

Climate Change in Bangladesh and Dynamic Health Disaster Management in the South Western Coastal Areas

Sonali Rani Das

Assistant Professor
Holy Family Red Crescent Nursing College, Bangladesh

ABSTRACT

Studies were conducted on dynamic health disaster management in the southwest coastal areas of Bangladesh with the main objective of identifying the climate change effects and its disaster impact. The results found the elements of climate and climate changes and its subsequent effects on the human health and health system of disaster and hazard areas. The environmental zones gave detail information on the incidences of diseases during different types of hazards/disasters. At least 30% respondents mentioned climate change induced several diseases. The results showed that 67% of the respondent gave probability of seasonal fever due to climate change, change sleeping behavior being lowest as in Bhola. The possibility of seasonal fever was commented highest for Barisal as 68.3%, the lowest being in the district of Khulna as 24%. The results show that in case of Biodiversity interaction regarding animal and fish extinction was due to climate change height response was from Barisal (88%) and lowest from Khulna. In case of climate change influence on community diseases 77% respondents from Barisal told it increase and lowest from Khulna. Another question was asked for temperature gap, height respondents were from Patuakhali and lowest from Bhola. Survey results revealed that health hazards have increased in the study area. According to them frequency of diseases like seasonal fever, skin disease, sleeping disorder have increased. Incident of unknown diseases also observed. Most of the respondents have perceived that livestock, wildlife population have decreased. Temperature stated most all the respondents from Barisal and Patuakhali said that temperature has changed and temperature gap increase. In case of temperature gap lowest response was from Khulna and Bhola respectively. It is suggested that government should formulate policy and program for holistic approach and development of low cost technique for adaptation to climate change impacts and improve livelihood of the rural communities.

Key words: Climate Change, Health Disaster, Environment, Coastal Areas

INTRODUCTION

Climate change is the biggest global health threat of the 21st century and is increasing. Climatic variables are vital environmental factors, which establish ecological niches of tree species and their patterns of distribution. Species-distribution models (SDMs), and forecasted global climate data, indicated that up to 43% of a sample of tree species in Amazonia could become non-viable by 2095. Human induced climate change threatens ecosystems and human health on a global scale. Climate change will have its greatest impact on those countries, which are already the poorest in the world, and it will deepen inequities, and the effects of global warming will shape the future of health among all peoples. Nevertheless, this message has failed to communicate most public discussion about the climate change (ADB, 1994, Amin, M.S. et al., 1995, BARC, 1990, Amin, et al 1990). According to the International Panel for Climate Change, an increase in the average global temperature will lead to changes in precipitation, and atmospheric moisture due to the changes in atmospheric circulation, and increases in evaporation, and water vapor.

NATURAL DISASTERS AROUND THE WORLD

According to the United Nations High Commissioner for Refugees (UNHCR) in 2010 about 42 million people around the world were forced to flee their homes because of natural disasters. What is alarming is that the number of internally displaced people because of natural disasters almost doubled between 2009 and 2010. The UNHCR report also pointed out that climate change is the most important factor contributing to natural disasters, and that the international community must recognize this fact, and do more to help the suffering humanity (Ahmed, 2008;; Amin, et al., 1993, FAO Anonn 2000; CEGIS, 2004). Disaster Healthcare – The

provision of healthcare services by healthcare professionals to disaster survivors and disaster responders both in a disaster impact area and healthcare evacuation receiving facilities throughout the disaster life cycle.

CLIMATE CHANGE AND DISASTER MEDICINE

Disaster medicine is the area of medical specialization serving the dual areas of providing health care to disaster survivors and providing medically related disaster preparation, disaster planning, disaster response and disaster recovery leadership throughout the disaster life cycle. Disaster medicine specialists provide insight, guidance and expertise on the principles and practice of medicine both in the disaster impact area and healthcare evacuation receiving facilities to emergency management professionals, hospitals, healthcare facilities, communities and governments (Amin, et al 2008, Coxhead and Jayasuriya 1994, Amin, and Anwar, I 1990).

The disaster medicine specialist is the liaison between and partner to the medical contingency planner, the emergency management professional, the incident command system, and government and policy makers (Amin, 1989). Climatic diseases Air pollution and airborne allergens will likely increase, worsening allergy and asthma conditions. Extreme heat can be expected to cause an increase in the number of premature deaths, Increase the risks of water-related illnesses. Climate change, including rising temperatures and changes in weather extremes, is expected to increase the exposure of food to certain pathogens and toxins climate change will have the largest health impact on vulnerable populations. Extreme weather and other events related to climate change will impact health. Disaster medicine is unique among the medical specialties in that unlike all other areas of specialization, the disaster medicine specialist does not practice the full scope of the specialty everyday but only in emergencies. Indeed, the disaster medicine specialist hopes to never practice the full scope of skills required for board certification. However, like the specialists in public health, environmental medicine and occupational medicine; disaster medicine specialists engage in the development and modification of public and private policy, legislation, disaster planning and disaster recovery.

OBJECTIVES OF THE RESEARCH

In this context the present piece of research has been formulated with the objectives: To identify the elements of climate change and its health hazards and the issues of poor disaster database.

METHODS AND MATERIALS

The Methodology considers all techniques, strategies, approaches to be applied at every phases of conducting the research, especially, in collecting, processing and analyzing information. Methodological consideration also involves the reliability and validity of techniques and findings. Documentary analysis has used for the study. Data are facts, figures and other relevant materials, past and present, serving as the bases for study and analysis. The different aspects of the methods and materials of the research are formulated consulting previous research recommendations (Amin, M. S. 1992, AEZ, Ref DVDs, 2009).

Research Design: Study design was an investigative technical survey directly from the specific sites.

Research Questions:

Disaster medication courses we are lacking in our education

- i. Disaster Health Information
- ii. National Incident Management System (NIMS)
- iii. Incident Command System, ICS-100
- iv. Ethical and Legal Aspects of Disaster
- v. Food Toxicology and Bio-safety
- vi. The Emergency Management
- vii. Environmental Health

Research Question: Questionnaire: main points

How do you feel that climate is changing? What are most vulnerable climate factor-Temperature/ Rainfall/ Humidity? Have knowledge about policy of GOB to combat climate change risk? Is there any law/ rule to punish for damage to environment? Do you have any adaptation guideline for agric, health, housing and livelihood? Name 3 options for mitigating climate change effects.

RESULTS AND DISCUSSION

Climate Change Effect Indicators on Health Points

The results found from the studies conducted are presented here indentifying the elements of climate and climate changes and its subsequent effects on the human health and health system of disaster and hazard areas. It was a multiple choice question; the respondents from three environmental zones (of Khulna, Barisal, Bhola, Patuakhali) gave detail information on the incidences of diseases during different types of hazards/disasters. At least 31.3 per cent and 31.2 per cent respondents mentioned diarrhea is a climatic induces disease.

The results given here show that 67% of the respondent gave probability of seasonal fever due to climate change, change sleeping behavior being lowest as in Bhola. The possibility of seasonal fever was commented highest for Barisal as 68.3%, the lowest being in the district of Khulna as 24%.

Table 1: Percent response on the climate change effect indicators on health points

Parameters	Khulna a	Barisal b	Patuakhali c	Bhola d	Mean
Seasonal fever	31	88	76	73	67.00
Unknown disease	69	42	59	71	60.25
Change in clothe	21	68	60	22	42.75
Change in sleeping behavior	23	53	51	13	35.00
Increased skin diseases	32	81	58	46	54.25
Increased child and mother diseases	24	78	81	42	56.25
Mean	33.33	68.33	64.17	44.50	52.58

*Notes:

1. ENV -Zone -13 :Ganges Tidal Floodplain: a. Khulna, b. Barisal
2. ENV -Zone-18 :Young Meghna Estuarine Floodplain: c. Patuakhali, d. Bhola

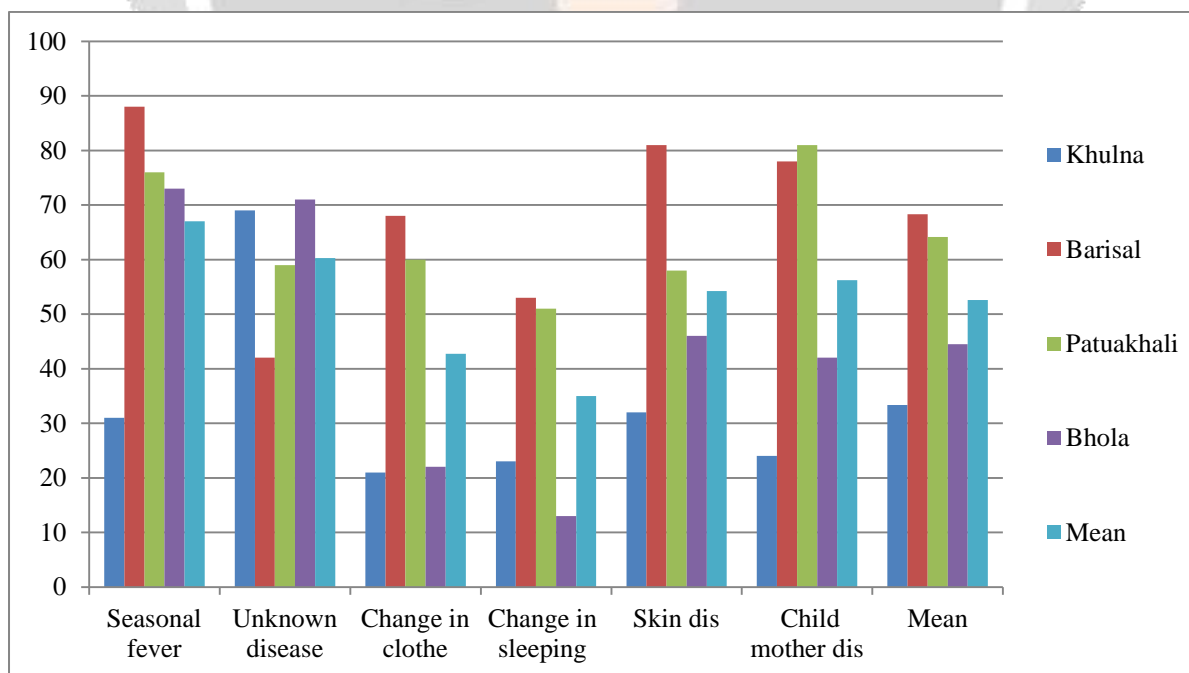


Fig. 1: Response on the climate change effect indicators on health parameters

Table 2: Percent response on the climate change effect biodiversity interactions

Parameters	Khulna a	Barisal b	Patuakhali c	Bhola d	Mean
Animal and Fish Extinction	71	88	76	83	79.50
Decreased existing domestic livestock	39	72	59	41	52.75
Change in wild life	51	38	30	32	37.75
Change in cropping system	23	83	51	23	45.00
Increased community diseases	32	77	58	46	53.25
Increased temperature gap	24	78	81	22	51.25
Mean	40.00	72.67	59.17	41.17	53.25

*Notes:

1. ENV -Zone -13 :Ganges Tidal Floodplain: a. Khulna, b. Barisal
2. ENV -Zone-18 :Young Meghna Estuarine Floodplain: c. Patuakhali, d. Bhola

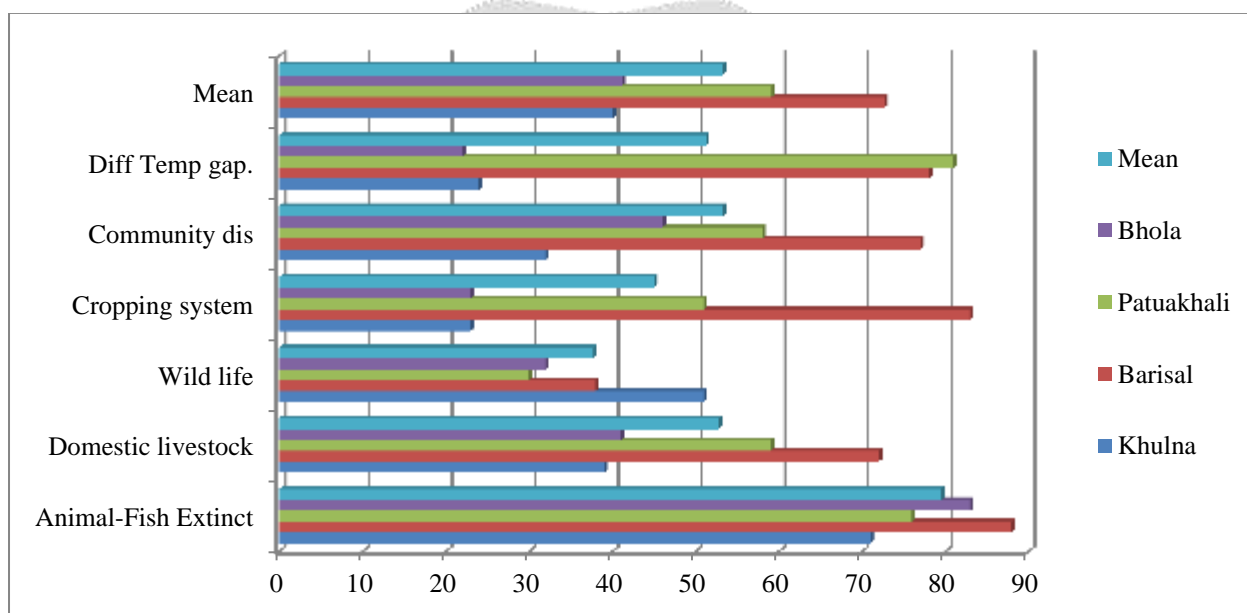


Fig. 2: Percent response on the climate change effect biodiversity interactions

The results show that in case of Biodiversity interaction regarding animal and fish extinction was due to climate change height response was from Barisal (88%) and lowest from Khulna . In case of decreased existing domestic livestock was height in Barisal and was lowest in Khulna. Similarly question asked for regarding wildlife change height response found from Khulna and lowest from Patukhali. Another question was done to know the effect of climate chage on cropping system, height response found from Barisal and lowest from Bhola and Khulna. In case of climate change influence on community diseases 77% respondents from Barisal told it increase and lowest from Khulna. Another question was asked for temperature gap, height respondents were from Patuakhali and lowest from Bhola.

Table 3: Percent response on the climate change effect biodiversity interactions

Parameters	Khulna	Barisal	Patuakhali	Bhola	Mean
Diarrhea	61	88	66	73	72.00
Malaria	59	22	19	23	30.75
Disability	74	43	81	53	62.75
Mental disorders	87	48	41	62	59.50
Dysentery	72	37	38	56	50.75
Skin disease	74	38	72	22	51.50
Mean	71.17	46.00	52.83	48.17	54.54

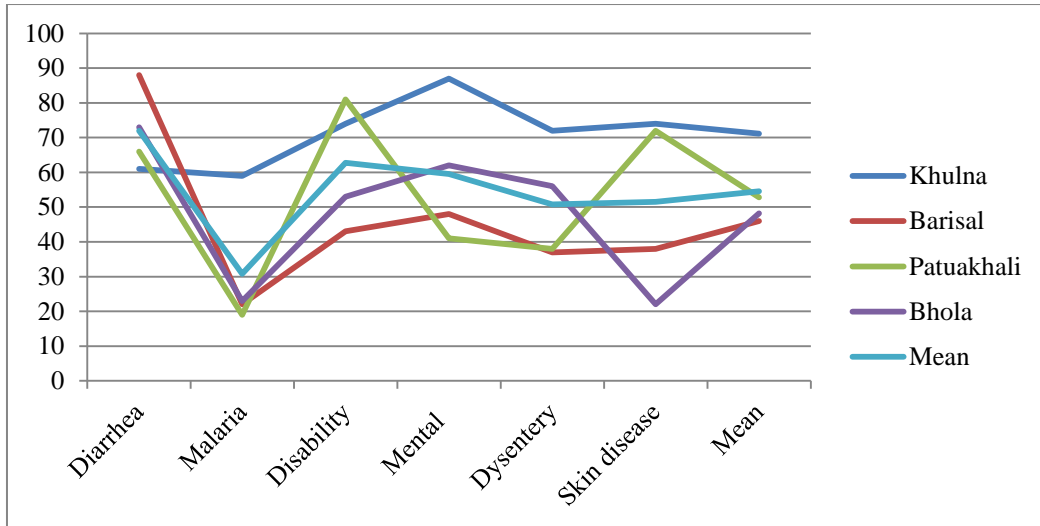


Fig. 3: Percent response on the disease spread as per districts

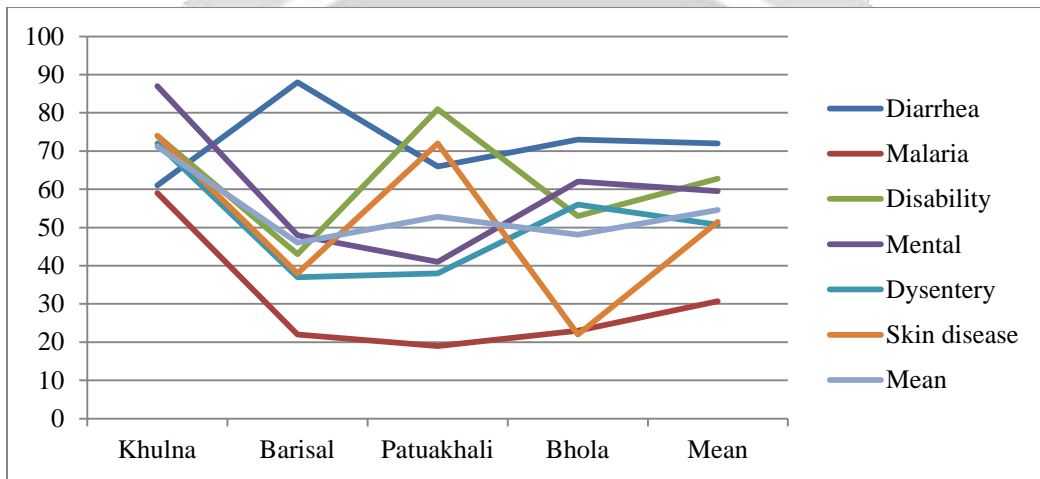


Fig. 4: Line graph on the response of disease spread as per districts

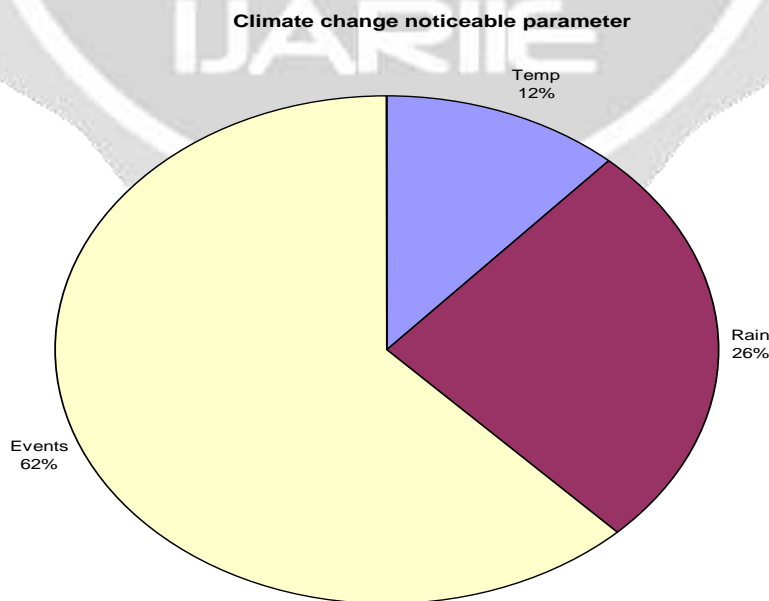


Fig. 5: Climate change measurable parameters

Climate change and its effects are going to be burning issue in both develop and developing country like Bangladesh. Respondents have perceived changes in their local environment around their surroundings. Most importantly the impacts have been seen in agriculture, livestock, health and biodiversity. The impacts on various factors have been discussed in subsequent paragraph. Survey results revealed that health hazards have increased in the study area. According to them frequency of diseases like seasonal fever, skin disease, sleeping disorder have increased. Incident of unknown diseases also observed. Most of the respondents have perceived that livestock, wildlife population have decreased. Temperature stated most all the respondents from Barisal and Patuakhali said that temperature has changed and temperature gap increase. In case of temperature gap lowest response was from Khulna and Bhola respectively. It is suggested that government should formulate policy and program for holistic approach and development of low cost technique for adaptation to climate change impacts and improve livelihood of the rural communities.

RECOMMENDATIONS

The study conclude that the effects of climate change on health are likely to be predominately negative and impact most heavily on low-income countries where capacity to adapt is weakest, but also on the most vulnerable groups in developed countries. Adaptation strategies should blunt some of the adverse impacts but will pose difficulties of implementation, particularly in low-income countries. With climate change already underway, there is a need to assess vulnerabilities and identify cost-effective intervention/adaptation options in the health sector and in other sectors that have direct links to human health. Early planning can help reduce future adverse health impacts and mitigation strategies, for example using a number of renewable energy sources, can improve health by reducing air pollution as well as addressing climate change. There is widespread scientific consensus that the world's climate is changing. Mounting evidence suggests current and future effects on human health, including injuries and illnesses from severe weather events, floods, and heat exposure; increases in allergic, respiratory, vector-borne, and waterborne diseases; and threats to food and water supplies. Indirect effects may include anxiety and depression and the consequences of mass migration and regional conflicts. Climate change related issues will be incorporated into our training programmes at community level. Involvement of community activists in order to reduce the risk of climate induced hazards through measures such as reforestation of mangroves and construction of retaining walls etc, while adaptation and mitigation programs will provide technical skills to support this. Efforts should be taken for community mobilization and involvement of communities in decision making and awareness raising campaign and community training. Inter-sectoral and Integrated initiative should be taken for technical assistance, for identify disaster related issues, building capacity among community activists and disaster risk reduction initiatives. Involvement of community members to acquire significant knowledge on raising public awareness and providing training to other community members.

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