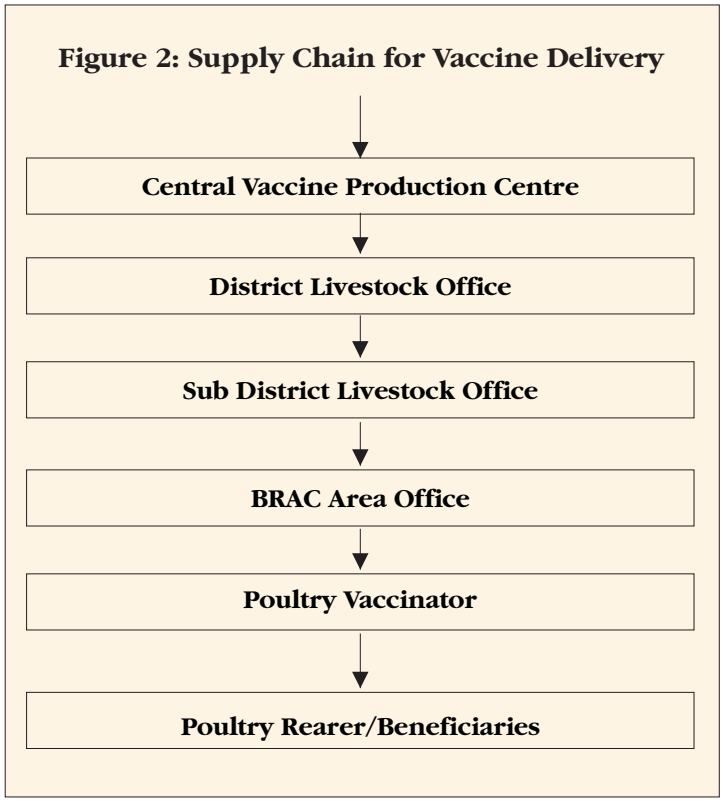
The Do's and Dont's practiced Post Bird Flu Outbreak are:

- Do not touch or handle sick birds without taking protective measure.
- Always wash hands with soap and water after handling birds.
- Cook poultry meat and eggs well before eating. Raw poultry products should not be eaten.
- Report unusual death of birds to local authorities.
- Precaution should be taken while disposing dead birds (bury into the earth)/dispose properly.
- Strengthening the vaccination of New Castle disease to reduce the confusion of the symptoms with avian flu.
- Possible confinement of all birds from wild birds or droppings.
- Not to allow ducks to rear in the nearby watershed and to keep them

Figure 1: Stakeholders and their interactions



Source: Dhamankar et al, 2008



This partnership has worked through role clarity on the part of each active stakeholder. BRAC on its part offers tangible inputs such as veterinary medicines, equipment and vaccines to poultry vaccinators. These are obtained from Government or the private sector and are usually supplied on a cost basis via BRAC's Area Office. BRAC also provides regular training, mentoring and advisory support to the vaccinators. Its Poultry activities are organized in a hierarchical pyramid starting with the BRAC head office in Dhaka, regional offices and a large number of area and branch offices. At the branch office level BRAC staff works directly with village organizations (VOs) comprising 30-40 members. Each branch office typically works with 100-120 VOs (approximately 3000 women, 60% of them in the poultry programme). To manage the program, one Program Assistant is assigned per 40 vaccinators (1 sub district) and is paid Tk.3000/- month. In some cases, a Program Organizer might also be employed to take care of 2 small sub districts and is paid Tk 5000/- month. He/She is responsible for scheduling and arranging refresher trainings, distribution of vaccines, monitoring and providing technical support to poultry vaccinators, maintaining records and reporting progress to higher authorities

Further, this vaccination practice also suits women poultry vaccinators since it is a paid occupation and entails part time work (2 hours daily) carried out in known neighborhoods/villages. Women vaccinators are preferred in the villages as the rearers are usually women and thus can be more open in front of other women. Moreover, poultry vaccinators have an understanding of socio-cultural values and respect traditions which aids in carrying out their work in rural areas.

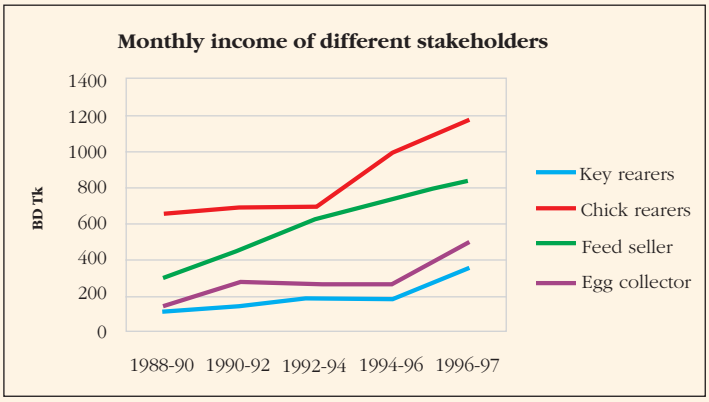
3.3 Outcomes and Sustainability

This model today reaches out to 2.47 million women poultry rearers in the farthest regions of Bangladesh and has been successful in reducing mortality levels in poultry and increasing incomes for the poorest. It has also created an invaluable opportunity for self employment for rural women with over 19,900 vaccinators delivering services through 1,260 BRAC field branches. This practice has contributed significantly to the poultry sub-sector through decrease in morbidity and mortality related to disease. Within one year of initiation, a marked reduction in poultry mortality from 21.3% to 7.6% was recorded and average annual income from sales increased from Tk 400 to Tk 2919. This also resulted in increase in family consumption of eggs from 43 to 186 and meat from 1.6 to 16.7 chicken per year – more details are presented in Annexure 7.

Another survey conducted in other Upazilas indicated that poultry mortality decreased from 45% to 25% within two years (Saleque, 1993).

Graphic 1 presented below, shows the average income of the different stakeholders of the Bangladesh Poultry Model for period 1988 – 1997. The decrease in poultry mortality has contributed to a rise in monthly income of all four types of stakeholders.

Graphic 1: Average monthly income (Tk) of different stakeholders for period 1988 – 1997



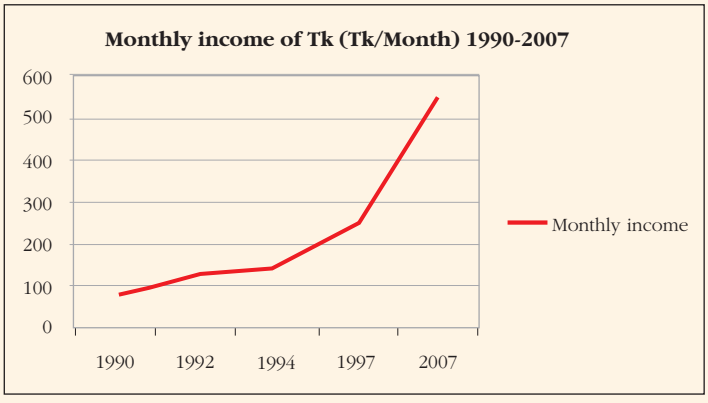
Source: BRAC 1996

The motivational work and management support provided by the poultry vaccinator has resulted in substantial reduction in mortality and subsequent increase in knowledge and income amongst poultry rearers.

Finally at an individual level, the women vaccinators themselves contribute to household income and thereby improve their own living conditions. Although some of the vaccinators today vaccinate sheep and goats, they do not vaccinate cattle as yet.

Discussions with some of the vaccinators revealed that the income from this work currently ranges between Tk 300/- to even Tk 3000/- in some areas, while Graphic 2 shows a steady increase of the monthly income of the vaccinators for period 1990 – 2007.

Graphic 2: Average monthly income of poultry vaccinators (Tk/Month)



Source: Saleque, 1999, 2007

A cost benefit analysis is shown in Table 6.

Table 6: Cost benefit analysis of Poultry Vaccinators

Particulars	Unit cost	Quantity	Per month (Tk.)	Total
Income				
Charge for vaccine	1	7 vials X 90Dose1	630	
Margin from Medicine sale			150	
Income/month (Tk.)				**780**
Cost:				
Vial	20	7	140	
Distilled water	10	2	20	
Transportation	20	4	80	
Cost/month (Tk.)				240
Net Profit/month (Tk.)				**540**

[1] 10 Dose - wastage

This programme has also encouraged vaccinators to increase their knowledge base and has educated them on health issues, sanitation, adult education, legal awareness, micro-credit schemes etc. As a member of the village organisations (VOs), a poultry vaccinator is now able to voice her concerns on social issues (for instance - dowry) and has a stronger voice in the family and community.

IV. Lessons Learnt and Key Elements of Success

1. Provision of simple poultry health and extension services covering all important vaccinations and messages regarding rearing practices reduces the mortality rate of poultry kept in backyard and small scale poultry systems to a great extent. Focus group discussions recalling 5 – 10 years of programme experience, revealed that the mortality rates can be maintained at 15% compared to 35-40% prior to the intervention. Depending on the quality of services as well as vaccines the rate can be brought down to 7% except when bird flu outbreaks take place.

2. Significant reduction in mortality rates positively impacts the overall productivity of the poultry flock kept in backyard and small scale poultry systems. This led to more birds and eggs being consumed and sold.

3. Poor semi-literate women can be successfully trained to provide simple poultry health and extension services in rural areas when adequate institutional support is provided in terms of technical backup (referral as well as monitoring) and input supply (vaccines, medicines etc) is available. This cadre of poultry vaccinators bridges the gap between small holder poultry rearers and livestock and veterinary professionals of Government and/or Non-Government organizations whose area of work is large and wide spread.

4. Being a **poultry vaccinator** not only provides self employment opportunity namely supplementing an average monthly income of TK 500 (US$ 8[4]), but generates community respect, empowerment, self confidence and dignity among the women involved. Furthermore, money in hands of women tends to also bring educational and nutritional benefits to children.

5. Backyard and small scale poultry keepers are **willing to pay** for the animal health services if they stand to benefit from the service. Based on 5-15 years experiences with more than 19,000 women poultry vaccinators, no serious difficulties were encountered in terms of vaccinators being paid by the poultry rearers. Difficulties did arise when vaccinator was very young and thus not respected or if the quality of vaccine was not up to the mark. Adequate back up of the support agency was curial in these cases.

6. Sound selection criteria, quality induction training (class room and on-the-job) and monthly refresher training are prerequisite for smooth functioning of vaccinators. **Widows, abandoned and married women** are the best performing vaccinators with hardly any drop out over a longer period of time (5-15 years). In general, the communities accept women vaccinators and allow them to freely enter their houses.

7. Efficient and effective functioning of poultry vaccinators requires close cooperation and clearly spelt out task division among the Government and Non-Government Organisations and other livestock professionals of relevance. A pilot period did contribute towards overcoming teething problems (reliable cold chain system; high turnover with male vaccinators etc.) and built a relationship of trust. As a result the positive impact of the programme is today being endorsed by the Government.

[4] Currency rate of 2007: One US dollar equal to 68 Bangladesh Taka

8. In bird flu endemic areas, **poultry vaccinators** can play a crucial role at community level in: i) promoting appropriate bio security measures, ii) creating overall awareness, iii) timely reporting of suspected case, and, iv) playing a coordinating role in case of outbreaks. Its success is largely dependent on quality training and guidance, easy access to appreciative veterinary/livestock professionals and how well their role is recognised and taken into account by not just the veterinary professionals but by all other actors seeking a solution to the bird flu problem.

9. It is learnt from the BRAC experience that **poultry vaccinators** are also playing a crucial role in disseminating information on social issues like education, sanitation, women health and dowry prevention etc.

10. The first experiences with expanding **vaccination schedules covering small ruminants** are positive. This has also increased the monthly income of vaccinator, while acceptance of small ruminants' rearers who are often women is also high. Regarding vaccinations of large ruminants, male vaccinators are preferred and these vaccinations are taken up by artificial inseminators.

V. Scope for Replication

This Good Practice effectively showcases a workable Government-NGO cooperation wherein the combined strengths of the Government viz.: resources and technology and the human-power, outreach and networks available to an NGO were used in a sustainable and cost effective manner to provide vaccination and poultry extension services to small holder poultry keepers in the remotest areas of Bangladesh.

The most important precondition of a smooth functioning of this **critical link** – cadre of vaccinators cum extension worker - is the recognition by veterinary and livestock professionals that, in principle, laywomen can be equipped to provide basic poultry health services. It is therefore first and foremost an attitudinal issue which in case of BRAC also formed the major resisting force initially. Once this resistance was overcome the ground was paved for developing the cadre and allied back and forward linkages.

Apart from provision of basic services, the poultry vaccinator also served as a critical link by contributing to epidemiological surveillance. As an example, during Bird Flu, the vaccinators were given specialised trainings to equip rearers to prevent and respond to outbreak conditions. A critical element emerging from this practice is also the importance of mass vaccination to reduce mortality to a minimum. Here introduction of payment for vaccination services, maintenance of cold chain and improved bio-security awareness, all proved vital for the success and sustainability of the model.

Another remarkable aspect was the selection criterion adopted. Drawing from BRAC's integrated agenda of reducing poverty and empowering women, the tireless efforts put in to select widows, abandoned and married women as vaccinators gave women a chance to overcome societal resistance and become financially strong professionals and skilled entrepreneurs. It is however important to acknowledge that apart from the poverty and empowerment agenda, this category of laywomen residing in the village was found to be the best performers and showed the lowest dropout rate.

Recent studies conducted by BRAC revealed that both female rearers and vaccinators have greatly benefited in income, family nutrition as well as empowerment through the initiative. More specifically, the focus on refresher trainings and development of entrepreneurial skills (through linkage with BRAC's micro-credit schemes[5]) significantly influenced the likelihood of women vaccinators remaining in active practice.

Although there is no formal recognition of this cadre of 'poultry health and extension workers', the Government does endorse them and as a result of which many other stakeholders are promoting the same. Current estimates are that around 35,000 are active (including BRAC's vaccinators). There is a strong correlation between quality of the services of these workers and the support provided by the supporting agency which in the case of BRAC worked because all the modalities were put in place and the entire cadre of these workers was institutionalised.

[5] BRAC links all its field activities to its micro credit programme so that both beneficiaries and service providers understand aspects of thrift and credit and financial management.

VI. Conclusion

This practice is worthy of replication because it empowered rural women to actively participate in the rural economy both as buyers and sellers of services. Moreover, as a result of this practice, they have developed strong linkages with the government and can access services of both the government and non-governmental sector. In Bangladesh, where females head 20%-30% of all rural households, an even more important aspect of the initiative is the enhancement of self-esteem which is clearly linked to the financial contribution made to the household and the status enjoyed in the society. The 'poultry vaccinators' have made a significant contribution to raise the stature and capabilities of women, who would otherwise be left out of the working sector. Furthermore, risks of outbreak of Avian Influenza are a major threat to the poultry sector today. Although various steps have been taken by the Government, NGOs and the private sector, these vaccinators have managed to effectively contribute by building awareness on bio-security, disposal management, cleanliness of farms, poultry health, reporting etc.

The model is today being further expanded to cover small ruminants, while the Bangladesh Livestock Policy (2007) acknowledges the important role this cadre can play. After distinguishing public veterinary service **functions** (animal disease control) and **delivery** (veterinary public health and regulatory affairs), and private veterinary service delivery (animal health), the Livestock Policy recommends the following functions under the latter to arrive at spatial coverage of veterinary service delivery – (a) inclusion of a cadre of 'community animal health workers' and, (b) 'stimulate and assist in establishing community based private practices'. The related legal and regulatory framework to ensure quality control of goods (vaccines, medicines, day-old chicks etc.) and services has, however, yet to be put in place.

Annexure 1[1]: An Overview of Village-based poultry production systems

For analytical purposes, FAO and OIE have identified four main production poultry systems[2 3] (sectors) of which sector 3. 'Small-scale Commercial Production System' and sector 4 'The Village or Backyard System' are typical representing smallholder poultry production. Although for typical family poultry the classification of Bessie (1987)[4] might be more appropriate, it is observed that the FAO & OIE classification is widely adopted including South Asia.

Sector 3 is a commercial but small-scale poultry production system that may produce meat or eggs or both. The birds are purchased from breeding companies. The products are sold commercially. The farms keep their birds indoors continuously. Bangladesh classifies units keeping less than 500 birds in this category.

The backyard system (Sector 4) is the most widespread in South Asia and undertaken by millions of households. Many of the households belong to the poorest in the country, while it is mainly women and children, who are responsible for the daily care and they are normally the owners and decision-makers. The birds kept in this system can be viewed as part of the prevailing farming system; mixing of species and age categories is common. Sector 4 can be further "broken" into 2 sub-sectors namely 4-A and 4-B.

Sector 4-A is characterised by a very basic system with scavenging indigenous poultry, no cross breeds, rather meat production than egg production and part of a mixed farming system. It is often referred to as traditional backyard poultry system.

Sector 4-B, which is characterised by the use of improved breeds, slightly improved management and input of additional services such as vaccinations and other investments.

Overview 1 summarises the key characteristics of Sector 3, 4-A and 4-B.

[1] Source: Permin et al., 2007.

[2] FAO: Food and Agriculture Organisation of the United Nations (http://www.fao.org/ag/againfo/home/en/index.htm ; http://www.fao.org/ag/againfo/programmes/en/ppli/home.html ;) OIE: World Organisation for Animal Heath (www.oie.int). Reference: Permin et al., 2007.

[3] Sector 1.: Industrial Integrated System,

Sector 2.: Commercial Production System,

Sector 3.: Small-scale Commercial Production System

Sector 4.: The Village or Backyard System.

[4] Bessie (1987) classification follows the following four broad production systems:

Free-range extension: birds are not confined, scavenge for food over a wide area,

Backyard extensive: poultry housed at night; free range during the day. Usually fed a little grain in the morning and evening to supplement scavenging.

Semi-intensive: these are a combination of eh extensive and intensive systems where birds are confined to a certain area with access to shelter. Feed and water are available in the shelter/house to avoid wastage by rain, wind and wild animals.

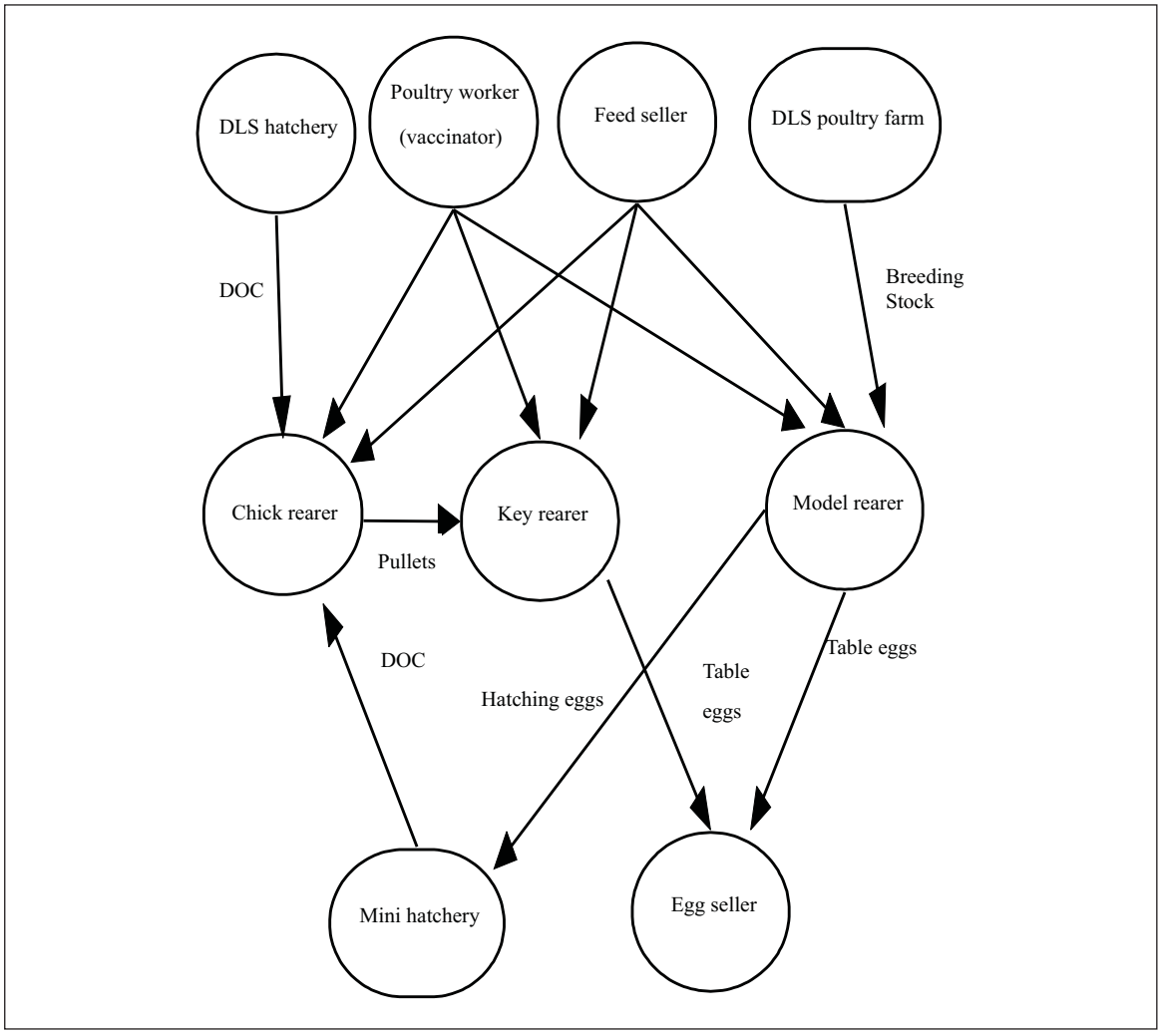
Intensive: these systems are used by medium to large-scale commercial enterprises, and are also used at the household level. Birds are fully confined either in houses or cages; deep litter system, slated floor system, battery cage system.

Overview 1[5]: Village-based poultry production systems

Sector 4A: Traditional free-range (1-10 birds) Low input/low output	Sector 4B: Improved free-range (5 – 50 birds) Low input/medium output	Sector 3: Small-scale confined (50 – 200 birds) High input/high output
‣ Majority of rural families	‣ Moderate number of rural families	‣ Few rural families
‣ Owned mostly by women	‣ Owned by women & family	‣ Businessmen, women
‣ Home consumption	‣ Home consumption and sale on local markets	
‣ Small cash income	‣ Family income	‣ Business income
‣ Social & cultural importance (gifts, religious)	‣ Social importance	‣ Little social importance
	‣ Micro-credit	‣ Credit based on assets
‣ Indigenous breeds	‣ Indigenous/ improved breeds	‣ Hybrids (broilers or layers)
‣ High mortality	‣ Moderate mortality	‣ Low mortality
‣ No feeding (scavenging)	‣ Local feeds (semi-scavenging)	‣ Balanced feeds
‣ No vaccination	‣ Newcastle Disease vaccination	‣ Several vaccination schemes
‣ No medication	‣ Little medication/local remedies	‣ Full medication
‣ No housing	‣ Simple housing	‣ Houses with cages or deep litter
‣ Egg production: 30-50 eggs/y/hen	‣ Egg production: 50-150 eggs/y/hen	‣ Egg production: 250-300 eggs/y/hen
‣ Long broody periods	‣ Short broody periods	‣ No broodiness
‣ Growth rate = 5-10 g/day	‣ Growth rate = 10-20 g/day	‣ Growth rate = 50-55 g/day

5 *Source*: Permin et al., 2007.

Annexure 2: Stakeholders in the Bangladesh Poultry Model



The key players in the system include — (i) Poultry vaccinator/extension worker who provides vaccination, some basic treatment and advice on poultry management. (ii) Poultry rearers — the target group for the project who rear layers and broilers under semi scavenging or small scale commercial system, (iii) Chick rearing units — who rear day old chicks to six weeks, (iv) Feed seller who provide supplementary feed, (v) Egg collector who provides the link with market.(Ahuja, 2007). Over the years the model has been further modified as well as adapted by a range of NGOs (often in cooperation with the DLS) and supported by DANIDA, IFAD and ADB etc.

Annexure 3: District wise Poultry Vaccinators Deployment

S No	District	No. of Poultry Vaccinators	S No	District	No. of Poultry Vaccinators
01.	Manikganj	480	26.	Rajshahi	610
02.	Gazipur	0	27.	Naogaon	420
03.	Tangail	670	28.	Bogra	720
04.	Jamalpur	490	29.	Joypurhat	520
05.	Sherpur	340	30.	Rangpur	550
06.	Kishorganj	510	31.	Barisal	400
07.	Netrokona	500	32.	Panchagor	200
08.	Mymensingh	860	33.	Thakurgaon	430
09.	Narsingdi	370	34.	Dinajpur	640
10.	Narayanganj	130	35.	Gaibandha	510
11.	Kushtia	380	36.	Noakhali	440
12.	Satkhira	330	37.	Comilla	,010
13.	Khulna	210	38.	Chandpur	500
14.	Jessore	530	39.	Laxmipur	380
15.	Chuadanga	290	40.	Bagerhat	460
16.	Jhenidah	440	41.	Gopalganj	240
17.	Meherpur	130	42.	Bhola	240
18.	Faridpur	250	43.	Jhalokathi	260
19.	Rajbari	340	44.	Pirojpur	290
20.	Magura	330	45.	Patuakhali	300
21.	Narail	200	46.	Barguna	200
22.	Sirajganj	450	47.	Madaripur	210
23.	Kurigram	360	48.	Sariatpur	250
24.	Pabna	550	49.	Lalmonirhat	300
25.	Natore	380	50.	Nilphamari	300
				Grand Total:	**19,900**

Annexure 4: Poultry Vaccinator 5-Day Training Module

Day-1

- Objective of poultry rearing and vaccination
- Breeds of poultry
- Difference between local and hybrid birds
- Selection of hatching eggs
- Storage of hatching and table eggs during summer and winter

Day-2

- Selection of broody hen
- Brooding procedure
- Care of broody hen
- Characteristics of good laying hen
- Rearing of local day old chicks
- Feeds and feeding
- Feed ingredients
- Function of feed ingredients
- How to prepare balanced feed
- Free range feeding

Day-3

- Feed requirement and supply of supplementary feed
- Different types of feeder and drinker
- Ideal condition of a night shelter
- Characteristics of healthy birds
- Factors affecting egg production
- Ratio of cock to hen
- Common diseases of poultry like Ranikhet,
- Cholera, Pox, Coccidiosis, Gumborro, Parasitic infestation and malnutrition
- Symptoms and treatment of Ranikhet disease

Day-4

- Prevention of Ranikhet
- Vaccination schedule of Ranikhet
- Symptoms, Prevalence, Prevention and Treatment of Pox, Gumborro, Coccidiosis and Cholera
- Internal parasitic (worm) infestation: symptoms and prevention
- External parasite (tick, mite etc.): symptoms and prevention
- Symptoms and treatment of malnutrition

Day-5

- Demonstration of vaccination procedure
- Different vaccines and their suitable time for vaccination
- Selection criteria of birds for vaccination
- Preservation and storage, and transportation techniques of different viral vaccines
- Dilution criteria and doses of different vaccines
- Precautions to be taken before and during vaccination
- Bio security measures
- Recommended measures to prevent diseases
- Disposal of dead birds
- Summary of vaccinators' responsibilities

Annexure 5: Information on the Animal Disease Act, 2003

Article 21 of the Act is illustrated below:

Persons not registered under the ordinance not to practice.

(1) Notwithstanding anything to the contrary contained in any other law for the time being in force, no one, other than a registered Veterinary practitioner, shall practice, or hold himself out as practicing, the veterinary medicine or surgery.

(2) Whoever, after the date fixed in this behalf by notification in the official gazette by the council, contravenes the provision of sub-section (1) shall be punishable with fine, which may extend to taka five hundred.

(3) The provisions of sub-section (1) shall not apply to any person who performs any of the following acts, namely:

(a) rendering to any animal first aid for the purpose of saving life or relieving pain;

(b) destruction of any animal by painless method;

(c) castration of any animal or caponizing of any poultry or bird;

(d) docking of the cattle or dog before its eyes are open;

(e) amputation of the claws of a dog before its eyes are open;

(f) **inoculation or vaccination of any animal, poultry or bird.**

Annexure 6: Overview of Vaccination Schedule followed by the Vaccinators*

Age	Name of Vaccine	Route of inoculation	Route dose/bird
1-3 day	BCRDV (F strain)	Intra ocular	2 drops
21 days	Booster BCRDV (F strain)	Intra ocular	2 drops
6-7 weeks	Fowl Pox live	Wing Web subcutaneous	One time
60th day	RDVLive (M strain)	Intramuscular	1ml
90th day	Fowl Pox Booster	I/M	0.2 ml

***Fowl cholera:** Vaccination is only carried out in areas and farms where the infection is widespread

Annexure 7: Changes recorded as a result of 'Vaccinator/ Poultry Extension Worker'

Intervention			
No	**Survey indicators**	**Before the intervention**	**After one year of the intervention**
1.	Number of families surveyed	97	97
2.	Average number of chicken/family	2.7	8.6
3.	Rate of poultry mortality (%)	21.3	7.6
4.	Sale of chicken	3.4	20.6
5.	Sale of eggs (number)	93	768
6.	Family consumption of eggs (No.)	43	186
7.	Family consumption of chicken (Kg)	1.6	16.7
8.	Average annual income from sale of eggs and chicken in Tk;	400.00	2,919.00
	Average annual income from sale of eggs and chicken in US $	8.00	60.00

Source: Fattah 1999

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Abbreviations

ADB	Asian Development Bank
BBS	Bangladesh Bureau of Statistics
BDP	BRAC Development Programme
BCRDV	Baby Chick Ranikhet Disease Vaccine
BDT	Bangladesh Taka
BRAC	Bangladesh Rural Advancement Committee
DANIDA	Danish International Development Agency
DLS	Department of Livestock Services
DOC	Day Old Chicks
FAO	Food and Agricultural Organisation
GOB	Government of Bangladesh
GDP	Gross Domestic Product
GP	Good Practice
HPAI	High Pathogenic Avian Influenza
HH	Households
HYV	High Yielding Variety
IFAD	International Fund for Agriculture Development
IGVGD	Income Generation for Vulnerable Group Development
MOFL	Ministry of Fisheries and Livestock
NGO	Non Government Organisation
NCD	New Castle Disease
PLDP	Participatory Livestock Development Programme
RDV	Ranikhet Disease Vaccine
SLDP	Smallholder Livestock Development Project
TLO	Thana Livestock Officer
TK	Taka
TMSS	Thengamara Mohila Sabuj Sangha
VGD	Vulnerable Group Development
VVPL	Veterinary Vaccine Production Laboratory
VO	Village Organisation
WFP	World Food Programme

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BRAC Bangladesh is one of the largest southern development organisations employing 120,337 people, with 61% women, and working with the twin objectives of poverty alleviation and empowerment of the poor. It has emerged as an independent, virtually self-financed paradigm in sustainable human development. BRAC works with people whose lives are dominated by extreme poverty, illiteracy, disease and other handicaps. With multifaceted development interventions, it strives to bring about positive changes in the quality of life of the poor people of Bangladesh as well as bring about change at the level of national and global policy on poverty reduction and social progress. Women and girls have been the central analytical lens of BRAC's anti-poverty approach, recognizing both their vulnerabilities but also their thirst for change.

For more information on BRAC, kindly visit their website at http://www.brac.net

About this Good Practice

19, 900 poultry vaccinators across Bangladesh stand as gate-keepers protecting poultry from diseases today. Through a 20 year old Government-NGO cooperation, Bangladesh has transformed its operations from centralised service delivery to a decentralised model that provides vaccination services, promotional messages and disease surveillance to poultry rearers in the remotest areas of the country. The cost of being disease-protected is just 1 Taka, but it brings with it, better income, nutrition, employment and empowerment. Poultry Vaccinators are charting a new course for pro-poor service delivery. This note captures the development of this innovative model and its impact on the country's poultry landscape!

SOUTH ASIA Pro Poor Livestock Policy Programme

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