



## “An IMPROVED RIVER CLEANING SYSTEM” A Review Paper

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**ABSTRACT:** India is a holy country and during festival like Ganesh Visarjan, Navratri, Durga Puja and daily waste dumping etc. there is a lot of water pollution done on nearby water bodies. These water pollutions are a very serious concern, for e.g.: Futala Lake. Due to increase in water pollution in the form of waster debris, it is hazardous to the life of aquatic animals as they can consume it and choke or die instantly. Not only the aquatic animals but also humans are in danger due to this problem. As this water is used for irrigation and drinking purpose it is not safe for us humans. This water when used for irrigation can infect the vegetable and can cause health issues for us. If drink then it can cause respiratory as well as diseases caused by water like jaundice and can also cause skin disease. As per a report published every year, we dump 29 crore liters of sewage waste in the Ganga river. Government and NMC are constantly working to remove the waste from these water bodies. One such moment was started by NMC to clean the Nag river in Nagpur in 2013. In total over 5,000 tons of garbage and other waste was removed from a 17.68km stretch of the Nag river, starting from Ambari's overflow point to the confluence with Pili River beyond Bharatwada during a 15-day campaign. While doing this The Times of India newspaper gave the report of the amount of waste daily being dumped in the river to be around a ton. The major population to be dumping waste in the rivers is those living in the slum areas. Every year the NMC is approximately removing at least half a ton of waste from nearby lakes. Our project focuses mainly cleaning the floating waste on the surface of these water bodies, generally plastics waste.

**Index terms-** Conveyor Belt, Propeller, Collection Bin, RC Control, Review Paper

### 1. INTRODUCTION

Nowadays, the environment problems arise in many towns in India these problems come along by developing activities such as construction of houses, offices, and other business areas. The Environment problems occur due to several reasons. The

Environment issue which comes up from year to year and still cannot be solved is about garbage and waste from various places disposed into rivers. That garbage can clogs water flow, induce the water become dirty, smelly, and often over flow and floods. Conventional methods used for collection of floating waste are manual basis or by means of boat, thrash skimmers etc. and deposited near the shore of rivers. These methods are risky, costly and time consuming. By considering all the parameters of river surface cleaning systems and eliminating the drawback of the methods used earlier, the remote operated river cleaning machine is to be designed which will help in river surface cleaning effectively, efficiently and eco-friendly. Endeavour behind this project is to design and fabricate an improved system which is used to clean the waste materials which are floats on the water surface. The system is basically detects the garbage and operable automatically from any where it collect the garbage or waste material and collect it in bin or basket for that Basket we use the level sensor which detects the garbage level if the garbage is get fully filled in the basket it indicates that basket is get full with garbage and it need to unload.

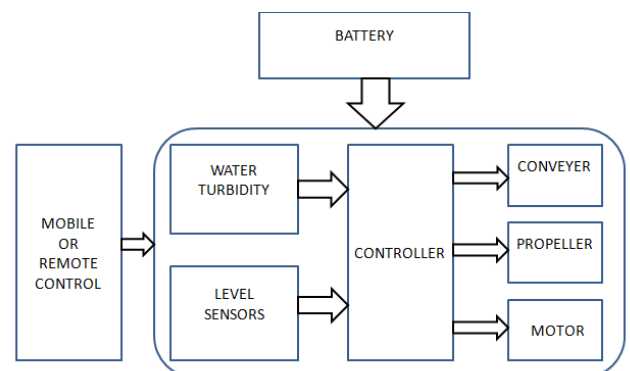


Fig1. Block Diagram

### 1.1. Problem Statement

- a) In the absence of garbage disposal facilities, the practice of dumping garbage into nearby water bodies has become quite common in recent years and has posed long-term negative impacts both on biodiversity of the area and as well as on the local environment.
- b) Many animals that live on or in the sea consume flotsam by mistake, as it often looks similar to their natural prey. Bulky plastic debris may become permanently lodged in the digestive tracts of these animals, blocking the passage of food and causing death through starvation or infection.

### 1.2. OBJECTIVES

- 1) Automatic detection of garbage and cleaning.
- 2) To minimize the use of fuel operated garbage collector.
- 3) To tackle the problem regarding wastage food material, plastic present in the water bodies.
- 4) To clean the polluted water as a result saving the aquatic animals.
- 5) To minimize the human effort which are required to clean the lake.
- 6) To overcome the difficulty of removing waste particulate floating on water surface.
- 7) To perform the fast & reliable operation during cleaning water bodies.
- 8) Improve the water quality.
- 9) To work for society for clean up a section of a water bodies.
- 10) Additional I-R based control.
- 11) Possibility of ML/AI support.

## 2. LITRATURE REVIEW

### DESIGN & FABRICATION OF RIVER CLEANING SYSTEM [1]

**Prof. Ketan.V.Dhande , Mr.Abhijeet.M. Ballade , Mr. Vishal.S. Garde , Mr.Akash.S. Lahane and Mr.Pranav.V. Boob**

India is holey country & during lots of festival like ganesh visarjan, navratri durga puja & mainly Siahnsth kumbhmela there is lots of water pollution of Godavari River at Nashik. The water pollution is very important problem in rivers, ponds and water bodies near Godavari River at Nashik. Due to increase in water pollution in the form to waste debris; it is hampering the life of aquatic animal and make their life in danger. Similarly sometimes the aquatic animal tends to eats surface waste debris considering it as a food; which ultimately cause the death of animals. Due to polluted water is are many skin deices to human kind are observed. So that to reduce the water pollution we are trying to make river cleanup machine. "River cleanup machine" a machine which involves the removing the waste debris from water surface and safely dispose from the water body. The river cleanup machine works on hydropower to extract waste water debris, plastics & garbage from Godavari river at Nashik.

### DESIGN AND FABRICATION OF RIVER CLEANING MACHINE [2]

**Saifali Sayyad<sup>1</sup>, Adarsh Dorlikar<sup>2</sup>, Sneha Ratnaparkhi<sup>3</sup>, Nikhil Tonge<sup>4</sup>, Tanvi Bhagat<sup>5</sup> Prof. Mahesh N. Buradkar**

This project emphasis on design and fabrication of the river waste cleaning machine. "River cleaning machine" a machine which involves the removing the waste debris from water surface and safely dispose from the water body. The work has done looking at the current situation of our national rivers which are dump with crore liters of sewage and loaded with pollutants, toxic materials, debris etc. Due to increase in water pollution in the form to waste debris; it is hampering the life of aquatic animal and make their life in danger. A machine will lift the waste surface debris from the water bodies, this will ultimately result in reduction of water pollution and lastly the aquatic animal's death to these problems will be reduced. The main aim of the project is to reduce the man power, time consumption for cleaning the river. In this project we have store the energy in the battery and used this energy for river cleaning with the help of a motor and chain drive arrangement.

### DESIGN AND CONSTRUCTION OF RIVER CLEANING MECHANISM [3]

**Dharmesh N. Kandare, Aniket N. Kalel, Aniket S. Jamdade, Gitesh P. Jawale , R.K. Khanpate Professor**

The project emphasizes on design & construction of river cleaning mechanism. The system is successfully able to clean the floating solid waste over the river surface more efficiently. This system works towards its social aim of cleaning the rivers & other water bodies. It simulates the conventionally used mechanisms of using conveyors in its working principles but have an intimidating modification of Air Tube Piping Guider mechanism for improving its efficiency. The conventional & generally used method of cleaning or more precisely collecting the floating waste are manual or by means of boat etc. and are deposited near the shore of river. But these methods are risky, costly, time consuming and required major workforce. By considering all the parameters of river surface cleaning systems and eliminating the drawback of all the methods mention earlier, the remote operated river cleaning machine has been design and constructed which helps in river surface cleaning effectively, efficiently and ecofriendly. The main aim of the project is to reduce the manpower, time consumption and thereby increasing the efficiency of the machine for cleaning the river. In this project, we have remotely controlled the operation of river cleaning with the help of motor, coupling & R/C arrangement.

## **DESIGN AND FABRICATION OF REMOTE CONTROLLED SEWAGE CLEANING MACHINE [4]**

**M. Mohamed Idhris, M.Elamparthi, C. Manoj Kumar, Dr. N. Nithyavathy, Mr. K. Suganeswaran, Mr. S. Arunkumar**

The motive of the project is to automate the sewage cleaning process in drainage, to reduce the spreading of diseases to human. The black water cleaning process helps to prevent pest infestations by reducing the residues that can attract and support pests. It also improves the shelf life and sensory quality of food products. In the proposed system, the machine is operated with remote control to clean the sewage. Hence, this system avoids the impacts from the sewage waste and its harmful gases. This helps to prevent the mosquito generation from the wastage. The system has a wiper motor that starts running as soon as the set-up is switched on. Two power window motors are connected to the wheel and it is driven with the help of the remote control set-up. The process starts collecting the sewage wastes by using the arm and it throws back the waste into the bin fixed in the machine at the bottom. An arm is used to lift the sewage and in turn a bucket is used to collect them. The set-up runs even in sewage area with water (limited to a particular amount) so that the wastages which floats on the water surface also gets collected. The garbage which affects the drainage is also picked up and removed. This system has limited human intervention in the process of cleaning and in turn reduces spreading of diseases to mankind.

## **DESIGN AND FABRICATION OF RIVER CLEANING MACHINE [5]**

**Sheikh Md Shahid Md Rafique, Dr. Akash Langde**

This project emphasis on design and fabrication of the river waste cleaning machine. The work has done looking at the current situation of our national rivers which are dump with crore liters of sewage and loaded with pollutants, toxic materials, debris etc. The government of India has taken charge to clean rivers and invest huge capital in many river cleaning projects like "Namami Gange", "Narmada Bachao" and many major and medium projects in various cities like Ahmadabad, Varanasi etc. By taking this into consideration, this machine has designed to clean river water surface.

## **AUTOMATED MARINE SURFACE TRASH CLEANER [6]**

**Md.Raseduzzaman Ruman, M.das,+1 authore Shantanu kumar Nath published 2019 Enviromental science 2019 IEEE 5<sup>th</sup> International conference for convergence in technology (12CT)**

This paper is describes the design and construction of an automated waater surface cleaner .It is executed thinking of the present situation of our national rivers consisting of millions of wastes hydrophytes ,toxicant plastics ,polythene,dead leaves etc. The use of an

automated water surface cleaner reduces water pollution at 10% of the total water pollution .Also it is used in those places where people cannot reach easily.The main focus of this paper is to eliminate trashes off the water surface by a remote control system thus reducing human effort .It requires RF remote connection for navigation purposes ,which is the input for wheel motor and a conveyer belt ,a GSM to get notified when the device is significantly loaded ,a motor connected conveyer belt to collect trash and an ARDUINO acting as the interface in between .A bin is attached to gather trashes and a sensor to notify the user if it is full .This system is economical as well since it reduces the labor cost required to do all these kind of stuff .

## **AGATOR (Automatic Garbage Collector) as Automatic Garbage Collector Robot Model [7]**

**Nurlansa, Dewi Anisa Istiqomah, and Mahendra Astu Osiany Sanggh a Pawitra, Member, IACSIT**

This research aims to design and make AGATOR (Automatic Garbage Collector), a rotor robot model as automatic garbage collector to counter accumulation of garbage in the river which has no flow effectively and efficiently. The method of implementation is design and construction. This method includes the identification of needs, analysis of the components required specifically, hardware and software engineering, developing, and testing. The test results obtain data by specification of AGATOR includes IC ATmega16 with 5 Volt voltage and 1,1 mAmpere current, IC Driver with 12 Volt voltage and 1,2 Ampere current, and Limit switch as the controller. Support devices of the robot are mechanical robot, robot control system, sensor system, and actuator robot. The maximum load drives the garbage receptacle until 5 kg. The average speed of robot when take out the garbage is 0,26 m/

## **AQUA DREDGER RIVER CLEANING MACHINE [8]**

**Kaushal Patwardhan ,Shivraj Hagawane ,Ashish Kalokhe**

This project focuses on design and fabrication of the river waste cleaning machine. The work has done looking at the current situation of our national rivers which are dump with core liters of sewage and loaded with pollutants, toxic materials, debris etc. The government of India has taken charge to clean rivers and invest huge capital in many river cleaning projects like "Namami Bachao" and many major and medium projects in various cities like Ahmadabad into consideration, this machine has designed to clean river water surface. Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate but also at higher cost. Automation plays an important role in when it comes to smart work. In this project we have fabricated the remote operated river cleaning machine. The main aim of the project is to reduce the man power and time consumed for cleaning the river. In



this project we have automated the operation of river cleaning with help of a motor and chain drive arrangement. Also a special purpose harvesting cutter is commissioned on a previous constructed model by other group of engineers. These project also emphasizes of the economical approach for implementation in urban areas.

### 3. METHODOLOGY

The project consists of a motor operated water wheel to run the project. It has four DC Motor the device which is running the project is chain drive coupled having collecting plate. The project consists of two main shafts balancing and hoisting the sprocket of chain drive. The components are rest on frame serve as main body of the project. The steel pipe with pressurize air generates pressure head to run the project on water surface. The fabricated storage tank is used to store the waste fulfilling the purpose of the project. In this project the main aim of this machine is to lift the waste debris from the water surface and dispose them in the tray. Here we are fabricating the remote operated river cleaning machine. The collecting plate and chain drives are rotating continuously by the motor. The collecting plate is coupled between the two chain drives for collect the waste materials from river. The collected wastages are thrown on the collecting tray with the help of conveyer. Our project is having propeller which is used to drive the machine on the river.

### 4. CONSTRUCTION & WORKING

In this project the main aim of this machine is to lift the waste debris from the water surface and dispose them in the tray. Here we are fabricating the remote operated river cleaning machine. The collecting plate and chain drives are rotating continuously by the motor. The collecting plate is coupled between the two chain drives for collect the waste materials from river. The collected wastages are thrown on the collecting tray with the help of conveyer. Our project is having propeller which is used to drive the machine on the river. The propeller is run with the help of two PMDC motor. The total electrical device is controlled by RF transmitter and receiver which use to control the machine remotely.

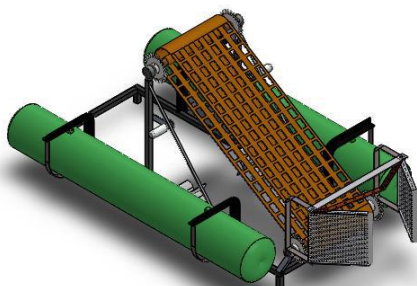


Fig.2 CAD Model of Assembled Machine

### 5. CONCLUSION

This project "An Improved River Cleaning System" is designed with the hope that it is very much economical and helpful to river and pond cleaning. It is very portable and very useful for the society. It will be helpful in cleaning river as a result will be helpful in saving aquatic lives.

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