**A SOCIO-ECONOMIC STATUS OF BUFFALO FARMERS AND MANAGEMENT OF BUFFALO AT COASTAL AREA OF MIRSHARAI IN CHITTAGONG.**

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**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| **Symbol** | **Elaboration** |
|  AI | Artificial Insemination |
|  CVASU | Chittagong Veterinary and Animal Sciences University |
|  etc | Etcetera |
|  et al | Et alli (and others) |
| Govt. | Government |
|  NGO | Non Governmental Organization |
| SSC | Secondary School Certificate |
|  TK. | Taka |
|  & | And |
|  % | Percent |

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**ABSTRACT**

The study was designed to investigate the socio-economic status of buffalo farmers, management practices and profitability of buffalo at coastal area of Mirsharai upozila under Chittagong district in Bangladesh. A total of 50 buffalo farmers were randomly selected from this area. The data was collected through the pre-tested questioner. The investigation revealed that the middle aged (31-50 years) farmers were more involved in buffalo rearing compared to old (>50 years) and young aged (<30 years) farmers. More than 80% of the farmers have primary educated. Almost 92% of the selected buffalo farmers were engaged with different agricultural activities. The buffalo farmers basically have no training skills but practiced buffalo rearing as their family profession where 22% of them are influenced by the neighboring buffalo farmers. The main purpose of rearing buffalo was supply as meat source. The feeding system of buffalo in the selected area was mainly extensive system. Farmers fed their buffalos with locally available roughages and tree leaves but they did not practice concentrate feeding. About 62% of the farmers used own capital and rest of them took bank loan and/or NGO’s loan for rearing buffaloes. The price of a pair of buffaloes for meat purpose ranged from Tk. 90000.00 to 150000.00. The annual rearing cost of per buffalo was only Tk. 10600.00 while a gross return was 19400 BDT per buffalo. The BCR (benefit cost ratio) of buffalo found about 1.83 in this study. So the buffalo rearing in the selected areas was profitable. According to the result of this study it is clear that the socio economic status of rural farmers was improved by buffalo rearing although some management practices need to be improved and artificial insemination (AI) facility should be introduced throughout the country.

**Keywords:** Artificial insemination, buffalo rearing, management, Profitable, Socio-economic.

 **BIOGRAPHY**

This is Md. Sahidur Rahman from Noakhali, Bangladesh. I attended Chittagong veterinary & animal sciences university (CVASU) with the aim to receive a graduation in DVM (Doctor of Veterinary Medicine) in this fall. It is a combined degree of veterinary medicine, husbandry practice and basic sciences with a one year comprehensive internship. At present, I am continuing internship while I took a 2 months clinical training in India. During my study at CVASU I successfully attended in few clinical training on modern veterinary practices and field training on Bat conservation. My research interest is in the field of Public Health & Dairy Science.

**Introduction: Chapter I**

The buffalo is a domestic but somewhat wild, faithful and friendly, rich in history, and can now be found in almost worldwide (Antonio B., 2005). It is reared as a triple purpose animal provides milk, meat and mechanical power to mankind. Its highly nutritious milk, leaner meat and best draught power for wet environments offer immense potential for the improvement of livelihood (Pasha and Hayat, 2012). The rich and precious milk gives creams, butter, yoghurt and many cheeses, including the delicious mozzarella.

Buffalo was originated from Asian wild buffalo which has been domesticated since pre-historic times in Asia particularly in indo-Pak subcontinent. Riverine buffalo, *Bubalus bubalus*, was domesticated nearly 5000 years ago in Iran, Iraq and indo-Pak subcontinent, whereas domestication of swamp buffalo, *Bubalus carabensis*, took place in China and other part of Southeast Asia after 1000 years (Bruford *et al.,* 2003). In this way buffalo is the specie which has been domesticated more recent as compared to *Bos taurus* and *Bos indicus* domesticated 10 000 years ago (Pasha and Hayat, 2012). The buffalo (*Bubalus bubalis*) population in the world is actually about 168 million head: 161 million can be found in Asia (95.83 percent); Asian buffalo includes two subspecies known as the River and Swamp types, the morphology and purposes of which are different as are the genetics (Antonio B., 2005). Buffalo population in Bangladesh is 1.62 million and is contributing through the production of 3500 and 22400 ton meat and milk respectively per year (DLS, 2013). These buffalo are found in the Bramhaputra-Jamuna flood plain of central Bangladesh, the Ganges-Meghna flood plain of southern Bangladesh and in institutional herds. Buffaloes in Bangladesh may be classified into 2 categories: (I) indigenous buffaloes found in the coastal areas and marshy land of the country, and (ii) migrated buffaloes from India and Myanmar found in the sugar- cane belt and Coxes’s bazar district respectively (Amin *et al*. 2015). Indigenous Bangladeshi buffaloes of the River type are found in the South-West. In the remaining parts of the country they are either Swamp or crosses of exotic breeds: Nili-Ravi and Murrah type (Faruque, 2000). Genotypes of these animals are not well characterized and need to be improved through appropriate breeding programmed.

The buffalo husbandry practices are largely influenced by their types and their economic uses (Saadullah, 2012). These common practices are: no housing system, no artificial insemination system, no routine vaccination program and no animal identification and record-keeping system. In fact these animals are considered a financial asset since they serve as an insurance against the risk of crop failure due to natural calamities (Dhanda, 2004). Buffaloes are known to be better at converting poor-quality roughage into milk and meat. They are reported to have a 5 percent higher digestibility of crude fiber than high-yielding cows; and a 4-5 percent higher efficiency of utilization of metabolic energy for milk production (Mudgal, 1988). Shortage of breeding bulls or non-availability of AI facilities in the villages also are the major problem The synchronization protocols, however, are efficient if buffaloes are cyclic and therefore these protocols can be used during the breeding season (autumn). In the spring season there is a higher variability between the beginning of estrus and the ovulation time and it is more difficult to establish the correct time for AI (Barile *et al*., 1997).

Although, buffalo is the flagship of all agricultural revolutions; green, white and red but unfortunately has been neglected in the past. Therefore, aim of this paper is to evaluate present situation and future perspectives of buffalo production in Asia (Pasha and Hayat, 2012).

The production of milk and meat from buffaloes in Asian countries over the last decades has shown a varying pattern: in countries such as India, Sri Lanka, Pakistan and China, the milk yield per animal has increased by 2.44 percent, 1 percent, 1.45 percent and 1.55 percent, respectively, while there has been either no change or only a negligible change in milk production in Bangladesh, Myanmar, Nepal and Vietnam. In four countries the numbers of buffaloes exceed the numbers of dairy cows, i.e. in Pakistan, Egypt, India and Nepal (Antonio B., 2005). Since 96% of the world river buffalo population is found in Asia, and since Asian buffaloes are almost exclusively raised by small-holders and landless farmers, there is an opportunity to improve the standard of living of small farmers in Asia through well planned buffalo development and research programmed. Buffalo population has been increased more in the recent past than that of cattle population. So in future, buffaloes can be an important source of milk and meat in Bangladesh in addition to draught power, if feeding and breeding systems are improved (Saadullah, 2012). Buffalo has some significant importance on livelihoods improvement. Buffalo rearing increase economic status of the farmers especially for the women and development of this sector is the key path to rural prosperity (Kalash *et al.,* 2009; Sarker *et al*.,2013). Buffaloes hold strategic place in overall livestock economy of Bangladesh and serve three important purposes such as milk, meat and drought power supply (Ghaffar *et al*. 1991).

In Bangladesh, the policy makers and the researchers did not emphasize the role of buffaloes on the rural development in accordance with its merits. There were Very little work has been done so far on the socio-economic status of the buffalo farmers and the management practices of buffalos in Bangladesh.

**Objectives**

The objectives of this study were as followings

1. To know the socio-economic condition of buffalo farmers.

2. To analyze the profitability of buffalo farming in the study area.

3. To identify the problems or limitations and prospects of buffalo farming.

**Materials and Methods Chapter II**

**Selection of study area**

This study was conducted at Mirsharai upozila in Chittagong district of Bangladesh. There was large coastal area with water lodge low land and plenty of green grass in this upozila, So many buffalo were reared by local farmers. Availability of buffalo is reason for selecting this area.

**Selection of Sample**

A total of 50 buffalo farmers were selected from this study area to collect data. This study includes only those farmers whose have at least five buffaloes.

**Preparation of Questionnaire and Data Collection**

Before final data collection draft schedule were prepared to keep the objectives in mind and pre-tested to avoid post survey hazards. After pre-testing, the draft schedule was improved, rearranged and modified based on the experience gained from the field and then the final questionnaire was developed. Data collection was done by personal interviewing and input in questionnaires during the month of September 2015. The information was checked carefully before leaving the study areas in order to minimize errors.

**Data Management**

To analyze the socio-economic status and cost-benefits of buffalo production some criteria were considered as variables. These variables are selected very carefully according to the aim of this study. Selected variables are as follows: educational status, occupational status, socio-economic status, livestock status, breeding, feeding system (feeds and fodder availability, sources of feed, feeding methods), housing, disease and health care, daily routine activities of farmers for buffalo rearing, annual cost and benefits of buffalo production and impact of income on livelihood improvement.

**Analytical technique**

Finally all the collected data were checked and cross checked before transferring to master sheets. The data was analyzed with the help of SPSS-v-16 computer package program.

**Results Chapter III**

The socio economic condition of buffalo farmers in selected area is shown in table 1.The majority of the buffalo rearing was practiced by the middle aged (76%) age ranged from 31 to 50 years. Other farmers were more than 50 years of age and the farmers less than 30 years of age were very few. Educational statuses of the farmers were mainly up to secondary label. More than 80% of the farmers have primary educated followed by SSC or above and rest of them could sign only. No farmers were found with higher degree. In the study area, 92% of the buffalo farmers were engaged with different agricultural activities and local business along with buffalo rearing.

**Table 1.** Socio economic condition of buffalo farmers in Mirsharai,Chittagong.

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameters** | **Category** | **Frequency** | **Percent (%)** |
| Age | <30 | 7 | 14 |
| 31- 40 | 23 | 46 |
| 41- 50 | 15 | 30 |
| >50 | 5 | 10 |
| **Total** | **50** | **100** |
| Education | Illiterate | 6 | 12 |
| Below SSC | 32 | 64 |
| SSC or above | 12 | 24 |
| **Total** | **50** | **100** |
| Occupation | Only buffalo rearing | 4 | 8 |
| Other agricultural work | 33 | 66 |
| Non agricultural work | 13 | 26 |
| **Total** | **50** | **100** |
| Annual income(tk in lac) | Low (below 1 lac) | 12 | 24 |
| Medium (1to4 lac) | 29 | 58 |
| High (above 4 lac) | 9 | 18 |
| **total** | **50** | **100** |
| Source of capital | Bank or NGO loan | 19 | 38 |
| Own capital | 31 | 62 |
| **Total** | **50** | **100** |
| Training skill | With training | 0 | 0 |
| Without training | 39 | 78 |
| Influenced by other farmer | 11 | 22 |
| **Total** | **50** | **100** |

About 62% of the farmers used own capital and rest of them took bank loan and/or NGO’s loan for rearing buffaloes. There were no farmers found who got training on buffalo rearing.

About 80% of the respondents practiced buffalo rearing as their family profession and rest twenty percent were influenced by seen neighboring farmers. (table. 1)

**Livelihood improvement of buffalo farmers**

Buffalo rearing was increased the livelihood status of the farmers especially for the farm women in study area. They were able to spent more money to purchase food and cloth, invest more in education of children. It indicated that social status increased dramatically through buffalo rearing in the in the studied area.

**Availability of feeds source in the selected area**

The green grasses and other fodders were available in the studied areas as it was coastal area. The buffaloes were reared in bathan so they are fully dependent on grazing and farmers did not use any concentrates. More than 90% farmers reported that feeds are naturally available in the selected areas. The main advantages of buffalo over cattle are that the dry or growing buffaloes may utilize coarse feeds more efficiently than Zebu cattle (Singh *et al*., 1973). The feed resource base for these animals is scavenging and consists of crop residues, household waste, tree fodder, roots and tuber, grain by-products and anything edible found in the immediate environment.

**Feeding system**

The feeding system of buffaloes in the selected areas was mainly extensive and Semi-intensive feeding system also practiced but Intensive feeding system was not practiced in the studied areas . Buffaloes were allowed to graze freely in large coastal area where plenty of green grasses were available. Only calves and diseased animals were reared in semi-intensive method.

**Advantages of buffalo farming over Cattle**

Buffaloes have number of advantages over cattle viz. utilization of low quality roughages to produce more protein and to gain more body weight, more disease resistance and outstanding draught capacity and longer life span. These advantages are also noticed in indigenous buffalo stock of Bangladesh. Available literatures indicate that indigenous buffaloes are three times heavier than indigenous cattle. Indigenous buffalo cows produce 2 times more milk than cows, having more milk fat and total milk solid. Another notable advantage, especially in the coastal areas, is that they can survive against tidal wave (Saadullah, 2012).

**Major diseases of buffaloes**

Four major diseases of buffaloes were generally found where the major occurrences was FMD followed by Black quarter, Anthrax and Hemorrhagic septicemia but no buffalo farmers claimed for early or endemic mastitis, but common diseases like scours, pneumonia, navel–ill, ecto and endo parasites (tick, lice, mice, round worm, tape worm, lung worm), blot, diarrhoea and anemia were noticed.

**Vaccination and de-worming**

The buffalo farmers were vaccinate their animals against four major diseases like Anthrax, FMD, BQ and HS which supply from livestock office. But regular supply of vaccine and veterinary doctors were not available so farmers practice irregular vaccination. Farmers were unconscious about regular de-worming of their buffalo. Herd de-worming were not regularly practiced here. Most of the farmers perform de-worming to the buffaloes occasionally.

**Housing**

Loose housing system is generally practiced for buffalo rearing in the selected area. Most of the farmers don’t have well idea about group wise housing. No separate maternity stalls were also available. Buffaloes and cattle are kept within the village at night, and the daytime animals were scavenging for roughage, together with other animals from the coastal areas. Grazing and browsing ranges over the whole area.

**Production and reproduction status of Buffalo**

Production of buffalo mainly depends on genetic characters, good ration, good management and climatic conditions of an area under adverse conditions; the return from these animals is uneconomic. The average milk productions of indigenous buffaloes were 2.7 liter/day. Its milk contain higher amount of fat than cow so the price also higher. At this study area the main purpose of rearing buffalo was supply as meat source. The farmers generally sold the buffaloes to the butcher on contract basis according to the demand of market. Milk production was negligible in study area. Buffaloes are well adapted to a hot and hot humid climate and play a distinct role in the economy of farmers, which is primarily based on agricultural production systems. The buffaloes show their maximum activity during night period. Their breeding take place mainly during night and males may be seen wrestling with their horns and females bleating to their calves. The gestation period of buffaloes in selected area was 10 months. The average number of service per conception was 3.1 times.

**Cost-benefit analysis of buffalo rearing**

**Cost of buffaloes**

The price of buffaloes varies according to the size, body condition, milk production and utility. The price of a pair of buffaloes for dual purpose ranged from Tk. 100000.00 to 120000.00 in this study area. The price of a pair of buffaloes for meat purpose ranged from Tk. 90000.00 to 150000.00 in Mirsharai, Chittagong.

**Management cost**

The annual cost of feeding, breeding, housing, equipment and healthcare of buffalo is presented in Table 2. The feed cost and labor cost was main cost of buffalo rearing. Farmers generally bred their buffaloes naturally with buffalo bull. For this reason, the breeding cost was low. So the healthcare cost was mainly medicinal cost. On the other hand, they did not purchase any feed for buffalo except the scarcity period, that time they purchase straw only. The total rearing cost of one buffalo per year was only Tk. 10600.00BDT.

**Table 2.** Cost of per buffalo per year in Mirsharai.

|  |  |
| --- | --- |
| **Category** | **Expenditure (BDT)** |
| Feed cost  | 3500.0  |
| Breeding cost  | 100.0  |
| Cost of housing and equipment  | 1000.0  |
| Labor cost | 5000 |
| Cost of medicine  | 800.0  |
| Other cost  | 200.0  |
| **Total rearing cost** | 10600.0 |

**Table 3.** Total and net income from one buffalo per year in Mirsharai.

|  |  |
| --- | --- |
| Category | Income (BDT) |
| Income from Milk  | 10000.00  |
| Income from meat | 20000.00 |
| **Total income** | 30000.00 |
| Total cost | 10600.00  |
| **Net income** = (total income **–** total cost) | 19400.00 |
| **BCR** =(total return /total cost) | 1.83 |

**Income from buffalo rearing**

The total and net income from a buffalo is presented in Table 3. Incomes mainly come from selling the animal to butcher for meat purpose and small amount milk production. In this study, the net income from one buffalo per year was found 19400.00 BDT indicated that rearing buffaloes in the selected areas was profitable.

**BCR**

From this study the BCR (Benefit cost ratio) of buffalo found about 1.83 which means that if one will invest tk1 he/she would be get return of 1.83 tk from buffalo rearing.

**Discussion Chapter IV**

This study revealed that buffaloes were reared by medium aged farmers ranged from 31 to 50 years followed by over 50 years and less than 30 years. More than 80% of the farmers have primary educated followed by SSC or above and rest of them could sign only. The education level of buffalo farmers was reported to be 91.82% and 56.1% in Bihar (Singh *et al*., 2011) and Jharkhand (Singh *et al*., 2012), respectively. In the study area, 8% of the buffalo farmers were engaged with only buffalo rearing and rest of them were involve with other business whereas (Sarker *et al.,* 2013) reported that 30% of the buffalo farmers of Bagerhat Districts in Bangladesh were fully depended on buffalo rearing.

At this study area more than half of the farmers (58%) belonged to medium income categories followed by high and low income categories whereas in India, majority (96.92%) of the respondents belonged to low family income categories (Sathyanarayan *et. al.,* 2010). About 62% of the farmers used own capital and rest of them took bank loan and/or NGO’s loan as initial investment for rearing buffaloes. There were no farmers with training on buffalo rearing same as the result of (Sarker *et al.,* 2013). Farmers used natural green grass or other forages as feed source of their buffalo no farmers were found to supply concentrate which is agreed with the result of (Amin *et al*., 2015)

In this study the total rearing cost per buffalo per year was found 10600 BDT which is more than 6850 BDT in Subornochar and 5070 BDT in Bagerhat reported by (Amin *et al*., 2015) and (Sarkar *et al*., 2013) respectively. Net annual income from rearing one buffalo (Sarkar *et al*., 2013) was Tk. 15630.00 BDT per year. From this study area it was found 19400 BDT which is more profitable may be due to least cost in housing, feeding and breeding.

**Conclusion Chapter V**

Considering all the studied parameters, buffalo rearing was a profitable practice in the selected areas and improve the socio-economic status, purchasing capacity of food and cloths, health care, education, housing of buffalo farmers.

The sound breeding program is needed to improve genotype of these indigenous buffaloes and AI facilities should introduce throughout the country Collaborative public-private partnership efforts to conduct applied research for improvement in different aspects of buffalo productivity, provide training to farmers, Bank or NGO loans for initial investment are some of the key factors which will enhance buffalo production.

**Limitations Chapter VI**

There were many limitation faces during this study on buffalo, some major of them were as followings

• Unable to got available response through questionnaire regarding this study due to illiteracy of farmers in record keeping practice.

• No scientific breeding, feeding and management practices of buffalo at this study area.

• Very few previous research work on buffalo in Bangladesh.

• Insufficient sources of information on status of indigenous buffalo.

• Lack of alacrities of people specially veterinarians to buffalo.

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