

Article

Livestock and poultry health management in Saint Martin's island

Uday Kumar Mohanta¹, Md. Nuruzzaman Munsi^{1*}, Md. Azharul Islam Talukder¹, Emdadul Haque Chowdhury² and Md. Mafijul Islam¹

¹Bangladesh Livestock Research Institute, Savar, Dhaka 1341, Bangladesh

²Department of Pathology, Bangladesh Agricultural University, Mymensingh 2202, Bangladesh

*Corresponding author: Dr. Md. Nuruzzaman Munsi, Senior Scientific Officer, Goat and Sheep Production Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka-1341, Bangladesh. Mobile: +8801717255443; E-mail: nzaman_blri@yahoo.com

Received: 15 November 2015/Accepted: 10 December 2015/ Published: 30 December 2015

Abstract: The study was performed to find out the existing status of livestock and poultry in the Saint Martin's island, to determine the prevalence of parasitic and other infectious and non-infectious diseases of these, and to find out the existence of intermediate hosts of various parasites in the island. Prevalence of endoparasites in cattle, buffalo and goat was higher in winter than that of summer. Prevalence of stomach worm was highest in goat in both winter (50%) and summer (40%). 31.47% cattle harbored stomach worm infection in winter and 15.79% in summer. More than 20% buffaloes suffered from either single infection with *Fasciola* and *Paramphistomum* or in combination in both the seasons. Goat suffered from some extra species like *Moniezia* and *Trichuris* and the prevalence is just double in winter than that of summer. Morbidity rate of FMD in cattle is high, although mortality is low. But, in case of chicken, both morbidity and mortality rates were high enough to make a massive loss with respect to number and production due to Ranikhet/Newcastle Disease (ND), pox in the island. About 92.11% of total chicken population was lost every year due to outbreak of ND. Incidence of infectious disease in livestock and poultry in the island is very high as because the farmers cannot immunize the animals through routine vaccination. Even some farmers do not know about the immunization of livestock and poultry, and the veterinary service is not available in the island.

Keywords: livestock; poultry; Saint Martin's island; parasite; FMD; ND

1. Introduction

Saint Martin's island belongs to the agro-ecological zone 29 (AEZ 29) (Quddus, 2009). The island lies between 92°18' and 92°21' E longitudes and 20°34' and 20°39' N latitudes. It is almost flat and is 3.6m above the mean sea level. It is a small island in the north-east of the Bay of Bengal, about 9 km south of the Cox'sBazar -Teknaf peninsular tip and forming the southernmost part of Bangladesh. It is about 8 km west of the northwest coast of Myanmar at the mouth of the river Naf.

The climate is governed by the subtropical monsoon, which largely occurs from May-August, with up to 1000 mm of rainfall in a single month. There is a vast zoo-geographic difference in St. Martin coral island. Water in this area is saline though there are some ponds and shallow tube wells. The annual average temperature is 34.8 °C and a minimum of 16.1 °C. The climate remains hot and humid with some seasons of temperate weather. This climatic condition is favorable for growth and survival of various stages of parasites, microbes and other pathogens. Again, movement of the animals is very frequent among Teknaf, Myanmar and the island. Due to the various diseases, animals in the area are of stunted growth and of low productivity. They come to maturity late and give a very little amount of milk. Though there has been a number of study of livestock diseases in Bangladesh, unfortunately there is no such study in this geo-climatic area. Therefore, the present

study was undertaken with the objective of recording data regarding the prevalence of livestock and poultry diseases.

2. Materials and Methods

This study was carried out from July/2011-June/2012, when most of the laboratory works was done in the laboratories of Bangladesh Livestock Research Institute, Savar, Dhaka, Bangladesh.

At the beginning, a detailed base line survey was conducted in Saint Martin's island with a structured questionnaire to study the existing status of livestock and poultry and socio-economic status of the farmers. Faecal Sample was collected directly from the rectum of cattle, buffalo and goat, brought to the laboratory and stored at 4°C until analysis. The samples were examined within 48 hours of collection using direct smear method and identification of the parasites was made by using the description of Yamaguti (1958) and Soulsby (1982).

The selected animals were thoroughly investigated to detect the general health conditions and the clinical manifestations of parasitic diseases such as emaciation, diarrhoea, anaemia, bottle jaw, etc.

The data were analysed by using the Microsoft Excel computer programme.

3. Results and Discussion

Total area of Saint Martin's island is 8 sq km. There were about 948 families with a total human population of about 6000. The island is 9 km far from Teknaf (Upazila headquarters) and only 5 km away from the neighboring Myanmar.

A total of 948 farm households of the village were categorized into landless, marginal, small and medium based on their landholdings (BBS, 2005; Hossain and Nessa, 2005). Landless farm families dominated (62.16% of the total) in the village followed by small (17.61%), marginal (14.66%) and medium (4.85%) (Table 1). Landless, marginal, small and medium farm families owned on an average 19.6, 77.86, 162.66 and 448.8 decimal of land respectively including homestead, pond, crop and fallow land, respectively (Table 1).

It was found that family size increased with farm size (Table 2). On an average each landless, marginal, small, and medium farm family had 6.52, 7.46, 7.11 and 7.4 heads, respectively which is higher than the national average. However, each farm family had higher proportion of female members over male counterpart which might be due to the illiteracy and religious misunderstanding of the inhabitants.

Number of livestock species in each farm family (all categories of farm together) was very small in all categories of farms (Table 3). Small farmers had higher number of cattle and chicken but marginal farmers had more goat and also duck heads and most of them were indigenous. There were no crossbred cattle. Most of the farmers had goat but none had any sheep. With a few exceptions, almost all farm families reared either chicken or duck or both. Some people also rear pigeon predominantly on ornamental basis. However, each farm family, irrespective of farm size, in the union possessed 595 cattle heads, 1371 goats, 17993 chickens, 389 ducks, and 120 buffaloes. Usually, poultry species were solely under the custody of the female member of each household and male member was not too much interested about the income from them.

A number of livestock and poultry diseases outbreaks took place in this island (Table 4). Foot and Mouth Disease (FMD) was the most widely spread livestock disease affecting health and productivity of cattle in each year. Ruminal impaction and skin disease were more or less common in the location. Other diseases were sporadic. PPR and contagious ecthyma were major issues affecting goat health and production. ND was the most common disease causing massive loss of chicken followed by pox in the union (Figure 1). Disease outbreak might be due to the spread of infectious agents through frequent animal movement from the neighboring country and Teknaf and by the visitors.

Soil quality of Island was sandy type. But there was some area where there water was lodged all times. Some indigenous aquatic vegetation and grass were there. These areas were used as grazing area. No land was spared for fodder cultivation in the union, even in the *Rabi* season. Other than cropping season, crop fields were remained fallow for a little time period after harvesting the crops. Therefore, there was no scope of fodder crop production in the village away from cropping season. Cattle usually graze two times a day for a time period of 4-5 hr day⁻¹. Goats were generally kept by women and children. Sometimes, animals lived on straw based confined feeding with no or a little amount of concentrate supplementation everyday.

Table 1. Farm category.

	Farm category			
	Landless	Marginal	Small	Medium
A. Farm family (No.) (n=948)	596 (62.86%)	139 (14.66%)	167 (17.61%)	46 (4.85%)
B. Farm size (acre farm)				
i. Home stead	14.35	31.86	57.22	52.4
ii. Pond/ditch	0	0	1	0.4
iii. Cultivable land	3.54	36.66	74.44	384
iv. Fallow/seasonal fallow	1.40	9.33	30	12
Total	19.29	77.86	162.66	448.8

Table 2. Family size.

Gender	Landless	Marginal	Small	Medium
Male	2.09	2.86	2.28	2.2
Female	2.06	2.4	2.55	2.4
Child	2.41	2.2	2.44	2.8
Total	6.52	7.46	7.11	7.4

Table 3. Livestock and poultry population.

Species	Farm category				All farm
	Landless	Marginal	Small	Medium	
Cattle	0.65	0.8	1	0.6	595
Goat	1.22	2	1.389	1.2	1371
Sheep	0	0	0	0	0
Buffalo	0.015	0	0	2.4	120
Duck	0.23	1.13	0.28	0	389
Chicken	13.90	14.33	34.89	12.8	17993

Table 4. Disease outbreak.

Species	Name of disease	Time of outbreak
Cattle/ Buffaloes	FMD	May-July
	Ruminal impaction	Round the year
	Skin disease	Round the year specially winter season
Goat	Liver Fluke infection	Round the year
	Diarrhoea	Round the year
	PPR	Round the year
Chicken	Contagious ecthyma	Round the year
	Ranikhet (ND)	Round the year
	Pox	Mostly in cold season
Duck	Cholera	May-June, October-November
	Plague	May-June, October-November

Table 5. Species specific prevalence of parasites.

Name of Parasites	Winter			Summer		
	Cattle	Buffalo	Goat	Cattle	Buffalo	Goat
<i>Fasciola</i>	11.85%	25%	-	7.89%	20%	-
<i>Paramphistomum</i>	23.68%	21.73%	-	15.79%	20%	-
<i>Schistosoma</i>	7.69%	11.83%	-	7.69%	15.79%	-
Stomach worm	31.47%	10%	50%	15.79%	-	40%
Ascaris	7.89%	-	-	2.63%	-	-
<i>Fasciola</i> & <i>Paramphistomum</i>	10.52%	30%	-	5.26%	20%	-
<i>Fasciola</i> +Stomach worm	7.89%	-	-	2.63%	-	7.69%
<i>Paramphistomum</i> + Stomach worm	7.89%	-	-	2.63%	-	15.38%
<i>Fasciola</i> + +Stomach worm	11.83%	-	-	2.63%	-	-
<i>Moniezia</i>	-	-	15.38%	-	-	7.69%
St. worm+ <i>Trichuris</i>	-	-	11.53%	-	-	7.69%

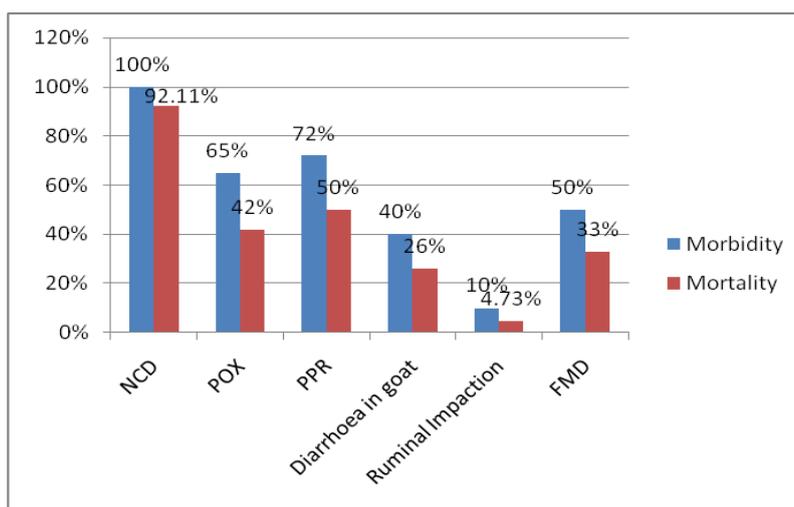


Figure 1. Morbidity and mortality.

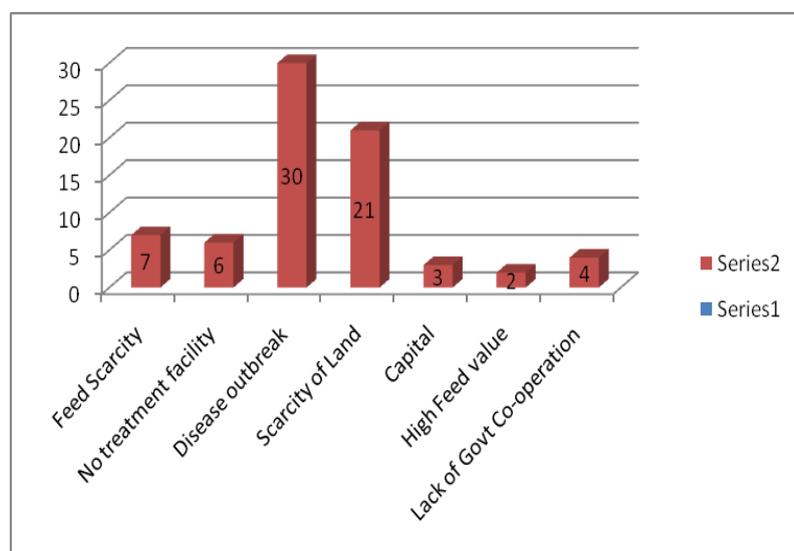


Figure 2. Problems faced by the farmers rearing livestock and poultry.

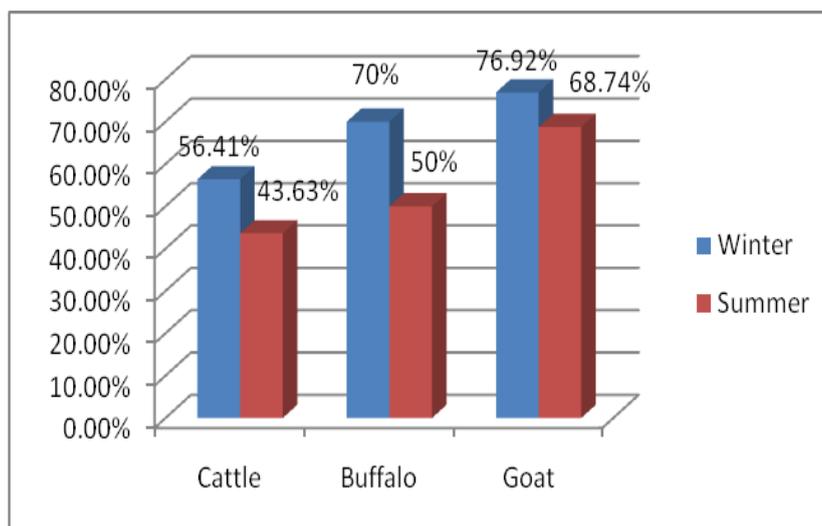


Figure 3. Overall seasonal prevalence of endoparasites.

Morbidity rate of FMD in cattle was high, although mortality was low (Figure 1). But, in case of chicken, both morbidity and mortality rates were high enough to make a massive loss with respect to number and production due to Ranikhet (ND) and pox. About 92.11% of total chicken population was lost every year due to outbreak of ND. Incidence of infectious disease of livestock and poultry in the island was very high as because the farmers could not immunize the animals through routine vaccination. Even some farmers did not know about the immunization of livestock and poultry. Again, there was no veterinary service in the island to give advice, treatment and vaccination facilities for their animals and poultry.

Disease outbreak was the main constraint faced by the farmers rearing livestock and poultry in the island. Scarcity of grazing land, feed scarcity, lack of livestock advisory services and treatment facilities also caused hindrance for livestock production in the island (Figure 2).

Prevalence of endoparasites in cattle, buffalo and goat was higher in winter than that of summer. In Bangladesh, winter usually begins with mild cold and passes through moderate cold and temperature ranging from 18.03-23.66°C. This climatic condition was suitable for the development and survival of many geo-parasites like *Oesophagostomum* spp., *Trichuris* spp. etc. Arthropod vectors like oribatid mites, which live on the pasture, were more available in winter than summer (Urquhart *et al.*, 1996). So, prevalence of helminth parasites was relatively higher in winter. On the other hand, scorching heat of the summer is lethal for the development of many helminth parasites.

In the present study, the prevalence of stomach worm was highest in goat in both winter (50%) and summer (40%) (Table 5) which contradicts the findings of Sardar *et al.*, (2006) and are much lower than the findings (63.41%) of another study conducted by Hassan *et al.*, (2011). About 31.47% buffalo harbored stomach worm infection in winter and 15.79% in summer. On the other hand, only 10% cattle harbored stomach worm infection in winter and 0% in summer, whereas Saha *et al.*, (2013) found 39.6% prevalence of gastrointestinal nematodes in buffalo in a study at three upazilas of Barisal district of Bangladesh. In the present study, more than 20% buffaloes suffered from either single infection with *Fasciola* and *Paramphistomum* or in combination in both the seasons. Goat suffered from some extra species like *Moniezia* and *Trichuris* and the prevalence is just double in winter than that of summer (Table 5).

In a study, Das *et al.*, (2010) found 47.7% prevalence of *Paramphistomum* and 5.8% prevalence of *Fasciola* in Red Chittagong cattle of Bangladesh of which the first one is much higher and the second one is lower than the present findings.

In another study, Sammadar *et al.*, (2015) found 20.84%, 23.96% and 10.37% prevalence of *Fasciola* and 7.47%, 16.87% and 2.56% prevalence of *Paramphistomum* in cattle, buffalo and goats, respectively which are almost similar except that of goats with the present results.

However, all the variations results mentioned above may be due to variations in geoclimatic conditions.

For trematode infection, intermediate host like snail was mandatory for the growth and survival of the developmental stages of the parasites. In the island, no intermediate host responsible for the growth and survival of *Fasciola* and *Paramphistomum* spp was found during this study. But the prevalence of the parasites was evident. From the history of livestock business, it was clear that the animals were either imported from

neighboring Myanmar or from ‘Shah-pari dip’ and Teknaf where these parasites were prevalent. However, a further study should be conducted to investigate into the existence of intermediate snail hosts.

4. Conclusions

As the area was isolated from the main land, ill communicated and expensive because of being a tourists’ spot, it was very tough to conduct research activities within the budget provided and specific time frame. However, there were some prevalence of different types of endoparasites with higher percentage in winter than in summer, and several economically important infectious diseases like ND, PPR, pox, FMD, etc. Intervention such as vaccination, extension activities, farmers’ training for livestock and poultry production and veterinary service might improve the production and thereby play a vital role in the economy of the island. Isolation and quarantine regulation along with intervention may keep the island, to an appreciable extent, free from diseases in livestock and poultry.

Conflict of interest

None to declare

References

- BBS (Bangladesh Bureau of Statistics), 2005. Yearbook of Agricultural Statistics of Bangladesh. Planning Div., Minist. Planning, Govt. People’s Repub. Bangladesh, Sher-e-Bangla Nagar, Dhaka. p. 226.
- Hossain SMA and J Nessa, 2005. Studies on livelihood improvement through integrated farming. Final report submitted to the Research Initiatives Bangladesh, Bangladesh Agril. Univ., Mymensingh, Bangladesh.
- Quddus MA, 2009. Crop production growth in different agro-ecological zones of Bangladesh. *J. Bangladesh Agril. Univ.* 7: 351–360.
- Soulsby EJJ, 1982. Helminths, Arthropods and Protozoa of Domesticated Animals. Seventh edition, English Language Book Society/Bailliere Tindal.
- Urquhart GM, J Armour, JL Duncan, AM Dunn and FW Jennings, 1996. Veterinary Parasitology. Second edn., Blackwell Science Ltd. pp. 102-103.
- Yamaguti S, 1958. Systema Helminthum. Volume I, Part I. Interscience Publishers, INC., New York, London. p. 200.
- Sammadar K, MH Haque, KM Ashfia, SF Nahar, F Boby and SS Saha, 2015. Prevalence of gastrointestinal parasitic infestation of ruminants at Rajbari, Bangladesh. *Int. J. Nat. Soc. Sci.*, 2: 27-34.
- Saha SS, DR Bhowmik and MMR Chowdhury, 2013. Prevalence of gastrointestinal helminthes in buffaloes in Barisal district of Bangladesh. *Bangl. J. Vet. Med.*, 11: 131-135.
- Sardar SA, MA Ehsan, AKMM Anower, MM Rahman and MA Islam, 2006. Incidence of liver flukes and gastrointestinal parasites in cattle. *Bangl. J. Vet. Med.*, 4: 39-42.
- Hassan MM, MA Hoque, SKMA Islam, SA Khan, K Roy and Q Banu, 2011. A prevalence of parasites in black bengal goats in Chittagong, Bangladesh. *Int. J. Livest. Prod.*, 2: 40-44.
- Das S, AKFH Bhuiyan, N Begum, MA Habib and T Arefin, 2010. Fertility and parasitic infestation of Red Chittagong cattle. *Bangladesh Veterinarian*, 27:74-81.