



WATER POLLUTION, ITS EFFECTS AND PREVENTION- AN AYURVED PERSPECTIVE

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ABSTRACT

Pollution is introduction of contamination into a natural environment that causes instability, disorders, harms, or discomforts to the ecosystem. Today not a single component of ecosystem is pollution free, which ultimately results in destruction of lives. water pollution is the biggest threat on the earth in this era. According to a research article published in a journal, more than 1 billion people in the world don't have access to safe drinking water & 5000 people die every day as a result of drinking unclean water. This unhealthy environment is mentioned in Charak *Samhita* under the title of '*Janapadodhwansa*'. In Ayurveda we have so many remedies and measures given by our ancestors to detoxify the poisoned environment. In today's condition those remedies can be proved very helpful in prevention and eradication of pollution

Keywords: *Janapadodhwansa*; Water Pollution; Environment; Detoxification.

INTRODUCTION

According to 'WHO' Health is a state of complete physical mental and social wellbeing and not merely an absence of disease. For healthy and happy living of

human beings, it is necessary to maintain 'Environmental purity'. Life thrives on two types of environment from which the organism gets its food, water

& air to survive & the internal environment which regulates the various metabolic processes at cellular and sub cellular level for life to be sustained. So, the quality of external environment is to be sustained for healthy life.^[1] During ancient times, atmosphere poisoning was done as a military operation to harm the enemy by introduction of toxic substances to water, air and land. The effect was not only confined to humans it affected the birds, flies, animals and even insects. The term was known as *Samarik Visha*.^[2]

The greatest problem mankind facing today is environmental pollution, increasing with every passing year. However, it existed from centuries, but it became significant after the industrial revolution in 19th century. Water is one of the basic needs for the mankind and its pollution is the biggest threat to the life. In Ayurveda water is one among the five *Mahabhootas* and *Prana* of the *Prushti* i.e. life. Even before the thousands of year *acharyas* of Ayurveda have analysed and described the issue of water pollution, its causes, its preventions, its impact on the body and environment and the purification measures of the polluted water.

In this article I am going to review the ayurvedic perspectives of water pollution, its causes, its preventative measures and its management on the basis of ancient *Samhita Granthas*, modern literatures and recent researches done on the related topic.

Aim – To study the pollution of water, its effects on environment and human life and its preventative measures prescribed in Ayurved literatures.

Materials & Methods:

Materials for the review will be collected from

1. Ancient Classical Texts
2. Modern literature.
3. New Researches related to this topic.

Review of Literature

Janapadodhwansa – it is the term coined by Charka. Destruction of population living in same area simultaneously due to 4 main reasons i.e. *Dushitvayu* (Air), *DushitJala* (water), *DushitDesh* (land), *Dushitkaal* (time) & this mass destruction is through epidemics, it is termed as *Janapadodhwansa*.^[3]

Charaka has mentioned ‘*Adharma*’ as a root cause of *Janapadodhwansa*.^[4]

Adharma – Inconsiderate, Self-Serving, Exploitative and Short-Sighted behavior of human.

Effect – It leads to upsetting of natural laws & tipping of nature’s delicate balance.

Current scenario-

Causes of water pollution^{[5][6]}.

1. Industries–Dumping of industrial waste in natural water affects –
 - The ph of water
 - Color of water
 - Temperature of water
 - Amount of minerals and salts present in water.
2. Urbanization -
 - Construction of houses, industries, roads etc. disturbs the physical quality of land.
 - Chemical pollution from mines etc.
 - Inadequate sewage collection
 - Increased use of fertilizers to grow more food.
3. Deforestation-
 - When the soil is stripped off from its protective vegetation it becomes prone to soil erosion.
 - Clearing of forest lands for sake of urbanization & industrialization causes soil erosion which leads to increase in murkiness of water resulting in pollution of water.
4. Mining –
 - Mines produce wastes that increase unnecessary amount of salts and minerals in water.
 - It also affects the pH of water and increases murkiness.
5. Agriculture-Increased use of pesticides and insecticides pollutes ground water.
6. Oil spills in ocean –Oil spills from ships and tankers while travelling pollutes sea water and forms a thick sludge.
7. Daily activities-Daily activities like washing of clothes, utensils, pets near river, ponds and lakes pollute water.
8. Acid rain- when acidic particles caused by air pollution in atmosphere are mixed with water vapors results in acid rain

9. Euthropication – it is an increased level of nutrients in water which depletes O₂ level resulting in destruction of aquatic animal population.

Nature of toxic water ^[7][*Vikrit jala*]-

Abnormal and intense smell, color, taste & touch. Sliminess, frothy and containing lines on it. Aquatic animals in such water die. Birds and animals who consume such water also suffer.

Nature of Pure Water ^[8](*ShuddhaJala*)

The water without any Smell, Taste, Clear, Cold, Light, and satisfies the thirst is pure water.

Effects of water pollution ^[9]-

1. Environmental degradation-

Water pollution hazardously affects humans, animals, and water life therefore resulting in environmental degradation.

2. Human health-

Polluted water consumption may result in diseases like cholera, diarrhea, typhoid, etc. people can get disease like hepatitis by consuming sea food that has been poisoned.

3. Disruptions of food chains-

Water pollution disrupts the food chain as well. Pollutants such as some heavy metals are eaten by tiny animals, later these animals are eaten by fishes and the food chain continued to be disrupted at higher levels.

Prevention of water pollution-

In Ayurveda '*Nidanparivarjana*' i.e. exclusion of root cause is said to be the best preventative major.

Groundwater pollution can be prevented in following ways-

1. Monitoring aquifer –Strict regulation of hazardous waste disposal can help to control water pollution.
2. Storing of hazardous waste above the ground level.
3. Restriction of fertilizers use - fertilize the gardens and plants with compost instead commercial inorganic fertilizers.
4. Minimize the use of pesticides.
5. Restriction of use of pesticides near water bodies.

Purification of polluted water-

Ayurvedic parameters for the purity of *Jala* are –

Roopa (appearance); *Varna* (color); *Gandha* (smell); *Rasa* (taste); *Guna* (quality); *Veerya*; *Vipaka*; *Prabhava*; *Dosha*; *Karma*

Following are the purificatory methods mentioned in *sushrut samhita* –

1. Filtration through thick cloth – Filtration of water through the thick cloth causes separation of infiltrate and helps to make water clear.
2. Boiling ^[8] - Effective in disinfection of water. Boiling the water at high temperature kills most of the microbes like bacteria's, viruses etc. it also makes the water *laghu* which makes it easy to digest and improves the *Gunas* (quality) of *Jala* (water).
3. Making water clear with herbs^[8]. Several drugs for *Jalaprasadan* are mentioned by Sushruta like *Katataka*, *Gomedaka*, *BisGranthi*, *Shaiwal Moola*, Filtration with cloth, addition of *Mukta* and *Sphatik* and are named under the title '*Saptakalushasya-prasadanani*'. It helps to remove turbidity of water. Also, it makes water more potable.
4. *Dhavashvakarnadiyoga*^[8]- *DhavaAshvakarna*, *Asan*, *Paribhadra*, *Patla*, *Siddhak*, *Mokshak*, *Amaltas*, *Somvalka* are burnt and this ash is then mixed with water. *Matra* – 1 *anjali* of ash purifies 1 *ghata* of water. This *yoga* even if used in this modern era gives the desirable results and helps to make water more potable. In Ayurveda many researches are going on this *yoga*.
5. Copper purification ^[8]- Keeping water in copper or silver vessel is also one of the ancient methods of purification.
6. Immersion of heated metallic rods in water – Metallic rods are heated to the desired temperature to make them red hot and then are immersed in the water this method helps to make the water pure.
7. Exposing of water in direct sunlight- this is practiced in today's era also exposing the water under the direct sunlight helps in purification and make the water toxin free ^[8].
8. Removing unpleasant smell – By adding some fragrant flowers like *Patla*, *Karvira* etc. researches on this are done on the Hebrew university and

results shown marked reduction of toxins in the water.

9. *Jalanikshepana* – it is explained in *Sushrutasamhita* which means storage of water in specially made chamber like pots with *amlakifalaka* and *munjalalay*. It helps to make water pure, potent and cool.

DISCUSSION

Water is one of the basic elements for human life. In today's era pollution is the greatest threat to the mankind and water pollution is worst of them all. Ayurved does not only deal with the human health but it also shares knowledge of proper balancing of ecosystem. If we see in detail most of the causes of water pollution are due to inconsiderate and self-serving human behavior which comes under the 'Adharma' which has been stated as a root cause of pollution by Charaka. In our ancient science our acharyas have analyzed this problem of water pollution thousands of years ago and gifted us the holy science with all the remedies we can use in today's era. The methods described by our acharyas are very effective even after thousands of years and some are still practiced. If the above methods are used in combination of two or three might be found more effective than other modern chemical purification processes. With less expenditure and more efficacy. So, using this knowledge in today's era we can obviously get some sigh of relief from the polluted water by preventing and decontaminating it with the procedures mentioned in our ancient texts. Though these ancient methods need to be studied more deeply and more researches should be done on this topic. In this article I tried to focus the preventative and decontamination methods that may be useful for society in present situation.

CONCLUSION

The fastest growing industrialization and urbanization are the main causes of environmental pollution. Today lots of work is going to control the pollution. Ayurveda also have so many remedies & measures given to detoxify the contaminate water, using these remedies

in existing conditions may be found helpful in prevention of water pollution.

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