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Assessing the Impacts of Climate Change on Water-Borne Diseases: A Comparative Study on Taltali Upazila of Barguna District

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Abstract

Objectives: To determine the economic challenges brought on by water-borne illnesses as a result of climate change. In addition to identifying potential access to safe drinking water during climate change and potential health hurdles brought on by water-related diseases, it is important to learn how to reduce the spread of water-borne diseases. Methods: A mixed method design was adopted to evaluate this research, and probability sampling, more specifically simple random sampling, was used to select to sample from the target population. The study was conducted in Taltali upazila of the Barguna district, and data was collected from 384 respondents; among them, 5 respondents were selected for the key informant interview. The research project began in June 2022 and was completed in December 2022. Results: 41.4% of respondents said they suffer from dysentery, 22.4% said the expense of treating water-borne diseases has increased as a result of climate change, and 37.8% said they must travel great distances to obtain clean drinking water. Currently, 41.7% of individuals utilize tube-well water, compared to 19.3% five to ten years ago, and 27.4% have been taught that water filtration helps reduce the spread of water-borne diseases. Conclusions: People's vulnerability to climate change in the study area is a result of factors such as rapid population increase, unequal access to resources, food insecurity, a long distance to collect water, inadequate medical facilities, a lack of poverty, and a weak health system.

Keywords

Climate Change, Water-Borne Diseases, Health, Vulnerability, Population, Poverty

1. Introduction

Climate change has immensely and crucially engulfed the environment and hu-

man existence. In developing countries, about 80% of illnesses are due to unsafe drinking water as well as water-related diseases. The scarcity of safe drinking water is a massive crisis for the inhabitants of Bangladesh. Protecting human health from the adverse impacts of climate change is a great challenge for the 21st century [1]. Climate change situation is dreadful for the 20 million maritime people who are already experiencing onward exposure to diseases because of the increased saline water (UNDP 2007). More than 15 million people are forced to drink saline water and about 30 million people are not able to take pure drinking water due to the absence of drinking water sources in the coastal areas of Bangladesh [2]. Changes in sedimentation, temperature, and the increase of the sea level are the prime factors that are anticipated to have conformities for the accessibility and availability of clean water throughout the world. Negative dominance of climate variance on water capitals is considered as having negative consequences on human health [3]. Lack of water executions for drinking, bathing, and also farming is not only a recent problem but also could increase complexities for the world's rising population in the coming years. In developing countries, the greatest dominance of climate variance is on both food security and water [4]. A huge amount of difficulties have been noticed due to elevated temperatures covering Europe and Asia. The climate disasters like floods and droughts have not only direct injuries but also negative impacts on human health. These incidents are most noticeable in developing countries like Bangladesh, because developed countries have enough coping mechanisms during climate change [5]. Rising temperatures and irregular inpouring patterns due to anthropogenic temperature change are responsible for the spread of water-borne diseases. Cholera and Typhoid are proxy bacterial water-borne communicable diseases that are linked with rising temperatures. It has been reported that 80% of diseases in developing countries such as Bangladesh are linked to Water-borne diseases [6]. A study noted that the increasing temperature has significantly inflamed the pre-monsoon period annually. A significant compensation is noted in March. Climate variability has a direct exorcism on the regeneration of water-borne contagious diseases such as diarrhea and cholera. It is desired that diarrhea rates will be provoked in many developing regions because of climate change, but the range can vary reclining on the nature of variation, region, and regional climate [7]. An immediate relation has been noted between climate concerns such as floods, heavy rainfall, and water-borne diseases. Generally, water-borne diseases and other infectious diseases increase after floods and rainfall. Besides, hot weather is also responsible for increasing the growth of water-borne diseases [8]. Numerous studies have been concerned with infections linked to contaminated water. There is an increasing risk of cholera and malaria caused by the adverse impacts of climate change. In developing countries like Bangladesh, the literacy rate is downcast, extremely in rural areas, and people are so unaware of water quality, water pollution, and water-borne diseases. There is a straight connection between income and education as well as acquaintance with wa-

ter-borne diseases, water pollution, and health impacts [9]. A survey showed that people with high educational backgrounds are well conscious of the result of water-borne diseases. Climate change is creating incarnate impressions on clean water generation and health. About 70% of people in coastal areas ascertained dysentery, diarrhea, and skin disorders as the remarkable water-borne health complexities during climate change [10]. Water crisis, which surrounds both water quality and also availability, is a crucial indicator of health. Besides drinking, water availability is immensely connected with food security, hygiene, and sanitation which are considered the primary bearers of the global hurdles of disease. Disadvantaged and poor people are the prime sufferer due to the unavailability of pure drinking water supply and it is linked to human health issues [11]. The medical cost during climate change becomes high. Most people take treatment from home. The day laborers and the farmers suffer the most because by infecting water-borne diseases, they cannot go out for work [12]. This situation creates negative impacts on family income. Besides the children who were infected with water-related diseases, could not attend school. It creates a negative dominance on children's education [13]. Moreover, the increasing prices of medicine create a great hamper for the treatment of water-borne diseases. Numerous literature reviews depict that there is a research gap in studies that are concerned with water-borne diseases and their socio-economic impacts therefore more study is desiderate to specifically inquire about the consequences of climate-encouraged percussion of water-borne diseases [14]. There are several studies attempted on safe drinking water qualities noticed to have a major gap in the existing literature. The researchers focused on people's drinking water practices and the impact of climate change on water-borne diseases [15]. The researchers want to explore various water-transmitted vulnerabilities which affected most coastal areas during climate change. No work has been conducted so far on the impacts of climate change on water-borne diseases in the study area. This research aimed to incorporate local people by inquiring about their investigation of the impacts of climate change on water-related diseases and also its numerous impacts on human health in the study area.

2. Methods

2.1. Study Area

Taltali upazila is situated in the southern part of Bangladesh. It is a cyclone-prone area. This upazila is an administrative location under the Barguna district in the division of Barishal, Bangladesh. The total area of Taltali is 333.83 square kilometers. Barguna sadar upazila & the Burishwar River are on the west of Taltali upazila. Kalapara upazila & Andharmanik River are in the east. The Bay of Bengal and the Tangragiri forest are in the south as well as Amtali upazila are in the north. The total population of Taltali upazila is 88,000. There are 43,703 male's population and 44,297 females. Both male & female age ranges (20 - 50+) of Taltali upazila are the population of this study. The density of the population

is 541.

2.1.1. Methods and Design

In order to evaluate this research, a mixed method design has been used. The research was conducted using an exploratory and descriptive research approach. When the goal of the research is to discover traits, frequencies, trends, and classifications, descriptive research is the best option. It was helpful since the researcher could utilize it when they were unsure of the subject. Because the problem being studied was novel and the data collection method was difficult for some reason, exploratory research was performed. Another issue is that there was no underlying information or paradigm with which to investigate it. The researchers had a basic idea about climate change and water-borne diseases that they intended to study. The exploratory research design was adopted for this reason. Qualitative and quantitative research methods have been applied in this study to obtain the objectives of the study.

2.1.2. Sampling and Sample Size

Probability sampling, more precisely simple random sampling has been used to select to sample from the target population. In simple random sampling, the sample has been carried out to obtain the sample from the target population. The sample from the target population is a subset of a statistical population in which every member of the subset has an equal chance of being selected and is meant to be an unbiased representation of the population. Purposive sampling techniques have been followed to select the respondents for key informant interviews (KII). The total population of Taltali upazila is 88,000. Among them, 384 respondents have been selected by using simple random sampling techniques. Data has been collected through 384 respondents. Among them, 5 Key informants who had a vast experience with the community and enough knowledge on the issue of climate change have been interviewed for KII. For identifying the sample size the following Table 1 has been followed.

2.1.3. Data Collection Instrument

For collecting quantitative data, a survey questionnaire has been used and for qualitative data, a checklist has been used.

2.1.4. Data Analysis Techniques

The data were examined using IBM SPSS statistics 26.0. The SPSS-26 has been used for data interpretation and presentation utilizing graphs, charts, tables, and simple percentages.

3. Results

3.1. Quantitative Result Presentation

Table 2 depicts the demographic condition of the people in study area. The respondents of this research were representative of the sufferer people who are in-

fected with water-borne diseases during climate change. The majority part of the respondents is male (62.8%). The researchers collected data from respondents of multiple ages. 15.6 % of the respondents are aged (20 - 25), 25.5% are aged (25 - 30). Most of the respondent's age range is 30 - 35 which occupies 27.6% of the total population, and 19.8 % are aged (35 - 40). Age ranges (40 - 45) connects 10.2% and the lowest part is (45 - 50) which occupies 1.3%. On the contrary 17.4% of respondents are farmers; the larger part is the service holder (40.4%), 31.3% do business, and the rest of the respondents do other activities. The educational qualification is so poor among the respondents. 4.4% are illiterate, many of the respondent's educational qualification is primary level (36.7%), 35.9% completed secondary level, 18.5% are higher secondary, only 4.4% completed honors and there is no one among the respondents who have completed master's degree which is so disappointing. 66.4% of the respondents belong to a nuclear family and 33.6 remain in the extended family. On the other hand, the study shows that respondent's income become average. Only 3.6% occupy an income range of (5000 - 10,000), 35.2% are income range of (10,000 - 15,000), 37.2% is (15,000 - 20,000), 11.5% respondents earn (20,000 - 25,000) taka monthly, 8.3% earn 25,000 - 30,000 taka, and only 4.2% earn 30,000 and more.

Table 1. Represents the expected sample size.

Number	Sample	Number	Sample
440	205	4000	351
460	210	4500	354
480	214	5000	357
500	217	6000	361
550	226	7000	364
600	234	8000	367
650	242	9000	368
700	248	10,000	370
750	254	15,000	375
800	260	20,000	377
850	265	30,000	379
900	269	40,000	380
950	274	50,000	381
1000	278	75,000	382
1100	285	100,000	384

Table 2. Demographic information of the respondents.

		Frequency	Percent
Sex	Male	241	62.8
	Female	143	37.2
	Total	384	100
Age	20 - 25	60	15.6
	25 - 30	98	25.5
	30 - 35	106	27.6
	35 - 40	76	19.8
	40 - 45	39	10.2
	45 - 50+	5	1.3
	Total	384	100
Occupation	Farmer	67	17.4
	Service	155	40.4
	Business	120	31.3
	Others	42	10.9
	Total	384	100
Educational qualifications	Illiterate	17	4.4
	Primary	141	36.7
	Secondary	138	35.9
	Higher secondary	71	18.5
	Total	384	100
Household size	Nuclear	255	66.4
	Extended	129	33.6
	Total	384	100
Monthly income	5000 - 10,000	14	3.6
	10,000 - 15,000	135	35.2
	15,000 - 20,000	143	37.2
	20,000 - 25,000	44	11.5
	25,000 - 30,000	32	8.3
	30,000+	16	4.2
	Total	384	100

Field survey 2022.

Table 3 depicts that the majority of the respondents experience flood most. The study area is cyclone-flood-prone. So the vulnerability of people knows no bounds. The respondents were infected with numerous types of water-borne diseases, among them they were infected with dysentery most that is 41.1%. Besides access to pure drinking water as well as sanitation and hygiene facilities are so acute in the selected areas. 139 people said that poor hygiene and sanitation is responsible for creating water-borne diseases which occupies 36.2%. 31.3% responded that the absence of pure drinking water is accountable for creating water-borne diseases. Besides depreciation of embankment, excessive rain, and also salinity problem are liable for creating water-related diseases. Many of the respondent's family members have been infected with water-borne diseases during climate change. 48.2% of respondents coincided that their 1 - 2 members of the family were infected with water-related disorders. On the other side, 37.8% answered that their 2 - 3 family members are tainted with water-borne disorders.

Table 4 shows that among various symptoms of water-borne diseases, Nausea & vomiting are common that covers 30.5%, and 26.6% suffer from skin disorders, Besides ear disorders, respiratory problems, muscle pain, and fever are also noticeable which occupy 7.8%, 18%, 12.2% & 4.9%. Health barriers show that stomach pain is so acute that connects 41.4% of people, besides psychological problem is so alarming that 23.2%, headache, mood swing, and fever are the common health obstacles among the people of the study area. The consequences of water-borne diseases are so alarming. It may cause liver damage, severe diarrhea, dehydration, and even death. 31.8% of people undergo severe diarrhea, 26.8% pass through extreme dehydration, 23.4% tolerate liver impairment, and 14.3% suffer from neurological diseases. Children & women are the most vulnerable group infected with water-borne diseases during climate change which covers 50.3% & 30.2%. Older people, men & people who have weak immune systems undergo the adverse impacts of water-borne diseases during climate change. Most people have to go a distance of collecting drinking water. The majority of the respondents have to go about 0.5 km for picking up water. Besides, people excerpt water from their neighboring homestead. People also trek water from a 1 km distance. A few people can collect water from their homesteads. The researchers noted numerous family crises that are caused by water-borne diseases & infection. Among them, 32.3% of people acknowledged that their transited children could not go to school. Furthermore, 28.4% of people ensured that their main earning members could not go to work due to water-related disorders that eventually create the deterioration of family income, which causes anxiety & depression that in the long run responsible for molding family crises. Therefore, among various healthcare system 30.5% go to the private hospital for treatment, 26.6% take homeopathy treatment, and 21.6% consult with the village doctors, village doctors play a momentous role in the treatment of water-borne diseases. 15.6% take self-care, it is also popular among people, because being aware people can get rid of water-borne diseases and only 5.7% go to health centers.

Table 3. Climate change and peoples vulnerability.

Climate change problems		
	Frequency	Percent
Cyclone	93	24.2
Flood	183	47.7
Excessive rain	85	22.1
Drought	22	5.7
Salinity	1	0.3
Total	384	100
Water-borne diseases caused by climate change		
Diarrhea	68	17.7
Cholera	119	31
Dysentery	158	41.1
Typhoid	39	10.2
Total	384	100
The ways of creating water-borne diseases		
Absence of pure drinking water	120	31.3
Hygiene & sanitation problem	139	36.2
Block sewerage system	67	17.4
Damage of embankment	18	4.7
Excessive rain	21	5.5
Salinity problem	19	4.9
Total	384	100
Family members affected by water-borne diseases		
1 - 2 members	185	48.2
2 - 3 members	145	37.8
3 - 4 members	43	11.2
4 - 5 members	9	2.3
More	2	0.5
Total	384	100

Field survey 2022.

Table 4. The complexities caused due to water-borne diseases during climate change.

Symptoms of water-borne diseases		
	Frequency	Percent
Nausea & vomiting	117	30.5
Skin disorder	102	26.6
Ear disorder	30	7.8
Respiratory problem	69	18
Fever	47	12.2
Headache & Muscle pain	19	4.9
Total	384	100
Health barriers		
Stomach pain	159	41.4
Psychological problem	89	23.2
Fever	51	13.3
Headache	55	14.3
Mood swing	30	7.8
Total	384	100
Consequences of water-borne diseases		
Neurological disorders	55	14.3
Liver damage	90	23.4
Extreme dehydration	103	26.8
Severe diarrhea	122	21.8
Death	14	3.6
Total	384	100
The vulnerable group due to water-borne diseases		
Men	26	6.8
Women	116	30.2
Children	193	50.3
Older people	36	9.4
People who have a weak immune system	13	3.4
Total	384	100

Continued

Distance of collecting pure drinking water		
Within homestead	23	6
Neighboring homestead	109	28.4
Within 0.5 km	145	37.8
Within 1 km	88	22.9
Within 1.5 km	19	4.9
Total	384	100
The family crisis created due to water-borne disease infection		
Infected child unable to attend school	124	32.3
Male members could not do work	109	28.4
Anxiety & depression	77	20.1
Deterioration of family income	47	12.2
Domestic crisis	27	7
Total	384	100
Available health care facilities		
Health center	22	5.7
Village doctor	83	21.6
Private hospital	117	30.5
Homeopathy	102	26.6
Self-care	60	15.6
Total	384	100
Economic problems		
Low savings	75	19.5
Extra food purchasing cost	79	20.6
Maintaining proper hygiene & sanitation cost	75	19.5
Medicine cost	69	18
Increasing doctors payments	86	22.4
Total	384	100

Field survey 2022.

Water-borne diseases create various economic problems. Among various problems proper hygiene & sanitation costs, doctor's payments, and extra food purchasing costs are high. 22.4% responded that doctor's payment is increasing, 20.6% extra food purchasing cost is also high, and 19.5% said that maintain proper hygiene & sanitation and also low savings. These are remarkable economic crises caused by water-borne diseases.

Table 5 notified the comparative use of medicine for curing water-related diseases. It shows that the use of saline is decreasing drastically more than before (59.6% - 19.3%). The use of antibiotic tablets (18.2% - 39%) & injections (22.2% - 41.7%) is increasing day by day. Besides the daily using water sources are changing more than before. The using of pond water decreased from (23.2% - 10.2%), Channel water minimized from (28.1% - 10.2%), the river water eroded from (23.7% - 8.6%). Now people are using tube-well & supply water. The usage of tube-well water increased from (19.3% - 41.7%), and the supply water enraged from (5.7% - 29.4%). The ways of purifying water are also changed. The practice of boiling water has decreased from (70.3%-30.5%), using a water purifier has increased from (3.9% - 43.8%), resorting to purifying tablets has also increased from (15.4% - 24.5%), and filtration is decreased from (10.4% - 1.3%). The treatment cost of water-borne diseases is increased more than before. The cost (500 - 1000) is decreased from (58.1% - 40.6%), the cost range (1000 - 1500) has increased from (26.8% - 31%), the cost line (1500 - 2000) has maximized from (7% - 17.4%), the cost range (2000 - 2500) has provoked slightly from (3.4% - 5.25%), the range (2500 - 3000) also slightly increased from (2.6% - 3.4%), and the cost line 3000 & more mini from (2.1% - 2.3%).

Table 6 shows the ways of minimizing water-related diseases are water filtration (27.1%), a better sewerage system (24%), and also washing hands after using toilets (10.9%) as well as handling animals (15.6%). Awareness building is also noticeable which occupies 17.2%.

3.2. Qualitative Result Presentation

3.2.1. Increasing Health Complexities

Water-borne diseases are the result of adverse impacts of climate change. The people in coastal areas are the victims of extreme health vulnerabilities due to water-borne diseases [16]. Climate variance is increasingly impacted on human health, especially through water-related diseases. Water-related diseases are creating vulnerability to the life of extremely disadvantaged people in Coastal areas including women, ethnic minorities, children, poor communities, and older people [17].

> "*Climate change is a threat to our livelihood, especially for the people who live in a coastal area like ours. I think many poor people suffer most during climate change and to bear the medical cost is beyond their rich. Children, women, and poor people also suffer from various water-borne diseases* (*KII, Taltali upazila*)".

Table 5. Comparative pictures of using, sources water for living & ways of purifying water-borne diseases and treatment cost of water-borne diseases.

The treatment method of water-borne diseases				
	Frequency		Percent	
	Before	After	Before	After
Saline	229	74	59.6	19.3
Anti-biotic injections	85	160	22.2	41.7
Anti-biotic tablets	70	150	18.2	39
Total	384	384	100	100
Sources of water for living				
Pond	89	39	23.2	10.2
Cannel	108	39	28.1	10.2
River	91	33	23.7	8.6
Tube-well	74	160	19.3	41.7
Supply water	22	113	5.7	29.4
Total	384	384	100	100
Ways of purifying water				
Boiling	270	117	70.3	30.5
Using water purifier	15	168	3.9	43.8
Using purifying tablets	59	94	15.4	24.5
Filtration	40	5	10.4	1.3
Total	384	384	100	100
The treatment cost of water-borne diseases				
500 - 1000	223	156	58.1	40.6
1000 - 1500	103	119	26.8	31
1500 - 2000	27	67	7	17.4
2000 - 2500	13	20	3.4	5.2
2500 - 3000	10	13	2.6	3.4
3000+	8	9	2.1	2.3
Total	384	384	100	100

Field survey 2022.

Table 6. The ways of minimizing water-borne diseases.

	Frequency	Percent
Ensuring hygiene & sanitation facilities	20	5.2
Washing hands after using toilets	42	10.9
Washing hands after handling animals	60	15.6
Ensuring a better sewerage system	92	24
Water filtration	104	27.1
Awareness building	66	17.2
Total	384	100

Field survey 2022.

3.2.2. Polluting Environment

Environmental pollution increases the risk of water-borne diseases. These pollutions are created due to the percussion of climate change. Sometimes excessive rainfall creates obstacles to maintaining daily hygiene among people in rural areas [18]. Climate variance is the critical factor to maximize the chances of discomfort through weather changes in rainfall, extreme temperature, and water deficit. Changes in climatic situations can maximize the accountability of diseases [19].

"*Climate change is undoubtedly a thread for human existence. I think people are responsible for the polluted environment and it creates only for overpopulation* (*KII, Taltali upazila*)".

3.2.3. Unavailability of Pure Drinking Water

Bangladesh is a flood-prone country, so the repeated occurrence of floods is a common picture for the coastal region of Bangladesh [20]. The main reason for infecting water-borne diseases is the lack of availability of pure drinking water. When coastal areas become flooded due to the repugnant impacts of climate change, there is a scarcity of pure drinking & daily using water [21]. This situation creates a great vulnerability and creates water-borne diseases.

"*We have no tube well of our own. So we have to collect water from other tube-well. Sometimes we have to go to the long distance to collect pure drinking water. Children have a great risk of infecting water-borne diseases. Most of the time due to the muddy road, we could not go out to collect water for long distances. So we have to use rainwater* (*KII, Taltali upazila*)".

3.2.4. Increasing Financial Burden

Medical cost is extremely high for the treatment of water-infected diseases. If the earning members of a family are infected with water-borne diseases, they could not take part in earning activities [22]. So it creates a great hamper on the life of

people, especially those who are in extremely poor financial conditions.

> "*There was a drinking water crisis everywhere. Many people are infected with cholera, diarrhea, dysentery, and so many water-borne diseases. Poor people like ours could not effort to maintain proper hygiene & sanitation. The children could not go to school due to water-borne disease infection. So it creates an extensive hamper to the education of children. The daily laborers suffer a lot during climate change* (*KII, Taltali upazila*)".

4. Discussion

The multiplication of climate variance on both food security and water is the utmost negative health dominance in a coastal region like the Barguna district. Barguna district is experiencing climate variance dominance as the result of the gradual increase of the sea level and also temperature [23]. Most of the people are passing vulnerable life especially, in the rainy season in this district. Repeated cyclones, floods, and excessive rain are very common in this area. Tidal surges or floods overwhelm tube-well, ponds, and water bodies and pollute the natural emergence of freshwater [24]. This scenario is especially hazardous for coastal people like Barguna because most of the people have to depend on surface water and groundwater for drinking. As a result, the coastal people are chasing an endless crisis of water savings for domestic use and drinking also. This scarcity has been maximized by the casualty of water-borne diseases that is combined with sea level increases, salinity problems, and floods. Climate variance helps the generation of bacteria and virus pathogens [25]. It increases the conditions of water-borne diseases. Water-related diseases like cholera, diarrhea, and skin disorders increase due to changing patterns of climate. They are likely to junction the supply of pure water by floods and waterlogging. The inhabitants of Barguna district are extremely vulnerable during climate change because of the geographical location and most of the people live in the lower side of this area [26]. Environmental complexity coupled with poor socio-economic and infrastructural factors in this district. The people face salinity and waterlogging problems that eventually result in water-borne diseases and negatively affect human health [27].

5. Conclusion

This research has painted an exact scenario of the impacts of climate change on water-borne diseases, assessing that water plays a crucial role in the life of coastal people in the Barguna district. The study has elucidated the scenario of pure drinking water availability and also accessibility among people in the study area. Climate change ambivalently affects the quality of water resources and also water availability. Climate change is so mysterious causing both human activities and natural forces. Rapid population growth, unbalanced access to resources, food insecurity, long distance of collecting water, poor medical facilities, lack of poverty, and poor health system are responsible for people's vulnerability during

climate change in the study area. So increasing adaptive mechanisms, diversifying coping measures, controlling policy, regulatory measures, and also public awareness is regarded as the crying needs for combating the adverse impacts of climate change.

6. Recommendations

In the view of the findings above, the following recommendations are made.

- Drinking water that has been cleaned is advisable because drinking water straight from the surface is unhealthy. Additionally, we should be excused from eating horrible foods without thoroughly washing them.
- To thoroughly wash hands in soapy, warm water for at least 20 seconds, sluggishly rubbing hands together, and using bleach if necessary.
- To implement a land management strategy to fight climate change. For instance, reducing plantation, delaying deterioration, and improving the soil's ability to capture water are all examples of soil carbon conservation. Fertilizer shouldn't be used in excess anymore.
- Solar power can help reduce the use of fossil fuels by utilizing alternative energy sources like wind.
- The government should offer jobs to those who have lost their source of income owing to flooding or other climate change-related vulnerabilities.
- In addition to ensuring that there are as many cyclone shelters as possible in flood-prone areas, the government should also provide enough emergency supplies for those who are most in need.

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Public Health Implications

The most crucial element needed to sustain life is water. Public health is regarded as being at risk from contaminated water. The purpose of this study is to assess how climate change is affecting water-borne illnesses. Today, we understand that a wide range of ailments are caused by water-borne illnesses. People are exposed to health risks that can be avoided when water and sanitation services are absent, subpar, or improperly managed. Clean water is essential to our economy. People can avoid diseases brought on by contaminated water by using appropriate hygiene practices.

Ethical Consideration

The necessary ethical approvals were received and granted.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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