Commercial poultry production in Bangladesh

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Abstract

Genetic potential exploitations of various commercial poultry manipulating their production systems have been increasing production and productivity of poultry meat and eggs in the country through private sector`s investment, policy support of the public sector and small scale farmers command performances. It created competitive advantages that helped to sustain the industry in a new environment of `high volume and low margin' investment, but disintegration of biotic and abiotic structures related to theproduction systems sometimes has been causing threats to public health including food safety, and continuous avian influenza virus outbreaks since 2007 is the most devastating one. Since the first outbreak cumulatively 1.74 million birds are lost till 2010, and it affected small scale poultry farms (357), the foundation blocks of the commercial poultry industry in the country, the equity of which lies with food security and employment.

Small scale farming is gradually becoming more competitive and often passes turbulent periods sharing profit or loss. Farmers` weakness in feed and health management found to be the major causes. Some of the central parts of the country are overexploited with hatcheries and small scale farming exposing public health to biological and environmental threats. The southern delta, on the other hand, having even a lower competition for land than others remains undeveloped where small scale farming may support the livelihood of the people, if hatcheries are available in the region. This requires implementation of poultry development policy, even after having it revised.

Improve preparedness for highly pathogenic avian influenza in addition to post outbreak control initiatives taken so far by the government, strengthening farm biosecurity and traceability, following sanitary and phyto-santary (SPS) measures in opening domestic market for others, are essential to arrest disease spreads or to avoid new threats. Further, policy formulation and its enforcement for marketing of live birds and products, establishment of landing station/local sale centres, in addition to disease control, may help smoothing out gyration of price and demand and supply of poultry products. Domestic market protection, continuation of tax holidays, poultry farm insurance, establishment of poultry bank for zero interest credit support, especially to small scale poultry farming, in addition to on-going compensation package may help shouldering of challenges for doubling production of poultry meat and eggs in the country.

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Prelude

Bangladesh poultry consists of i) native chicken & duck, once that were sole sources of egg and poultry meat in the country till early eighties, and ii) commercial poultry, that maintaining a lag phase during eighties gained national competitive advantages hurdling different types of biological and biochemical threats, like avian influenza and feed adulterants. Pioneered by the Eggs and Hens Ltd. as early as 1954 and steered by the Biman Poultry Complex after the independence, commercial poultry industry took a smooth takeoff through heavy investment of private sectors during nineties, and it accounts for an estimated capital investment of about US$3.0 billion facilitating employment of about 6.0 million peoples (The Daily Ittefaq, March 10, 2011). Private sector`s command performances and policy support of the government nourished competition in commercial poultry farming at the beginning due to `low volume and high margin' investment. The competition in the industry increased manifolds today due to national competitive advantages that may help to sustain in a new environment of `high volume and low margin' investment.

The equity of small scale poultry farming the foundation blocks of commercial poultry that support both vertical and horizontal expansion of the industry lies with food security and employment. The average daily per capita availability of animal and fish protein is only 15.5g resulting in an animal to plant protein ratio of 1:3.70 in place of the required amount of 30g and a dietary ratio of 1:1. Livestock and poultry, at present, contribute only 7.1g dietary animal protein and it requires almost double production of milk, meat and eggs (Huque 2009) to support food security. Moreover, rapid income growth, diversification in food demand patterns, slowdown in income-induced demand for rice and coarse grains accompanied by a shift of diets to higher value foods, and rapid migration of population to urban areas have been increasing demand of foods of animal origins, and poultry meat and eggs are the accepted protein sources for peoples irrespective of their race and religion. Moreover, an inverse relation between land area and hard core poverty per cent, and ownership of about 69.0% of the total poultry by the households having no or minimum land support justify these peoples live under poverty may minimize their income and expenditure gaps through raising poultry profitably, if backward and forward linkage supports are given.

Economic growth of the country that we speculate will further increase the demand of milk, meat and eggs, and their market will be more competitive as we geographically positioned between India and China, who have been achieving dramatic economic growth recently. Both the countries recently had food inflation that was driven by increased demand of vegetable and to some extent of fruits, and we may face a similar situation for foods of farm animal and poultry origin, if strategic production goal is not achieved. Iterating concerns on food inflation threats on world economic growth the secretary-general of organization for Economic Co-operation and development (OECD) recently called for a greater investment in agriculture worldwide in order to boost food production.

The present paper is an attempt to summarize scientific and policy options reviewing present population dynamics of commercial poultry, their production, productivity, and problems for increasing poultry meat and farm egg production in the country.

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Population dynamics of commercial poultry

(a) Population of different generations

Broiler parent stock was import depended initially, and domestic production capacity was built gradually. The local production surpassed the import resulting in a ratio of 86:14 in 2010 (Table1). Annually about 239.1 $x10^3$ broiler parent stock birds are increased that boosted broiler day old chick (DOCs) production @$27.4x10^6$ per year.

Table1: Population dynamics of commercial poultry

Items	Years										Annual increase
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
1.0 Grand Parent Stock (GPS)											
Thousands imported											
Layers	-	-	-	-	-	-	-	-	1.50	3.00	
Broilers	-	-	5	25	120	125	120	148.8	145.0	168.8	21.8 $x10^3$
2.0 Parent Stock											
(a) Thousands produced locally											
Layers	-	-	-	-	-	-	-	-	-	180	
Broilers	-	-	59.3	429	1291	2410	2040	2400	2960	2900	
(b) Thousands imported											
Layers	236	370	238	345	212	400	378.8	909	609.15	1343	
Broilers	1062	1381	2299	1863	1454	1488.7	650.0	771.5	168.8	474.3	
© Total parent Stock (a+b)											
Layers	236	370	238	345	212	400	378.8	909	609.15	1523	102.4 $x10^3$
Broilers	1062	1381	2358.3	2292	2745	3898.7	2690	3171.5	3128.8	3374.3	239.1 $x10^3$
3.0 Total Day Old Chicks (DOCs in Millions)											
Layers	21.24	33.3	12.42	30.9	19.1	25.3	32.5	63.6	42.6	106.6	6.67 $x10^6$
Broilers	100.4	116.0	163.9	164.1	192.5	288.2	325.6	301.3	297.2	320.5	27.4 $x10^6$

Source: Saleque,(2009) and other source (DLS, BLRI and BAB)

The commercial layer farming is also developed on imported parent stock, and its population increased @102.4 $x10^3$ annually, and helped to grow layer DOCs production @ $6.67x10^6$ annually. The first grandparent stock layer farming started in 2009 importing 1500 birds, and it increased to 3000 in 2010. All these germplasms being import depended remain under threat of different biological problems of domestic and/or exotic origins, like that of highly pathogenic avian influenza (AI) that has been affecting the industry since 2007.

One pertinent question remains unversed in the data presented in Table1 that how AI, in the last 4 years, has been affecting grandparent or parent stocks or DOCs production and marketing. Recently published data show that AI outbreaks during the last five years caused a loss of total 1.74 million birds, and whether they are the bird of small scale poultry farmers or the breeder farmers or both is not clear. It is important to fix future strategy for controlling the disease. Table1 shows that the increasing trend in layer or broiler DOCs production up to 2007 is slowed down afterwards may be due to AI outbreaks, and it gained momentums back in 2010. If all these numbers of layer DOCs came into production the commercial egg production would have been almost double than that of the total egg production of the country even in 2007 (5369.0 million, BER, 2009). A strong and authentic database is a prerequisite to face challenges of today and tomorrow, and professional organizations in coordination with public sector may play active roles here.

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Regional availability of chicks

Chick availability to farmers often affects small scale commercial poultry farming. All grandparent stock farm are established at the peripheries of the country (Thakurgaon, Dinajpur, Chuadanga, Moulivibazar and Chittagong), and most of them produce broiler parent stock (Fig-1c), except one.

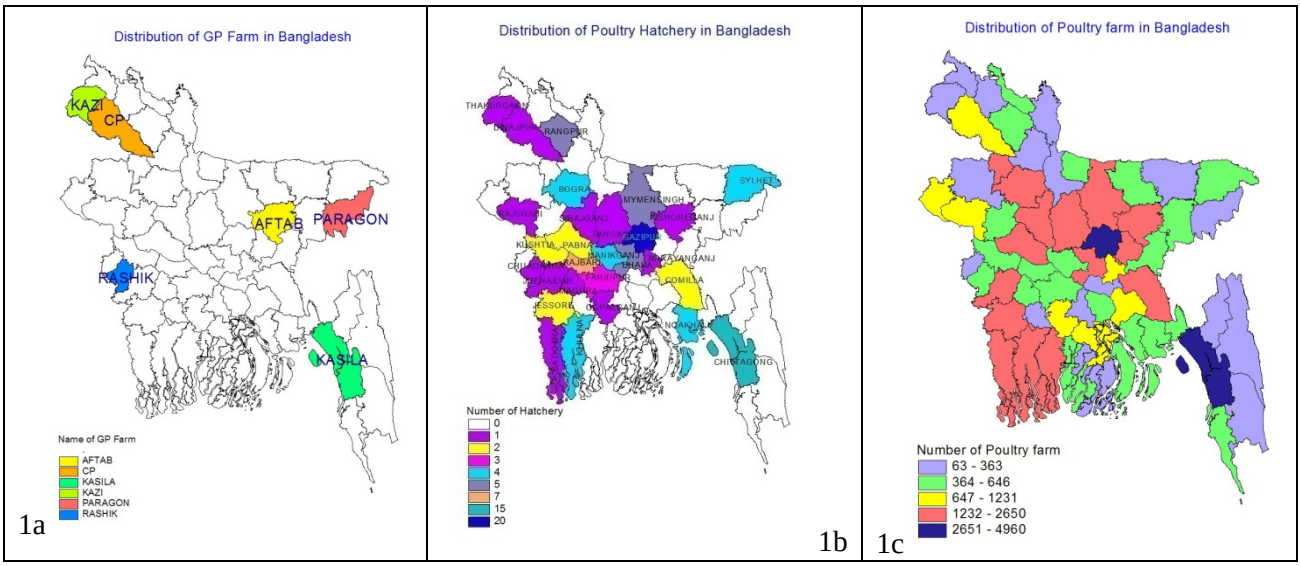
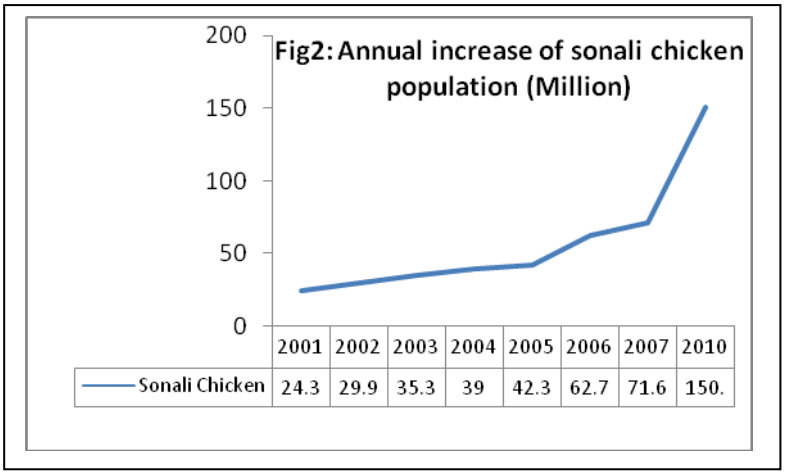


Fig1: Distribution of grandparent or parent stock and smallholder farm in the country

Gazipur of Dhaka division has the highest number of parent stock farm and/or hatchery (20 hatcheries), followed by Chittagong and Sylhet (15 in each district), and Rangpur, Pabna and Rajbari districts (5 to 7 hatchery in each, Fig 1b). The hatchery is thinly distributed in the south-western, central and northern areas (<4.0 or 0). The southern delta or the further up areas have no hatchery (Fig-1b). Absence of hatchery, in addition to other factors, may have resulted in a lower number of small scale commercial poultry farms (<1231 farms per district) in these areas Fig-1c). Nevertheless, lower household concentration, especially in the hill tract areas may also have resulted in a thinner concentration of commercial poultry farms. But the southern delta and northern area may require further attention for establishing commercial hatchery to help growth of small scale poultry farming in the area, and this may help livelihood improvement of the people live under negative balance of household income and expenditure at a higher concentration.



c) Sonali chicken production

Sonali, a crossbred bird of RIRxFayoumi, having its phenotypic outlook similar to local poultry and market demand is increasingly reared by the small scale farmers of the northern regions of the country (Fig2). Its population has been increasing @ 14.0 million a year, and stands to about 150.9 million in 2010. Small scale farmers, of both the genders rear 50 to 1000 parent stock and produce 900 to 18000

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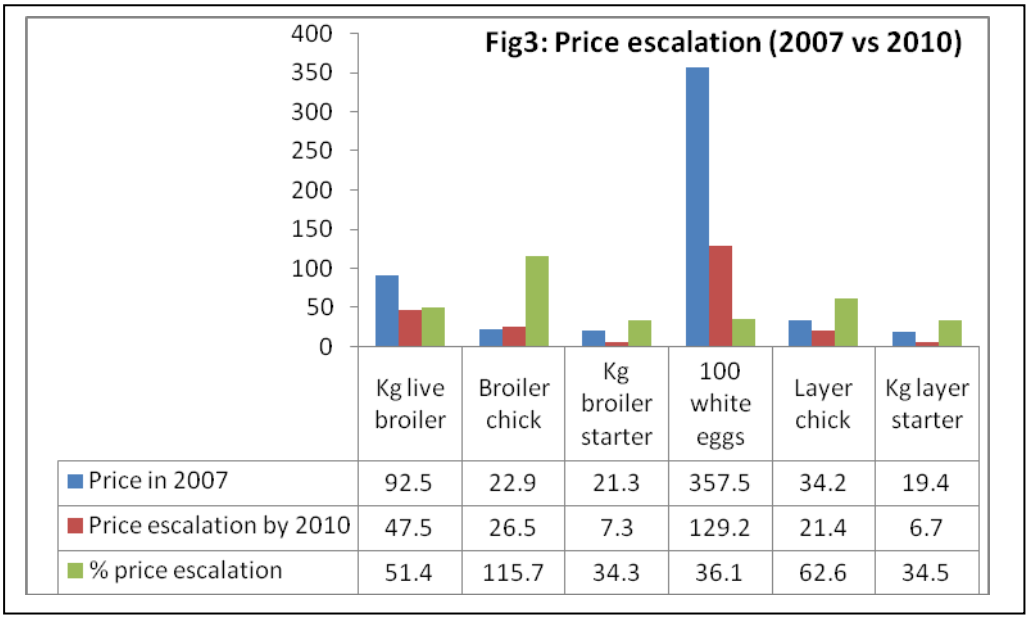
fertile eggs per month and sell them to local hatcheries. About 60 hatcheries having 2000 to 5000 parent stock is already established in the region, and they produce about 36000 to 90000 fertile eggs a month to support chick productions (Zamal, 2009).

Production and productivity of commercial poultry

Total annual egg production in the country is reported to increase (Table2). Annual increase of layer DOCs supports this trend, even having continuous avian influenza outbreaks since 2007. The estimation of farm egg production from layer DOCs population results in a higher estimated growth of eggs than that of the data shown in Table2. How these DOCS are used is a pertinent question to address demand and supply gaps of eggs. Ducks contribute about 22 to 25% 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.

Table2: Production of farm eggs and broiler meat

Items	Years										Reference
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Total eggs, Millions	3266.0	3398.0	4777.0	4780.0	5623.0	5422.0	5369.0	5653.2	-	-	BER, 2009
Broiler meat x10^6 Kg	15.1	17.4	24.6	24.6	28.9	43.2	48.8	45.2	44.6	48.1	Estimated



Most of the advancement in chicken meat production comes from the broiler farming in the country. Table 2 shows that the estimated annual broiler meat production is almost tripled during the past decade (15.1 million Kg in 2001 to 48.1 million Kg in 2010). The trend in production increases is slow or almost plateaued during the period of 2007 to 2010 when the industry has been hurdling against biological threats like avian influenza and price escalation of inputs, especially of chicks and feeds. Nevertrheless, Fig 3 shows that price escalation based on the price of 2007 was 115.7% and 62.6% for broiler and layer chicks, 34.3% and 34.5% for broiler and layer starter feed, and 51.4% and 36.1% for live broiler and white eggs (Fig3). Other inputs and product prices were increased at a similar rate. Thus, it may be said that price escalation of inputs and products was competitive, and input price hikes may not be considered a factor that governed production or productivity of commercial poultry.

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Nevertheless, small scale farming is gradually becoming more competitive and often passes turbulent periods sharing profit or loss. Biological threats, farmer`s skill in technology use, quality of inputs etc, other than price hikes of input or DOCs may have affected small scale poultry productions and productivity. Fig 4a shows that a farmer rears up to 1000 broiler birds per batch may gain profit or loss in a market condition of 2010, and no significant (r^2=0.028) relation could be built between number of broiler reared and profit or loss of farmers. The scattered distribution of profit or loss data against flock sizes shows that majority farmers had profit margins (Fig 4a), but those who had higher chick mortality and less efficient in feed conversion ratio management in their farm incurred losses (Fig 4b and Fig 4c).

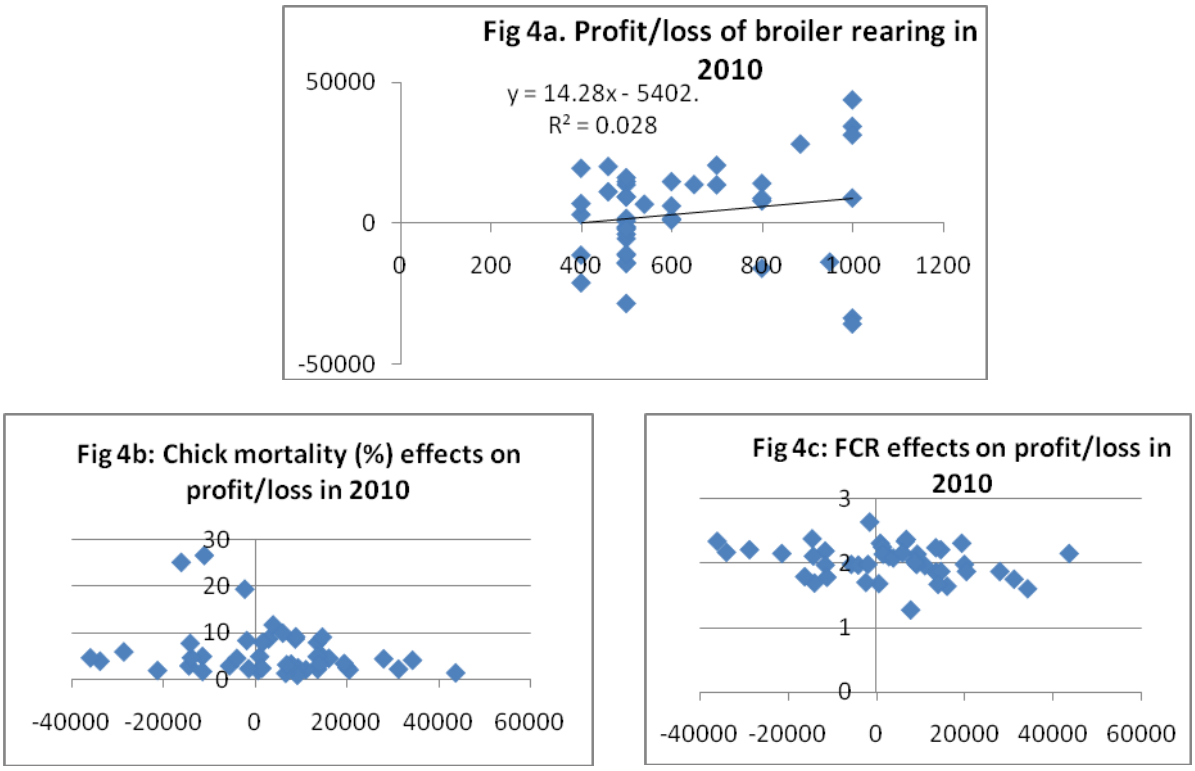

Fig 4: Factors affect production and productivity of commercial poultry

This emphasizes that the farmers skill on feed and health management must be improved further through training and technology dissemination for sustainable production of commercial poultry.

Disease outbreaks

Avian influenza (AI) among other poultry disease is still considered as the most difficult biological hurdle to jump over domestically or control biologically because of its zoonotic and mutagenic characteristics. Since the first outbreak in 2007 AI is continued to affect poultry industry every year showing continuous annual outbreaks in four districts of the central and northern, and discontinuous outbreaks in 45 districts all over the country (Fig 5a). About 1742316 birds were infected, of which 299772 died and 1327596 were culled up to 2010. Moreover, about 118663 backyard fowl were also culled due to AI outbreaks (Table3).

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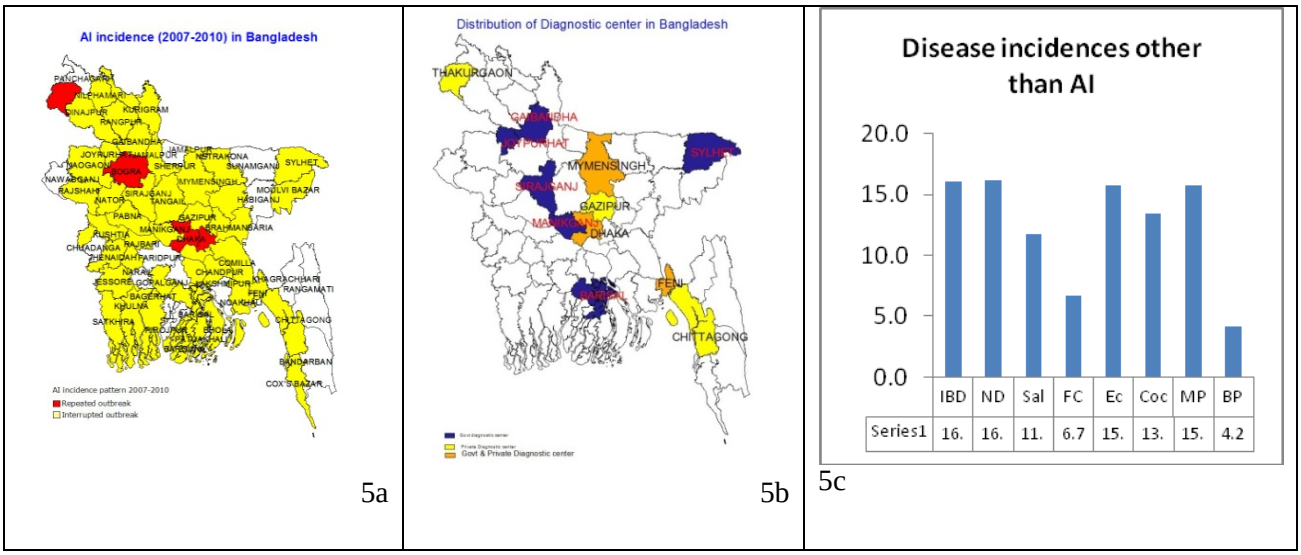
Table3: Avian influenza incidences since first outbreaks in 2007 in Bangladesh

Years	District & (Farm) Nos.	Total birds	Death		Culled			
			Number	%	Commercial		Backyard	
					Number	%	Number	%
2007	20 (68)	205160	35076	17.1	136426	66.5	33708	16.4
2008	44 (227)	1296687	243005	18.7	975373	75.2	81769	6.31
2009	16 (32)	48810	3687	7.55	42281	86.6	3047	6.24
2010	13 (30)	191659	18004	9.39	173516	90.5	139	0.07
Total	-	**1742316**	**299772**	-	**1327596**	-	**118663**	-

AI outbreak is seasonal and use to affect birds during the period when the ambient temperature remain below 27^0C for a major part of a day. Both public and private sector established diagnostic centre in different regions of the country (Fig 5b) to support the surveillance system of the disease, and the diagnostic facility is available in the districts experienced both continuous discontinuous outbreak areas (Fig 5a). The Govt. taking the support of the World Bank finance has been implementing two development projects to combat the AI outbreak problems.

Fig 5: Distribution of AI outbreaks and diagnostic centre



Infectious bursal (IBD), Newcastle (ND), Salmonella (Sal), E coli (Ec), Coccidiosis (Coc), Micoplasma (Mp) and blood parasite(BP) are other diseases found at the smallholder commercial poultry farms across the regions of the country and the average rate of incidences recorded to be 16.1, 16.2, 11.8, 6.70, 15.8, 13.5, 15.8 and 4.20%, respectively (Fig 5c).

Disease surveillance, diagnosis and prevention are basic support system required to be strengthened further in the country. Emerging and re-emerging diseases are constantly becoming threat to poultry industry, and building preventive capacity is one of the primary requirements for diversification of production options further protecting public health. Avian influenza, an emerging transboundary zoonotic disease is caused by virus that has capacity to assort and reassert genetically, and is complicated to eradicate once it is hosted by an ecosystem. Taking consideration of seasonality of its incidences, specificity to hosts, mutagenic characteristics and transboundary movement strict biosecurity measure may be followed with traceability. Moreover, guidelines for conservation of ecosystem and wild bird habitats should also be followed. Further, capacity building for establishing

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regional surveillances of transboundary diseases including AI is essential, especially for the disease of zoonotic characteristics.

Improve preparedness for highly pathogenic avian influenza in addition to post outbreak control initiatives taken so far by the government, strengthening farm biosecurity and traceability, and following sanitary and phyto-santary (SPS) measures are essential to avoid introduction of new biological threats including AI. These require also capacity strengthening of the public sector.

Marketing

Looking into the disadvantages of the farm chicken industry in the country one would raise the absence of product marketing policy, absence of which allow price volatility, demand and supply mismatch or taxation of non-producers (middlemen); the effect of which is shouldered by the consumers and to some extent producers as well. Huque (2010) shows that middlemen intervention helps price escalation of products resulting in dissatisfaction of consumers. Fig 6 shows that producers get almost 75% of the retail price of eggs, and the rest 25% is shared by egg collectors, aratdar (warehouse owner) in the first stage, and whole seller, fariah and retailer in the second stage before selling to consumers.

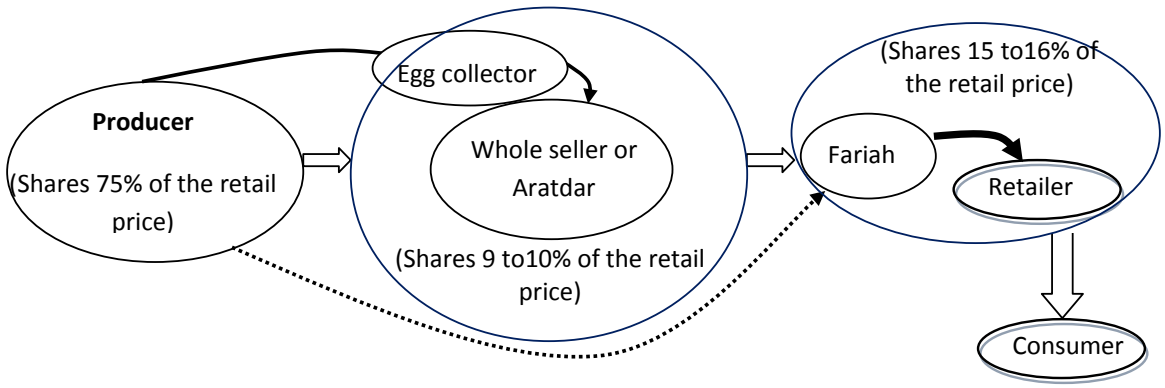

Fig 6: Cost sharing of egg marketing (Huque, 2010)

Doubling of packing, breaking, transport, establishment charge & profit margins in the two stages of marketing after production put extra burden of at least 9.0 to 10.0% of egg price, and saving this cost would favour consumer satisfaction. Any option that would facilitate producers to sell their farm products to selling centre may save this extra cost. Some of the large producers often sell their eggs directly to fariah and harvest 10 to 15% more profit (Fig6).

Marketing policy formulation through a joint initiative of the public and private sector may help to smooth out gyration of price or demand and supply of poultry products. Establishment of some landing station/local sale centres around cities and towns, like that of the developed countries, where the producers/farmers would be able to sell their eggs and other agricultural products on a competitive price is also important.

Remunerative financial support

Poultry sector requires support of incentive financial packages that may revamp the productivity with faster growth and this may include easy access to zero interest credits, may be through establishing a separate banking system especially to support small scale poultry farming, continuation of tax holiday, market protection, and establishment of poultry farm insurance system in addition to on-

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going compensation package. This may help shouldering of challenges for double production of poultry meat and eggs and avoiding of inflation of food of poultry origin.

In conclusion it may be stated that commercial poultry industry being constrained by biological, physical and/or financial factors has achieved national competitive advantages over the decades of production practices, and it would facilitate further to double the production of poultry meat and eggs, if small scale producers are supported with training and technology, policies related to biosecurity and marketing, and remunerative financial packages for increasing farm production and productivity to help improvement of their food security and livelihood.

Acknowledgement

Sharing of data, views and information by the organizations and individuals with the authors and helping in geographical citations while formulating and writing this article is acknowledged with thanks and gratitude. All the database collected and used are printed in an appendix table of the book, and may be cited referring World Poultry Science Association-Bangladesh Branch (WAPSA-BB).

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