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RESEARCH ARTICLE

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CLIMATE CHANGE OBSERVED IN THE BARINDTRACK

ABSTRACT

This study focuses on the various climate change situations in theGomastapurupazila of ChapainNawabganj district ofthe high barind track. The selection of this upazila was based on the availability of consistent data.The variations of production of Aus, Aman and Boro ricehave been found due to climate change. We have found the fluctuations of temperature and monthly total rainfall. The ground water level also gradually low down.

Keywords: Climate change, Ground water, Drought, Rainfall

1. INTRODUCTION

The Barind tract covers the Rajshahi, Natore, Chapai-nawabganj, Naogaon,Dinajpur, Rangpur, Pabna, Bogra and Joypurhat districts of Bangladesh and the Maldah district of West Bengal. Except for the wet season extreme temperature prevails in this region. About 80 percent people of Bangladesh are directly or indirectly dependent on agriculture and Barind tract is the most favourable agricultural section of Bangladesh.Impacts of climate change are visible in the barind track in the form of temperature variations, erratic rainfall patterns with low monsoon rains, the decrease of the duration of rainy season, heavy rainfall occurs within a short period, increased number of cyclones and droughts, prevalence of rough weather and gradually low down of ground water level. In this region the lowest temperature 8^0C and highest temperature 41^0C recorded in the last 10 years. The minimum rainfall 672mm and the maximum rainfall 1598mm recorded in the last 7years.

Climate is now a great concern through the world. Many NGOs, organisations and persons are doing research in this field.Islam et al. (2011)shows that due to climate variability agricultural sector of Bangladesh is most likely to face significant yield reduction in future.The life and livelihoods of the people in the coastal areas and in the arid and semi-arid regions of Bangladesh has already impacted due to climate change (MOP, 2011). Crop agriculture is the most vulnerable to climate change among different sectors of the Bangladesh economy (GOB 2009). For changes in climatic variables crop yield is fluctuated (Hazell, 1984; Anderson &Hazell, 1987).N. J. Ericksen (1993) shows the relationships between three main elements for reducing vulnerabilities to global warming.BRRI, CEGIS and BIOFORSK (2012) discussed the climate change variabilities by a farmers group discussion in the nine block of Rajshahi and ChapaiNawabganj district of the high barind track.Thenumber of hot days in a year increased in manyplaces and the number of cold days decreased innearly all land areas (IPCC, 2001).

In this study we tried to observe the climate change situation ofGomastapurupazila in the high barind track.

2. RESEARCH AREA

This study is conducted in the Gomastapurupazila out of five upazila's of ChapaiNawabganj district, bounded by West Bengal of India andPorshaupazila on the north;Shibganjupazila on the south; NiamatpurandNacholeupazila's on the east;Nachole,Bholahat and Shibganjupazila's and West Bengal of India on the west.Mahananda and Punarbhaba are the noted rivers and there are 21depressions. Most noted depressions areDamosBeel, Choral Beel and Bara Beel.This area consists of highland (60%), the medium land covers only (9-14)% and the low land covers 17% of the total lands.

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3. METHODOLOGY

While conducting this study, we divide the whole procedure in two phases: firstly literature review and secondly field research.

3.1 Literature Research

We collected secondary relevant data from different institutions, local office, departments and websites and reviewed them. These institutes include upazila agriculture office, upazila statistics office, Barendra multipurpose development authorityoffice and Bangladesh meteorological department. From these sources, relevant local dataphysically collected.These local data include temperature, annual rainfall, rice production and ground water level. We analysed these data to present a better understanding of climate change impacts in this region.

3.2 Field Research

Field research is needed to obtain a good idea about the climate change and its impacts faced by the local people, their adapting strategies and opinions on this issue. The methodologies used to conduct this study are shown below:

A. Interviews

We took some interviews individually with the local people of this study area through a pre designed questionnaire. In this interview, we tried to acquire people's perception and awareness about climate change and its direct and indirect impact on agriculture.

B. Group Discussion

We developed a questionnaire of different climate change issues, mainly water sources for agriculture irrigation, temperature variation, rainfall, duration of rainy season and winter season, river, pond and ground water situation. In this focus group discussions meeting, we tried to collect the experiences of people in the above issues of last ten to twenty years.

4. AUS, AMAN AND BORO RICE YIELD

These three major ricegrow in three different seasons. Aus is normally sown in March-April and harvested in June-July. Aman is generally planted in July-August and harvested in November-December. Finally, Boro is planted in December-January and harvested in May-June (Islam, 1988; GOB, 2009). To some extent, the calendar for these rice crops varies marginally from location to location conditional on soil texture and elevation of land. These growing seasons are also practically matched with three climatic seasons, namely, the hot summer (March-May), the monsoon (July-October) and the winter (December-February). According to BRRI (1991), Aus rice requires supplementary irrigation during the initial stage of its growing season while Aman is almost completely rain-fed rice that grows in the months of monsoon, although it necessitates for supplementary irrigation during planting and sometimes in the flowering stage depending on the availability of rainwater. On the other hand, since Boro rice grows in the dry winter and the hot summer, it is thus completely irrigated (Mahmood, 1997). The variations of Aus, Aman and Boro rice production for the year 2010-2013 is shown in figure 1.

5. Drought and Rainfall

Low trends of rainfall in any season and unavailability of groundwater due to less power supplyare the main cause of drought in this region of barind track. Intense rainfall in a short spell of time, described as a climate change impact. On an average 30% of the total cultivable land was fallow. Shortage of rainfall affects the critical reproductive stages ofAman rice, reducing its yield, also affects fisheries and other household-level activities.A total of 1406mm rainfall recorded in the year 2007 whereas 672 mm in the year 2012 during the tenure 2007-2013 (Fig. 2).

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6. Ground water level

The fresh water sources in this study area are surface water and ground water. The surface water sources include Ponds, Dighi, River, Kharis and Damus. These resources of water are already declining in this upland barind track due to less rainfall and over exploitation to support irrigation in the dry months. In this study, we observed that the average ground water level isgradually low downduring the tenure 2000-2009 (Fig. 3).

7. CONCLUSIONS

The effects of climate change on agriculture and other sectors are already evident in this region. Severe droughts tell us to understand the climate change in this study area of the high barind track. In this severe drought prone area, the variations of production of Aus, Aman and Boro rice have been found due to climate change. Temperature fluctuation and monthly total rainfall variations are observed. The gradually decreasing ground water level is also a great concern in this rice productive area.

ACKNOWLEDGEMENT

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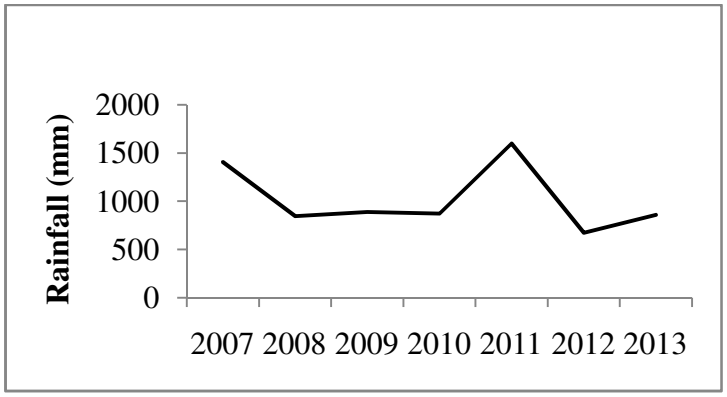

Figure 1: Production variation of three rice crops for the year 2010-2013.

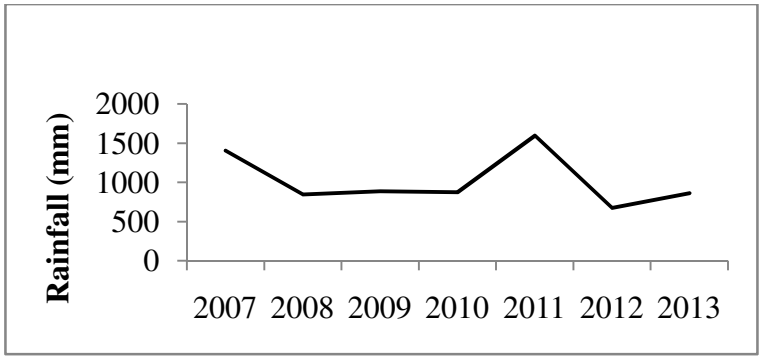

Figure 2: Rainfall variations for the year 2007-2013.

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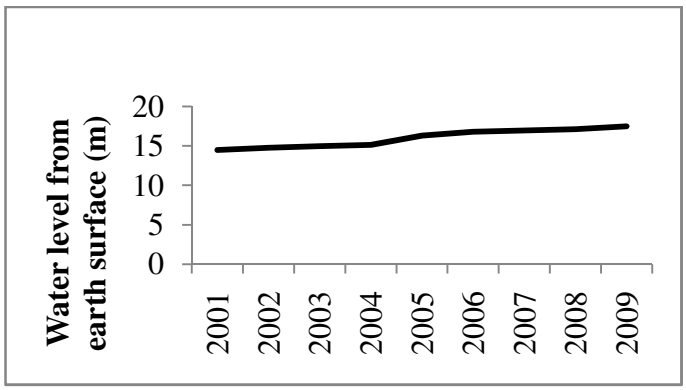

Figure 3: Ground water levelfor the year 2001-2009.

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