International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES),(UGC APPROVED)
Impact Factor: 5.22 (SJIF-2017),e-ISSN:2455-2585
"International Conference on Modern Trends in Civil Engineering"(ICMTCE-2019)
(Towards Sustainable Development Goals)
Volume 5, Special Issue 02, Feb.-2019

RIVER REJUVENATING STRUCTURE, ONE AND ONLY OF ITS KIND STRUCTURE WHOLLY DEDICATED TO RIVERS.

[1]Om Datt Singh and [2]Er Devesh Ojha

[1]*Civil Engineering Department, Amity University, Lucknow (UP), India,*
[2] *Assistant Professor, Civil Engineering Department, Amity University,Lucknow (UP), India,*

Abstract- India is gifted with few of the world's most prestigious Rivers naming them as Yamuna and Ganga. Both of them are heavily gifted with minerals and great source of livelihood. But According to the CSE(Centre of Sciences and Engineering),around 80% of Yamuna's Pollution is due to raw sewage . Ganga is considered to be the most polluted river in India approximately 1 billion litres of raw untreated sewage is dumped in ganga regularly. Ganga contains 60,000 faecal coli form bacteria per 100ml, which is threat to not just humans but also to the river itself. In short our rivers are on point of DEATH. Hence there is Project which is based on the idea of goals of sustainable practices. Taking into the considerations of the pollution level in water bodies in order to rejuvenate and give rivers back their life. So, I have made a structure good enough to reduce the amount of pollutant in water by 50% within very less time. It will not need any out source for energy as it being self sufficient it drives its energy from solar panels spread over it. Through the basic ways of making water pollutant free this structure can either be installed on an existing canal, small river tributaries. It will not only improve the quality of river water but all the aspects related to it. Like vegetation around, air pollution, soil pollution, improving ecological balance and recharging ground water. It is low cost eco friendly structure and considering the present scenario the immediate need of the environment. We have always cleaned water in sewage treatment plant where the cleaner potable water goes for human use and same semi polluted water to the water bodies, here we are trying to return the cleaner water to the river back in order to regenerate its property to clean itself. We can either make the whole new structure or it can be installed over the older canals and most importantly near the source of the pollution. The structure and the procedure tend to clean the suspended particle and toxic waste and improve the overall ecosystem.

Keywords: River rejuvenation, cleaning rivers, sustainable global goals, protection against pollution.

INTRODUCTION

SUSTAINABLE PRACTICES (RIVER REJUVENATING STRUCTURE)

The Sustainable Practices Policy establishes goals in nine areas of sustainable practices: green building, clean energy, transportation, climate protection, sustainable operations, waste reduction and recycling, environmentally preferable purchasing, sustainable foodservice, sustainable water systems.

Taking the goals into consideration we have focused on Topics:

- Climate Protection
- Sustainable Water System

Hence considering the topic we found out that our rivers are dying and are in very serious condition. We not only need to take major steps to stop the pollution sources but it also need to make a structure which can improve the quality of river water and give them their life.
Hence we have come up with an idea of making a model which can purifies the the running water and will return the pollutant free water to the river. It's a short term plan once the river is in its natural form we just need to stop the sources of pollution.

RIVER REJUVENATING STRUCTURE

We have always used the river water it has been the source of our live many cities are habituated near river it does not only support human needs but the whole ecosystem is depended upon it. The canal will be made which will have the inlet and out let to the river only. The (RRS) is much needed because the rivers been polluted so long and in such a deadly way that it is impossible to go back to its natural way by itself. We have polluted it for so long hence it's our duty to help rivers to the life again.

International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES),(UGC APPROVED)
Impact Factor: 5.22 (SJIF-2017),e-ISSN:2455-2585
"International Conference on Modern Trends in Civil Engineering"(ICMTCE-2019)
(Towards Sustainable Development Goals)
Volume 5, Special Issue 02, Feb.-2019

METHODOLOGY

Our modern lifestyle provides us the luxury of using various products to make our lives more comfortable and easy, but it comes at a price. A common byproduct of our current lifestyle includes wastewater, which can either be in the form of water running down the shower or runoff from wet roads. This wastewater is unfit for human consumption or use.
Fortunately, we can make the wastewater potable and usable by employing wastewater treatment technologies that filter and treat the wastewater by removing contaminants such as sewage and chemicals. Four common ways to treat wastewater include physical water treatment, biological water treatment, chemical treatment, and sludge treatment. Let us learn about these processes in detail.

Physical Water Treatment:

In this stage, physical methods are used for cleaning the wastewater. Processes like screening, sedimentation and skimming are used to remove the solids. No chemicals are involved in this process. One of the main techniques of physical wastewater treatment includes sedimentation, which is a process of suspending the insoluble/heavy particles from the wastewater. Once the insoluble material settles down at the bottom, you can separate the pure water. Another effective physical water treatment technique includes aeration. This process consists of circulating air through the water to provide oxygen to it. Filtration, the third method, is used for filtering out all the contaminants. You can use special kind of filters to pass the wastewater and separate the contaminants and insoluble particles present in it. The sand filter is the most commonly used filter. The grease found on the surface of some wastewater can also be removed easily through this method.

Biological Water Treatment:

This uses various biological processes to break down the organic matter present in wastewater, such as soap, human waste, oils and food. Microorganisms metabolize organic matter in the wastewater in biological treatment. It can be divided into three categories:

- The structure is based on a simple principle of removing pollutant mainly (SUSPENDED PARTICLES) along with the other pollutant such as toxic and BOD. Aerobic processes: Bacteria decomposes the organic matter and converts it into carbon dioxide that can be used by plants. Oxygen is used in this process.
- Anaerobic processes: Here, fermentation is used for fermenting the waste at a specific temperature. Oxygen is not used in anaerobic process.
- Composting: A type of aerobic process where wastewater is treated by mixing it with sawdust or other carbon sources

Secondary treatment removes most of the solids present in wastewater, however, some dissolved nutrients such as nitrogen and phosphorous may remain.

Chemical Water Treatment:

As the name suggests, this treatment involves the use of chemicals in water. Chlorine, an oxidizing chemical, is commonly used to kill bacteria which decomposes water by adding contaminants to it. Another oxidizing agent used for purifying the wastewater is ozone.Neutralization is a technique where an acid or base is added to bring the water to its natural pH of 7. Chemicals prevent the bacteria from reproducing in water, thus making the water pure.

Sludge Treatment:

This is a solid-liquid separation process where the least possible residual moisture is required in the solid phase and the lowest possible solid particle residues are required in the separated liquid phase.
An example of this includes dewatering of sludge from industrial wastewater or sewage plant where the residual moisture in dewatered solids determines the disposal costs and the cent rate quality determines the pollution load returned back to the treatment facility. You need to minimize both.
A solid-liquid separation devic**e** such as a centrifuge is used for removing the solids from the wastewater.Wastewater has a lot of impact on the natural world and it is important to treat it effectively. By treating wastewater, you don't just save the creatures thriving on it, but also protect the planet as a whole.

All the processes will be done by the particular chambers of the structure .such as:-

1. *ON BANK DAM*
2. *INLET CHAMBER*
3. *CHAMBER (A)*
4. *CHAMBER (B)*
5. *PURIFIER*
6. *VEGITATION*
7. *OUT LET*

***ON BANK DAM*:**

The construction of the dam will include making the river bed deep by digging it's shown in the figure it does not block the natural flow of the river it's a on bank dam it will regulate the flow of the river and perform these following functions:-

- Regulation of the flow of the water in order to make sure the steady flow of water for purification.
- Regulate the availability of water in all weather and directing the excess water to the vegetation areas.
- Having a small scale hydroelectric power plant so as to generate electricity for the functioning of whole project.

INLET CHAMBER:

The main purpose of the construction of the inlet chamber is to take the polluted river water from the stream and make pass through different component for the first phase of the purification.

The following will be the main functions

- It will be having a high frequency signal output so as to prohibit any river animal to enter through, major protection will be taken for the safety of humans too.
- It will be constructed to the same level of that of river bed and will consume all kind of solid waste through it.
- The tank in the first chamber will allow the things to sell tele down and break them to suitable size through the breakdown component of the chamber.
- Through the process of electrolysis the electricity will be passed through for the suspended particles to combine and stellate down.
- The sediment part will be collected and used in ecofriendly way.
- The chamber will be covered with the solar panels so to provide electricity and preventing evaporation.
- The chamber will also make sure to make the water flow to the next chamber in a steady manner.

CHAMBER (A)

The whole chamber will be constructed of a charcoal layered block making sure to decrease the pollutant of the rivers. It will also be covered by solar panels.
The major function will be:-

- To purify the water by passing it through the charcoal mesh.
- The charcoal will not only decrees the suspended particles but it will also absorb the major amount of the toxics.

CHAMBER (B)

The chamber will be constructed with the main purpous to remove the presence of phosphorous in the water.it can either be done through the process of electrolysis or with the addition of reagents that will react with phosphorous and sedementize it.

PURIFIER
This part of the project will add the oxygen to the water bodies. This can be done through the vegetation (banana tree leafs) or by adding oxygen tablets.

VEGETATION
This part will mostly be covered with banana trees. Will balance and improved the ecosystem.
OUTLET
This part will check the quality of the water and regulate the out flow.

CONCLUSION

The River rejuvenating structure holds immense potential of improving the river water quality and thereby improving the aquatic life. After the construction of RRS a constant monitoring criteria is required its efficient functioning.

REFERENCES

- **APHA(1998) Standard methods for examination of water and wastewater, 20th edition.**
- **Bain MB, Stevenson NJ (1999) Aquatic habitat assessment.**
- **Biswas SP(1993) Manual of methods in fish biology**
- **Chaudhary M, MishraS, Kumar A (2017) Estimation of water pollution and probability of health risk due to imbalanced nutrients in river Ganga**
- **Cernia M.M (1995) Impoverishment Risks,Risk Management and Reconstruction.**
- **S.K Duggal, Volume 1**
- **S.K Duggal , Volume 2**