



Criterion: - 3

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five year.

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1	Hardas G. lilhare	Domestic waste variations in different economical section: A review	Swaminarayan Siddhanta Institute of Technology	International journal for research in applied science and engineering technology (IJRASFT)
2	Hardas G. lilhare	Domestic wastewater treatment by root zone technology using macrophytes	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and development (IJSRD)
3	Hardas G. lilhare	A review of industrial waste management plant to acquire zero liquid discharge	Swaminarayan Siddhanta Institute of Technology	International journal for modern trends in science and technology
4	Hardas G. lilhare	Industrial waste management plant to acquire zero liquid discharge	Swaminarayan Siddhanta Institute of Technology	International journal for modern trends in science and technology
5	Dr. Arif Khan	Waste water treatment using inverse fluidization unit by algae	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and development (IJSRD)
6	Dr. Arif Khan	Water pollution-sources effects and control	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and development (IJSRD)
7	Dr. Arif Khan	Standard for environmental protection in India	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and development (IJSRD)



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8	Dr. Arif Khan	Analysis of environmental management and planning in the oil and gas	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and development (IJSRD)
9	Dr. Arif Khan	Analysis and recommendations of total dissolve solid of Chandrapur region	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and reviews (IJSRR)
10	Dr. Arif Khan	Rural water hygiene intervention in Katol	Swaminarayan Siddhanta Institute of Technology	International Journal of engineering and technology
11	Hardas G. lilhare	Sewer design by using simplified method, conventional method and its comparison	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and development (IJSRD)
12	Sneha Nagdeve	Desalination and water purifications technologies: A Review.	Swaminarayan Siddhanta Institute of Technology	International journal for scientific research and development (IJSRD)
13	Dr. Arif Khan	Analysis and total dissolve solid of Chandrapur region	Swaminarayan Siddhanta Institute of Technology	IJCRT
14	Dr. Arif Khan	A fuzzy approach to find Land use index	Swaminarayan Siddhanta Institute of Technology	International journal of innovative research in science engineering and technology



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Domestic Waste Variation in Different Economical Section: A Review

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Abstract: Solid waste generation and characterization are the very important parameters which affects the environment as well as human health. Municipal solid waste (MSW) characterization depends on social structure and income levels in the area. This study aims to determine the variations in waste composition within MSW by income levels following the analysis conducted on the characterization & quantity of solid wastes produced in the WARDHA city in MAHARASHTRA, INDIA which is the research area of this study.

Keywords: MSW, Income Level, WARDHA City, Maharashtra, India

1. INTRODUCTION

A. Background Study

Waste management represents a great challenge for local authorities, which have the responsibility to provide the well-planned collection system and proper treatment of municipal waste. Amounts of waste and characteristics of MSW differ not only from country to country, but also from area to area and neighborhood to neighborhood, even within the same city. These differences depend on socio-economic structure, lifestyle, income level, consumption, and usage habits of people. An efficient system for MSW management requires a good knowledge of the characterization of solid wastes to be carried out & disposed. Physical features of solid wastes are significant parameters for the selection and functioning of collection and transportation equipment, studies related to recoverable matter, as well as selection and design of proper disposal methods.

The top Cities of India are facing two primary challenges-First with disconnecting MSW generation & second with the inefficient collection, storage, transportation and final disposal of solid waste by the local municipal bodies. Experiences from the cities of the developed countries suggest that MSW generation is strongly connected with various socio-economic factors like household income, occupation of the city dwellers where finally any municipality has a role (Khan, Kumar & Samadani 2016). The management of MSW has been a serious environmental issue in many urban areas of developing countries. Improper dumping & burning of waste without pollution control measures is common in many developing nations such as India. Hence, a better solution required for resolving their waste related problems.



Figure 1. Improper Storage of Waste

Waste structure defines all parameters that are effective in decision-making processes about solid waste management. Composition and the amount of solid wastes differ by the source of generation, season, lifestyles of people, social parameters, economic status, habits of the people, and some regulation-related to waste and the recoverability of waste. In another characterization study, research was conducted based on three different income levels (low, middle, high) and suggestions were made regarding waste management.



Domestic Wastewater Treatment by Root Zone Technology using Macrophytes

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Abstract— This project examines Root Zone Technology by using macrophytes, which is a low-cost and environmentally friendly method of wastewater treatment. To effectively treat domestic and industrial effluents, the root zone treatment and macrophytes treatment system uses a natural method. The wetland bed will be divided into number of zones: soil layer, sand layer, coal layer and aggregate layer. Root zone plants (*Colocasia esculenta*) planted on the top layer and then treated with floating macrophytes (*Pistia stratiotes*/Spiradela and Lemna). When wastewater passes through the top and intermediate layers, all suspended solids become trapped in the pores of soil and sand, and the remaining solids are removed by bacteria. After passing through filter bed water is allowed to flow in another chamber where water is treated with floating macrophytes which utilizes dissolved and suspended nutrients and helps to reduce concentration of pollution of waste water. The effluent characteristics such as pH, color, odor, BOD, COD, TDS, TSS, Nitrogen, and Phosphate determined. The result shows a reduction in parameters because of the longer detention periods, the removal rate is increasing. The goal of this project is to determine which wastewater treatment method is the most cost-effective in comparison to traditional wastewater treatment methods. The conventional method is unsuitable for rural areas due to its high cost. One of the alternative wastewater treatment technologies is the Root Zone Technology combine with macrophytes. This Treatment process is simple to use, requires little installation, and requires little maintenance. It is also less expensive than traditional treatment systems. To reap the benefits of this technology and ensure long-term development, it must be fully utilized in developing countries such as India.

Keywords: Wastewater Treatment, Root Zone Technology, Macrophytes

I. INTRODUCTION

Water is the basic source of life. The vast oceans contain 93% of the total amount of water, 4% is underground water, 2% is stored in the form of icebergs and ice caps, and less than 1% is available as freshwater. Environmental protection has received a lot of attention in recent years as a result of globalization (Climate Change report, 2002). The major water bodies around the world are polluted by the discharge of domestic sewage and industrial wastewater. Water treatment technology is both effective and eco-friendly. Growing population, industrialization, and urbanization are the primary sources of pollution in India. The improper disposal of waste is now a major environmental issue. As economic development has increased, so has water pollution. Most of the Municipal waste is discharged directly into the river without being treated. In urban areas, wastewater

treatment plants are available, but in rural areas, sewage drains are directly connected to water bodies.

Root zone technology with aquatic and floating Macrophytes is certain to be a beneficial treatment and alternative treatment technology for wastewater treatment. Root zone technology is a technique for purifying waste as it flows through a man-made wetland area. Some of the physical, chemical and biogeochemical processes that remove pollutants include sedimentation, absorption and nitrification, and uptake by wetland plants. These systems use wetland plants, Macrophytes, soils, and associated microorganisms to remove contaminants and impurities from wastewater. These plants are essential parts of the wastewater treatment process. The larger aquatic plants growing in wetlands are usually called aquatic macrophytes. These include aquatic vascular plants, aquatic mosses, floating and some larger algae. The presence or absence of aquatic macrophytes is one of the characteristics used to define wetlands, and as such macrophytes are an indispensable component of these ecosystems. As the most important removal processes in constructed treatment wetlands are based on physical and microbial processes, the role of the macrophytes is important for treatment process. There is no need for machinery or electricity, there are no operating costs, low maintenance costs, it improves the landscape, provides a natural habitat for birds, and there are no odor issues. The project uses root zone technology, aquatic macrophytes (*Colocasia esculenta*) and floating macrophytes (*Spiradela*/*Pistia stratiotes* and Lemna) for treatment to analyze the wastewater characteristics.

II. LITERATURE REVIEW

The literature review pertaining to survey of root zone technology system by using macrophytes and literature related topics experimental aspects of wastewater treatment with various methods is presented below.

A. Nanda Sahil (2017)

has studied on Root Zone waste water Treatment for domestic sewage the wastewater is collected from the septic tank which that overflows is transferred to the plant. On the plant, a pit of essential dimension is made. The clarified sewage from the septic tank is made to pass through the Root Zone pit. The length and breadth of the pit depends on the volume of the wastewater to be treated per day. The pit is lined by sealing with low-Density Polypropylene sheets or rolls. If necessary, other types of civil structure can be made into the treatment tank. The pit is filled layer by layer with layered media of adequate porosity.

B. Mane Mahesh et al. (2017)

He has studied on Introduction to Waste Water Treatment by Root Zone Technique. In This study Increasing urbanization





A Review of Industrial Waste Management Plant to Aquire Zero Liquid Discharge

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ABSTRACT

Industrialization is necessary for us of us economic growth. Increase in business improvement has extended water consumption and is resulting in depletion of water assets. On the other hand, water pollution is a chief difficulty. People have lengthy been trying to discover for effective and dependable approaches to treat wastewater and recycle or reusing the handled water has turn out to be a need. Zero Liquid Discharge (ZLD) is a great state of affairs of entire closed loop cycle, in which discharge of any liquid effluent is removed; it's for a tremendous attempt of each enterprise who implements it to fulfill with the environmental regulation in a difficult manner. However, it's miles going through some challenges for its implementation consisting of its high expenses and electricity efficiency. Here on this evaluation, we've got supplied diverse ZLD technologies which are feasible for extraordinary commercial sectors and some modern technology by which the treasured water can be stored and recycled at supply.

Keywords: Zero liquid discharge, wastewater, zld technologies, ETP industries

1. INTRODUCTION

Blasting mega trends in industrialisation and urbanization are establishing higher weight on the climate including the world's freshwater assets. In numerous spaces, internationally and especially in quick creating and arising economies like India, fast development in ventures and assembling units are making a danger to water quality and huge strain on water supplies. Concerns related to water accessibility hazards are expanded in districts inclined to water scarcity. As these patterns increase, businesses that utilization a lot of water what's more create high

quantum of wastewater are feeling the squeeze to execute more maintainable water the board procedures which utilizes less measure of water, limit effects on getting waters and moderate functional dangers. This outcomes in driving improvements in advances in the worldwide water treatment market. ZLD frameworks are standing out enough to be noticed as valuable wastewater treatment/water the executives answers for complex modern wastewaters. It is a water treatment process in which wastewater is treated, sanitized and further reused. The ZLD cycle totally disperses with fluid release from industry in this way decreases and takes out





Industrial Waste Management Plant To Acquire Zero Liquid Discharge

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ABSTRACT

Industrialization is necessary for us of as economic growth. Increase in business improvement has extended water consumption and is resulting in depletion of water assets. On the other hand, water pollution is a chief difficulty. People have longly been trying to discover fee effective and dependable approaches to treat wastewater and recycle or reusing the handled water has turn out to be a need. Zero Liquid Discharge (ZLD) is a great state of affairs of entire closed loop cycle, in which discharge of any liquid effluent is removed; it's for a tremendous attempt of each enterprise who implements it to fulfill with the environmental regulation in a difficult manner. However, it's miles going through some challenges for its implementation consisting of its high expenses and electricity efficiency. Here on this evaluation, we've got supplied diverse ZLD technologies which are feasible for extraordinary commercial sectors and some modern technology by which the treasured water can be stored and recycled at supply.

Keywords: Zero liquid discharge, wastewater, zld technologies, ETP industries, BOD, COD

1. INTRODUCTION

Zero liquid discharge (ZLD) a wastewater management strategy that eliminates liquid waste and maximizes water usage efficiency has attracted renewed interest worldwide in recent years. Although implementation of ZLD reduces water pollution and augments water supply, the technology is constrained by high cost and intensive energy consumption. Freshwater scarcity, one of the most critical global challenges of our time, poses a major threat to economic growth, water security, and ecosystem health. The challenge of providing adequate and safe drinking water is further complicated by climate change and the pressures of economic development and industrialization. The public

and industrial sectors consume substantial amounts of freshwater while producing vast quantities of wastewater. If inadequately treated, wastewater discharge into the aquatic environment causes severe pollution that adversely impacts aquatic ecosystems and public health. Recovery and recycling of wastewater has become a growing trend in the past decade due to rising water demand. Wastewater reuse not only minimizes the volume and environmental risk of discharged wastewater, but also alleviates the pressure on ecosystems resulting from freshwater withdrawal. Through reuse, wastewater is no longer considered a "pure waste" that potentially harms the environment, but rather an additional resource that can be harnessed to



WASTEWATER TREATMENT USING INVERSE FLUIDIZATION UNIT BY ALGAE

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Abstract- Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) play important role in determining the quality of wastewater. Hence it is necessary to calculate COD and BOD of water before setting up of wastewater treatment plant. Algae has been used for decades for various purposes. It is one of the important characteristics is to nitrogen, phosphorus etc., which are harmful for drinking and other purposes but they act as food for algae. Thus in this study COD and BOD analysis is done for sterilized and non-sterilized wastewater after and before treating it with algae in inverse fluidization under aerobic condition for different time interval and found that percentage reduction in COD and BOD for sterilized wastewater gives greater value than non-sterilized water the reason for this difference being the decrease in the competition between algae and other micro-organism which are present in raw wastewater. And COD % reduction is 65-70% and BOD % reduction is 68.72- 70.55%

Keywords- Inverse fluidization unit, Wastewater Treatment, BOD, COD, Algae

1. INTRODUCTION

1.1 Inverse fluidization process

Among many conventional processes available for wastewater treatment inverse fluidisation process which is a three phase fluidisation process has been widely used for many applications such as hydro-treating and conversion of heavy petroleum and synthetic, crystallization, food processing, biomedical engineering, merchant production, treatment of municipal sewage wastewater and similarly many processes. Some of the benefits which one's process can gain if this unit is used are easy to handle, less consumption of power, low space requirement, less chemical waste and eco-friendly as it does not produce any chemical as its waste after the process. Indeed the most significant feature of it is high efficiency as compared to the other conventional fluidization processes.

The name inverse fluidisation comes from the direction of flow of liquid and gas which depends upon the density of the particle. Here the liquid is fed continuously from the top using pump if it is a continuous process and gas is released from using sparger from the bottom after it has been compressed in a compressor, thus it makes the process counter current flow process. In this counter current flow process the density of the particle is lesser than that of the liquid which is in a continuous phase.

With the rapid growth in population and industrialization is leading to the depletion of natural resources and causing major environmental problems such water pollution, soil pollution etc. The environmental problem which is of our concern is water pollution which is mainly caused due to the discharge of heavy metals from steel, dairy and fertilizer industries and nitrogen, phosphorus, sulphides and chlorides. Due to rapid use of nitrogen in fertilizer industries an excessive amount of it may cause several health related problems and causes eutrophication and acidification of water bodies. To overcome this process there are various methods which have been used for decades but the question arises is which process is more economical and numerous benefits over others.

1.2 Why inverse fluidisation technique and not the conventional one?

• The bio film thickness which grows very fast on the surface of the solid particle, if provided proper conditions. Sometimes it also happens that bio film thickness increases so much that it causes bloom and proper mixing



Water Pollution-Sources, Effects and Control

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Abstract— The data regarding water pollution and human health was obtained and compiled through a thorough review of various published research articles of international reputed journal and relevant books. Water covers about 70% Earth's surface. Safe drinking water is a basic need for all humans. The WHO reports that 80% diseases are waterborne. Industrialization, discharge of domestic waste, radioactive waste, population growth, excessive use of pesticides, fertilizers and leakage from water tanks are major sources of water pollution. These wastes have negative effects on human health. Different chemicals have different effects depending on their locations and kinds. Bacterial, viral and parasitic diseases like typhoid, cholera, encephalitis, poliomyelitis, hepatitis, skin infection and gastrointestinal are spreading through polluted water. It is recommended to examine the water quality on regular basis to avoid its destructive effects on human health. Domestic and agriculture waste should not be disposed of without treating.

Keywords: Water pollution, sources of water pollution, harmful chemicals, infectious diseases

I. INTRODUCTION

Water is one of the renewable resources essential for sustaining all forms of life, food production, economic development, and for general wellbeing. It is impossible to substitute for most of its uses, difficult to de-pollute, expensive to transport, and it is truly a unique gift to mankind from nature. Water is also one of the most manageable natural resources as it is capable of diversion, transport, storage, and recycling. All these properties impart to water its great utility for human beings. The surface water and groundwater resources of the country play a major role in agriculture, hydropower generation, livestock production, industrial activities, forestry, fisheries, navigation, recreational activities etc. The freshwater ecosystems of the world comprise only about 0.5% of the earth's surface and have a volume of 2.84x10⁵ Km³. Rivers constitute an insignificant amount (0.1%) of the land surface. Only 0.01% of the waters of the earth occur in river channels. In spite of these low quantities, running waters are of enormous significance (Wezel, 2001). India receives annual precipitation of about 4000 km³, including snowfall. Out of this, monsoon rainfall is of the order of 3000 km³. Rainfall in India is dependent on the south-west and north-east monsoon on shallow cyclonic depressions and disturbances and on local storms (Kumar et al., 2005). Most of it takes place under the influence of south-west monsoon between June and September except in Tamil Nadu, where it is under the influence of north-east monsoon during October and November (Kumar et al., 2005). India is gifted with river system comprising more than 20 major rivers with several tributaries. Many of these rivers are perennial and some of them are seasonal. Although India occupies only 3.29 million km² geographical area, constituting 2.4% of the

world's land area, it supports over 15% of the world's population. The population of India as on 1st March 2001 stood at 1,027,015,247 persons. Thus, India supports about 1/6th of world population, 1/50th of world's land and 1/25th of world's water resources (Water Management Forum, 2003).

In the last few decades, there has been a tremendous increase in the demand for freshwater due to rapid growth of population and the accelerated pace of industrialization (RamaKrishnaiah et al., 2009). Human health is threatened by most of the agricultural development activities particularly in relation to excessive application of fertilizers and insanitary conditions (Okeke and Igbarima, 2003). Anthropogenic activities related to extensive urbanization, agricultural practices, industrialization, and population expansion have led to water quality deterioration in many parts of the world (Baig et al., 2009; Mian et al., 2010; Wang et al., 2010). In addition, deficient water resources have increasingly restrained water pollution control and water quality improvement (Bu et al., 2010). Water pollution has been a research focus for government and scientists. Therefore, protecting river water quality is extremely urgent because of serious water pollution and global scarcity of water resources.

II. SOURCES OF WATER POLLUTION

Water pollution can occur from two sources. 1. Point source and 2. Non-point source (Table 1). Point sources of pollution are those which have direct identifiable source. Example includes pipe attached to a factory, oil spill from a tanker, effluents coming out from industries. Point sources of pollution include wastewater effluent (both municipal and industrial) and storm sewer discharge and affect mostly the area near it. Whereas non-point sources of pollution are those which arrive from different sources of origin and number of ways by which contaminants enter into groundwater or surface water and arrive in the environment from different non identifiable sources. Examples are runoff from agricultural fields, urban waste etc. Sometimes pollution that enters the environment in one place has an effect hundreds or even thousands of miles away. This is known as transboundary pollution. One example is the radioactive waste that travels through the oceans from nuclear reprocessing plants to nearby countries. Water pollutants may be

- 1) Organic and
- 2) Inorganic water pollutant.

Characteristics of point and nonpoint sources of chemical inputs to receiving waters (adapted from Carpenter et al., 1998).

Point Sources	Nonpoint Sources
- Wastewater effluent (municipal and industrial)	- Runoff from agriculture (including return flow from irrigated agriculture)
- Runoff and leachate	- Runoff from pasture and range



Standards for Environmental Protection in India

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Abstract— There is a critical situation waiting for our future generation about the consumption of all the resources of globe to produce electricity that our planet took billions of years to create. Over a short duration of shut down or an on-demand power source to supplement a renewable energy system, crude oil based engine-driven generators can provide a viable technological solution. The ICE generator is a mature technology that has been employed with great success the world over. Indeed, it is arguable that this success and the ubiquitous nature of the technology have led directly to many of the environmental crises facing our planet today. Nevertheless, the disadvantages of the engine-driven generator are many, and in some applications, it is the appropriate technology for the job. Even today, the major power source of automobile is crude oil based ICE which are need to be changed gradually by an alternative source of energy. By taking EURO emission standard as reference Central Pollution Control Board in India has implemented Bharat emission standards and it is updating its regulation in regular interval of time. In this paper, a complete review of various stages of Bharat emission standards and the reason for making the emission rules and regulations stringent in recent times were discussed in this paper.

Keywords: Bharat stage, BS VI emission, Emission standards, Environmental Protection, Euro Norms, Indian emission norms, Pollution

I. INTRODUCTION

CURRENTLY, there are more than 1.2 billion automobiles present in the road which are the basic sources of pollution and crude oil consumption. So, it is necessary to monitor and regulate the various emissions of Automobile. It is noted that the certain harmful gases were formed as a byproduct due to the variation in the engine combustion process and were released to the atmosphere through the exhaust pipe causes serious effect to the human health; they were Hydrocarbons (HC), Nitrogen Oxides (NO), Carbon monoxide (CO) & Particulate Matter (PM). Apart from these byproducts, as a result of perfect combustion Carbon Dioxide is produced in the engines and this is one of the major greenhouse gases which lead to global warming. To control the release of these harmful exhaust gases into the environment various countries have initiated and implemented different pollution standards to the Automobile manufacturers according to the vehicle type in order to keep the air quality clean. For example, Environmental Protection Agency (EPA) in United States government, European Union Research Organization (EURO) in Europe has framed strict rules for the vehicles to limit the toxic exhaust emissions releasing into the environment. The EURO emission standards that were adopted in the European countries and Tier Emission standards were adopted in USA. The Air (prevention and control of pollution) Act was

initially enacted to regulate the air pollution in 1981 and the Environment (Protection) Act of 1986 by the government of India paved the way to regulate the motor vehicle emission in India. Followed by this India have initiated to follow certain emission standards through the Motor vehicles act of 1988, which allows the government to implement the emission standards. Emission standards for petrol vehicles from 1991 and for diesel vehicles from 1992 and started to follow EURO emission standards as a reference from the year 2000. The Auto fuel policy of 2003 have described about the timeline for the implementation of the various stages of emission standards in all over India and the implementation of emission standards in selected cities and the rest of the country. The Indian emission standard India 2000 (BS I) is taken from EURO I emission standards as a reference, BS II from EURO II, BS III from EURO III, BS IV from EURO IV, BS V from EURO V and BS VI from EURO VI. The supreme court of India have ordered to stop the selling of BS-IV vehicle by the end of March 2020 and planning to implement BS-VI emission standards nationwide from April, 2020. The emission standard value of various categories of were discussed in this journal based upon the values provided in the Central Pollution Control Board, Ministry of Environment forest and climate change, Government of India and Emission standards, India from Dieselnet. The major emissions like CO,HC,NOx and PM data were collectively compiled and the graphs were generated for the understanding purpose. However, the other exhaust emissions like sulphur, Ozone, benzene and soot formation in the Gasoline Direct Injection(GDI) were not discussed in this paper. The CO₂ formation as a result of perfect combustion is also a major greenhouse gas that has to be reduced from the automobiles and also the amount of fuel consumption should also be reduced.

II. BHARAT STAGE STANDARDS

Table I shows the history of emission standards implementation in various stages in India. As both the state and central government have to cooperate for the implementation of the emission standards and also the necessity in the various regions of the country the emission standards were implemented in various stages. Initially the emission standards were implemented for gasoline vehicles from 1991 and for diesel vehicles in 1992. Later from the year 2000 India have started to follow the EURO emission standards, and Bharat Stage I (EURO I) emission standard was implemented nationwide from the same year. BS II emission standard emission standard were implemented in three stages from 2001 to 2005 and BS III emission standards were implemented in two stages from 2005 to 2010 in order to cover whole nation. The National auto fuel policy 2003 have framed out the road map for the implementation of BS IV type emission standards upto the year 2010 and later the auto fuel policy was updated by



Analysis of Environmental Management and Planning in The Oil and Gas

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Abstract— The actions that have a great likelihood of triggering environmental accidents, like in the petrochemical zone, it is sensible to imagine the environmental management to be a significant variable within the corporation's tactical arrangement. Nonetheless, this is not every time correct. In some circumstances, an alteration in the companies' policy, leaving a responsive situation and supposing a proactive one, only occurs upon the incidence of serious environmental coincidences with strong effect in the television. For the company that was the object of study, these coincidences provided rise to deep fluctuations in its environmental management, terminating in investments of about US\$ 2. 61 billion in environment, healthiness and safety, from 2011 to 2015. This was the highest volume to date invested on these regions by an oil company. This case study seeks to discuss the integration between environmental management and strategic planning in the petrochemical zone over a period of 10 years (from 2005 to 2015) in order to make a contextual analysis of the period before and after the environmental accidents possible.

Keywords: Oil and Gas Sector, Pollution, Management, Petrobras, Planning

I. INTRODUCTION

Meanwhile the end of the 1980s, the main world firms have been giving more devotion to the environmental subject, because of the severity of rules or because of the consciousness and following demand from society for more commitment to the environment. Moreover these lawful and social subjects, financial specialists predict that the environmental anxieties from large societies—which are absorbed in attracting new investors—are going to growth a lot and will be an significant distinctive aspect, persuading investors' choices as well as subsequent in monetary returns. It is stimulating to detect that although only the financial returns in the December 2004-June 2015 period are measured companies' shares involved in the Dow Jones Sustainability Group (DJSG) had an increase of 146% versus 108% of the Dow Jones general (Exam Guide, 2004). A way of demanding to assess the significance of the environmental subject within these large organizations is to assess the collaboration level among the environmental management accepted by the business and its planned planning. The analysis of this interaction becomes even more relevant when the occurrence of serious environmental accidents has a strong repercussion in the media. In 2000, the studied company was responsible for two serious environmental accidents, with a total oil spill of about 5. 3 million liters. The accidents made the company change drastically both the strategic plans and, mainly, the environmental management. Traditionally the petrochemical zone is one of the most harmful activities to the

environment. The World Bank, using the databank of Industrial Pollution Projection System (IPPS), grants the petrochemical sector as extremely hazardous polluting agent for several types of different pollutants [1]. We should also mention the high risks of oil and its end product leaks mainly during pumping and carrying operations. The charter below shows the foremost polluting gases releases from the petrochemical sector among others. According to Table1, we can realize the significance of the petrochemical zone in any debate related to environment preservation. Moreover this, in respective [2], there are quiet some questions that can be discovered such as the combination between strategic planning and environmental management. Subsidizing to this argument, by donating how environmental management has changed in 10-year time, its relation and integration with strategic planning earlier and next to the serious environmental accidents, the imaginable results on the financial act during this period of the largest Brazilian business and one of the 14 large corporations in this sector of the world establish the consequence of this research. So, the aim of this study is to debate the combination of the environmental management with Petrobras-Petroleo Brasileiro S/A strategic plans, as well as measure the alterations that happened afterward the environmental accidents in the 2005-2014 period [3,4].

Sulphur dioxide, SO ₂	Metallurgy of not ferrous; oil refinery and petrochemical industry
Nitrogen dioxide, NO ₂	Oil refiner petrochemical industry and siderurgy
Carbon monoxide, CO and volatile organic composites, COV	Oil refinery petrochemical industry, siderurgy and chemicals

Table 1: Pollutants proceeding from oil activity and others

II. STRATEGIC PREPARATION AND THE ENVIRONMENTAL MANAGEMENT

For Anthony and Govindarajan (1998), strategic planning contains of the process through which the suites that will be accepted by the corporation are nominated, and the estimated quantity of assets that the company will backup for each platform is decided in the following years. They also noticed out that the strategic planning is systematic; there is a procedure of annual planning, with certain actions and goals. However, the strategic formulation is not systematic. The strategies are always reexamined when accidents and risks appear. strategy can also be understood as a company's "choice and commitment" to its goals and practices. The incorporation of environmental management to strategic planning can be assessed according to the priority of its implementation, preservation and update, moreover the incomes invested on the area [4]. The precise





Analysis and Recommendations of Total Dissolved Solid of Chandrapur Area

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ABSTRACT

The Chandrapur cities rapidly developing due to industrialization over the last two decades. It is considered as the fourth most polluted city in India. In view of the present study, understanding about the pollution status of water quality, especially in the vicinity of Chandrapur district, industrial area and mining projects. Environmental studies carried out on land and surface water to detect physical chemical parameters like TDS and dirt. At some stations the concentration of parameters beyond the boundaries can be reduced and in this area can be an invaluable source for domestic purposes. Current project status relate the water quality accounts of different sites located in Chandrapur and their capacity. Generally water is a good solvent and easy to blame. Pure water, tasteless, colourless, and odourless. Any solution of mineral, salts, metals, cations or anions dissolve in water. Total dissolved inorganic salts (main calcium, magnesium, potassium, sodium, bicarbonates, chloride and sulphates) and some small amount of organic matter that are dissolved in water. We generally have something to contribute to the definition of salinity ions TDS as a discussion on TDS only for freshwater systems. Study of quality of water for streams, rivers and lakes is the most important application of TDS, although TDS is the primary pollutant, but it does not indicate the presence of a broad array of chemical contaminated substances as an indicator of the aesthetic characteristics of drinking water.

KEYWORDS-TDS (Total Dissolve Solids), Turbidity, Dissolved solids, Suspended solids, Hydroponic, Gravimetry, conductivity Keyword, Surface water, Ground water, Physico-Chemical Parameters, APHA.

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Rural Water Hygiene Intervention in Katol

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Abstract: - This paper describes the methodology used for and finding of and tilting of assessment of sustainability of rural water hygiene intervention under Tal. katol. Nagpur District. Water treatment project implemented by the government of Katol Nagpur District with support of the government of Maharashtra. The methodology involve development of the assessment tools household, survey, focus group discussion interviews with key informants and audit of water hygiene infrastructure. The sustainability of the project was assess against may be Indicators group under five categories such as institutional, social, financial, technical and sanitation and hygiene. The overall sustainability score for the project of (Katol Tal. Nagpur District Nagpur) average 89% in 2019 that shows a significant increase when compare with previous year project score (70% in 2015, 78% in 2017).

Key words: methodology, Assessment of sustainability, hygiene intervention.

1.INTRODUCTION:

The Government of Katol District Nagpur with support of Government of Maharashtra implemented by Katol Water Hygiene Project during 2018 to 2019. The project sought to contribute to improve child survival through increase assest to sustainable safe water and improve hygiene practices in Katol Tal. District Nagpur. The key achievement of this project was till January 2019 includes provision of access to safe water supply to 43,270. Beneficiaries through construction of 15 pipe water supply system that in (Involved more than 250 Km of pipeline) and drilling of 19 boreholes provision of pipe water supply 12 schools and colleges, 5 health centre also provision of rain water harvesting facilities over this places. here by promotion of safe hygiene practices and household sanitation 43,270 people and capacity building for sustainable population and maintenance of the supported water system. The Katol water supply project which had a total budget of 50 to 60 Lakhs was coordinated by Katol water and sanitation under the leadership of Ministry of infrastructure of Government of Maharashtra. This project describes the methodology used for assessment of the sustainability of the Katol water supply project as well as its key beneficially

1.1 Description Of Methodology:

This sustainability of rural and water hygiene intervention remains major challenge in the developing construction like India. In Katol, where the coverage of include water supply and sanitation is 85% and 83% (GoK, 2018) respectively. the methodology used for the assessment of the sustainability of intervation implemented under Katol water supply project was based on the data collection and exercise.

The data collection exercise used for the assessment is briefly described as follows:



Sewer Design by using Simplified Method, Conventional Method & its Comparison

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Abstract—Network are an important part of the infrastructure of our society. The investment that is needed for construction and maintenance of this network is so huge and thus any saving in the cost of these networks may result in considerable reduction of total construction cost. The aim of the optimal design of sewerage network is to find a cost-effective solution that minimizes capital investment while ensuring a good system performance under specific design criteria. Two main cost of sewerage network design are excavation and pipe cost which often create contradictory objective in the design of sewerage networks. Any reduction in pipe size is likely to result in an increase in pipe slope and consequently excavation costs. Reducing excavation cost on the other hand requires milder slopes for pipes, leading to larger pipe size for carrying the design discharge therefore finding an economical design for sewerage networks require an optimal trade-off between pipes and excavation costs which can be easily achieved by engineering judgment. This paper presents comparison between two methods i.e. simplified method (design 1) and conventional method (design 2).

Key words: Sewerage System, Conventional Method, Simplified Method, Manhole Contour, RCC (Reinforced Cement Concrete), PCC (Plain Cement Concrete), Drop Manhole

1. INTRODUCTION

Sewer system is essential for the public health and welfare in all areas of concentrated population and development. Sewer performs the virtually needed function of collecting these wastes and conveying them to point of disposal.

The present project was undertaken to design an efficient sewerage system for Hostel Area (Government College of engineering Chandrapur, 63 acres campus). In this regard, as part of project, assessment of the present condition of the sewerage system and sanitation system was conducted by surveying the nearby areas. Estimation of the daily water requirement, available water sources and daily total water usage was conducted. Estimation of the peak runoff was also done. Survey of Hostel area was conducted with help of detailed questionnaire prepared as part of project. Surveying of the area was performed and map of the area showing the land contours was referred. The contour map was used to select and design the gradient and slope of the area for the purpose of laying sewer lines. Hydraulic analysis was also conducted for designing storm drains system. The sewer lines were aligned to ensure economic transport of sewerage to the disposal site. Sewer pipe materials were selected along with fitting and joints for the sewerage system were selected. Sewer appurtenances were also selected for the final design.

In the present study, selected site have the problems due to openly through grey water. It creates the unhygienic

environment surrounding the boy's hostel which causes the growth of flies and mosquitos. It causes disease like malaria, diarrhea, dengue, etc. There is no proper sewerage system is provided for the disposal of grey water. It form the marshy land surrounding the hostel campus. This problem is increasing day by day which we have to remove by providing the proper sewerage system to make campus hygienic. So an effort is needed to design an appropriate sewerage scheme for a hostel, keeping in view the typical requirements and problems related with that includes scattered population, lack of skilled man power and resources.

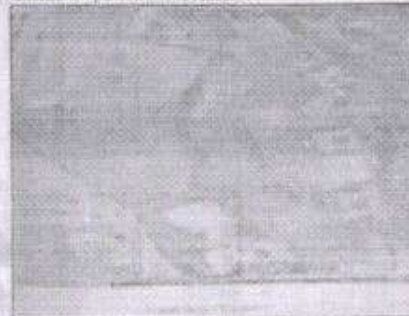


Fig. 1. Proposed Site (Government Boys Hostel)



Fig. 2. Present Situation of Hostel Campus Due to Openly Spread Grey Water



Fig. 3. Present Situation of Open Sewer



Desalination & Water Purification Technologies: A Review

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Abstract— About 40 million people (over 75% are children) are affected by water borne diseases every year. Nearly six million children below 14 years of age suffer from fluorosis due to fluoride contamination in water. Arsenic is another dangerous contaminant in ground water, putting at risk more than 10 million people in the country. Bacteriological contamination, which leads to diarrhea, cholera, hepatitis etc., is at alert level in India. Contamination due to iron, hardness and salinity in water are other major concerns. Medical expenditure on water borne diseases is estimated to be Rs. 2400 crores annually in the country. The need for desalination and water purification is destined to grow in the coming years as the requirement for water increases. Bhabha Atomic Research Centre (BARC) has been engaged in R&D on desalination and water purification technologies for several years and has developed indigenous technologies which are available for know-how transfer to interested parties. I hope this technical information document will serve the purpose of creating awareness of and appreciation for desalination and water purification technologies, among the entrepreneurs, NGOs and other interested groups, so that safe drinking water can be made available to the needy population in a reliable, sustainable and affordable manner using the indigenous technologies and supplementing with market technologies in an accelerated manner on a significant scale. BARC would encourage entrepreneurs to come forward and make use of the indigenous know-how for wider deployment.

Key words: Water Purification, Bhabha Atomic Research Centre (BARC)

I. INTRODUCTION

The World Health Organisation (WHO) has set international guidelines for drinking water. Almost all countries have drinking water quality regulations, often inspired by WHO guidelines. According to the United Nations, over 1.1 billion people are currently without safe drinking water. It is predicted that a significant fraction of the global population (over 3.5 billion people) will be living in areas facing severe water shortages by the year 2025. More than half of the world's hospital beds are occupied by patients suffering from water borne diseases. Many of these diseases can be prevented by providing safe drinking water. The United Nations General Assembly has proclaimed the years 2005-2015 as the International Decade for Action 'Water for Life'. Government of India has launched 'Bharat Nirman' Yojana which includes drinking water as an important programme. It is in this context, the role of desalination and water purification becomes very important.

Desalination of water is one of the key drivers under non-power applications of DAE program. Desalination Division, Bhabha Atomic Research Centre (BARC) has been engaged in R&D on various aspects of desalination and water purification technologies starting

from basic research work to development and deployment efforts. Dedicated team of scientists and engineers have contributed substantially to the expertise gathered, technologies developed and know how generated in the research centre.

The research work carried out has mainly focused on technological innovations, quality, reliability and commercialization potential of the product technology for deployment over large scale. State-of-the-art reliable technologies have been developed to address the growing need of good quality water for industries and human consumption.

We have acquired valuable experience on operation and trouble shooting of desalination and water purification plants and are equipped to provide consultancy to interested parties on design, installation, commissioning and operation of these systems. Such consultancies are provided after signing a Memorandum of Understanding (MoU). Several water technologies developed by Desalination Division have been transferred to private parties on non-exclusive basis.

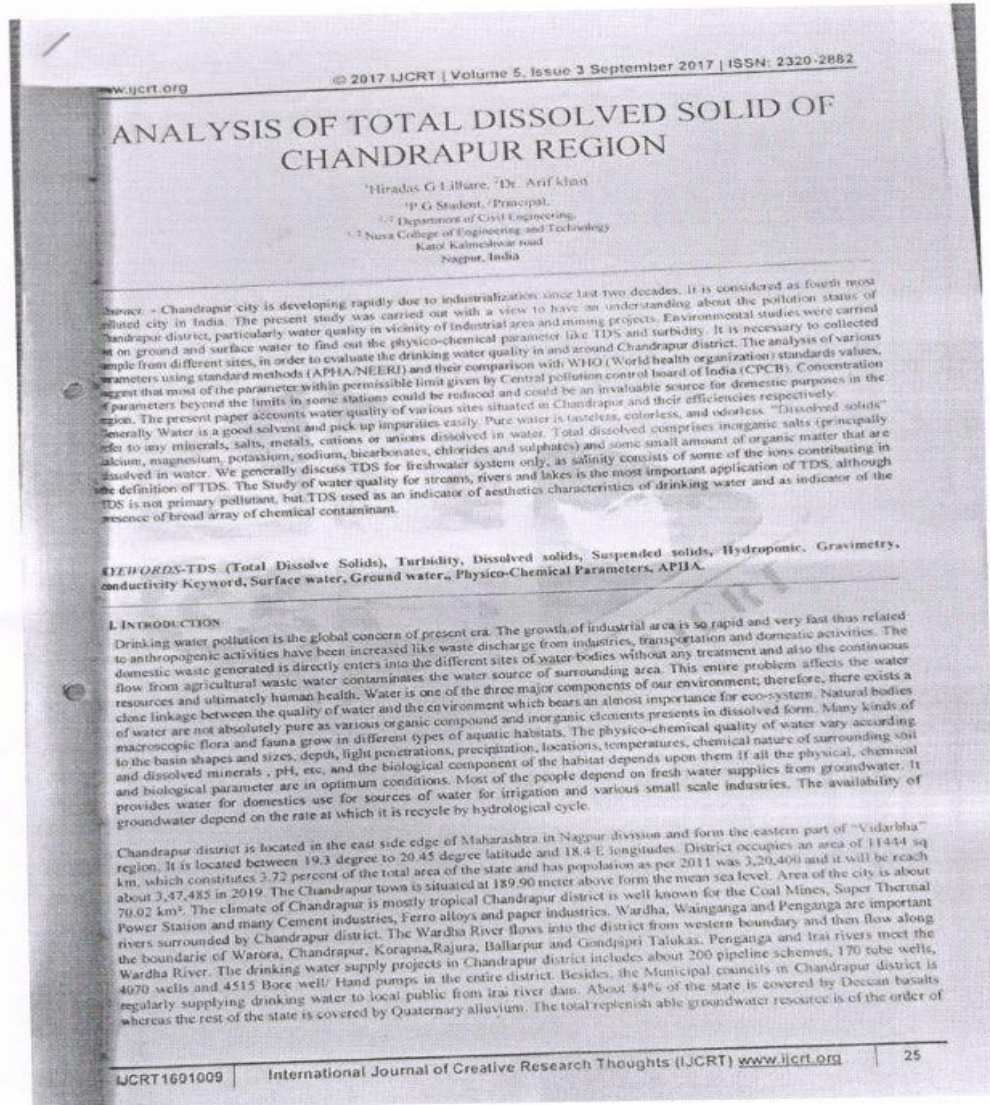
We are thankful to all the scientists and engineers who came forward to share their expertise and information in the formulation of this Technical Information Document. This document would not have been materialised, but for the encouragement and support of Director BARC and Chairman AEC for water technologies.

The document is not intended to provide detailed technical information on various technologies, but is aimed to provide a glimpse of the technologies for the entrepreneurs, NGOs and other interested parties. The purpose of bringing out this technical document is to consolidate the work carried out by Desalination Division (BARC), so that deployment of such technologies could be accelerated through the participation of private entrepreneurs, NGOs and other interested groups.

II. A BRIEF HISTORY

World's water consumption rate is doubling every 20 years, outpacing by two times the rate of population growth. The availability of good quality water is on the decline and water demand is on the rise. Worldwide availability of fresh water for industrial needs and human consumption is limited. Various industrial and developmental activities in recent times have resulted in increasing the pollution level and deteriorating the water quality. Water shortages and unreliable water quality are considered major obstacles to achieve sustainable development and improvement in the quality of life. The water demand in the country is increasing fast due to progressive increase in the demand of water for irrigation, rapid industrialization, population growth and improving life standards. The existing water resources are diminishing (i) due to unequal distribution of rain water and occasional drought, (ii) excessive exploitation of ground water sources and its insufficient







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A Fuzzy Approach to Find Land Use Index

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ABSTRACT: In present era land quality is one of the most important environmental issues as the green cover is reducing day by day mainly due to industrialization and urbanization. Industries discharge their effluents either on land or in water body and pollute the land. A thick cover of concrete is covering earthen land gradually. The Traditional report of Land use pattern is prepared by considering number of variables and hence becomes too technical and detailed. For purpose of analysis different indicators of land use pattern are identified and reported on basis of area covered. In present study fuzzy set theory has been used to develop Fuzzy Land Use Index (FLUI) to represent land use pattern of an area. FLUI will help in taking decision about utility of land for developmental activities.

KEYWORDS: Fuzzy Land Use Index, Fuzzy Water Quality Index, Fuzzy Set Theory, Fuzzy Air quality Index, Water Quality Index, Air Quality Index.

I. INTRODUCTION

Every region has its land use plan. Land may be covered by forest; it is used for agriculture, mining operation, residential purpose etc. However, some portion of the land of a particular area is left unutilized with no green cover and no other habitable activity. This is barren land or waste land. When a specific 'developmental activity' is proposed in region, it becomes necessary to determine its Land Use index. The 'developmental activity' may have its impact on land use pattern of surrounding region by using its land for other purposes. It may result in deforestation of the region, conversion of agricultural land to some other purpose, submergence of forest area, agricultural area or industrial area etc.

So far there is no globally accepted Land use pattern measuring system, some countries and regions have used, or are using land use pattern data on basis of percentage analysis. Most land use pattern analysis rely on normalizing, or standardizing, data parameters by parameters according to traditional system having standing boundary conditions and some interpretation of 'good' versus 'bad'.

Traditional reports on land use pattern tend to be too detailed, presenting monitoring data on individual substances, without providing a whole and interpreted picture of Land use. However, So far efforts have not been taken to find a single index value to report Land use pattern as has been done to develop Air Quality Index and Water Quality Index by various agencies. In addition to this completely new indices based on fuzzy set theory have also been developed, that is Fuzzy Air quality Index [4] and Fuzzy Water Quality Index [1].

II. FUZZY SET THEORY

Modern world today has realized that the traditional approach of handling the data /information is not sufficed. The traditional knowledge works on the principle of yes or no, this or that, black or white. This traditional way (Boolean), does not take into account the variability between the two extremes. Thus fuzzy logic today has emerged as a valuable tool to handle such information.

Computers operate on a binary true or false basis. Unfortunately our world is not binary. The world we live in is full of ambiguities. "The temperature is quit warm" cannot be evaluated as strictly true or false rather we accept that this statement has certain ambiguities. Thus, the mathematical theory of fuzzy logic was developed. The theory of fuzzy logic basically states that rather than a statement being true or false, each statement has a certain confidence level. For example let's say a confidence value of 0.000 meant false and a confidence value 1.000 meant true, then the

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