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An Analysis of Animal Health and Veterinary Facilities in Coping the Climate Change in Bangladesh: What Education System can Offer for the Benefit

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ABSTRACT

The current situation of climate change related to animal health impacts, overall awareness, mapping of livestock and national policy in these regards are needed an especial scholarly attention in Bangladesh. The national policy primarily fails to deal with the impacts of climate change on animal health and its danger since it is virtually invisible than the others harming events such as natural disasters. Therefore, this study addresses some issues generated through an analysis of animal health and veterinary facilities in coping with the climate change and also answer on how a sound effective policy can develop by overcoming the issue. This study focuses the lack of inter-linkage of national policy and planning including the shortcomings of the current veterinary education system to bring together the climate change issue and impacts on animal health. The experiences of this study may utilize for climate change related animal health impacts and a way forward for potential veterinary policy in Bangladesh.

Key words: Climate change, veterinary facilities, animal health, affecting factor, policy, education system

INTRODUCTION

Climate change issue is one of the most focus points in this contemporary world and it is already beginning to transform the life on Earth. Around the globe, seasons are shifting, temperatures are climbing and sea levels are rising and rapidly alter the lands and waters with a very unusual way. The range of time scales, consequences, perspectives and methods of addressing these issues are now providing with the evidences of the changing patterns of climate factors that adversely affecting the society, economy and environment (Hertel *et al.*, 2010; Burke *et al.*, 2009; Bonfils *et al.*, 2008; Lobell *et al.*, 2007; Cahill *et al.*, 2007; Field *et al.*, 2007; IPCC, 2007). Scientific studies find that rapid transform for economic development causes the major damage to the environmental systems (Al-Amin *et al.*, 2010). The scientific evidence is now irrefutable and real with fundamental scientific evidences (Lobell *et al.*, 2008, 2011; Burke *et al.*, 2009, 2010; Stern, 2007; IPCC, 2007).

A new dimension has added in the recent climate change issue is the animal health and its impact to economy. Climate change also has a negative impact on animals, but particularly livestock which is associated with certain activities to climate change (Gale *et al.*, 2009). Least developed and developing countries are affecting foremost as because of less capacity to cope with the problems. The direct impacts of climate change on animal health are well evident in literature (Slenning, 2010; McIntyre *et al.*, 2010). Bangladesh is not an exception to this issue and the impacts are rapid approaching.

Climate change effects are quite varying from region to region, therefore, we need to consider potential causes and victims in Bangladesh to see the possible planning lacking focusing on animal health. To minimize the impacts of animal health and veterinary facilitates in coping the climate change, we must bear in mind some fundamental concepts such as how large this impact is? What is the most significant disease that affects the animal health? What is the relationship between animal property and animal as economic good? What are the issues to mapping of livestock property? How to analyze economic gain and lose based on the current situation of animal health and climate change issue? How veterinary science and veterinary education system can help in this area? What is overall awareness to this issue? Therefore, to answer these questions, we must need to assess future disease realistically and must consider the effects of climate change on animal health deeply in the contest of Bangladesh.

We know that ecosystem, animal health and economic impacts are tied to climate change issues. If ecosystem alters for climatic change that directly and indirectly affect animal health and economy (Slenning, 2010; McIntyre *et al.*, 2010; Gale *et al.*, 2009). The time has now come to consider the current effectors of climate change and what is the economic impact of animal health is the way forward. A sound analysis is necessitated of animal health and veterinary facilitates in Bangladesh in coping the climate change issues. Therefore, we feel necessary also a sound framework for sound analysis to overcome of the impacts on animal health. Most importantly, we need to consider what education system and related veterinary research can offer benefit to fill the gap on the technical, institutional and operational barrier. This study contributes to raise those issues where climate change matters and places an effective policy framework for long-term policy options.

MATERIAL AND METHODS

Framework of issues: Any climate change related framework must consider the affecting factors within the climate change regime and possible alternative to resolve the problems. This is the very basic issue whatever it is global or country specific. Therefore, analyzing the vulnerability of animal health and related matters, we must consider some essential issues such as (1) limited technological capacity to adapt to climate change, (2) degrees of dependence on the environment, (3) level of technical knowledge, (4) level of risk awareness, (5) indirect impacts of climate change and prevalence of diseases, (6) increase or decrease of the climate change related infectious agent, (7) predispose the susceptible animal to infection, (8) increase or decrease contact between infected and susceptible animals, (9) pathogens with part of their life cycle outside the host and temporal distribution of *Fasciola hepatica* (temporary water bodies) and *Fasciola gigantica* (permanent water bodies), (10) prevalence of vector borne diseases and their survival condition due to climate change impacts and finally, (11) solution point of concerned issues.

As we are looking the framework of effective policy issues; thus, we need an assessment of the impacts of climate change on farm animals and its welfare, including increased risk of animal disease and starvation. The other major issue on climate change is the effects of climate change on

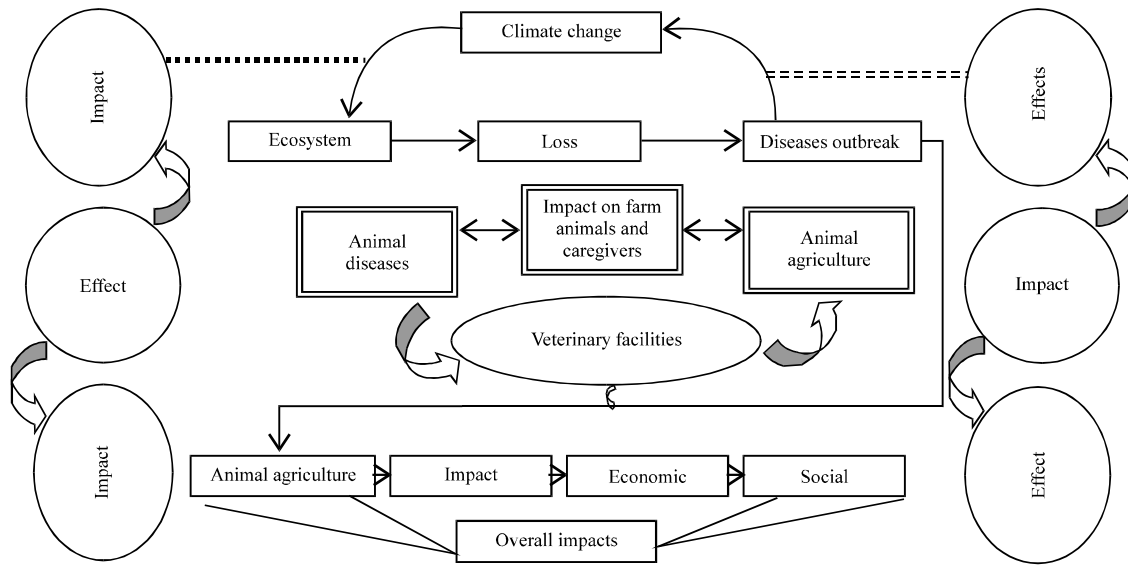


Fig. 1: Relationship between climate change, animal health and economic impact. Source: Al-Amin and Alam (2011)

farms animals and the effectors that reduce economic development. Therefore, we need to see the enhanced impact of climate change on farm's animal health and the inter-linkage of climate change, ecosystem and diseases outbreak. Study on the mitigation possibilities of the climate change is of dire necessity from the animal health prospective as well. In Fig. 1, we underline the animal health's affecting factors for climate change issue such as (a) effects of climate change on the spread and emergence of animal diseases, (b) effects of climate change on farm animals on climate change, (c) the inter-linkage of climate change, ecosystem and diseases outbreak and (d) veterinary research facilities in coping with the climate change issue which are recently addressed by the study of Al-Amin and Alam (2011). These factors are essential in proposing an effective framework of strategies and policy options.

Veterinary facilitates in coping with climate change: Livestock are integrated into the mixed farming system in Bangladesh, where 25% of the population is directly involved in livestock related economic activities. Livestock services are delivered to the farmers in Bangladesh by public sector organizations like the Directorate of Livestock Services (DLS) and Bangladesh Livestock Research Institute (BLRI), a number of Non-Governmental Organizations (NGOs), Cooperative Societies and private organizations such as poultry hatcheries, pharmaceutical companies and others traders (BER, 2001). Five training Institutes of DLS are primarily used for imparting basic knowledge or up-dating training of its auxiliary staff and rarely for training of farmers. Animal health protection and treatment is the most voluminous component of DLSs service delivery system and is executed through a network of 9 Regional diagnostic laboratories, 17 district diagnostic laboratories, one Veterinary Vaccine Production Laboratory (VVPL) and 464 Upazila (sub-district) Veterinary Hospitals (UVH). DLS' diagnostic laboratories are equipped with sophisticated equipment, but the activities are limited to examination of a few blood, sera and faecal samples and post-mortem examinations of birds belonging to private farmers. Most initial diagnostic activities are accomplished in the Upazila Veterinary Hospitals (BER, 2001).

The VVPL produces around 25 million doses of vaccines against infectious diseases like Anthrax, Haemorrhagic Septicaemia, Black Quarter, Foot and Mouth Diseases of ruminants as well as Newcastle Disease (Ranikhet), Fowl Cholera, Fowl Pox and Duck Plague of poultry. This production can meet the demands for Newcastle Disease vaccines but it cannot meet the demands for the other the other vaccines. The total vaccine production and supply can only supply 10% of the required vaccines. About 80% of the vaccines for ruminants are distributed by means of DLS' own staff, Veterinary Field Assistants (VFA), whereas 80% of the poultry vaccines are distributed at village level through poultry workers of NGOs in the SLDP/PLDP project area. These services are not available in non-project areas (BER, 2010). The Upazila Veterinary Hospitals (UVH) functions as nucleus of DLS activities at grass root level are insufficient. Moreover, DLS service delivery network hardly facilitates services to be delivered beyond 10 km from the Upazilla. DLS can by using its services network and limited field staff provides effective preventive services to only 10% of the ruminants and treatments to around 13% of the ruminants belonging to all category stakeholders. Thus service delivery at grass root level is inadequate, ineffective and infrequent. The people who are most deprived of these services are the poor and those who live in remote areas (BER, 2010).

Bangladesh Livestock Research Institute (BLRI) is the other public sector organization which has a mandated to technologies for improving livestock production. Some other public sector organizations also provide or facilitate delivery of livestock services to farmers. These are Palli Karma Shahayak Foundation (PKSF), Bangladesh Rural Development Board (BRDB), Bangladesh Milk Producers' Cooperative Union Limited (MILKVITA). However, the service delivery network hardly facilitates to the poor around the Bangladeshi rural areas. Since most Programme Assistants (PA) are technically weak and the interaction time allocated to the beneficiary is very limited, technical services most of the time is provided by most NGOs. The major weakness of the NGOs is that most of its staff does not have technical graduates (graduates in veterinary science or animal husbandry). This fact seriously reduces their capabilities to operate the livestock packages. However, GMF and NGO recruited veterinary science graduates such as livestock officers and trained Veterinary Field Assistants (VFA) as auxiliary staff ensuring an effective technical as back up services. None of the NGOs except from GMF and BRAC has established output service networks by which livestock and livestock products of beneficiaries are marketed (CLDDP, 2002).

Support services, extension and training: As we noted that about 25% of the population is directly involved in livestock related economic activities but the indirect involvement surely is much higher. The current support systems of regional diagnostic laboratories, district diagnostic laboratories, veterinary vaccine production laboratory and sub-district veterinary hospitals are insufficient. There is no research institute available currently in Bangladesh which is directly contributing related to climate change diseases migration and diseases spreads against regional migrated infectious. The poor stakeholders are the most deprived for ruminants and treatments. Recently, a study: Al-Amin and Alam (2011) underlined the animal health's affecting factors for climate change issue and discussed the issues and effects of climate change on the spread of animal diseases and impacts and essential factors in proposing an effective framework of strategies. We understand the fundamental issues of limited technological capacity to adapt to climate change, level of technical knowledge, lack of risk awareness and supports from the government to lessen climate change related infectious agent and diseases. Surely, Bangladesh is far behind on the climate change related fundamental issues on animal health and livestock related economic

activities and professional adult training. There has been much emphasis on the livestock producers in connection with the targeted livestock services in the late 90s; however, some lacking distress the support services, which focus on improving the skills of the poor livestock stakeholders, are strongly needed with advanced technological requirements.

We can easily identify the climate change issue on animal health and its affecting factors and gap of policy knowledge of considering animal health and veterinary facilitates in Bangladesh. Despite the high income generating potential, climate change related factors constrain the poor farmers in adopting and expanding livestock related activities. The persistence of high climate related risk factors inhibit the poor from expanding their scale of operation and livestock related output service networks. We know the fundamental issues of limited technological capacity and shortcomings. However, here we need to analyses the function of veterinary science graduates. We can not undermine the numbers of veterinary science graduates and veterinary surgeons in Bangladesh (Al-Amin and Alam, 2011; BER, 2010). However, the fundamental issue is that Bangladesh is lacking of sufficient veterinary science graduates in the related field and suffers for trained veterinary field assistants. The question arise here: what is the reason behind that? Do our veterinary science graduates are not sufficient trained in the veterinary field? Does our veterinary education system effective? If we consider that our veterinary education system is not effective to overcome the raised issue; then how veterinary education system can become effective? Do our veterinary facilitates in coping with climate change are efficient?

This kind of issues we must consider to develop an effective policy framework for the long-run policy issues. As the climate change issues are important for animal health, impacts and livestock related output service networks and 25% people of Bangladesh are directly related. Therefore, there is no way to overlook the issues with other national development priorities. A good number of researches must carry out to analyze the distant climate change impact on animal health and veterinary education system can be more effective in Bangladesh. We must provide top priority of some socio-economic drawback together with national planning lacking within the distant climate change issues which is detailed address by Al-Amin and Alam (2011). Otherwise, the time line will be over to embark the issue and we must embrace implications in very near future.

POLICY AND DISCUSSION

Concern: This study identified the induce of climate change on animal health and its affecting factors and gap of policy knowledge of considering animal health and veterinary facilitates in coping the climate change. The issue is not the end indeed. Here, we recognize also the effects of climate change on the spread and emergence of animal diseases and effects of climate change on farm animals in the framework for effective strategies. We locate a number of difficulties in the way forward for sufficient climatological information to make accurate localized risks for climate change issues and lacking on the way forward to national policy orientation. The evidence we find in the related literature by the recent research findings such as Attitalla (2011), Abdelhak *et al.* (2011), Zarra-Nezhad and Hosainpour (2011), Rezaie (2011), Slenning (2010), McIntyre *et al.* (2010), Nazrun *et al.* (2010), Qureshi *et al.* (2010), Hung-Wen and Ching-Fang (2010), Ali *et al.* (2010), Gale *et al.* (2009), Ostfeld (2009), Randolph (2009), Yacob *et al.* (2009), Rabia *et al.* (2009), Sepehrdoust (2009), Aydinalp and Cresser (2008), De La Rocque *et al.* (2008), Martin *et al.* (2008), Pinto *et al.* (2008), Khorshid (2008), Menin (2007), King *et al.* (2006), Anderson *et al.* (2004), Curriero *et al.* (2001) and Rosset (1999).

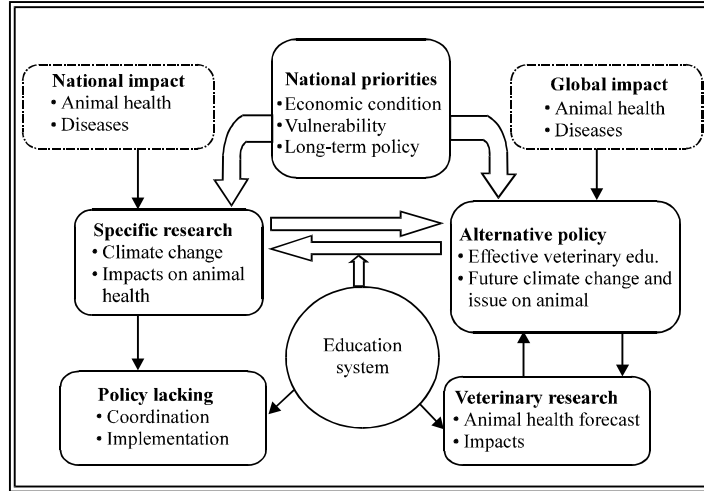


Fig. 2: Framework for effective policy in coping climate change. Sources: Authors

This study raises some socio-economic lacking together with national planning deficient within the distant climate change issues and framework (Fig. 2). From the framework of issues and materials it is clear what to do to develop a sound effective policy strategy by (a) national priorities, (b) research on climate change and impacts on animal health, (c) global outbreak of animal health impacts in the regional economics, (d) adoption of pro-poor technology and (e) effective veterinary education system. Bangladesh is suffering for climate change related researches on animal health impact, analyses on distant animal health forecast, regional impacts for global climate change on disease spreads and insufficient national pro-poor technology. In the pervious section, we raised the issue that Bangladesh is lacking of sufficient veterinary science graduates in the related field and trained veterinary field assistants. The programme assistants in Bangladesh are technically weak and the allocated resource to the beneficiary is very limited. Bangladesh livestock research institutes are unable fully to facilitate livestock services to farmers. Policy makers often do not collaborate with scientists to identify the needs. Poor farmers are therefore not directly involved in this identification of needs whereas poor farmer interests are directly related and involved to the performance.

Even though, insufficient and inefficient veterinary science graduates in the related field and trained veterinary field an assistant is prime parameter for the problems, the reasons are manifolds. The other fundamental reason is also very clear and simple. Bangladesh Civil Service (BCS) and Veterinary Education System (VES) are circuitously responsible. In career selection, the veterinary science graduates often switch over to irrelevant field in the BCS public service such as police, magistrate, foreign affairs and banks as they easily make sound score in the BCS public cadre service commission. Since service places for veterinary graduates are mainly located to the rural areas thus non-standard live style forced them not work on it. Furthermore, veterinary science graduates feel that occupations related to veterinary activities are not prestigious compared to other BCS public cadre service. Therefore, the lacking in the education system distress the specific veterinary research in the climate change issues and the impacts are fourfold such as (a) national animal health, (b) specific veterinary research, (c) alternative animal health policy and (d) national priority and policy (Fig. 2).

Recommendation: Now we need to rethink of the distant possible occurrences climate change matter on livestock and animal health and policy makers must consider long-term policy options. Moreover as Bangladesh is suffering for veterinary science graduates such as livestock officers and trained veterinary field assistants in the field. Therefore, special focus must be placed on veterinary science related education and current technical education system should be enhanced by incorporating special program such as by (1) distance learning, (2) adult professional based technical education system, (3) trained more veterinary field assistants and (4) discourage the switch over irrelevant field in the BCS public service.

As climate change effects are vary from region to region, therefore, we need to consider causes and victims of climate change issues focusing on climate change impacts on animal health. Bangladesh must undertake effective initiatives and programmes to minimize the impacts of animal health and veterinary facilitates and some fundamental issue we raised. Bangladeshi livestock service requires assessment by a top-down process on the basis of the national policy. It does not always correspond to the needs of a specific category however; it rather conforms to the demands of different stakeholders. The national veterinary policy of Bangladesh is also suffering for analyze economic gain and lose due to climate change impacts on animal health, mapping of livestock property as business and economic goods and lack of established output service networks by which livestock and livestock products of beneficiaries are marketed. To make valid choices, to overcome this social issue, practitioners and decision makers must understand what the distant impact of climate change reality is and what factors that needs to furnish to propose more effective strategies.

CONCLUSION

While, the current impact of climate change on animal health is yet to be explored in Bangladesh, the inevitability of awareness on this issue and national policy through significant research study are not even a matter of treatise. Therefore, we feel coercion to contribute with our capability to raise the issue of impact of climate change on animal health and where climate change matters. Here, we aimed to address some of deficiencies based on a developing country as case study. We also placed a framework for policy issue, especially by following an analysis of animal health and veterinary facilitates in coping the climate change. We further focused what should be in place to ensure an effective plan to deal with the raised issues. In order to make some potential suggestions, this study supplemented the discussion on the climate change issue and its impacts on animal health identifying the danger. The outcomes of this study would be useful for policy makers and legislators to comprehend and to compare the climate change related animal health impacts and current shortfall of policy in Bangladesh.

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