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308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

Current Scenario of the Small-scale Broiler Farming in Bangladesh: Potentials for the Future Projection

Md. Saiful Islam¹, Sasaki Takashi² and Kaniz Quamrun Nahar Chhab²

¹Department of Bioscience and Food Production Science, Faculty of Agriculture,
Interdisciplinary Graduate School of Science and Technology, Shinshu University, Japan

²Department of Science of Food Resource Production, Faculty of Agriculture, Shinshu University, Japan

Abstract: In Bangladesh, there are two types of broiler farming of which contract broiler farming is still under trial while independent small-scale broiler farming is dominant and performed for the development of broiler sector. The present study examined the potentials of small-scale independent broiler farms and farmers' economic behavior in relation to farm size. Farm size is found to be closely related to farmers' behavior and attitude. Farmers' behavior and attitude appeared to be very crucial factor for the development of broiler production. The primary data were collected from the independent small-scale farms in Mymensingh district of Bangladesh. The results showed that independent small-scale broiler farming is a profitable venture for rural farmers. Farmers are involving in this sector because of lower investment, less space requirement, utilization of family labor and quick returns. To examine the farmers' behavior, farmers were classified into two income goal groups in terms of total per capita income: a) First Income Goal Group (FIGG) and b) Second Income Goal Group (SIGG). The economic behaviors of the farmers were differed by income goal groups. Most of the farmers belonging to the FIGG were interested to enlarge their farm size, the opposed trend has been observed in farmers of SIGG. Economic behavior and attitude should be considered in making any suggestion and recommendation for changing the existing level of small-scale broiler farming.

Key words: Independent broiler farming, contract farming, potential, behavior, rural

INTRODUCTION

Bangladesh is a country with a very high population density. Agricultural development involving allocation of additional land is not possible at all. Therefore, emphasize should be given to other sectors in agriculture like broiler rearing. The potential for the development of small-scale poultry as well as broiler sector has been successfully proved and the contributions of this sector have a significant role in the economy of Bangladesh (Rahman, 2003). In recent decades, the demand for broiler meat is increasing in developing countries. In Bangladesh, the demand for broiler meat is increased rapidly, propelled by increased income and population growth and urbanization. The number of broiler farms increased by more than 26 times in 2001-02 as compared to that of 1994-95 and broiler contributes nearly 24 percent of total meat production in Bangladesh (Raha, 2005). Broiler meat production was increased from 151200 tons in 2001 to 547200 tons in 2006 (BPIA, 2008). In 2006, the annual per capita meat consumption was 5.9 kg where 3.9 kg (66%) came from the commercial broiler production sector (Dolberg, 2008). Thereby, broiler farming seems to be a considerable part of meat production and consumption in the country.

In Bangladesh, broiler farming can be broadly divided into two categories: independent and contract farming. Contract farming in developing countries has experienced mixed yield, with some successes and failures. In India, Thailand, and the Philippines, integrators account for a large proportion of the broiler industry, and contract broiler farming is popular with a sizeable number of poultry firms (Fairoze *et al.*, 2006; Costales, 2004; USDA, 2006). In Bangladesh, however, the growth of contract farming has been very slow, and performance is not very satisfactory. The contract system of broiler farming has a few unresolved issues and is still under trial. The independent farming is therefore dominant and performed for the development of broiler sector as an important profitable venture.

In urban areas, most of the independent farms are large and used hired labor. However, in rural areas, most of the farmers rearing small number of broilers are using family labor rather than hired labor. In this paper, farmers those who are using family labor and utilizing own backyard or fellow land to maximize farm income considered as small-scale farmers. Still majority of the broiler production in Bangladesh comes from small-scale farms in rural areas and plays a vital role in the rural economy (Hassan and Hassan, 2003). Therefore,

focus on the small-scale broiler farming in rural areas is needed for increasing the amount of broiler meat. However, research on benefit-cost analysis of fast growing small-scale broiler farms under private management in rural areas of Bangladesh is scanty. There are a limited number of studies (e.g., Ukil and Poul, 1992; Yasmin *et al.*, 1989; Ershad *et al.*, 2004) on production and economic aspects of commercial independent poultry farms where they analyzed only the average profitability of sample farms. These studies did not analyze the extent of the farmers' intention to expand their farms. In addition, farmers' attitude and behavior on expansion of farm size based on the household income of small-scale broiler farming is yet to be investigated, while farm size is a very crucial factor for the increasing broiler meat production.

The present study evaluated the current economic condition of the independent small-scale broiler farmers in rural Bangladesh. Also, farmers' economic behavior in respect to profit in farms with various sizes was analyzed. This study also assessed the possibility of development and expansion of farms in Bangladesh.

MATERIALS AND METHODS

In order to fulfill the objectives of the study, the Sadar Upazilla of Mymensingh district was selected considering the concentration of broiler farms in that area. A total of 50 farmers out of 126 farmers (40% sampling intensity) were interviewed using structured and pre-tested interview schedules. Data were collected on a memory recall basis for a one year production cycle. The data were collected during June to September 2008, on a regular basis by the first author. Information on the contract farming system were collected from the officials of *Aftab Bahumukhi Farms Limited* (ABFL) at Kishoregonj district and Bangladesh Rural Advancement Committee (BRAC) head office at Dhaka, in 2008 and 2009, through personal communication.

Small-scale farmers in the study areas are usually practicing different number of batches in a year having various numbers of birds ranging from 300-2000 individuals in each batch. Changing batch number in a year and bird numbers in each batch is the common feature for farmers in rearing broilers. Farmers' attitude and behavior are closely related with various farms sizes. To explore such an attitudinal and behavioral relationship with farm in various sizes, farms were classified into three categories as 1000-3000, 3001-5000 and more than 5000 broilers per year. The categorization of various farm sizes would help to explore farmers' income behavior in connection with their family expenditure. Therefore, farmers' economic behavior was analyzed not only on the basis of their income from broiler farming but also considering other sources as total household income and per capita income.

State of the contract farming and independent farming: There were about 110,800 broiler farms of various sizes in Bangladesh (BRAC, 2006) and yet at present the two enterprises ABFL and BRAC together handle only 600 (ABFL-250; BRAC-350) contract farms. The contract farming system is not a nationwide phenomenon, and is practiced only in a few places.

ABFL at Kishoregonj district, a pioneer in the contract farming system, began broiler production under contract with 20 selected farmers in 1994 on credit. In 2002, the number of broiler farms had increased to 650 and this number remained static until 2003. Following the ABFL venture, BRAC also entered into contract farming with 20 selected farmers in 2001 on credit in Sherpur district. The number of farms had increased to 75 in 2002 and thereafter remained static until 2004. This may be due to the fact that at the beginning, farmers had a growing interest in this innovation and made a genuine and honest effort to increase productivity. The production of broilers under contract entails agreements between farmers and integrators that specify the conditions of producing and marketing the broilers. These two contract systems are almost identically similar, barring the following differences: the ABFL operates an insurance scheme to cover the production risk of the farmers against losses arising from the death of birds owing to disease or other reasons. On the other hand, in the case of BRAC, risks is borne entirely by the farmers, and have no internal insurance schemes to cover the risk of losses to them.

As mentioned above, the contract involved certain terms and conditions: feed, Day Old Chicks (DOC), medicines, vaccines and technical support were provided by ABFL and BRAC; while the sheds, land, equipments and labor were provided by the farmers. Finally, broiler sale was managed by both integrators. In the beginning, ABFL and BRAC provided inputs (feed, DOC, medicine, vaccine) on credit. However, this arrangement did not produce the desired results owing, primarily, to the lack of responsibility, honesty and sincerity on the part of the contracted farmers. Both ABFL and BRAC incurred considerable losses of about Taka (Tk.) 55 million and Tk. 3 million, respectively. Both integrators, therefore, had to change their attitude: now, they provide inputs only in lieu of cash payments. In credit systems operated by ABFL, the integrator was providing inputs in credit and buying the mature broilers from the farmers at a predetermined price. In the cash system, however, the following clauses are spelt out: (a) the farmers are obligated to buy inputs from the integrators and sell their birds to them; (b) the prices of, both, the inputs and the mature broilers are established by ABFL, based on the prevailing market prices in Dhaka; and for BRAC the price based on the prevailing local market price. Still ABFL continue the insurance scheme to cover the farmers against losses arising from the death of chicks owing to disease or other reasons.

On the other hand, the phenomenon of the independent small-scale broiler farming is rapidly gaining momentum (Rahman *et al.*, 2006) as demonstrated throughout the country. The upbeat impact of this farming system in Bangladesh has also been explored by Islam and Sasaki (2009). They found that in rural Bangladesh, small-scale independent broiler farming improved the economic situation of rural farmers and increased the empowerment, decision making ability and social status of the women in families. These positive factors encourage farmers to start farming independently. Small-scale independent broiler farmers in the rural areas of Mymensingh district are able to economize on the cost of inputs and sell after negotiating prices with the buyers. This is possible because these farmers have regular access to market information and relatively easy access to transportation, which allows them to communicate with the urban markets of their region. Farmers in the study area are known to have sold their birds at the farm gate to traders who had come to buy, largely minimizing their transportation costs and reducing the associated risks of broiler mortality during transportation. Moreover, in the study area, farmers are able to easily avail training and technical support facilities offered by the government, Bangladesh Agricultural University, NGOs and other private institutions. Mymensingh, as of today, does not have a multipurpose poultry industry big enough to maintain a contractual system, when a big poultry industry is one of the prerequisites for operating a contract system. Farmers prefer the independent broiler farming system; this system, therefore, is dominant in Mymensingh district as well as in almost every other peri-urban areas of Bangladesh.

Socio-economic profile of the sample broiler farmers:

This section presents the characteristics of the independent small-scale broiler farms surveyed. Table 1 presents the mean values for small-scale farmers' socio-economic characteristics according to various categories of farm size. There are no significant difference in variables of age, education, experience, family member, landholdings and average batches per year among the farmers in three groups. Therefore, all

sample farmers could possibly have the same socio-economic background.

The family size for all groups of farmers is higher than the national average (4.89) of Bangladesh (BBS, 2006). In Bangladesh, farmers are classified into different categories based on land holding, i.e. landless, marginal, small and large- having 0-5, 6-49, 50-249 and 250-750 decimal of land respectively (Agricultural Census, 2001 (BBS, 2006)). Thus, as per categorization all of our sample farmers were under small categories. Before broiler farming, the per capita income of sample farmers was lower (average: Tk. 13,522.86) than that of national per capita income of rural people. The source of income was mainly crop followed by fisheries, business and service.

RESULTS AND DISCUSSION

Impact of farm size on profitability of sample broiler farmers: Independent small-scale broiler farming is a profitable venture in rural farmers because of lower investment, less space requirement, utilization of family labor and quick returns. Large farms (>5000 birds) were found to be more profit efficient than small counterparts. This result partially agrees with Rahman *et al.* (2001). They showed that in Bangladesh, rich and educated farmers raised more poultry, got increased productivity from their family poultry and consequently, were capable to maximize profitability in rearing poultry.

The data obtained were compared among the 3 rearing groups having variable farm size. Table 2 shows that almost all components of different variable cost items had declining tendency with the increase of farm size. However, sharp decrease of variable costs (except veterinary costs) was obtained only when farmers reared more than 5,000 broilers per year. Particularly, feed cost being the dominant share of variable cost, was reduced significantly ($p < 0.05$) by about six percent, mostly as a function of reduced mortality. The fact was happened when we considered the average feed cost of other two groups who reared less than 5,000 broilers per year. Similarly, profit making efficiency had also an increasing trend with the increasing number of broilers reared (Table 3). It is evident from Table 3 that variable cost and total cost in rearing broilers maintained close

Table 1: Socio-economic characteristics of the respondents

Particulars	Number of broilers according to different farm sizes		
	1000-3000 (n = 13)	3001-5000 (n = 30)	>5000 (n = 7)
Age (years)	33.54	37.63	34.43
Education (years of schooling)	8.23	8.87	10.14
Experience in broiler farming (years)	3.69	4.30	4.72
Family members	5.15	5.90	5.43
Total land holdings (decimal)	66.85	73.70	88.23
Number of batches per year	4.92	5.50	5.43
Number of birds reared per year	2553.85	3848.33	6557.14

Source: Field Survey, 2008; n = Number of respondents

Table 2: Relation between number of broilers and values of different items of variable cost (Per bird basis)

Number of broilers	Items and values (Tk) of variable cost						
	DOC	Feed	Litter	Vaccine	Electricity	Transport	Family labor
1000-3000 (n = 13)	29.59±3.32	64.13 ^a ±2.40	1.48±0.38	4.58±1.01	1.32±0.45	1.16±0.35	2.95±0.93
3001-5000 (n = 30)	30.17±2.89	63.42 ^a ±3.04	1.29±0.35	4.33±0.97	1.11±0.28	1.1±0.46	3.01±0.88
>5000 (n = 7)	29.43±3.21	60.14 ^b ±2.75	1.15±0.27	4.67±0.76	1.02±0.27	1.11±0.50	2.27±0.37

^{ab}Values having uncommon superscripts in the same column differ significantly (p<0.05); ± = Standard Deviation; n = Number of respondents

Table 3: Relationship between number of broilers with the values of total cost items and returns (per bird basis)

Number of broilers	Cost items				
	Total variable cost (Tk)	Total depreciation cost (Tk) of house and equipment	Total cost (Tk)	Total return (Tk)	Net return (Tk)
1000-3000 (n = 13)	105.21 ^a ±4.21	2.57±0.62	107.78 ^a ±4.19	124.01±6.90	16.23 ^{ab} ±4.41
3001-5000 (n = 30)	104.56 ^a ±5.26	2.51±0.90	107.07 ^a ±5.29	122.26±6.38	15.19 ^a ±3.69
>5000 (n = 7)	99.81 ^b ±5.58	1.81±0.66	101.62 ^b ±5.68	120.71±9.59	19.09 ^b ±5.02

^{ab}Values having uncommon superscripts in the same column differ significantly (p<0.05); ± = Standard Deviation; n = Number of respondents.

(1) Expenses on Day-Old-Chicks (DOCs), feed, litter, treatment, electricity, transportation, labor, housing, tools and equipment were called cost items.

(2) Net return was calculated by deducting total cost from total return

relationship with net return up to 5,000 birds reared per year. Increasing total number of birds reared per year reduced variable and total cost with a consequent marked improvement of net return. So, reduction of variable cost might improve the profitability of small-scale broiler farming in rural Bangladesh. The net return of the farmers who reared more than 5000 birds was increased significantly (p<0.05) compared to the group reared 3001-5000 broilers. But net return obtained in group reared 1000-3000 did not significantly vary with other 2 groups (p>0.05). Thus, large farms (>5000 birds) were more profit efficient than that of their other two small size counterparts. Such a relation of farm size with net return may have been arisen for the increased ability of the larger flock size to decrease per unit variable cost (Table 2). The results also show that there was scale effect on economic efficiency of the broiler farms as economic efficiency was found to increase with the increase of scale farming (number of birds in the flock). Thus, large farms achieved higher economic efficiency due to better cost economy and better technical performance of the flock.

Income trend of farmers with various farm sizes: The issue of increasing farm size has been arisen in the context of changed attitude and behavior of the farmers. Farmers' decision for increasing farm size depends on household income per year. In uplifting their living standards, farmers are much concerned with household income as it covers the family expenses. Those facts coincide with Islam and Sasaki (2009). So, how household income per year is influencing the expansion of farm size and also how it is related to household income per year from broiler farming? With the changed

and increasing income situation, the farmers were classified into two income goal groups in terms of total per capita income (Table 4): a) the farmers reared broilers ranging from 1000-5000 and earned almost similar income which may be termed as First Income Goal Group (FIGG) and b) farmers reared more than 5000 broilers achieved highest income that may be termed as Second Income Goal Group (SIGG).

Table 4 shows the contribution of broiler farming to the respondents' total household income per year and total per capita income. Before broiler farming, in all groups, the average per capita income from other sources was much lower (average: Tk. 13,522.86 (US\$ 196) than that of present income. It was even, lower in comparison with the national per capita income of rural people (US\$ 212) in 2000 (HIES, 2005), when most of them started broiler farming. In this context, the farmers showed much interest in broiler farming to maximize their income, which was exclusively necessary to support their basic needs. It should be mentioned here that, since inception of broiler farming, farmers' per capita income have been increased remarkably in all groups and exceeded average national per capita income for rural areas (US\$ 232) and it was even higher than that of national per capita income (US\$ 277) in 2005 (HIES, 2005).

Furthermore, the FIGG with flock size of 1000-5000, whose average per capita income was Tk. 26,626.44 (US\$386) which was 66.38 percent higher than that of national average income for rural people in 2005. However, since this is a semi-urban region, farmers' income should be compared with average income in the urban area. At that point, their annual income became comparable to that of average income in the urban area. The income level of Tk. 26,626.44 is seen to be very

Table 4: Income trend of different categories of broiler farmers (in Tk.)

Number of broilers	Per year household income from broiler farming	Per capita income from broiler farming	Per year total household income	Total per capita income	Per capita income from other sources
1000-3000 (n = 13)	49,332.23±13592.96	10978.99±5672.20 (159)	127793.77±21294.75	27154.81±9606.79 (393)	16175.82±5306.71 (234)
3001-5000 (n = 30)	70,440.93±17422.54	13824.86±8972.63 (200)	135760.93±24687.76	26397.48±14874.12 (382)	12572.62±6532.29 (182)
>5000 (n = 7)	137,143.85±19187.75	28181.50±9105.94 (408)	211429.57±40849.28	40849.86±13681.93 (592)	12668.37±7840.04 (183)

Figures in parenthesis indicate US\$; US\$1 = 69 Tk. (September, 2008). n = Number of respondents; ^{abc}Values having uncommon superscripts in the same column differ significantly (p<0.05); ± = Standard Deviation

Table 5: Farmers intention to expand broiler farming

Number of broilers		Farmers intention		Number of respondents
		Yes	No	
1000-3000	FIGG	11 (84.62)	2 (15.38)	13
3001-5000		24 (80.00)	6 (20.00)	30
>5000	SIGG	1 (14.29)	6 (85.71)	7

Figures in parenthesis indicate percentage

similar to average income for the urban population (Tk. 26,604) (HIES, 2005). In fact, in the FIGG, the extent of expansion of the farm size was closely related to the amount of income excluding broiler farming; per capita income from other sources was lower; the expansion of the farm size was greater. On the other hand, a SIGG consisting of farmers who reared more than 5,000 broilers per year had a total per capita income of Tk. 40,849.86 (US\$592), which was also much higher (53.37 percent) than those farmers rearing fewer than 5,000 broilers per year.

In addition, to analysis the attitude of the farmers, it is also worthwhile to examine the possibility to expand farm size by using hired labor, borrowed money and separate land.

Table 5 depicts that more than 81% farmers in FIGG showed their interest to expand their farm because they are not satisfied with their present income level. Therefore, they want to increase farm size to maximize income and enter into SIGG. The achievement of total per capita income for the farmers who reared 1000-3000 and 3001-5000 broilers (Table 4) were much lower than that of SIGG, the targeted goal might have been achieved by increasing farm size. On the other hand, farmers with more than 5000 broilers are reluctant to expand their present level of operation. This is may be they are satisfied with their present level of income. Therefore, about the question "To what extent farmers want to expand the farm size for fulfilling their satisfaction?" It could be concluded that SIGG is the most desirable and targetable income goal and most of the farmers may fix their target to enter into SIGG.

It can be inferred that although the large farm size is profitable, majority (85.71%) of the farmers of SIGG are not interested to expand farm size beyond 5000 broilers. So, it might be assumed that small-scale broiler farms

in rural areas are not interested to run with large scale farms using employed labor and separate land.

Conclusion: In Bangladesh, the fate of small-scale contract farming is not clear yet. It may take some time to formulate a suitable and viable contract package for the operation and expansion of contract broiler farming. On the other hand, small-scale broiler farming in rural areas of Bangladesh is an important issue, and there are serious concerns regarding its development. The present study reveals that, small-scale independent broiler farming is potential to increase profit, employment opportunity and per capita income with increased meat production efficiency. Economic efficiency of broiler production is increased with the increase of farm size. The economic behavior and attitude is different among the farmers who reared more than 5000 birds and reared less than 5000. There is still possibility of increasing the farm size. Most of the farmers with less than 5000 birds are interested to enlarge their farm, however, if the farm size has more than 5000 birds it has been seen that the farmers are showing fewer tendencies for expanding their farms.

Therefore, both the increase of farm size and wider expansion of farm number throughout the country might be necessary for increasing the production of broiler meat. The farmers have the intension to use their own backyard land and family labor to maximize their farm income. Farmers' behavioral pattern should be considered in making any suggestion and recommendation for changing the existing level of small-scale broiler farming.

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