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A Legal Analysis on Water Pollution Pertaining to Periyar River of Kerala

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ABSTRACT

Life under water is not only part of Environmental diversity but also the source of livelihood for many and a balance-maker for environmental sustainability. In this world of technological commonality in a Global village, the relevance of ecological resources, especially the rivers, is coming to an end due to human intervention and the upholding of self-satisfactory elements of human intellect for a better standard of living.

Recently, the Government of India, under the guidance of the National River Conservation Directorate, decided to initiate a project on the ecological conservation of Indian rivers, especially focusing on six rivers, including the Cauvery, Godavary, Mahanadi, Narmada, Barak, and Periyar, in order to intensively study the aforementioned rivers and analyze their ecological status for conservation planning. This includes the longest river of Kerala, the Periyar, which is a 225 km resource, starting its journey from the Sivagiri hills to the Cochin backwaters, connecting both Kerala and Tamil Nadu, and is facing aquatic pollution as an effect of Human intervention, implicating the lack of ecological resources.

Thus, it is a need of the hour to have a look at how the selfish motivation and unending needs of humanity affect the biological resources, especially focusing on the Periyar river of Kerala and the impacts of the after-effects on the community that relies on this river and on the environmentally sustaining balance mechanism. The researchers tries to convey the aforementioned issues by connecting the pollution happening in the Periyar River in Kerala with the guiding light of judicial precedents and ecological reports.

Keywords*: Environment, Sustainability, Rivers, Human Intervention, Pollution.*

I. INTRODUCTION

"Everything originated in water and everything is sustained by water."

\- Johann Wolfann Von Goethe

Comprising over 70% of the Earth's surface, water is undoubtedly the most precious natural resource that exists on our planet. Without the seemingly invaluable compound comprised of hydrogen and oxygen, life on Earth would be non-existent: it is essential for everything on our

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planet to grow and prosper. Although we as humans recognize this fact, we disregard it by polluting our rivers, lakes, and oceans. Subsequently, we are slowly but surely harming our planet to the point where organisms are dying at a very alarming rate. In addition to innocent organisms dying off, our drinking water has become greatly affected as is our ability to use water for recreational purposes.

Pollution is the biggest threat to our existing water resources both fresh water and seawater as well as to mankind. For example, globally, estimates suggest that nearly 1.5 billion people lack safe drinking water and that at least 5 million deaths per year can be attributed to waterborne diseases. In India a staggering 70% of the available water is polluted. It is estimated that 73 million work days are lost every year due to water related diseases, such as typhoid, infective hepatitis, cholera, diarrhoeas and dysentery. Many of them become epidemic proportions. It is in this context that there is an urgent need to look at the matter and propose some solutions so as to make the current legal regime more productive and effective.

(A) Literature Review

- **The Central Pollution Control Board (CPCB) of India**, in association with **State Pollution Control Boards (SPCBs) / Pollution Control Committees**(PPCs) reveals that, ”organic pollution is the predominant cause of water pollution. The river stretches are polluted mainly due to discharge of untreated / partially treated sewage and discharge of industrial wastewater”.
- **R. Buckminster Fuller**, a renowned American creative designer and Architect said; “Water pollution is nothing but the resources we are not harvesting ,we allow them to disperse because we have been ignorant of their value”.
- **Ronald Reagan**, the 40th president of USA, opined; “We still have too much air and water pollution and we still need to work to reduce it, but we also need to put the problem of pollution into a historical as well as scientific perspective”.

(B) Research Question

1) What are the implications of Industrial effluents in constituting water pollution?
2) How the human activities affect the ecological balance of Periyar river?
3) How Judiciary helps in protecting water bodies from exploitable activities?

(C) Objective

The researchers try to convey the effect of human activities constituting the water pollution in Indian rivers, pertaining to Periyar River in Kerala with the guiding light of judicial precedents

and ecological reports of India.

(D) Methodology

The present study is based on secondary data collected from various sources about available information on "A Legal Analysis on Water Pollution Pertaining to Periyar River of Kerala". Also the secondary data has been collected from different sources which include the official data as well as available literature on the subject from different journals, books, newspaper articles, court judgements etc.

II. INDUSTRIAL EFFLUENTS – CATALYST OF CREATING WATER POLLUTION IN RIVERS

On the World Water Day of 22nd March of 2022, Pedro Arrojo Agudo, who is the UN special rappoteur on Human rights to Safe Drinking Water and Sanitation, indicated the need of protecting of aquatic resources including the riverbanks and their ecosystems as he said:

"In the face of increasing climate variability, the key to adaptation strategies lies in strengthening the resilience of the water cycle by recovering and conserving the functionality of the most inertial ecosystems of the water cycle: wetlands, riverbank ecosystems, riverbeds, and, above all, underground aquifers."

The contamination of water resources has been started with the advent of Industrial revolution, way back to the middle of 20th century when the rivers were contaminated with chemicals, harming animal as well as human life. This man-made phenomenon is defined as an "addition of some substance (organic, inorganic, biological or radiological) or factor (heat), which degrades the quality of water so that it either becomes health hazard".

The level of water pollution has been raised on four reasons, which includes domestic waste water omitted from households with connection to public sewage systems, agricultural waste resources which is the contamination of water resources made by the farm animal waste or pesticides or chemical fertilizers from the agricultural lands, pollution from thermal and nuclear industries, radio-active water contamination, solid waste pollution created by garbage and the Industrial effluents.

Among these causes, the most emerging reason is none other than the pollution caused by the industrial waste discharge. As the scope of Industrial developments gets broad in this era of Technology, most of the industries like food-related industries, chemical industries, plastic industries, oil refineries etc., use water a lot. Also, the quality of water also varies from the type of industrial structure and the method of usage. Thus, such industrial units discharge several

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organic and inorganic waste, where some of the inorganic components of metals, chlorides, cyanides, thiocyanides, sulphates, alkalies etc., does not dissolve with the water and creates ecological changes to the water.

One of the best examples which can forward is the issues faced by the Sarno river of Italy, which is in-record as the most polluted rivers of the world. The aforementioned river is 24 kilometres long, with Solofrana and Cavaiola as their tributaries, covering up three provinces and not lesser than thirty-nine municipalities in Campania region of Southern Italy. The major environmental emergency regarding the river is that it involves a population between 705,000 and one million, which also has agrifood and tanning industrial centres, which constitutes as a driving force of the local economy as well as the highest sources of environmental pollution.

The Civil Protection Department of The Presidency of the Council of Ministers in Italy, further says in their reports; "The combination of high-density population and the presence of highly polluting economic activities have given rise to an extremely precarious environmental situation in this area, which represents an insurmountable obstacle in the way of all prospects of growth. In fact, the serious state of environmental decline, as well as making massive redevelopment measures necessary, suffocates the natural and historical-archaeological wealth of this area, making socio-economic development impossible. Also, the decontamination of the river Sarno, which began with the Special Project for the reclamation of the entire Bay of Naples in 1973, is a story, which, after over thirty years, has not yet reached a conclusion, despite the ongoing attention it receives from institutions." Here, it can be inferred that the major source of the pollution is nothing but the industrial discharge of waste, causing contagious diseases , also leading the death of humans as well as the animals, in a

Another example of the heinous river pollution is the pollution occurred to the Citarum River in the West Java of Indonesia, which runs over 270 kilometres connecting thousands of people by supporting the food , water and electricity support to more than 25 million, irrigating thousands of hectres of rice fields and supplying the nation's largest reservoir. But, the emergence of many waste-disposing factories along its shores, this living spine has been held under the contamination and the loss of biodiversity. The quality of water across most of the parts of the river has been found unsafe for the human health. In 2018, the Government of Indonesia has been establishes a seven-year revitalisation program named as "Citarum Herum" , with the goal of making the water of Citarum river drinkable by the year 2050. This plan has been supported by the International Monetary Fund and Asian Development Bank, also with the implementation of reforestation of surrounding mountains, extracting toxic sediments, regulating proper discharge of wastewater and environmental education projects.

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The after-effects of the illusion of Industrial water are constituted as a severe effect towards not only to the aquatic biodiversity, but to human health also. When coming to the aquatic biota first, Dissolved Oxygen (DO) O_2 is the important content of water, which makes the freshwater resources to be eligible for the survival of aquatic organisms. So, the presence of organic and inorganic wastes which is present in water decreases the dissolved O, content of the water.

A number of factors like surface turbulence, photo-synthetic activity, O_2 consumption by organism and decomposition of organic matter are the factors which determine the amount of DO present in water. Thus, the higher amounts of organic waste increase the rates of decomposition and O, consumption, thereby decreases the DO content of water. Oxygen depletion is a major cause for the hazards for the contaminated water. This is caused by the sewage, agricultural wastes etc., in which the contamination of the water bodies by the pollutants reduces the DO content and affects the survival of aquatic organisms like plankton, fishes etc,. Industrial effluents also constitute another cause for hazardous water pollution, where chemical substances like heavy metals, polychlorinated biphenyls and pesticides cause fish diseases.

Human health is severely affected with the Industrial pollution. Nitrates, which are the presence of the salts of the nitric acid, can cause health issues when it is present in the drinking water. When a person eats contaminated seafood or drinking water, he or she ingests the elements of micro plastics. The scientists of Tokyo Bay made a research by examining 64 fishes belonging to Anchovies breed and found out that the amount of micro plastics has found in their digestive systems approximately in 77%. Also, the dissolution of heavy metals causes imbalance of the chemical elements of water and affects severely on human health when this water is getting consumed. The element of mercury contained in the waste water are converted by bacterial action into extremely toxic Methyl Mercury, which can create numbness of limbs, lips and tongue, deafness, blur in vision etc.

Apart from this, the polluted water from sewage contains pathogens like virus, bacteria, parasitic protozoa and other worms. Thus, such contaminated water is also a source of water-borne diseases like Jaundice, Typhoid, and Cholera etc. It also affects the human teeth by the excessive presence of fluoride, which leads to deformity of teeth. Thus, it is important to have a clear Idea on the impact of the pollution happening to the Periyar river of Kerala and the the health consequences on the population relied on this river.

III. EFFECT OF ECOLOGICAL BALANCE IN PERIYAR RIVER DUE TO HUMAN ACTIVITIES

(A) The geography of Periyar River in Kerala:

Periyar River, which is also known as the "Lifeline of Kerala", which is flowing in perennial nature in 244 kilometres. This longest river originates from the Sivagiri peaks of Sundarmala, Tamilnadu, and flows through Periyar National park and reaches the river. From there, it goes through Idukki dam and reaches the Arabian sea through Vembanad Lake. Also, a portion of the water of this river is diverted through a tunnel into Vaigal river of Tamilnadu state. Also, this river is a source for some of the villages in Tamilnadu, which is affected by drought. But, rest of the part is flowing through Kerala, especially through the districts of Idukki, Thrissur and Ernakulam.

(B) The Mapping of river:

The journey of Periyar river starts from the Ghats in the North, and emerging as a west-flowing tributary, by joining with Mulllayar, in Mullakudy. The river flows through various parts of Periyar Tiger Reserve. Also, it forms a border between the Periyarian portion of the reserve in the eastern side and the Sunderamala section in the western side as it flows in lower downstream. Also, in further eastern side, it again creates a boundary with Moolavaigai and Thannikudy, and in the western side, it forms a border with Ummikuppan, Mlappara, and Aruviyoda. Further, it joins together into the Periyar Lake. The Lake is formed by a Mullaperiyar dam made at the confluence of the Periyar and Mullayar rivers. Some of the water is diverted into the Nirar, a Tamil Nadu tributary and also redirected through a tunnel and reaches the Suruliar River, which is a tributary of the Vaigai River.

Now, the river is flowing to the north in down streams and flows through Vandiperiyar,Elappara, Ayyapannakovil and to Idukki, into a reservoir made by three dams; Cheruthoni, Idukki and Kulamavu, which is also a major source of production Hydro-electricity. The river flows through North –West wards and downward from the mountains and go west side in order to the coastal region of Ernakulam District. When it reaches Aluva, Ernakulam it splits to two branches - Mangalapuzha and Marthandavarma, where Mangalapuzha joins with Chalakkudi river in Thrissur and joins the Lakshwadeep sea at Munambam and Marthandavarma branch flows to south and through the Udyogmandala region, it reaches the Cochin backwaters. The length-to-width ratio of the river is 6: 1 and the basin of the river covers the most of the central Kerala with a total square kilometre of 5,398 square km, with a shape of inverted "L" letter with the intersection at the widest point.

(C) **Amount of Sewage and Garbage in Periyar River**:

Fecal coliform level in Periyar from the sewage monitoring station was well over the

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permissible limit of 500mpn/100mL, with an average of 113,000mpn/100 mL.

(D) Agricultural Runoff in Periyar River:

The river directly receives civic effluents from townships like Vandiperiyar, Munnar, Malayattor, Perumbavoor, Kalamassery, Aluva, and Paravur. Of Ernakulam district.

(E) Industrial pollution in Periyar River:

None of these local bodies possesses proper sewage treatment facilities, resulting in the discharge of hazardous pollutants like phosphates, sulphides, ammonia, and fluorides into the river. The intensive agricultural practice along the banks and watershed area has been enriching the river water with huge amounts of pesticides and fertilizers especially during surface runoff in the rainy season. Inorganic phosphorus from agricultural activities – whose safe limit is 80-100 µg/l – was registered at a peak value of 955µg/l.Too much phosphorus can cause decreased levels of dissolved oxygen due to growth of algal bloom or a process called eutrophication, which affects aquatic life. While the Idukki section of the Periyar is struggling with contamination from domestic sewage, Angamaly to Kochi is the most industrialized zone of the Periyar river basin.

There are over 50 large and medium industries and over 2500 small scale industries in this region. The industries located in Edayar – Eloor area consume about 189,343 metric cube of water per day and discharge about 75% of it as wastewater along with a large quantity of effluents and pollutants. The effluents allegedly released by many of these industries have turned the water into a deep black colour. For the last 3 years, the river went from red to dark brown to black.

There are more than 30 unauthorized effluent pipes spewing toxins straight into the river from the industry.

Then there are the regular fish kills. The sight of many smaller kinds of fish lying dead on the surface of the water has now become an all-too-common sight. When the Pollution Control Board visited the river, for instance, hundreds of dead Indian anchovies could be seen floating in various parts of the river. But there have also been much larger fish kills, in which thousands of larger fishes ended up dead especially during summer, the last incident having occurred in April 2020. As the years go by, Periyar pollution has become the root cause of many social and environmental issues.

In the Kerala floods of 2018 – which affected nearly 5 million people made the waste chemicals from the river that had overflowed into the residents and nearby low-lying areas caused

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additional damage, which shows the evidence of the environmental issues.

(F) Administrative Initiative on saving Periyar River:

The Periyar pollution and social issues related to it has always got huge attention and influence from the masses.

The Kerala Administration, along with the district administration has made an advanced pollution monitoring committee along with civic bodies. The committee consists of experts, representatives of local bodies and factories, and NGOs.

Periyar River Action Plan has been drafted by the Kerala State Pollution Control Board (KSPCB) to address the persistent issue of the Kochi city's filthy drinking water source. The National Green Tribunal (NGT) had ordered the drafting of an action plan to deal with the solid waste and septage polluting the Alua-Eloor-Kalamassery stretch of the Periyar. The Pollution Control Board has sent notices to the companies with directives to install treatment plants or close down the factories. The Total Ecosystem Restoration Project for Periyar was one of the finest projects built so far. A 24-hour water quality monitoring system for the Periyar was set up by the Pollution Control Board. The results of the water quality from the Eloor-Edayar stretch of the river will be displayed live on the display board set up at Eloor. Despite the instalment and strict enforcement measures the administration needs to take, the local community must also contribute.

By establishing circular economy based programs that have active collaborations with local stakeholders such as city administrations, local communities, universities, and educational agencies, private sector companies, and NGOs / NPOs, local problems can be turned into opportunities for the local community.

IV. THE ROLE OF JUDICIARY IN PROTECTING WATER BODIES FROM POLLUTION

The Constitutional provisions provide the bed-rock for framing of environmental legislation in the country. According to the VII Schedule of the Indian Constitution, the areas of responsibility between the Central and State Governments have been defined through the subject grouped in Central, concurrent and State lists. Environment does not figure in any of these lists, as yet and there is no explicit provision for environmental protection in the Constitution although the directive principles, in the amendments of the Constitution, through Articles 48(A) and 51A (g) assign specific responsibilities on the State and the citizens. Most of the environment related laws enacted by the Parliament have been based on the Articles 252 and 253 of the Constitution.

Despite having an impressive line-up of laws within the statute books, the Indian legal system

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has constantly been failing in terms of enforcement. Bureaucratic lethargy, lack of sensitivity amongst legislators towards environmental problems, and an errant industrial manufacturing combine with state inefficiency are some of the reasons which prompted the judiciary in general and Supreme Court in particular to step in and correct the wrongs.

But the question is, can the environment be protected at present times when almost all the countries are still at their developing stages? Development comes through industrialization, which is the main factor behind the degradation of environment. To resolve the issue, the Judiciary had to make a balance between economic development and preservation of the eco-systems; therefore judiciary came with a doctrine called 'Sustainable Development' i.e. there must be a balance between development and ecology. Sustainable development is not a new notion, many societies throughout history have recognized the importance of achieving a balance between the environment, society, and economics. Sustainable development focuses on raising the living standards of all people on the planet without risking the environment's ability to supply them indefinitely. It necessitates an understanding that actions have consequences and we must find innovative ways to change institutional structures and individual behaviour. In other words, it's about taking action, changing policy, and practice at all levels.

Subhash Kumar v. State of Bihar was one of the first few cases where the Supreme Court emphasized the importance of protecting and conserving the natural environment. The scope of Article 21, the right to life was widened when the court read into it the "right to wholesome environment." The court went even further and said, "The Right to Life includes the Right to enjoyment of pollution free water and air for a fuller enjoyment of life."

In The Kanpur Municipalities Case the court by suo-moto laid down a series of guidelines for the municipality on issues like removal of wastes, construction of sewer lines, construction of urinals etc. In Indian Council for Enviro-Legal Action v. Union of India, popularly known as Bichhiri case struck a blow to chemical industries in Rajasthan which were releasing highly toxic effluents and untreated sludge into the environment, leading to the pollution of underground aquifers. The court took the question of liability of the respondent from different angle and stamped the validity of "polluter pays Principle" and "absolute liability" in this case.

Another historical case is the Vellore Tanneries Case. A PIL was instituted by the plaintiffs against the tanneries in Tamilnadu which had been releasing vast amount of untreated sludge into the river water. As a result, arable lands, wells used for agriculture and drinking water sources were affected. The court in this case recognized 'the Precautionary Principle', reiterated 'Polluter Pays Principle' and fined the tanneries. In this case the doctrine of "public Trust" was

applied for the first time.

The Judiciary have the power to enforce punishments for non compliance of the orders of the Pollution Control Boards or any other violation of the law.

(A) Pollution Control Board:

In order to achieve pollution free water, the Water Act set up Pollution Control Boards at Centre and State levels. These Boards lays down standards of discharge and treatment of effluents into water bodies for all persons to follow, including body corporates. Anyone who violates these standards can be punished under the law.

As per this Act, it is also mandatory for any industry or business to take prior permission of the Pollution Control Board at their State if their operation or process would discharge sewage waste or trade effluent into a stream. It also made it compulsory to report any alterations made in the existing discharge outlets. Any non compliance would invite a severe punishment of imprisonment and or a fine.

In order to control and prevent water pollution, the Board can:

- Undertake emergency measures to remove and dispose the polluting matters.
- Issue immediate orders restraining or prohibiting the activities causing the pollution to reduce the same.
- Apply to courts to stop existing water pollution in streams and wells and request the court to direct the polluter to remove the polluting matter or stop a potential polluter from doing the same. In case the pollution has already occurred; the Board can be authorised by the Court to remove and dispose of the polluting materials at the expense of the polluter.

Direct closure or regulation of any industry or business for violation of standards or non compliance of any order. It even has the authority to stop or regulate the water supply, electricity or any other service of the industry.

V. CONCLUSION AND SUGGESTIONS

From the above parts of this paper it is clear that the situation of water pollution is taking a turn in our country. The reasons for this are many. According to the researchers, the root cause is the explosion of population whereby it becomes practically impossible to cope effectively with environmental problems, even if there is a desire to do so . Secondly, the planning is also defective.

Thus the result is that the growth of resources is not keeping pace with the growth of population and resources per capita are diminishing. As a consequence of which there is an ever-increasing pressure on water resources too. This is resulting in large scale water pollution which is growing very rapidly. However, there are some steps taken by legislature such as Water (Prevention and Control of Pollution) Act 1974, Environmental (Protection) Act 1986, etc. It is necessary that water pollution control laws should be made more stringent and adequate provisions for funds should be made.

1. There should be some amendments with respect to following definitions:

a) The definition of 'pollution' should be amended to include 'pollution of water due to its radiological disintegration' within its ambit.

b) The definition of the term 'Stream' should be amended to include 'rain water' thereby not giving any scope to pollute the rain water.

c) Some very relevant and important terms like pollutants, toxic pollutants, discharge of pollutants etc should be defined.

d) Section 24 should be amended as it does not put any liability on a person if she or he unknowingly does anything which causes pollution. The concept of 'absolute liability' should be introduced.

2. There is a need for specific provision in the Act for Public Participation, for better implementation of the Act.

3. There should be provisions in the Act for fixing up standards of quality and targets for eradication of pollution.

4. Trained personnel to the agencies entrusted with the task should be added.

5. Also setting up of environment courts to tackle pollution cases, more media involvement and dissemination of information through documentation is required at both central as well as state level

6. Effective utilization of fund is necessary. Due to sensitivity in such issues the funds should be rightly allocated and allocation should be fully utilized.

7. Apart from legislative and judicial efforts, there is a need to strengthen general public awareness on water pollution. This awareness should include fundamental duties of citizens towards environment. Children from schools should be taught such principles.

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