

# **River Pollution: Causes, Actions and Revival**

**For a better tomorrow, act today**



**Janhit Foundation**



## About Janhit Foundation

Janhit Foundation is an independent, not-for-profit non-governmental organization, actively engaged in the promotion of human welfare through environmental protection since 1998.

Key areas of work include:

- Groundwater quality protection for human health
- Provision of safe drinking water to marginalized communities
- Protection of river water quality for aquatic ecosystems
- Enhancement of available water resources through water conservation measures
- Promotion of sustainable agriculture by organic farming methods
- Environmental education and empowerment of local communities

Janhit Foundation undertakes this work through scientific research, campaigns, advocacy and grass-root level community involvement.

As a public interest organisation, Janhit Foundation focuses on strengthening local communities through their active participation in decision making, to achieve sustainable development. We believe that environmental degradation can only be addressed adequately if local people are empowered in decision making at all levels and have control over resources.

To achieve our goals, we work in partnership with government, non-governmental, national and international organisations on environment and human rights issues.

**Sonakshi Hudda**, *Editor*

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Address

### **Rain Centre**

C-28, Shastri Nagar, Meerut

Phones : 0121-2763418, 4004123

E-mail : [info@janhitfoundation.org](mailto:info@janhitfoundation.org)

Website : [www.janhitfoundation.org](http://www.janhitfoundation.org)

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## Preface

Rivers have a special place in the lives of the Indians. They consider rivers to be sacred, take holy dip during *Amavasya* (New moon), *Pooranmasi* (Full moon) and on other religious occasions. River water is used for irrigation which in return gives food to the people. They also maintain the ecology of the region and bring prosperity. An area without a river is considered to be poor. Unfortunately, during the past two decades the river water quality has deteriorated at a rapid pace. One of the major reasons for this is the untreated waste water being released to the rivers, turning them to be a dirty drain. The Ganga and the Yamuna, the two most sacred rivers of our country are no exception to it. Thousands of crores of rupees is being pumped to save the rivers through various plans.

The present booklet is a small initiative towards creating awareness amongst the community about the importance of rivers and how the community is affected if they are not properly managed. I hope the booklet when distributed to various stakeholders like the community, students and teachers, government officials and scientists would create an impact on the minds of people which in turn would find solutions to this monstrous problem.

I sincerely thank Mr. Anil Rana, Director of Janhit Foundation to give me sufficient background material and tips to document this work. I also thank Mr. Anuj Sinha, Head, *Rashtriya Vigyan Evam Prodyogiki Sanchar Parishad* and Dr. Pamposh Kumar, Sr. Scientist to support Janhit Foundation towards the publication of these booklets.

*Let us join together to save our rivers.*

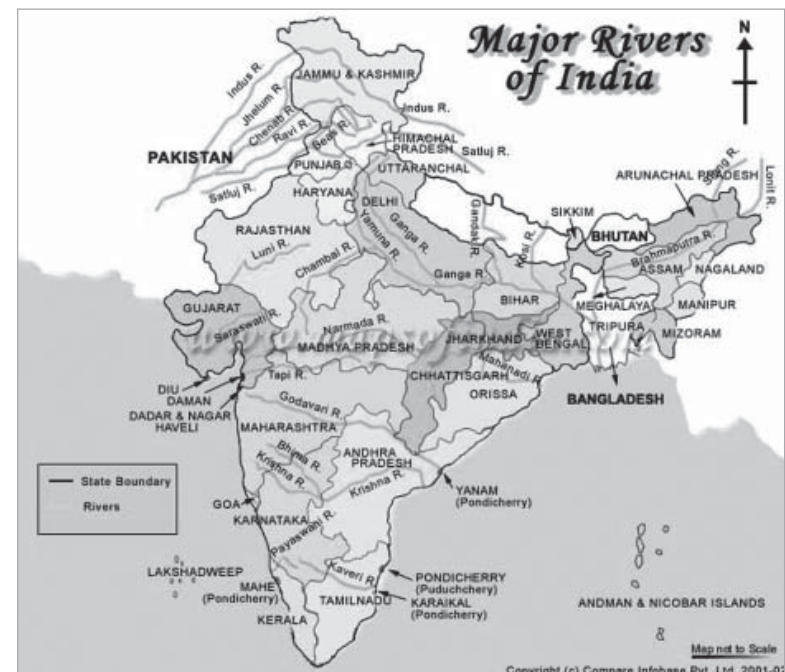
Sonakshi Hudda

## Introduction

Water is the source of life. It covers 70% of the Earth. But only a small portion of this precious natural resource is fit for human consumption. Out of the earth's total water, 97% is stored in oceans which is not fit for human consumption. The further 3% is stored in various sources like rivers, lakes, and under-ground aquifers.

## Rivers of India

India is a blessed country when water sources comes into question which is available in the form of numerous rivers and lakes. It has 14 major, 55 minor and numerous small rivers. India is often referred as the "Land of Rivers". In fact riverbanks first hosted human civilizations in India as elsewhere in the world. Rivers in India play important social



and economic roles. This is the reason why Indians worship rivers as goddesses. Our mythologies are full of stories glorifying the rivers.

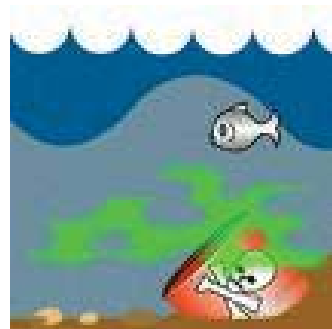
Our current life is totally dependent on rivers. The river systems provide irrigation, potable water, cheap transportation, electricity, as well as livelihoods for a large number of people all over the country.

Some important rivers of India are:

Brahmaputra	Cauvery (Kaveri)	Chambal	Ganga (Ganges)
Godavari	Gomati	Hindon	Indus
Jhelum	Kali	Krishna	Narmada
Periyar	Ravi	Sutlej	Yamuna

### Pollution of Rivers

The spiritual reverence for rivers remains intact. But the physical well being of the rivers show that we have totally failed in keeping our reverence for rivers. Rapid growth in industrialization to support the country's growing population and economy has polluted our rivers like never before. Studies show that domestic and industrial sewage, agricultural wastes have polluted almost all of Indian rivers. Most of these rivers have turned into sewage carrying drains. This poses a serious health problem as millions of people continue to depend on this polluted water from the rivers. Water-borne diseases are a common cause of illness in India today. The bad effects of river pollution are not limited to human population only. Pollution of river has affected animals, fish, and bird's population, sometimes threatening their very existence. Polluted water seriously affects the reproductive ability of animal and fish species in rivers thus making them extinct in future.



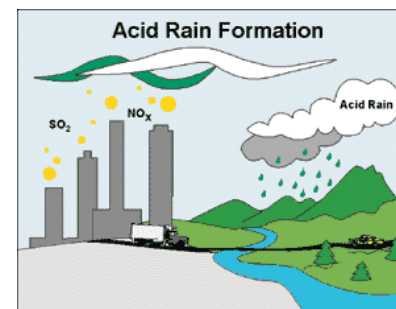
### Causes of Pollution

There is no sign of river pollution being stopped. It is increasing day by day. There are several sources of water pollution, which work together to reduce overall river water quality. Industries discharge their liquid waste products into rivers. Our agriculture practice that uses chemical fertilizers and pesticides also contribute to river pollution as rainwater drains these chemicals into the rivers. Domestic wastes that we throw into rivers adds to pollution levels. As population grows, the size of towns and cities also grows. With that the amount of domestic wastes that we throw into river increases. In most of the towns and cities, the municipal drains carry our wastes to rivers. There are examples of rivers catching fire because of high pollution levels. This shows how seriously polluted our rivers are.

In our everyday life we can easily see symptoms of river pollution. The floating dead fishes in our river, any coloured water in the river, or a bad smell from the river point towards river pollution. If you see or feel any of these things in a river be sure that the river is a victim of pollution. River pollution can be due to the causes below:

#### a) Acid rain

Rain falling through polluted air absorbs some of the pollutants. Polluted air contains many poisonous gases such as sulphur di-oxide (SO<sub>2</sub>), oxide of nitrogen (NO<sub>x</sub>) etc. that



react with rainwater to form acids. We call this acid rain. On reaching the ground the acidic rainwater has many effects. It can release harmful substances such as aluminium and heavy metals from the soil. These are normally present

in an inert and harmless state, but acidic conditions result into many compounds poisonous to plant and animal life. When washed into rivers, lakes and streams they can kill small water creatures and fish.

#### **b) Industrial pollution**

Lot of industrial wastes discharged into water are mixtures of chemicals, which are difficult to clean up. Increase of the heavy metals in industrial waste water that drains into rivers has resulted in severe river pollution. Some industrial wastes are so toxic that if they are not immediately and strictly controlled then it will become very expensive later to deal with. Some industries try to cut the costs of safety measures by illegally dumping chemicals at places where they think they will not be caught. These dumped wastes then runs off into river alongwith rain water.

#### **c) Agricultural pollution**

The extensive uses of chemicals in the form of fertilizers and pesticides in agriculture have left the water bodies contaminated with heavy metals. Such heavy metals enter human body through the food we eat, and many of them cause health problems such as cancer. When waste in the form of



chemicals or liquid manure enter rivers, the amount of oxygen in the water reduces. Without sufficient oxygen no life form can survive in a water body. It also permanently changes the nature of river. Another serious contaminant from agriculture is nitrate apart from heavy metals. Nitrate is found in agricultural chemicals. The water running off from agricultural fields brings nitrate into rivers. We also intake nitrate through our drinking water when sourced from the river. Some experts believe that high levels of nitrate in drinking water may pose a serious threat to health.

#### **d) Oil Pollution**

Careless people can also pollute rivers and harm wildlife by pouring things like used car oil and paint into drains. If oil enters a slow-moving river it forms a rainbow-coloured film over the entire surface preventing oxygen from entering the water. As mentioned above, without oxygen the river is biologically dead.

#### **e) Other sources of pollution**

- Phosphorus from household waste water and sewage is another powerful pollutant. It comes from detergents and stays in rivers for a long time where it takes up valuable oxygen. Only few sewage systems are equipped to remove phosphates.
- Disposal of solid waste, plastic bags and flower garlands into rivers.
- People defecating in open and near rivers contribute to river pollution.
- Animals washing and wallowing in the river
- The practice of dumping human remains in the river also poses health threats because of the unsustainable rate at which partially burned bodies are dumped. The dumped dead bodies of people suffering from certain infectious diseases spread pollution and epidemics.

## River pollution in Western Uttar Pradesh

Western UP has many big and small rivers. Ganga, Yamuna, Hindon, Kali (East & West) and Krishna are the important rivers that sustain the region's lives. But over the past few decades, these rivers are continuously being polluted. They are so polluted that many think the rivers now take lives instead of giving it.

### Major rivers flowing through Western U.P.

Name of the river	Total length	Starts from	Ends at
Ganga	2525 Sq. km	Gomukh (Gangotri)	Pathar (Bangladesh)
Yamuna	1376 km.	Yamunotri (Uttarakhand)	Allahabad (Uttar Pradesh)
Hindon	200 km.	Saharanpur	Momnathal Village (Noida)
Krishni	78 km.	Krishni Village (Saharanpur)	Barnawa (Baghpat)
Kali River (East)	300 km.	Antwada Village (Muzaffarnagar)	Kannauj (Uttar Pradesh)
Kali River (West)	75 km.	Gagnoli Village (Saharanpur)	Pithlokar Village (Meerut)

**Hindon River:** The River Hindon formerly known as *Harnandi* originates from Saharanpur district and after covering six districts finally meets the Yamuna River near Noida. It is a dead river today. Many of the villagers use the river water for drinking purposes. Owing to high concentration of contaminants like heavy metals and pesticides, the rural community residing on its banks is facing serious health problems.

There are thousands of people suffering from serious ailments like cancer, stomach diseases, neurological disor-

## Heavy Metals in Hindon River

Place	Metal	Permissible Limit (mg/l)	Content exceeding the permissible limit
Sharakthal (Saharanpur)	Lead	0.01	179 times
Budhana (Muzaffarnagar)	Chromium	0.10	122 times
Mohannagar (Ghaziabad)	Lead	0.01	14 times
Momnathal (Gautambudh Nagar)	Chromium	0.10	36 times

Source : A study report of Janhit Foundation

ders and skin diseases. A study of the water quality of Hindon river by Janhit Foundation shows that the water in the river has heavy presence of lead, cadmium, chromium and a number of pesticides in hundreds of times more than the permissible limits.

**Kali River (East):** Kali originates from a village called Antwada in Khatauli Block of Muzaffarnagar district in Western UP. It flows through a distance of 300 kilometers covering Meerut, Ghaziabad, Bulandshahr, Aligarh, Etaha,



### Heavy Metals in Kali River (East)

Place	Metal	Permissible Limit (mg/l)	Content exceeding the permissible limit
Ajhota	Manganese	0.01	18,250 times
Kudla	Chromium	0.05	140 times
Jalalpur	Cadmium	0.003	333.3 times
Behchola	Nickel	0.02	600 times
Ulhaspur	Jasta	5.0	248.6 times
Kudla	Iron	0.3	33,340 times
Dedwa	Copper	0.05	2,040 times

Source: The study report of Central Ground Water Board (Govt. of India)

### Heavy Metals in Kali River (West)

Place	Metal	Permissible Limit (mg/l)	Content exceeding the permissible limit
Malira (Muzaffarnagar)	Chromium	0.10	30 times
Pithlokar (Meerut)	Lead	0.01	112 times

Source: The study report of Janhit Foundation

Farukhabad and Kannauj districts before meeting the Ganga river near Kannauj. There are hundreds of villages situated on the banks of the Kali (East). The people from these villages utilize the water of this river for irrigation and livestock rearing.

The untreated effluents of chemical plants, sugar mills, distilleries and slaughterhouses have made Kali River (East) almost dead. The water has turned black with hardly any oxygen left in it. Like other rivers, this river is also considered as holy and pure. The river has got the name since it is believed that it's water used to cure black cough (*Kali Khansi*). Till 1980s, the water in the river was clean. However, now the river has changed literally black in colour very similar to its name.

### How river pollution affects our lives: The case of Jaibheem Nagar

Jaibheem Nagar, a slum locality in Meerut city is located on the bank of Kali River (East) near the medical college. The water quality of the river is so bad that it has even let to the contamination of underlying ground water. As a result of which, women and children especially young girls have to cover a tiresome journey of 2-2.5 kms everyday to fetch clean drinking water for their families. Preliminary analysis of drinking water samples by Janhit Foundation revealed excessive contamination of the river water. The test found heavy metals like mercury, chromium, cadmium and lead in water samples. These metals can cause many serious health problems.

### Results of Heavy Metals Study in Jaibheem Nagar

Source	Metal	Permissible Limit (mg/l)	Content limit more than the permissible limit
Pond water	Lead	0-05	5 times
Pond water	Mercury	0-001	12 times
Pond water	Cadmium	0-01	6 times
Pond water	Chromium	0-05	3 times
Kalu's private hand pump	Iron	0-3	75 times
Kalu's private hand pump	Cadmium	0-01	3 times
Ramdhari's private hand pump	Iron	0-3	13 times
India Mark II hand pump	Iron	0-3	5 times
Goraknath's private hand pump	Lead	0-05	3 times
Goraknath's private hand pump	Mercury	0-001	3 times
Rambhul's Private hand pump	Iron	0.3	66 times

Source: The study report of Janhit Foundation

Due to this contamination in drinking water the residents of the slum suffer from epidermal, gastrointestinal, neurological disorders and cardiac ailments. Pregnant women and children are the worst affected. The residents have abandoned a number of hand pumps since the water coming out of them is severely contaminated.



### How to control river pollution?

Controlling river pollution is in our own interest. As citizens of India we have constitutional duty to protect our environment. Similarly, the government also has a duty to protect the environment for the welfare of its citizens. There are many ways we can protect the river from pollution. Some immediate ways to control pollution are:

- Industries should install machineries to remove contaminants from their effluents and wastewater. One way to do so is installation of Effluent Treatment Plant (ETP). This way we can control pollution at the source itself.
- The towns and cities should also have facilities to clean the sewage effluent. All towns and cities must have Sewage Treatment Plants (STPs) that clean up the sewage.
- Farmers should give up chemicals and pesticides in farming and should instead adopt organic methods of farming thus reducing chemical pollution of rivers.
- We should stop our religious practices that pollute river water.

- Proper drainage and sewage systems should be adopted that will not allow the polluted water to mix with river water.
- Ban on *Dhobi ghats* alongside the river.

### How should I contribute to make the rivers clean?

As pointed out above, it is our duty to protect our environment. An individual effort may not be sufficient to clean our rivers, but when all of us contribute towards this goal it becomes a big effort. Thus it can help in cleaning up our rivers. There are many ways you can contribute towards a clean river in your locality:

- Promoting communities participation in local river cleaning up
- Organizing awareness programs and meetings on the river pollution and its threats
- Distribution of literature on the causes and ill effects of river pollution
- Talking to our family and friends for spreading awareness on the importance of good water quality and clean rivers.