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Water Scarcity in Semi Arid Region in West Bengal

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ABSTRACT: The value of water throughout India has been heavily discussed as of late. Water is a subject that transcends religious and ethnic boundaries, from federal decisions on river-linking and dam-building to state-level debates about sharing. Therefore, if water gets skewed due to prolonged lack of rainfall and contemporaneous exploitation for human use, it might fast gain a national narrative that would have an effect on the national economy, agricultural production, religious tourism (given because river is the religious lifeblood of the country), subaltern disputes, and much more. The report highlights a number of elements, features, and challenges that contribute to water insecurity, including groundwater sources depletion, glacier retreat, precipitation, changes in temperature, water management governance, and civil society activities including various water conservation methods. The correlation between water scarcity and climatic variability was studied by looking into the issues in each ecological zone. Creating a database with statistics for each metric is the next step in assessing the severity of a vulnerability. The following predictions, divided into two groups, are derived from this data. Places, and Issues. Climate change is making India's water security dilemma more worse because of inefficient water delivery and management.

KEYWORDS: Water, Security, India, Human security, Environment.

I.INTRODUCTION

The hard summer, drought in Central India, late monsoons, flood in the northern Shiwalik belt, and fewer winter months have persisted for three years in a row, making it obvious that something must be done. India must pay greater attention to the problem of climate change. In particular, the implications on the availability of food and water are catastrophic. Water is a hotly contested issue in India. Water is a topic that transcends political, religious, and racial boundaries, as seen by the fact that the federal government has decided to link rivers, construct dams, and spark localised state conflicts over sharing. As a consequence, if water gets skewed as a result of recurrent rain failures and simultaneous exploitation for human use, it may quickly achieve a national narrative that will have an effect on the national economy, agricultural productivity, religious tourism (given that river is the religious lifeblood of the country), subaltern disputes, and much more.

This article gives a nationwide prognosis for India on the risk of water shortage in the near future based on qualitative research on India's existing water usage and management practises. To answer the question "How major is the role of Climate Change in causing water security?," this portion of the article analyses the impact of climate change on the availability of water. Is it a new danger, or does it just exacerbate an existing one that has already been generated by humans?

The study develops a framework for categorising India's twenty agro-ecological areas. The issues were then investigated thoroughly throughout all biological zones to provide the groundwork for a comprehension of the causal link between water scarcity and climatic variability. In order to quantify a vulnerability, the next step is to compile a data table including numerical values for each criterion. On the basis of this data, we may make the following split predictions: areas and locations of concern. Climate indicators are exhibiting unprecedented levels of variance throughout the world. A lot of shifts in time and place are visible. A ten-to-fifteen percent increase in monsoon rainfall. Drought-prone central India might see a precipitation loss of 5-25%, while northern India's winter precipitation is expected to decline drastically (Ramesh and Yadava, 2005). As a result of possible adjustments in the frequency of extreme weather events, northern India is at danger of suffering more heat waves and droughts (Sen Roy and Singh, 2002). Vegetation, hydrology, and the water balance are also expected to suffer greatly. While climatic variability affects all ecosystems, regions, and sectors, the degree to which each is vulnerable to its effects depends on its inhabitants' and their communities' capacity for adaptation. Some of the world's most vulnerable ecosystems are likely

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to be located in places with little resources and extreme environments like deserts and polar regions . In drylands, where drought, desertification, and water shortages are frequent realities of everyday life, increases in evapotranspiration have profound effects on agriculture, horticulture, forestry, and human activities.

II.ISSUE-WISE PROJECTIONS

As much as half of India's population relies on groundwater for survival, it's important to protect it.For human use, groundwater recharge is most important for water safety. Extremely low levels of groundwater, exceeding 40 bgml, make a region of the Deccan Plateau particularly vulnerable. Groundwater has become scarce in Maharashtra as a result of excessive borewell drilling to depths more than 1,000 feet. A strong heat wave occurrence has also made the cotton belt an area prone to drought. Tamil Nadu has a similar problem, with a severe lack of subsurface water. Unchecked urbanisation and encroachments on water sources have brought this state to the brink of a water crisis marsh regions, a failure to de-silt water reservoirs in a timely manner, and a failure to design for flood zones. Maximum reliance on groundwater is seen in the western plain of Haryana and Punjab, where water levels have dropped by 8 ms during the last five years. When compared to the average recharge of 100%, Punjab draws 145% of its water from the earth, while Haryana draws 110%. Forty-eight percent of wells in the Central Highlands have decreasing water levels. The decadal mean of groundwater variation in the Northern Plains does not suggest a sudden decline. Groundwater use, however, becomes difficult in a disaster-prone region. Jammu and Kashmir, two states in the western Himalayas, suffer from severe drought throughout the winter months. In addition, 50 bodies of water in Jammu have been encroached upon for the construction of hotels catering to tourists. The resulting drop in groundwater level is inevitable. The issue is not now severe, but it might become apparent when temperatures increase and weather patterns shift. There hasn't been much of a change in the ground water level from around 2 to 40bgml on the Kutch peninsula. Fewer sources of fresh water are accessible since they are located in saltier, lower areas.

Late monsoon start, unpredictable precipitation, and intense downpour (leading to floods) have become the new normal. According to the IMD, the Northern portion has seen a deviation of typical monsoon rainfall pattern, and certain areas in the region have had rainfall deficits of up to -42%. However, there has been a rising pattern of rainfall in the northern plains. Not only has the frequency of downpours grown, but so has their ferocity. In the mountains, this has the potential to cause flooding. Because of the increased foot traffic, these areas may be more vulnerable to natural disasters. Decadal rainfall is increasing in Rajasthan and Gujarat, but temperatures are also rising. The effects of this unusual amount of rain vary from place to region. The supply of freshwater has been impacted because of the sporadic nature of the rain.

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Zones	States	Ground-water Depletion[3]	Rainfall[1]	Temp[2]	Glacial Retreat[6]	National and civil society initiatives[7]	Impact of Climate Change[8]
Western Himalayas	J&K, Himachal Pradesh	High	Normal to deficit	Increase	High	Isolated	Medium
Western Plains and Kutch	Gujarat, Rajasthan, Haryana, Punjab	Medium to High	Deficit	Increase		Effective	Medium to High
Deccan Plateau	Andhra Pradesh, Karnataka	High	High Deficit	High Increase		Isolated	High
Deccan Plateau	Maharashtra	High	High deficit	High Increase	-	Ineffective	High
Northern Plains	Bihar	Medium	Heavy	High	Visible	(No Dam)	High
Central Highlands	Madhya Pradesh, Uttar Pradesh	Medium	Deficit	Increase		Ineffective	High
Eastern Ghats	Tamil Nadu, Kerala	High	Deficit	Increase		Nil	High
Eastern Coastal Plains	Odisha	Medium	Deficit	Increase		Effective	Medium
Western Coastal Plains	Goa	High	Deficit	Increase		Nil	Medium
Bengal and Assam Plains	West Bengal, Assam	Medium	Heavy	Increase		Isolated	High
North Eastern Hills	Arunachal Pradesh, Sikkim, Meghalaya, Manipur, Tripura, Nagaland, Mizoram	Depletion	Heavy	Increase		Isolated	Low to Medium
Islands	Andaman and Nicobar Islands	Medium	Normal	Increase			(No trends due to lack of data)

Bengal and Assam plains (States:Bengal andAssam)
The Ganga river basin and groundwater borewells provide the majority of the state of West Bengal's drinking water. Catchment areas on the western side include the Mayurakshi, Ajoy, Damodar, Dwarakeshwar, and Kasai rivers, while catchment areas on the eastern side include the Mahananda, Jalangi, and Bhairab rivers. The Brahmaputra and its three branches, the Teesta, the Torsa, and the Jaldhaka, all have their origins in Northern State. In addition to this, the southwestern part of the state is home to its very own teeny-tiny and independent river basin, which goes by the name of the Subarnarekha basin.

According to statistics provided by the CGWB, before to the start of the monsoon season in 2017, the water table in the southern part of the state, which is home to shallow aquifers, was located between two and five metres below ground level. The water levels in the limited aquifers of Haora, East Medinipur, and South 24 Parganas were determined to be between 5-10 metres below ground level (bgl) and 10-20 metres, respectively. The water level changed by little more than 2 metres on a yearly basis from April 2014 to April 2015. There were 1120 wells that were investigated, and of them, 530 were placed in the falling zone well category, while 590 were placed in the rising zone well category. The proportion of times that the water level increased or decreased fell within the range of 42.1% and 36.1% when it was within this range. The average piezometric level in Kolkata was 14.5 metres below ground level (bgl), while its highest was 16.5 metres above ground level (agl). The piezometric level is the height to which rainwater in a confined aquifer

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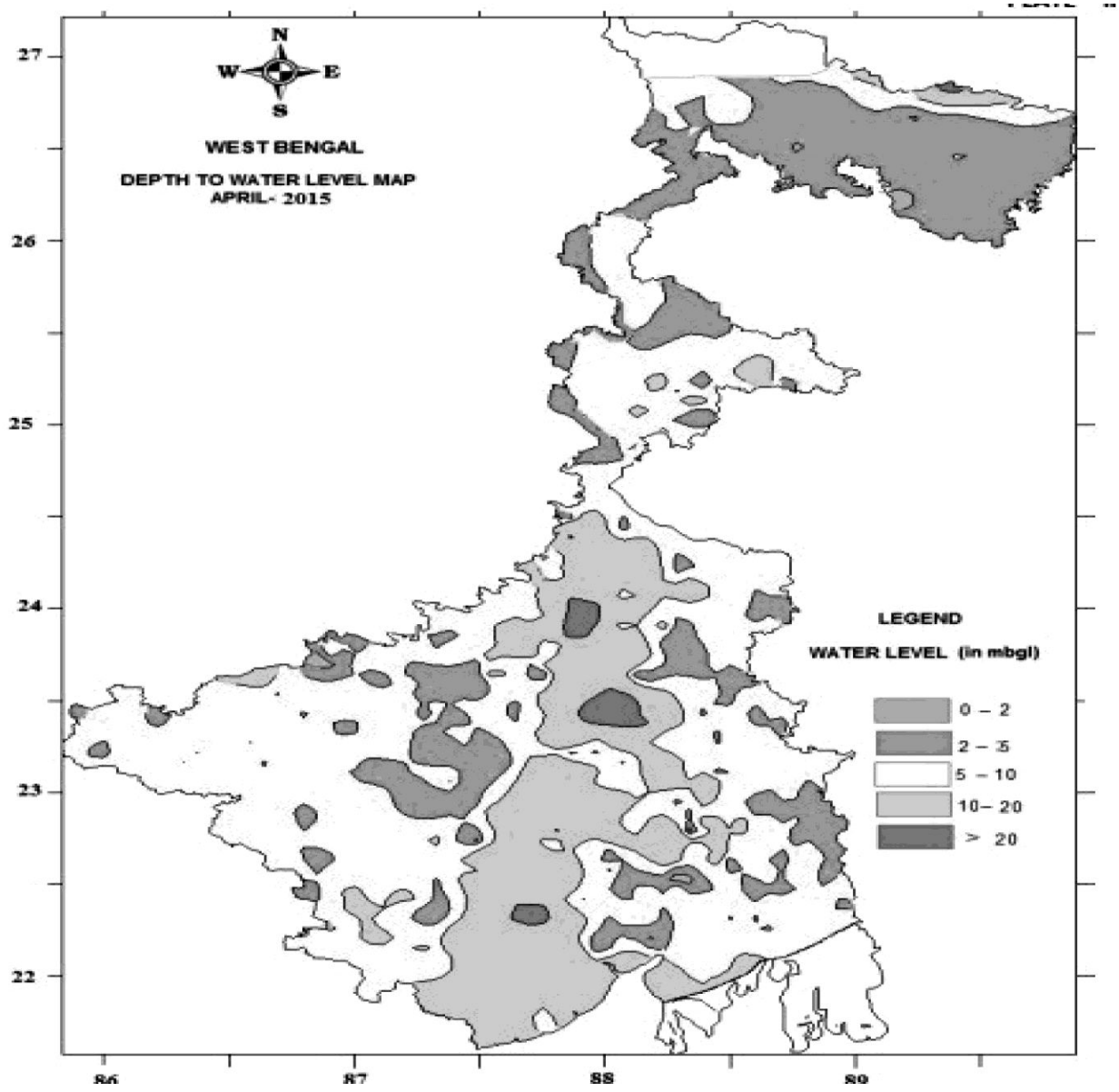
would rise (mbgl). This is as a result of the vast amount of groundwater that is being taken out for use in industry as well as for human use. The groundwater in the vicinity of the Sunderbans has now become bitter and salty as a result of misuse and negligence, which has worsened the groundwater condition.



Map1:Groundwaterlevel(premonsoon)inWestBengal(2015)

Assam has been battered by natural disasters including floods, torrential rain, and landslides during the last several years. Bordubatop, a hamlet in Morigaon, Dhemaji, Lakkhimpur, Barpeta, Bongaigaon, and Dhubri, has been flooded since April 2017.Included are the districts of Nagaon, Dibrugarh, and Hailakandi. Dhemaji has had about 1,76,566 people and 96 villages impacted by the flooding. With a population of 48,381, this disaster has impacted 58 communities in Majuli. There is a serious lack of potable water in these regions as well. The district administration claims that several communities around the city are experiencing water shortages.

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III.CONCLUSION

The lack of adequate water management and distribution in India is the root cause of the water security crisis there; the effects of climate change are only serving to exacerbate the situation. When we look at the statistics, we can see that the changes in climate that are affecting South Asia are in line with the trend that is occurring all over the globe. Every area has the same brutally hot summers, drawn-out monsoons, torrential downpours, and fewer cold months than the others. Since the hydrological cycle is highly connected with water replenishment and availability, the water deficit in the country has been caused by late monsoons and intense heat. This is because the hydrological cycle. As defined by the International Panel on Climate Change, the phrase "climate change" refers to any long-term shift in weather patterns, regardless of whether the change is brought about by natural fluctuation or by the actions of humans. It is essential to keep in mind that human development initiatives are mostly to blame for India's climate change and water shortages. This is something that must not be forgotten.
The water supply of the country is not distributed in a manner that is fair to all of its citizens. As a consequence of this, it is essential to develop a water regulatory organisation in order to keep up with the growing needs. It is up to the general population to encourage water conservation given that such rules do not currently exist in the United States. The desert and semi-arid areas of India no longer face a severe lack of available water as a direct result of the efforts of India's civic society. This has resulted in major water contamination in areas of India that are home to more than one hundred million people. Last but not least, insufficient technology and leakage account for the loss of fifty percent of India's piped water supply.

Therefore, we may come to the conclusion that the primary and primary cause of water scarcity in India is the government's aged infrastructure, as well as its highly polluted levels, its lack of planning, and other forms of growth. However, it is exactly these acts that have worsened climatic anomalies, further endangering India's already vulnerable water supply. India's water supply is already in a dangerous position.

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