



Impact of Climatic Condition on Water Borne Diseases in Morena District, M.P (India)

KEYWORDS

Sanitary, poverty, exploitation, coastline and recreational

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ABSTRACT *Environmental pollution, a potential global problem has rendered waters along the coastline and recreational beaches unsatisfactory for public use. Population explosion and inadequate infrastructure to properly treat and dispose of the sewage, lack of sanitary condition, poverty and over exploitation of natural water has resulted in the discharge of considerable quantities of untreated waste in to the natural waters. climate change is expected to increase the severity of weather. it means that some regions with experience an increase in rainfall and flood risk, while some regions that are prone to droughts may experience more extreme droughts*

Introduction

In India, almost three quarters of a billion people live in rural areas without access to safe drinking water and water borne infection are a major cause of morbidity (patil et.al.2002). Higher temperature is hastening rates of evaporation of surface water there by reducing the availability of fresh water. Lack of fresh water compromises hygiene and hence increasing incidence of Diarrhoeal diseases in the country and worldwide

Diseases such as enteric fever and Diarrhoeal diseases are highly endemic to India and are major public health problems among the children under five years. The planning commission in its report "India assessment 2002 - Water supply and sanitation" acknowledgements that mortality and morbidity levels due to water borne diseases in the country are unacceptably high.

On the global basis, around 2 million deaths per year are especially to diarrhea in children (Gordon et. al 2004). Typhoid and paratyphoid fever resulting in an annual incidence of about 17 million cases worldwide (Kindhauser 2003) and India has the highest incidence of typhoid around 3million cases per year (Amon, typhoid in the Hindu, february2003).

A significant amount of disease could be prevented especially in developing country through better access to safe water supply, adequate sanitation facilities and better hygiene practices. In order to allow informed decision- making on interventions aimed at disease prevention and control, it is crucial to carryout a sound economic evaluation of the various options available in specific settings

Materials & Methods:

The method followed for the preparation of the research paper can be categorized into following steps

1. Collection of relevant data :

It is the collection of useful data which is related to the topic through directly or indirectly from the concerned departments or source that is easily available in local city Morena as IDSP, Meteorological department of Morena

2. Statistical analysis :

Lastly we analyzed the collected data from the various source of local city in statistical way and comprised the results that are found after analysis.

Study area

This case study is carried out at local city of Morena .Morena district is one of the 50 districts of the central Indian state of Madhya Pradesh. The name, Morena is derived from the mor

+ raina means the place where peacock is enormously found. Morena, which has an identity of being home to perhaps the largest number of peacocks in the India. The district is part of Chambal Division. The town of Morena is the district and divisional headquarters. The district has a widely dispersed population of 1,965,137 as of 2011. Morena is fifth district in state in density of population after Bhopal, Indore, Jabalpur, Gwalior.

The Morena climate can be termed as extremes, both in summer and winter. The summers are usually very hot and the winters very cold in Morena. The rains in Morena are, however, restricted only to the monsoon months. The north-western wind blows, predominantly, over the city of Morena

These variations cause the many adversely impact on the human and environment. That's directly related with many diseases –

Water - borne
Water - washed
Water - based
Water – related insect vector
Diseases caused by defective sanitation

· Climate :

The climate is temperate and temperature ranges from 30^o C to 45^o C in summers. The winter temperature ranges between 2^o C to 3^o C. The rainfall is very limited ranging between 500 mm to 1000 mm

· Status of rainfall in Morena :

Year	Rainfall(mm)
2007	441.1
2008	548.3
2009	482.9
2010	884.7
2011	614.3
2012	473.8

Heavy rainfall leads to surface runoff carrying disease causing agents to soil and drinking water bodies. It increases the chance of an increase in waterborne diseases in the region

· Sources of water in Morena :

There are two types of sources of drinking water –

A: Surface water

B: Ground water

A: Status of surface water:

Dams & ponds	Depth (in ft)	Current status (in ft)
pagara	430	385
Kutwar	290	255
Laxman talaiya	42	18
Badokhar pond	47	22
Morena gaon pond	38	10

Around the above mentioned dams, ponds and rivers are also the sources of surface water in Morena city most popular rivers are Chambal, Asan, and Kwari.

B: Sources of ground water:

In Morena region, there is a growing condition of scarcity of water due to high climatic temperature. The surface water bodies are insufficient and more polluted than ground water. Therefore, most of the population depends upon ground water for their domestic purposes. There are four types of sources for ground water supply in Morena city are – tube well, hand pump, wells, motor jet pump.

According to the data available from dept. of PHE Morena, the ground water availability in 2010 was 440 cu. km/annum it has reduced to 410 cu. km/annum in 2011. the cause of this reduction is due to the increasing temperature during summer season which is due to global warming and this increases various types of water borne diseases

Classification of water borne diseases:

Disease	Type of infection	Microbial agents	Sources	Symptoms
Cholera	Bacterial	Vibrio cholerae	Drinking water contaminated with bacterium	Watery diarrhea, nausea, cramps, nose bleeding and vomiting
Dysentery	Bacterial	Shigella dysenteriae	Drinking water contaminated with bacterium	Passage of feces with blood
Typhoid fever	Bacterial	Salmonella typhi	Ingestion of contaminated water	Profuse sweating and diarrhea
diarrhea	Bacterial and viral	Shigella, salmonella, E.coli	Intake of contaminated water	Abdominal pain, nausea, fever and bloody stool
Poliomyelitis (polio)	Viral	Polio virus	Virus enter water through the feces of infected individuals	Headache, fever, paralysis
Hepatitis A	Viral	Hepatitis A virus (HAV)	Can manifest itself in water and food	Nausea, vomiting, fever, jaundice

The reasons of increase in the number of diseases

1. Sewage mixing with water
2. Contamination due to effluent discharge containing chemicals from the industries
3. High quantity of chlorine mixing to purify the drinking water
4. Mixing of lead through corrosion or rusting of pipes
5. High amount of air pollutants and dissolved particles contaminating water bodies
6. Dumping of solid waste into rivers and dams
7. Depleting ground water table makes a large population dependant upon the rain water. This rain water contains various types of acids and pollutants which causes water borne diseases

Results & Recommendation

According to the data available from PHE department of Morena, following are the number of cases of water borne diseases year wise

Year	Dysentery	Gastroenteritis	Hepatitis A	Typhoid
2009	59	8241	1	916
2010	71	11201	9	677
2011	83	11657	8	719
2012	95	13544	11	856

Table: Result of water borne diseases, source PHE Morena

The number of various diseases has increase in year wise. The above data shows that many reasons are responsible for

Reasons of contamination in water:

- the treatment does not fulfil the cleaning of the water because only chlorine is given in high quantity and this chlorinated water carries the sediments of storage tanks or water tower of GMC to the reservoirs. This cause the water unfit for drinking purpose.
- The reservoirs and water towers are not cleaned from many years which cause sedimentation and growth of algal bloom.
- Various type of pollution, like air pollution, land pollution, and water pollution.
- Directly and indirectly effluent discharge from the industries into the surface water bodies and others.
- Open dumping of solid waste in different place.
- Poor maintenance of plumbing and solid waste management.

Status of water borne diseases in Morena:

According to the data available from district hospital, following are the number of cases of water – borne diseases year wise

The number of cases of dysentery and gastroenteritis has increased in 2009 where as typhoid cases have decreased in the same year for an unknown reason. The reasons in the increase in the number of diseases are the follow.

the increasement of water borne diseases in which rain fall and temperature are most common climatic factors which increases the level of water borne diseases. Heavy rainfall leads to surface runoff carrying disease causing agents to soil and drinking water bodies. It increases the chance of an increase in water borne diseases in the region.

Following recommendation prevent the rapid dispersal of water borne diseases:

1. The sanitation facility provided by the municipal corporation should be improved
2. The solid waste management of the city run by Municipal Corporation of Morena includes collection of waste and their disposal but many people dispose off their domestic waste in near by places which is carried away by rain water. There should be proper disposal facilities
3. The water treatment system must be monitored and improved
4. The pipe line through which treated drinking water is supplied must be checked
5. water filters should be adopted by the people
6. Personal hygiene practices must be adopted
7. Media should be involved for spreading and educating the mass about these diseases and their prevention
8. Government policies must be implemented for the betterment of the country

Conclusion

The current situation of Morena would not allow the total hy-

gienic conditions to prevail in these areas. It is suggested that the installation of water and sewerage connection may be provided by the government to the rural people free of cost. Government must have control to see such facilities are availed of by all to ensure complete environmental sanita-

tion. To achieve these goals and government policies each and every person should give his contribution. The ultimate goal to develop a society and a country should be the improvement of human health by improving and developing environment factors.

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