



Sonali chicken farming in southern part of Bangladesh

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ABSTRACT

The study was conducted to identify the socio-economic status and problems faced by the Sonali farmers at Wazirpur Upazila in Barishal District. A total of 90 respondents from 9 unions were selected randomly for primary data collection. The farmers and their farming were evaluated through the analysis of data collected in a pre-structured questionnaire. This study revealed that a maximum portion of the farmers were middle-aged (52.2%), male (92.2%), and had a secondary level of education (54.4%). Most farmers had medium-sized farm (38.9%) and invested their own capital in farming (54.9%). Although major farmers had low experience in Sonali chicken farming, they had high management skills (63.9%). In terms of occupation, the highest percentage of farmers (38.9%) had a conjugated occupation of poultry and crop. Most of the farmers had their own tube-well (74.7%) and use sanitary latrine (71.1%). Nevertheless, only 17% of the farmers had good health condition. About 49% of the farmers had only one chicken house, and 87.8% followed the floor system for rearing Sonali chicken. Surprisingly, all the farms followed an all-in-all-out marketing system for Sonali chicken. Most of the farmers (96.7%) vaccinated their poultry birds and added coccidiostat (73.3%) and vitamin mineral premix (94.4%) to the feed. A major portion of the farmers identified the irregular fluctuation in the market price of feeds (95.6%) and day-old chicks (93.3%) as severe problem, followed by high price of feed but low price of meat (87.8%). A disorganized marketing channel was the next major problem faced by the poultry farmers (83.3%). Taken together, the Sonali farmers of Barishal were middle-aged; poorly educated, and invested their own capital for farming, and they faced a variety of challenges during farming and marketing their chickens. To enhance Sonali farmers' socio-economic conditions and alleviate their problems, the government should take appropriate steps to provide finance and farm-based training, including modern animal husbandry practices.

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Introduction

The poultry industry of Bangladesh has proved to be an attractive economic movement with a contribution of about 1.5-1.6% to Gross Domestic Products (GDP) and an annual growth rate of 12-

15% on average. According to the Bangladesh Poultry Industries Central Committee (BPICC), the cumulative investment in the poultry sector of Bangladesh is estimated to be around BDT 3500

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million, with over 6 million people employed (Saleque and Ansarey, 2020). It is assumed that by 2021, this industry will create employment opportunity for about 10 million people and unemployed young men and women make up the majority of them (Saleque and Ansarey, 2020). Aside from producing jobs, the poultry industry boosted Bangladesh's food security and increased the supply of high-quality protein in people's diets. With rising incomes, urbanization, and dietary changes, the demand for meat, eggs, and associated items has exploded. Meat is an essential component of our daily diet, and chickens' meat is now the cheapest form of animal protein in Bangladesh, despite religious, economic, social, and demographic differences (Al-Nasser *et al.*, 2007; Simon, 2009). According to Begum *et al.* (2011), poultry meat accounts for 37% of overall meat output and roughly 22-27% of total animal protein supply in Bangladesh (Prabakaran, 2003).

Based on the preceding discussion, it can be said that, Bangladesh's poultry industry is one of the key job generators, which also improves the food security, boosts the supply of high-quality protein, contributes to the country's economic development, and reduces poverty in Bangladesh's rural and urban areas. Native chickens, scavenge on cereal by-products and wastes of rural areas (Rao, 1990) are still playing a noteworthy role on quantitative production of chicken eggs and meat in the developing countries. Because of special smell, taste and texture, the meat of non-descript native-colored chickens are very popular among all classes of consumers of Bangladesh (Barua and Howlader, 1990). Indigenous chicken and duck of free range provide 75.06% eggs and 86.05% meat (Huque *et al.*, 1999), although their flock size (below 20) and performance (up to 1.50 kg meat and 35-40 eggs annually) are limited (Das *et al.*, 2008). As a result, the market price of indigenous chicken meat is 2-3 times that of commercial chicken. Furthermore, because to food safety concerns, consumers' attitudes regarding commercial broiler meat are changing day by day.

Sonali chicken, the crossbred of Rhode Island Red (RIR) male and Fayoumi female was developed in 1986, has similar phenotypic appearance and taste to that of local non-descript chickens. Between

1996 and 2000, Bangladesh's Department of Livestock Services (DLS) introduced Sonali crossbred chicken in the northern areas of the country through various projects, creating jobs for millions of rural women (FAO, 2015). Sonali rearing is rapidly becoming popular because of its better production records (average weight; adult male 2-2.5 kg and adult female 1.5-2 kg with feed conversion ratio of 4.33), higher disease resistance, lowest mortality and highest profit rate per hen (Rahman *et al.*, 1997; Huque *et al.*, 1999). They are also very much suited to the semi-intensive rearing system in rural areas. Traders can sell Sonali at higher price than broiler. Sonali chicken consumption climbed by 45 percent in July 2019 compared to 20 percent in July 2018. Commercial Sonali farming provides employment opportunities for unemployed family members, improve socio-economic conditions (of about 76% of Sonali beneficiary has been improved) and increases women employment among rural people of Bangladesh. If we can boost Sonali production, it will be able to contribute more to the country's total meat production. The poultry producers of Barishal district have recently noticed a trend of Sonali chicken farming. Therefore, the purpose of this study was to identify the socio-economic status of the Sonali chicken farmers and the major problems they experience while conducting poultry business in the Barishal district of Bangladesh.

Materials and Methods

Study area

The survey was conducted in 9 unions of Wazirpur Upazila of Barishal district. Wazirpur Upazila is located in between 22°43' and 22°56' north latitudes and in between 90°01' and 90°18' east longitudes. This Upazila was considered representative in terms of availability of various types of birds including Sonali chicken.

Sample selection procedure

Before selecting the survey samples, a list of unions and villages under Wazirpur Upazila was prepared in consultation with government officials, the local offices of non-governmental organizations (NGOs) and poultry dealers/agents. Farms were

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chosen at random from a sample frame developed through discussions with various stakeholders.

To avoid survey inaccuracies, data and information from a specific locality were collected at the same time. For primary data collection, a total of 90 respondents from 9 unions (10 per union) were chosen at random. The survey included intensive system of Sonali chicken production.

Preparation of survey instruments

Based on the information needed to meet the study objectives, a predesigned structured interview schedule for the sample survey was created. Farm management records/information and personal interviews were used for retrospective analysis. The interview schedule included various portions devoted to the specific features needed to achieve the study's goals. Before establishing the final schedule, a draft was created. After pre-testing the draft schedule with a few farmers in the research area, it was reassembled and subsequently revised.

Sources of data and collecting primary data

Primary and secondary data were utilized in the investigation. The 90 farmers who provided both qualitative and quantitative data were the main source of primary data. To collect primary data, we follow the procedure described by Hossain *et al.* (2017). Before actual interview an introductory visit with the respondents was made to the study area to provide brief information regarding the aims, nature and study's objective. Questions were asked systemically and explained whenever it was felt necessary. The respondents were interviewed at their own house so they could give accurate information without any wavering and sound mind. Excellent cooperation was received from all respondents when the data was collected and therefore, no serious problem was faced by the researchers. Data were collected by the researchers during January to March, 2021. The Department of Livestock Services, various poultry associations, and other government and non-government organizations provided secondary data and information.

Data processing and analysis

All data obtained in the field was input into computers using Microsoft Excel. The qualitative data were transferred into quantitative data by appropriate scoring technique. For analyzing the data, a combination of descriptive statistics (sums, averages, percentages, etc.), mathematical techniques and SPSS (version 23) were used to obtain meaningful results.

Results

Socio-economic condition of the Sonali farm owners

Age, gender and educational level

The socio-economic condition of the Sonali farmers at Wazirpur Upazila of Barishal district is displayed in Table 1. According to our findings, the maximum number of Sonali farmers was within the middle age (31 to 50 years) group (52.2%), followed by young (18-30 years, 20.7%) and old age group (above 50 years, 8.1%). When it comes to gender issue 92.2% male had involved in Sonali chicken farming, compared to only 7.8% of female. Most of the farmers have secondary (6-10 grade) level of education (54.4) followed by higher secondary (11-12 grade, 23.3%), primary (1-5 grade, 18.9%) and higher study (>12 grade, 3.3%).

Farm size and investment source

In relation to farm size Sonali farmers were categorized into landless (0.02 ha), marginal (0.02 to 0.20 ha), small (0.21 to 1.0 ha) and large (3.0 ha) (Hannan *et al.*, 2020). In the present study, majority of poultry farmers belonged to medium land size category (38.9%) followed by small (30.0%), marginal (17.8%), landless (11.1%) and large (2.2%) categories. The sources of investment for the farmers were highly varied (Table 1). Most of the farmer (54.9%) invests their own money in farming, 18% takes bank loan, 5.4% manages investment from money lender in terms of interest, and remaining 2.7% takes loan from money lender but without interest.

Table 1. Socio-economic conditions of the Sonali farmers in the experimental area (n=90)

Parameter	Category	Respondents	Percentage
Age	Young age (18-30)	23	20.7
	Middle age (31-50)	58	52.2
	Old (>50)	9	8.1
Gender	Male	83	92.2
	Female	7	7.8
Education level of farm owner	Illiterate	0	0
	Primary (1-5)	16	18.9
	Secondary (6-10)	49	54.4
	Higher secondary (11-12)	21	23.3
	Higher study (>12)	3	3.3
Farm size (hectare)	Landless (>2)	10	11.1
	Marginal (2-20)	16	17.8
	Small (21-100)	27	30.0
	Medium (101-300)	35	38.9
	Large (>300)	2	2.2
Investment source	Own	61	54.9
	Bank loan	20	18.0
	With interest from money lender	6	5.4
	Without interest from money lender	6	2.7
Source of drinking water	Own tube-well	83	74.7
	Shared-in tube-well	7	6.3
	Shared-in deep tube-well	0	0
Condition of latrines	Non-sanitary	0	0
	Semi-sanitary	11	9.9
	sanitary	79	71.1
Health status	Good	19	17.1
	Moderate	61	54.9
	Poor	10	9.0

Health status of poultry farmers

There was remarkable difference in the farmers' drinking water sources and latrine conditions (Table 1). Most of the farmer had their own tube-well (74.7%) and used sanitary latrine (71.1%). The sharing of tube well (6.3%) is only during certain dry months. Around 17% of farmers reported good health, while 54.9% and 9% reported moderate and poor health, respectively.

Farming experience, management skill, occupation and annual income

Based on the farming experience, poultry farmers were categorized into four group: no (0 year, no experience), low (1-5 years), medium (6-15 years), high (16-30 years) and very high (>30years). Table 2 represented that, the majority of the farmers (25.6%) in Wazirpur Upazila had low experience (1-5 years) in Sonali chicken farming. Additionally, about 23.3% farmers had no experience in chicken farming. About 18.9% farmers had medium (6-15 years), 16.7% had high (16-30 years) and 15.6% had very high (>30years) experience in poultry farming.

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Table 2. Farming experience, poultry farm management skill, occupation and annual income of the farmers in the experimental area (n=90)

Parameter	Category	Respondents	Percentage
Farming experience (year)	No experience (0)	21	23.3
	Low (1-5)	23	25.6
	Medium (6-15)	17	18.9
	High (16-30)	15	16.7
	Very High (>30)	14	15.6
Poultry farm management skill	High	71	63.9
	Medium	15	13.5
	Low	4	3.6
Occupation	Poultry	18	20.0
	Poultry and crop	35	38.9
	Poultry and service	9	10.0
	Poultry and business	8	8.9
	Poultry and fish	16	17.8
	Poultry, crop and fish	4	4.4
	Annual income ('000 BDT)	Low (up to 40)	20
	Medium (41-80)	46	51.1
	High (>80)	24	26.7
Income from Sonali production ('000 BDT)	Low (up to 10)	36	40
	Medium (11-20)	41	45.6
	High (>20)	13	11.7

Table 3: Correlation between farming experience and poultry farm management skill

	Farming Experience	Poultry Firm Management Skill
Farming Experience	1	0.708**
Poultry Firm Management Skill	0.708**	1

**Correlation is significant at the 0.01 level (2-tailed).

About 63.9% of the farmers had high poultry farm management skill. There was a positive correlation between farming experience and poultry farm management skill (Table 3). In terms of occupation, the major farmers (38.9%) had a conjugated occupation of poultry and crop followed by exclusive poultry farming (20.0%), poultry and fish (17.8%), poultry and business (8.9%), poultry and service (10.0%), and poultry, agriculture and fish (4.4%). Annual income from poultry farm showed that the maximum percentage of farmers belonged to medium income group (51.1%),

followed by high (26.7%) and low-income group (22.2%).

Different Management practices

Different management practices followed by the Sonali chicken farmers of Barishal district are shown in Table 4. About 49% of the farmers have only one chicken house, 38.9% has two houses and 12.2% has more than two chicken houses. Most of the farm follow floor rearing system (87.8%) for rearing Sonali chicken, followed by cage rearing (6.7%) and net rearing (5.6%). Surprisingly, all

Table 4. Different management practices followed by Sonali chicken farmers (n=90)

Parameters	Category	Respondents	Percentage
Number of chicken house/farm	1	44	48.9
	2	35	38.9
	> 2	11	12.2
Rearing method (intensive)	Floor-rearing	79	87.8
	Net-rearing	5	5.6
	Cage rearing	6	6.7
Marketing system	All-in-all-out	90	100
	Not all-in-all out	0	0
All-in-all-out mode	One chicken house	78	86.7
	The whole chicken farm	12	13.3
Vaccination	Regular	87	96.7
	Irregular	3	3.3
Coccidiostat feeding	Yes	66	73.3
	No	24	26.7
Application of antibiotics	Yes	63	70.0
	No	27	30.0
Vitamin mineral premix feeding	Yes	85	94.4
	No	5	5.6

Table 5. Problems faced by Sonali chicken farmers (n=90)

Parameters	Respondents	Percentage
Inadequate availability of quality feed	72	80.0
Inadequate availability of quality chick	69	76.7
Lack of vaccine	65	72.2
Natural disaster	55	61.1
Inadequate availability of technical advisor	67	74.4
Corrupt middleman	75	83.3
Irregular fluctuation of market price of day-old chicks	84	93.3
irregular fluctuation of market price of feed	86	95.6
High price of feed but low price of meat	79	87.8
Disease out-break	65	72.2

the farms follow all-in-al-out marketing system for Sonali chicken. About 86.7% farmers depleted one chicken house at a time, while 13.3% farmers depleted the whole chicken farm at a time. Most of the farmers (96.7%) vaccinated their poultry birds.

On an average 73.3% of the Sonali farmers provided coccidiostat regularly while 70% farmers provided antibiotics. Vitamin mineral premix was added to feed by 94.4% farmers. Both readymade and hand mixed feeds were provided to the birds.

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The nutrients content of the hand mixed feed was almost similar to the readymade feed. The major components of layer ration were maize, rice polish, soybean meal, concentrate protein, limestone, layer premix, di-calcium phosphate, common salt and some other additives. The average crude protein content (%) and energy content (ME, Kcal/kg) values were 17.55 ± 0.07 and 2783.33 ± 7.97 , respectively.

Problem faced by Sonali chicken farmers

The farmers of the study area confronted many different problems at different extent. Data presented in Table 5 represented ten major problems that the Sonali chicken farmers were pointed out during the study period. Major portion of the farmers identified the irregular fluctuation of market price of feeds (95.6%) and day-old chicks (93.3%) as highly severe problem tackled by the Sonali chicken farmers followed by high price of feed but low price of meat (87.8%). Corrupt middleman was the next foremost problem faced by 83.3% poultry farmers. About 80% of the farmers acknowledged inadequate availability of quality feed as one of the most serious issues in chicken farming, while inadequate availability of quality chick, inadequate availability of technical advisor, lack of vaccine, disease outbreak and natural disaster have been recognized by 76.7%, 74.4%, 72.2%, 72.2% and 61.1% farmers, respectively.

Discussion

Socio-economic conditions of the Sonali farm owners

Farmers' access to agricultural loans, adoption of farming practices, and farm profit have all been influenced by their socioeconomic circumstances (Nouman *et al.*, 2013). Age, gender, education level, farm size and investment source, farming experience, poultry farm management skill, occupation, annual income, income from broiler production, health status, marketing system were used to assess the socio-economic status of the Sonali chicken farmers. Every criterion was again divided into different categories.

According to my information, no research report has discussed the age and gender as socio-economic characteristics of Sonali chicken farmers. However some reports have been found that discussed the age and gender to converse the socio-economic condition of poultry farmers in Bangladesh. In our research, it was found that maximum percentage of Sonali farmers was middle-aged male. This tendency was similar to the findings of Eva (2013) and Hannan *et al.* (2020). Hannan *et al.* (2020) conducted an experiment to observe the socio-economic conditions of poultry farmers in the south-western region of Bangladesh and found the highest number of farmers within the middle-aged (31 to 40 years, 45.6%) male (86.8%) group. Eva (2013) also reported that the majority of the poultry farmers (43.3%) belonged to middle (41 to 50 years) age group.

About 54.4% of Sonali farmers of Wazirpur Upazila had secondary (6-10 grades) level of education followed by higher secondary, primary and higher study. In consistent with our study, Islam *et al.* (2013) also reported the majority of respondents has less than a SSC level of education (30.5%) followed by HSC (28.8%). We did not find any illiterate farmers in our study. In contrast to our findings, Hossen *et al.* (2012) reported 19.33% no-educated Sonali farmers in Joypurhat district. The result of Kumar and Manotosh (1994) was also in shape with findings of Hossen *et al.* (2012). Hannan *et al.* (2020) reported maximum percentage of farmers belonged to HSC level of education (31.8%) followed by SSC (24.2%), below SSC (22%), Bachelor (13.4%) and Masters (8.6%). In the commercial poultry business, education has a good impact on productivity and should be used to increase performance in both the domestic and worldwide markets (Larbi-Apau and Sarpong, 2010).

In the present study, maximum percentage of poultry farmers belonged to medium farm size category (38.9%) followed by small (30.0%), marginal (17.8%), landless (11.1%) and large (2.2%) categories. Our results are in consistent with the findings of Hannan *et al.* (2020). Rahman *et al.* (1997a) conducted a socio-economic study of

livestock farmers and found the similar findings regarding land size of the farmers. Whereas, Alam *et al.* (2014) and Rahman *et al.* (2002) reported highest number of poultry farmers belonged to large farm size followed by medium, small, marginal and landless. Islam *et al.* (2010) reported that all of the farmers involved in broiler farming were in small farm size categories (Having 6-49 decimal land).

Most of the farmers (54.9%) invests their own money in farming. Our results are similar with the findings of Alam *et al.* (2014) and Rahman *et al.* (2002) who also reported that majority of the poultry farmers invest their own money for farming, followed by bank loan, money lending with interest and money lending without interest.

Sanitation and hygiene along with safe water supply are crucial for improving the socio-economic condition of peoples' life. In our study we found that most of the farmer had own tube-well (74.7%) and most of them use sanitary latrine (71.1%). Our results are fully consistent with findings of Alam *et al.* (2014). On the contrary, Ahmed *et al.* (2009) showed higher percentage of farmer using semi-sanitary latrine. In terms of health status our study revealed that, about 55% of the farmers had moderate health condition followed by 17% had good health which is in consistent with the findings of Alam *et al.* (2014) who reported 50% farmers had moderate health condition and 20% had good health condition.

Farming experience, management skill, occupation and annual income

About 25.6% of the farmers in Wazirpur Upazila had low experience (1-5 years) in Sonali chicken farming. Furthermore, about 23.3% farmers had no experience in chicken farming. Contrary to our results, in a baseline survey Shahjahan and Bhuiyan (2016) found that, major portion of the poultry farmers of Mymensingh district were highly experienced (16-30 years). According to a study by Hai *et al.* (2008), 30% of farmers in Bangladesh's Fulbaria sub-district possessed adequate health and nutrition knowledge. Yasmin *et al.* (1989) showed that just 13% of poultry farmers had adequate

understanding of poultry feeding, breeding, housing, disease prevention and control, while 17% had insufficient knowledge. These inconsistencies in results regarding farming experience may be due to regional effects. The poultry farm management skill was categorized into high, medium and low. Even though the average farming experience was about 20%, the management skill of 63.9% farmers was high. This may be due educated people are engaged themselves in poultry farming. Table 3 depicts that farming experience has positive correlation with poultry farm management skill because when a respondent have enough farming experience, poultry farm management skills is also increased.

Considering the occupation of the respondents, maximum percentage of farmers had a conjugated occupation of poultry and crop (38.9%) followed by exclusive poultry farming (20.0%). Our results are partially consistent with the finding of Islam *et al.* (2013) who reported that major farmers involved in poultry and agriculture (43.3%) followed by poultry farming (16.7%). In contrast to our findings, Alam *et al.* (2014) reported that, the main occupation of 55% farmers in Gazipur district was exclusively poultry farming and the remaining 45% was involved in subsidiary occupation. Ahmed *et al.* (2009) showed that, farming is the primary source of income for 35% of broiler farmers. The region may have an effect on occupation, as Gazipur is considered as the poultry zone of Bangladesh. Major percentages of the farmers categorized as medium income group and earn about BDT 11 to 20 thousand annually from their poultry farm. In consistent with our results, Hannan *et al.* (2020) also reported that the majority of farmers were in the middle income group (43.6 %).

Different management practices

To maximize productivity with the least amount of investment, sound and scientific management procedures are critical. We found that 87.8% farmers followed floor rearing system for rearing Sonali chicken which is in consistent with the findings of Rahman *et al.* (2002). Most of the farmers in the experimental area vaccinated their poultry birds (96.7%), provided coccidiostat

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(73.3%) and antibiotics (70% farmers) and added vitamin mineral premix (94.4%) with Sonali chicken diets. As a preventative strategy, vaccines were given against disease incidence, while the remaining 3.3% of farmers irregularly vaccinated their chickens to reduce production costs. Eva (2013) and Islam *et al.* (2013) also found that maximum farmers practiced vaccination program and provided coccidiostat and vitamin mineral premix to the birds which are also in agreement with our findings.

Problem faced by Sonali chicken farmers

Despite poultry production's dominant position in the livestock industry, it is not without its hurdles. The challenges of poultry production cannot be understated, and these difficulties have hampered the industry's rate of output. Farmers in the research area were asked to list the challenges they were facing, along with their severity. Major portion of the farmers identified the irregular fluctuation of market price of feeds and day-old chicks as highly severe problem tackled by the Sonali chicken farmers followed by high price of feed but low price of meat. Rahman *et al.* (1998) stated that market price fluctuation of concentrate feed is very common in rural areas that have a great influence on meat and egg production. The existence of middlemen was another foremost problem. In the study area, poultry marketing was done by traditional marketing systems where the farmers were sometimes forced to sell Sonali chickens at lower prices because of inadequate market information, transport facilities, etc. Besides these, inadequate availability of quality feed, inadequate availability of quality chick, inadequate availability of technical advisor, lack of vaccine, disease outbreak and natural disaster have also been identified as key problems of Sonali chicken farming in Barishal district. Hannan *et al.* (2020) identified irregular fluctuation of market price as the highly severe problem followed by unscrupulous middleman, social security and political unrest, monopoly business syndicate, inadequate availability of quality feed, inadequate availability of quality chick, load shedding of electricity, natural disaster and inadequate availability of technical

advisor. Pruthi and Grewal (1992) identified inadequate training (88%), sub-standard broiler chicks from suppliers (66%), poor quality feed supply (78%), lack of expert advice (88%) as major problems of poultry enterprise.

Conclusion

The purpose of this study was to determine the socio-economic position and problems faced by the Sonali chicken farmers of Wazirpur Upazila in Barishal district. We found that the maximum percentage of farmers were middle-aged male who had a secondary level of education. A farmer with a medium land size earned the most money only from the chicken farms. Although Sonali farming is promoted as a successful venture for Barisal farmers, they have to face many problems during farming and marketing. To improve the socio-economic condition of the farmers and reduce the problems of farmers, the government should implement a strategy that will persuade basic research in feeds, feeding and nutrition, general management, and economic and social aspects of raising the profitability and usability of Sonali. The market should be made stable so that prices of day-old chicks, feed, and medicine don't increase suddenly, and the value of live birds doesn't drop immediately and unexpectedly. Good quality chicks are the top priority, and so a government hatchery should be available in every district.

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