

Research Article**Buffalo production and management practices in coastal area of Bangladesh**

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The study was conducted to investigate the buffalo production and management practices at Subarno Char Upazilla, under the Noakhali district of Bangladesh. A total of 20 randomly selected households surveyed directly using a predesigned questionnaire. Mainly two production system namely extensive bathan and semi-intensive bathan farming system practiced in the investigated area. Only a very few farmer provided housing facility during night time only. Available natural green fodder found highest in October and lowest in July due to climatic change in that area. Natural mating was the only breeding method practiced that is due to the lack of artificial insemination (AI) provision. A wide range of infectious diseases found in those areas where 100% farmer reported foot and mouth disease (FMD) but surprisingly no one reported about mastitis. Overall, calf mortality was 25.28% irrespective of breed, age, sex and farming system. These findings may assist the farmers, researchers and policymakers to make the decision for improved buffalo production in the coastal area of Bangladesh.

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1. INTRODUCTION

Bangladesh is a developing country and the systems of animal production and uses differ extensively in accordance with climate, soil and socio-economic status of people. Buffaloes are the important animal species in the tropical and subtropical countries of the world including Bangladesh for their uses in the agricultural sector. The farmers are keeping buffaloes for milk and traction their cultivable land. Conventionally small farmers are bulk producers of milk and meat. Most of the farmers are rural smallholders who have traditionally integrated their livestock with crop production. Buffaloes are raised mainly for draught power in crop production (Saadullah 2012) though they are called a triple-purpose animal. In Bangladesh, there are three different types of buffalo are found: river type, crossbred type and swamp type (Momin et al., 2016). Noakhali district, a coastal area in the bank of Bay of

Bengal, its topography, vegetation and livelihood of the peoples is different from the plain and hilly areas of Bangladesh. This area represents an extensive flat, coastal and delta land, situated on the tidal flood plain of the Meghna River delta, characterized by flat land and low relief. The area is inclined by diurnal tidal cycles and the tidal fluctuations vary depending on seasons, being pronounced during the monsoon season. Alluvial plain land annually inundated and fertilized by silt deposits from the Meghna estuary. Buffaloes are concentrated in this area and reared mainly for milk yield with meat production as an adjunct. Buffalo meat pertain a good dietary value; it is lean and contains less saturated fat compared to beef and pork. Production and management systems of buffaloes differ depending on the geography and foliage patterns of the country. Buffaloes are reared under an extensive system where large-scale pasture land and enough green forages/grasses are available

like coastal and hilly areas. In addition, buffaloes are raised under a semi-intensive system on plain land and marshy land where there is limited pasture land. The aim of this study was to know the overall management system of buffalo in the coastal area of Bangladesh.

2. METHODOLOGY

2.1. Study area

The study was conducted in the coastal area of Noakhali district, which is located in the western part of Bangladesh at the bank of "The Bay of Bengal" October 2013 to November 2014. This area represents a huge flat, coastal land, situated on the bank of Meghna River.

2.2. Data collection

A predesigned well-structured questionnaire (production system, various management factors, feeding, breeding, and vaccination history, medication of anthelmintics and occurrence of various diseases information) was used for collecting the available information on buffalo production and various constraints at the Subarno char Upazila. A total of 20 households (of those farmers who have at least 20 buffaloes) surveyed directly. The investigation was repeated in a different season with the intention of

distinguishing the yearly scenario of buffalo production and to recognize the constraints of buffalo production in the study area. The investigation was conducted through direct farm visit by the researcher with the help of local personnel.

2.3. Management of buffaloes

Information on buffalo management was collected through interviewing the farmer directly by asking those following questions.

- How many months they keep their buffalo in bathan and locality?
- How they transport their buffalo?
- How they feed their animals and where they graze their buffaloes?
- How much time they allow their buffalo for grazing?
- What type of housing facility they usually provide?
- What type of feed supplement do they provide to buffalo?
- When they start milking after parturition?
- How they vaccinate their animal and how much they cost for vaccination?
- Which vaccine they usually use and from which source?
- Which disease causes impairment of production and which anthelmintics they usually use?



Picture 1: Grazing of buffalo in char area under the extensive farming system

2.4. Breeding methods of buffaloes

Information on buffalo breeding methods collected through interviewing the farmer directly by asking those following questions.

- How they detect estrus in their buffalo?
- What are the usual breeding methods they practice?
- How they maintain breeding bulls and how many bulls available in the herd?

- Which genotype usually preferred and why?
- Is there any provision of Artificial Insemination facilities?
- How many bulls available in the herd?

2.5. Availability of feeds and fodders

The amount of grasses availability was calculated by putting a different value in each month of the year. The values determined by data collected from farmers (on available grasses in various season and amount of production) and direct visual observation.



Picture 2: Buffalo grazing area with wallowing pond



Picture 3: Grazing area in bathan (char land)



Picture 4: Grazing area in the locality under the semi-intensive farming system

3. RESULTS

3.1. Buffalo production system

In Subarno char, buffaloes were mostly reared under two different farming systems: extensive farming system and semi-intensive farming system. The herd size of buffalo's under extensive farming system was 90-105 and semi-intensive farming system was 60-70. Under the extensive system, buffaloes were allowed to browse (free range) freely in bathan (char land) throughout the year, because browsing fields were available as char and were very far from the locality. They graze all day long in the marshy areas and in the evening they return to the particular place for the night. Provision of housing facility and nutritional facility was not established in this system. Buffaloes kept in the open air during the night time and they totally live on natural grazing.

In case of semi-intensive bathan farming system, buffaloes were kept in char land for approximately 6 months from mid-June to December and remaining a period of the year they kept in farmer's house or around the house. Management practice were almost similar to the extensive farming system during the period of keeping char land. In remaining period of the year, buffaloes kept in farmer's house. A few farmers allowed housing facility to the buffaloes during night time only, though providing housing facility which

found very poor. Remaining farmers maintained their buffaloes by keeping them in air during night time near the farmer's house.

Farmers of both systems vaccinate (against FMD, HS and Anthrax) their animal once in a year, but they are not concerned about the type of the vaccine. They also provide anthelmintics (market available bolus and DLS supplied bolus) once in a year as a prophylactic measure.

3.2. Availability of green fodder

Buffaloes of the studied area usually grazed on natural grasses. Availability of various fodders depends on season, weather and climate. Available grass and their nutrient quality directly affect the production and reproduction of buffalo. Various grasses were found in the investigated area with a variation of the season. Durba, Chiringa, and Roadside grass were found in the locality area especially in December to mid-June. Whereas, in char land, available grasses were Uri grass, Capra grass, Bari grass and Hatlata. These grasses found throughout the year but increased growth during mid-June to November. Availability of the amount of natural fodder is throughout the year is shown in figure 1. Grasses were available during the month from September to October and March, April, where June to August and November, December are fodder scarcity periods in the investigated area.

Pattern of grass availability

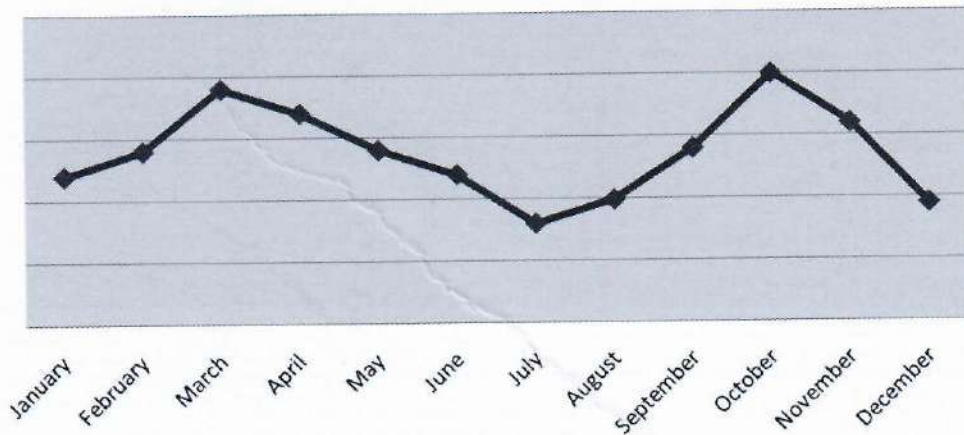


Figure 1: Pattern of seasonal availability of green fodder throughout the year

3.3. Breeding management

Natural breeding was the only breeding method reported in the studied area. The farmers are usually used buffalo bull for their own farm. Sometimes they rent buffalo bull from neighboring farmer. There was no consideration of pedigree information of these bulls available at estrous is used for breeding. In case of an extensive farming system, random mating occurred within and among farms. This causes a great deterioration in performance of the buffalo cows and the destruction of breed characteristics. Use of

artificial insemination (AI) not reported by the farmers.

3.4. Occurrence of diseases

Percentage of farms affected by various diseases shown in the following Figure 2. Both infectious and metabolic diseases were common in the studied area. Among the infectious diseases, every farmer reported about the occurrence FMD in both type of farm, besides this surprisingly no farmer reported about the occurrence of mastitis. A few farmers reported about the acidosis (metabolic disease) occurrence.

Disease occurrence

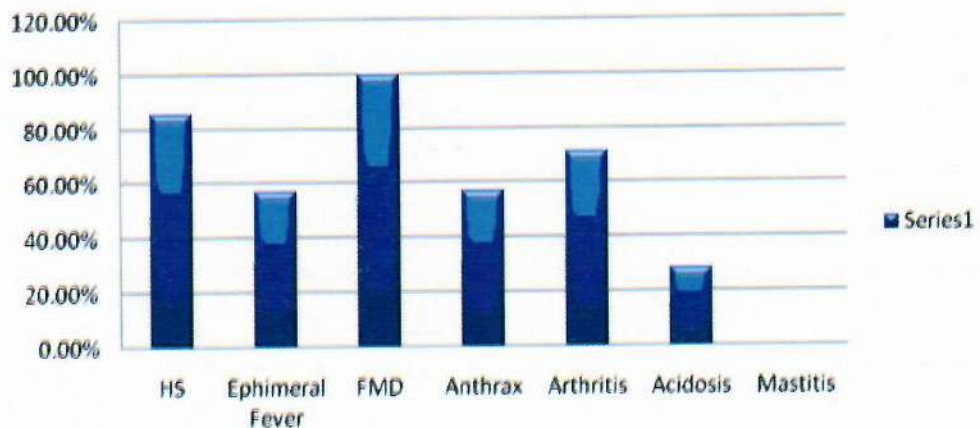


Figure 2: Percentage of farms affected by various diseases

3.6. Calf mortality

Calf mortality is one of the most vital constraints of buffalo production. The percentage of calf mortality found in the studied area was 25.28% irrespective of

age, sex and farming system. Though the farmers of extensive bathan farming system were reported more occurrences.

4. DISCUSSION

4.1. Buffalo production system

The buffaloes were reared under two different farming systems in the investigated area, namely extensive bathan farming (practiced in lower part near the sea where shown large scale pasture land) and semi-intensive bathan farming (practiced in upper part near the locality where limited pasture land available). This was might be due to climate, soil and socio-economic opportunities of the studied area. The findings of this study are similar to the findings of Dhanda (2013); Huque and Borghese (2012); Faruque (2003). Intensive buffalo farming system was not found in the studied area might be due to the type of buffalo breeds and their low producing capability. A similar effect also reported by Dhanda (2013) in Bangladesh. Almost every farmer vaccinates their buffaloes once in a year and treated with market available or DLS (Department of Livestock Service) supplied anthelmintics occasionally. This finding was in the line of the findings of Sarker et al., (2013).

4.2. Availability of green fodder

Availability of various natural fodders directly depends on seasonal change and climatic change for their growth. Grasses found available during the month of September to October due to the effect autumn season and March to April as a reason of summer seasonal effect, while June to August (monsoon season) and November to December are fodder scarcity periods due to the effect of monsoon season and winter season. During monsoon season there occurred heavy rainfall, in some extent flood occurred in the studied area; whereas during winter season there was found heavy fog and smog which impair fodder growth. The findings of the pattern of availability of natural feeds and fodders of the studied area almost suited to Sarwar et al., (2002) in Pakistan.

4.3. Breeding management

Natural breeding was the only breeding methods found in the studied area. The findings of this study are analogous with the findings of Huque and Borghese (2012); Siddiquee et al., (2010) in Bangladesh and Qureshi et al., (2002) in Pakistan. Provision of AI was not reported by the farmer in the studied area might be due to lack of AI infrastructure for buffaloes in the country.

4.4. Occurrence of various diseases

Every farmer of the studied area reported about the occurrence of FMD, that is might be due to availability various serotype of infectious agent here and there within the area. The FMD virus easily transmitted in a number of ways, including close-contact animal to animal spread, long-distance aerosol spread and fomites, or inanimate objects, typically fodder and motor vehicles. The clothes and skin of animal handlers, such as farmers, standing water, and feed supplements containing infected animal products can harbor the virus, as well. The outcome under this study was similar to Sarker et al., (2013).

Anthrax and ephemeral fever were other infectious diseases which also found higher immediately after FMD. The higher occurrence of anthrax found due to *B. anthracis* spores can be remained infective in soil for many years (The Merck Veterinary Manual). During this time, they act as a potential source of infection for grazing livestock, but generally, do not represent a direct infection risk for humans. Grazing animals may become infected when they ingest sufficient quantities of these spores from the soil. In addition to direct transmission, biting flies may mechanically transmit *B. anthracis* spores from one animal to another (Sam, 2005). The occurrence of ephemeral fever usually during the time when increased number of mosquito specially winter season. Arthritis might be occurred by reason of much physical activity of buffaloes during grazing. But surprisingly, no farmer reported the occurrence of mastitis. Similar outcome also reported by Sarker et al., (2013).

4.5. Calf mortality

The percentage of calf mortality found in the studied area was 25.28% irrespective of age, sex and farming system which is higher than 14.1% than crossbreed calves and lower than 37.1% in Niliravi calves in Government Buffalo Farm of Bangladesh indicated by Islam et al., (2004). Early mortality in buffalo calves was found higher in south Asia than those reported in Mediterranean buffalo calves (Khan 2009; Ranjhan, 2007). The major causes of high mortality rate in dairy farm level were; inadequate feeding management and lack of health facilities like colostrum feeding, improper milk feeding, naval cord disinfection and timely treatment (Tiwari et al., 2007). Improper and inadequate nutrients availability has resulted in high mortality rates in calves (Pasha and Khan, 2010; Wynn et al., 2009; Tiwari et al., 2007; Sahoo et al., 2004)

5. CONCLUSION

The owners of buffaloes under the studied area followed the traditional rearing system. The major constraints of the investigated area were poor husbandry knowledge of farmers, absence of defined housing system; lack of numbers of high yielding breeds; scarcity of breeding males; unavailability of feeds or fodders and absence of AI facilities. There are some limitations: such as smaller studied population size; time period (only one year studied); farmer do not keep records for productive and reproductive performances; poor communication facilities to and from studied area. If the constraints could be overcome properly, it would have an accurate result. However, this study indicates some important indications. These findings can be used by the farmers, researcher and policymakers for future improvement of buffalo.

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