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# ANALYSIS OF ENVIRONMENT POLLUTION OF ECOSYSTEM OF RIVER GANGA IN UTTAR PRADESH

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## ABSTRACT

A major challenge facing mankind is to meet basic human needs while sustaining the resource base upon which these needs depend. The problems of population growth, the exploitation of natural resources and environmental degradation are complex and long-term and are exacerbated by their linkage with poverty, inequality and social conflict. Environmental degradation threatens human and other faunal and floral species. In the Asia Pacific region population is expected to increase by about 40 percent over the next 15 years in the cities by some 90 percent and economic activities will double the demand on natural resources. Political, economic and social factors underlie these problems and it is now generally recognized that it is impossible to separate economic development issues from environment issues. In some cases, economic pressures force developing nations to exploit rapidly their natural wealth at the expense of future needs; rates of exploitation often exceed the regulatory capacities of governmental and traditional institutions, and cultural attitudes, sometimes discourage appropriate sustainable resource management

*Key words: Population growth, Political, economic and social factors*

## INTRODUCTION

The universe is the creation of supreme power meant for benefit to all His creations, Individual species must, therefore, learn to enjoy its benefit by forming a part of the system in close relation with other species. There should be awareness of the interdependence of all living things to maintain the ecological processes and life support system. As long as mankind worked in harmony with the nature, as a part of this system, damage to the system was minimal. However, during the last century, mans' relationship with his environment has drastically changed due to vast increase in his expectations and activities. Evaluation and application of science and technologies in meeting the ever- i n c r e a s i n g needs of man has not left any part of the biosphere untouched making his own survival precarious.

The implications of demographic pressures on renewable and non- renewable resources need widespread analysis and understanding. There is an urgent need for rapid and intensive development of many kinds to ensure better quality of life, without any damage to environment so that its capacity to support life is not unduly impaired. Population of our country has been growing at an alarming rate and its requirement of food and many other materials has increased proportionately. Science and technology have given not only tremendous capacity to man for building and creation but also invested him with equally great powers of destruction, the population stress are intensifying and will increasingly determine the quality of human life, the earth's carrying capacity, and the ability of biological system to provide resources for human needs.

The provision of basic human needs must therefore, be the bed rock of economic development. Such development of course should be closely linked to environment protection, resource management and family planning.

## THE CHALLENGE

In many developing countries, environmental management is hampered by international economic relationship: agriculture, forestry, energy production and mining generate over half the gross national product of many nations and account for even larger shares of livelihood and employment. Natural resource exports boost their economics; consequently, there are several, almost irresistible pressures to overexploit the resource base.

Human beings can, however, make development sustainable - in other words ensure that present needs can be met without compromising the ability of future generations to meet their needs. Forced to concern themselves with the impacts of ecological stress, they now realize that constraints on effective natural resources management also hold back economic and social progress.

Most governments in the Asia-Pacific region are aware that environmental problems jeopardize development potential. Many have passed environmental legislation and established environmental agencies. There is also growing awareness that effective international cooperation is necessary to manage ecological and economic interdependence. Through these developments, determined initiative are needed in the key areas of population and human resources, food security, species and ecosystems, energy, industry and human settlements, if greater environmental degradation and human suffering are to be avoided. In some areas, forest is being replanted. Some nations are controlling soil loss and desertification. Family planning is better understood. Water supplies are being protected and pest management practices are being reappraised. In seventies, an understanding of their need for promoting eco-development without destruction became more widespread. Thanks to the United Nations Conference on the Human Environment held at Stockholm in 1972, the Chairman of the National Committee on Environmental Planning and Co-ordination, Dr. Pal initiated steps for the development of a grid of biosphere reserves, gene sanctuaries, national parks and botanical gardens. He worked for the organization of both inland and marine national parks as well for the conservation of unique as well as fragile eco-systems.

The challenges faced by the Earth are stupendous. The Earth summit held at Rio de Janeiro, in 1992 also highlighted many of the grave threats faced by the Earth. Agenda 21 which resulted from this conference, signed by representatives of 120 countries was a significant milestone in protection of world Environment. The slogan "Think Globally, Act locally" caught the attention of many industrialized countries as well as developing countries. (Hashim, 2002).

It is now being realized that earth's resources are finite and limited and that the natural environment can no more be considered a free and inexhaustible bounty. It must be utilized in such a way that these assets are not seriously damaged or destroyed. Therefore, it has become necessary to plan development activities in such a manner that the precious environment is conserved not only for the present but for the future also.

After independence, population explosion, unplanned industrialization, urbanization and green revolution have resulted in environmental pollution, resource exploitation and environmental quality degradation. Ultimately entire ecological balance on earth has been disturbed. In the last 5-6 decades huge production and utilization of insecticides and fertilizer has lead to the release of toxic and hazardous wastes into the environment in liquid, solid and gaseous forms.

Environment has been defined as the complete range of external conditions under which an organism lives. Air, water and land, the three amenities of life and its rapid utilization have given rise to substances, termed as pollutants. Water is the basis of life. Total volume of water on the planet earth is estimated about 1500 million cubic kilometers. Of this amount the oceans and seas make up a 97%; of the remaining 3%; three quarter is locked up in the form of ice, mainly the polar and Greenland ice caps, and glaciers. Rest of the water (0.75%) is found in rivers and lakes, ground water and the water vapour in the atmosphere. Paramasivarn, M. and Sreenivasan, A. (2017).

Our day-to-day activities such as domestic, agricultural, fisheries, industrial, forestry, recreational etc. are

essentially dependent on water. Due to this very necessity of water, human cultures and civilizations grew near the water bodies such as lakes, rivers etc. Tremendous scientific and technical advancements leading to rapid urbanization, industrialization and population explosion have resulted in qualitative and quantitative deterioration of water. Lack of foresight and carelessness towards the environment has added new dimensions to the miseries of our natural resources. In addition to air, water is the other basic amenity of life which has been extensively polluted due to:

- Domestic Sewage
- Industrial Waste
- Chemical inputs of Agriculture
- Elevated temperature
- Poor management and awareness

## STATE OF RIVERS IN INDIA

During the process of rapid industrialization and green revolution all the major rivers have been extensively used for the water supply and dumping ground for the sewage and industrial wastes. Due to this reason, all the 14 major Rivers such as Brahmaputra, Ganga, Brahmani, Cauvery, Godavari; Indus, Krishna, Mahanadi, Mahi, Narmada, Pennar, Sabarmati all the 14 major rivers such as Brahmaputra, Ganga, Brahmani, Cauvery, Godavari, Indus, Krishna, Mahanadi, Mahi, Narmada, Pennar, Sabarnati, Subernrekha and Tapti are being polluted continuously.

About 80% of the Indian population is directly or indirectly dependent on the river waters. Approximately 80% of the disease infections are water borne and 50% of the deaths among the children are due to diarrhoeal disease (Mohan, D. (2015)). It is evident that almost all the big rivers are being polluted by effluents of industries, sewage discharge distillery etc.

In India, the ecological status of rivers is further jeopardized due to "Mass bathing" at specific sites like Kashi Prayag, Haridwar or Ujjain during specific times like "Kumbh Melas" and other such festivals when millions of people bathe simultaneously at a point in sacred rivers. These festivals go on for weeks and months. The religious people also present flowers and garlands to the river deemed to be goddesses adding to the toll. (Agrawal, 2002)

## ORIGIN OF RIVER GANGA

Ganga is a perennial river formed by confluence of two smaller rivers at Devprayag. Bhagirathi is one of them originating at Gaumukh in Gangotri glacier, 3,129 meter above sea level, while other one is Alaknanda with her origin in Sapta Tal glacier. After gorging a distance of about 220 km in the Himalayas, it enters into the plain at Haridwar and after meandering over a distance of about 2,290 km in the plains in the states of Uttar Pradesh, Bihar and West Bengal, it joins the Bay of Bengal through a large number of branches flowing in India and Bangla Desh. The entire area comprises of wide geographical diversity. It consists of hilly terrains in the north up to Haridwar, low lying agricultural alluvial plains in the middle and deltaic region in the east before it meets the Bay of Bengal. Its drainage basin covers one of the most thickly populated regions of the world where the Indo-Aryan civilization flourished for many centuries. Ganga is formed by confluence of a number of tributaries like Yamuna, Kali, Kamali, Ramganga, Gandak and Koshi from Himalayas and are mainly snow fed. Yamuna which rises in the Yamunotri glacier and joins the Ganga at Allahabad is the western most river of Ganga system. From the south, the tributaries joining the Ganga are the Chambal, Betwa, Tons, Ken, Son etc., which rise in the Vindhyan highlands of the central part of India. The Ganga basin receives waters from an area about one quarter of the total area of India, i.e. 8,61,404 sq. km. which is about 28% of the Indian territory, lying along a total length of about 2,525 km in the northern part of the Indian subcontinent. The average annual run-off of the basin is estimated at about 4,93,400 million m<sup>3</sup> which is nearly 30% of the total water resources (16,70,000 million m<sup>3</sup>) of the whole country. It has the largest gross sown area of 58 million ha. It is a cradle of civilization for nearly 26% of India's total population (Ghosh, 1991).

## **POLLUTION SOURCES OF RIVER GANGA**

- Major sources of Ganga pollution are as follows:
- Discharge of untreated domestic and cattle wastes.
- Discharge of untreated industrial effluents.
- Surface run-off from agricultural fields.
- Surface run-off from areas on which urban solid wastes are dumped.
- Surface run-off from areas on which industrial solid wastes are dumped.
- Disposal of unburnt / half burnt animals and human dead bodies.

The domestic and industrial wastes from 29 class I cities (population over 1 lac), 23 class II cities (population between 50,000 and 1 lakh) and about 48 towns having less than 50,000 population are directly or indirectly discharged into the river Ganga. About 75% of the population of river Ganga is caused by discharge of untreated sewage/sullage (Anonymous, 1985a)

## **RIVER GANGA AND VARANASI**

The river Ganga is a source of inspiration and nationalistic sentiments of several generations. Among the towns located on the banks of the Ganga, Varanasi stands out as the crowning jewel. Beliefs about town like Varanasi have been built over centuries and reinforced by generations. The veneration of the Ganga at Varanasi is an integral part of Indian culture. Since the value of Varanasi as a heritage site is immeasurable, it was in the fitness of things that the Ganga and Varanasi are rare combination of holy place and seat of learning throughout the world.

The stretch of the river from Farrukhabad to Varanasi in general, is very critical in terms of the availability of minimum flow of water in the river. As a result, the desired improvement in the river water quality has not been achieved. Various efforts have led to the development of some appropriate technologies of sewage treatments to make the programme sustainable. Different aspects of Physico-chemical and biological properties of river water have been studied by several workers in India and abroad. In India the pollution problems of River Ganga have been studied by numerous workers at various places.

The present situation necessitates the importance of adopting a holistic approach in which land and water are managed as components of a total dynamic system and should emerge as logical unit of optimal development.

During past few decades, the water quality of the river Ganga has been severely damaged. The degree of its pollution is increasing continuously and posing great public problems. However, there is a paucity of ecological data and public awareness and their involvement in relation to pollution management of Ganga water at Varanasi.

## **OBJECTIVES OF THE STUDY**

Present study will be conducted with the following objectives:

- To conduct a survey of the pollution sources of the river Ganga at Varanasi.
- To analyse the Physico-chemical properties of river Ganga such as pH, temperature, turbidity, DO, BOD, COD, alkalinity, nitrate and phosphate content
- To analyse the phytoplankton productivity to evaluate the biotic component with special reference to phytoplankton.
- To study the merits and demerits of various management practices adopted by government organization i.e. Ganga Action Plan.
- To study the role of Non-Governmental Organizations (NGO's) and people for prevention of Ganga water pollution.
- Suggestions for the eco-management of river Ganga at Varanasi.

## **LIMITATIONS OF THE STUDY**

- Lack of resources hinders the process of work.
- Lack of finance also comes in the way during working.

- Variation in information's from different sources.
- Lack of desirable information.
- Lack of cooperation of Government officials and sometimes their responses were discouraging.

## LAYOUT OF THE THESIS

The project work will be divided into six chapters: The first chapter "Introduction" relates to the importance of the study, objectives and limitations; the second chapter "Varanasi and River Ganga at a Glance" delineates the glimpses of Varanasi with special reference to river Ganga. Third chapter "Review of literature" presents an overview of the past findings of studies conducted in the related aspects of the present study. Fourth chapter deals with the "Research Methodology" used in present study, covering items like sampling procedure, tools and techniques used in data collection, statistical treatment of the data etc. The fifth chapter deals with "findings and discussion of the study; the last chapter is "Summary and Conclusion" followed by bibliography.

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