



# Design & Fabrication of River Water Cleaning Machine

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**ABSTRACT:** 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.

The main aim of our project is to design and develop river cleaning machine. The 3 D model is drawn. All the parts are manufactured and then assembled together and then the testing of model is carried out.

**Keywords :-** Motor, Bucket Conveyor, Collecting Tank, Sprocket, Bearing.

## 1. INTRODUCTION

The "River cleaning machine" used in that places where there is waste debris in the water body which are to be removed. This machine is consisting of waterwheel driven conveyer mechanism which collect & remove the wastage, garbage & plastic wastages from water bodies. This also reduce the difficulties which we face when collection of debris take place. 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. It consists of Belt drive mechanism which lifts the debris from the water. The use of this project will be made in rivers, ponds, lakes and other water bodies for to clean the surface water debris from bodies.

## 2. LITERATURE REVIEW

[1] "Design and fabrication of River Waste Cleaning Machine" by Mr. P. M. Sirsat, Dr. I. A. Khan, Mr. P. V. Jadhav, Mr. P. T. Date

This paper emphasis on design and fabrication details of the river waste cleaning machine. The work has done looking at the current situation of our national rivers which are dump with crore litres 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 cleanings 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.

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 has designed which helps in river surface cleaning effectively, efficiently and eco- friendly.

The machine consists of collecting plate coupled with conveyor belt and chain drives which rotate by the PMDC motor. The collected waste is thrown on the collecting tray. Propeller is used to drive the machine on the river & run with help of PMDC motor. The total electrical devices are controlled by RF transmitter and receiver which use to control the machine remotely.

The “River waste cleaning machine” is used where there is waste debris in the water body which are to be removed. This machine consists of DC motors, RF transmitter and receiver, propeller, PVC pipes and chain drive with the conveyor attached to it for collecting wastage, garbage & plastic wastages from water bodies. The project “River Waste Cleaning Machine” has designed which is very much economical, easy to operate and helpful for water cleaning and it can be modified with more cleaning capacity and efficiency

## **[2] “Design and fabrication of beach cleaning machine” by Vivek Dhole, Omkar Doke, Ajitkumar Kakade, Shrishail Teradale, Prof. Rohit Patil**

Due to the difficulties faced in keeping the beach clean manually, we have come up with equipment which not only collects the waste (sticks, on degradable waste) but also separates, which is easy for waste disposal. The machine mainly consists of an engine which runs through a fossil fuel which drives the entire process. The waste is collected through conveyor blade along with the sand which falls of through the perforations on the conveyor back to the sand bed; separation of waste material takes place through principle of Density difference. It consists of two hoppers where the different waste gets collected which facilitates easy disposal of waste. The coastal area beaches are main attraction for tourism, so in attracting tourist the beach must be kept clean. For the purpose of cleaning the beach, some cleaning machine must be used so we have manufactured a cleaning machine which is helpful in cleaning the beaches.

The motor is responsible for driving mechanism of conveyor. The strainer attached to the conveyor will collect the wastages from the surroundings and transferred to storage bucket through conveying belt. As today’s era is moving towards being digitalized and automated with a great speed, the youth want everything very easily and smart. Not only the youth but the people of all generation are finding it very easy to be smart effort and more and more being healthy and are getting attracted or joined towards latest technology of being “smart work”. Nobody likes to suffer and wait for our long waiting hours just to get good surrounding or so. To avoid this and to save time of our management of waste we are creating a application called “Smart cleaning system”. For that we are using system by which beach cleaner can do his work smartly using communication through application. Smart Cleaning System proposed to overcome the real time problems. With the continued expansion of industries, the problem of sewage water must be urgently resolved due to the increasing sewage problems from industries of the surrounding environment. The wastes produced from the industries are very harmful to human beings and to the environment. Second Important thing is waste management system by which worker can maintain all his health and work good through application maintain that reporting worker don’t need to wait and get in to drainage.

## **[3] “Drainage Water Cleaner Machine” by Ganesh S. Patil, Rahul A. Pawar, Manish D. Borole, Shubham G. Ahire, Ajay L. Krishnani, Amit H. Karwande**

Water is the basic need for the existence of life on earth. In spite of 70% water on earth majority of water is not suitable for drinking purpose. There is a huge demand of clean water as it is used for a variety of purpose such as drinking, bathing, cleaning, cooking etc. Impurities present in water can cause serious health issues that can damage the life of human beings. Wastewater is characterized as the stream of utilized water from homes, organizations, ventures, business exercises and foundations which are subjected to the treatment plants by a precisely planned and built system of funnels. The measure of stream dealt with by a treatment plant shifts with the season of day and with the times of the year. The procedures looked into here incorporate both those that expel poison soils in wastewater and those that vanishes them. Utilizing a wastewater treatment innovation that expels, instead of decimates, a toxin will give a treatment remains. This sort of wastewater is characterized and characterized by its wellsprings of cause. Regularly 200 to 500 liters of wastewater are created for every individual associated with the framework

consistently. At wastewater treatment plant, this stream is dealt with before it is permitted to be come back to the earth. There are no occasions for wastewater treatment, and most plants work 24 hours each day of the week. Waste water treatment plants take a shot at basic purpose of the water cycle, helping nature shields water from the intemperate contamination. Most treatment plants have essentialtreatment and auxiliary treatment.

The waste and gases produced from the industries are very harmful to human beings and to the environment. Our proposed system is used to clean and control the drainage level using auto mechanism technique Mechanical control techniques include the total or halfway evacuation of Plastic containers and Un- disintegrated solids by mechanical means, including: gathering, destroying, cutting, rototilling, rotating, and binding.

In recent past there have been many researches carried out waste water management Our project also stands one of them with ideology & new tech Many specific empirical studies have been carried out and categories such as drainage cleaning system and its automation have been studied to a great depth. We focus more on making the system mobile in the drainage.

**[4] “STUDY OF RIVER HARVESTING & TRASH CLEANING MACHINE” by Rajendra Patil, Rahul Itnare,Sagar Ahirrao, Amol Jadhav, Ajay Dhumal**

Mechanical control methods involve the complete or partial removal of plants by mechanical means, including: harvesting, shredding, mowing, rototilling, rotovating, and chaining. Mechanical control methods can also be used to expedite manual harvesting activities, including hand harvesting, raking, and cut stump control, with the use of motor- driven machinery. These management techniques for plants rarely result in localized eradication of the species, but rather, reduce target plant abundance to non-nuisance levels. A range of machinery for managing and controlling aquatic vegetation is in use today, designed for specific plant types and for operation in specific aquatic habitats. A mechanical aquatic harvester is a type of barge used for a variety of tasks, including aquatic plant management and trash removal in rivers, lakes, bays, and harbours. Harvesters are designed to collect and unload vegetation and debris using a conveyor system on a boom, adjustable to the appropriate cutting height, up to 6 feet below the surface of the water. Cutter bars collect material and bring it aboard the vessel using the conveyor; when the barge has reached capacity, cut material is transported to a disposal site and offloaded using the conveyor.

Many work boats and vessels have been proposed for collection of floating solid waste and other debris. These may typically be formed as a catamaran-type hull, i.e., a pair of pontoons or sponsors, or as a monohull, with paddle wheel or screw drive propulsion, and an operator station. In one typical trash skimmer design, one or more hydraulically powered open mesh conveyors are positioned between the pontoons of a catamaran-type twin-hull vessel. Twin over-the- rear propellers are used to propel and manoeuvre the vessel, and these can be tipped up for cleaning weeds and debris from the propeller blades. A main pickup conveyor extends off the front end, and extends into the water to catch the floatable, which it picks up and carries back to a main storage conveyor.

**[5] “Design and Analysis of River Water Cleaning Machine”, by Madhavi N.Wagh, Kashinath Munde**

This project emphasis on Design and Analysis of the River Water Cleaning Machine. The work has done looking at the current situation of our national rivers which are dump with crore litters 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 cleanings 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. Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. In this project we have automated the operation of river cleaning with help of a motor and chain drive arrangement. Some needs of automation are described below. Here using RF transmitter and receiver are to control the cleaning machine. Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics forms an attractive medium for low-cost automation.

The Over two thirds of Earth's surface is covered by water; less than a third is taken up by land. As Earth's population continues to grow, people are putting ever-increasing pressure on the planet's water resources. In a sense, our oceans, rivers, and other inland waters are being "squeezed" by human activities so their quality is reduced. Poorer water quality means water

pollution. This invention relates to skimmer boats, i.e., work boats for collecting and disposing of floating solid waste materials in harbours and waterways.

This project design and analysis of river water cleaning machine is fabricated on the basis of literature and research on different journal and paper relevantly available and fabricated in accordance so it can provide flexibility in operation. This innovation is easy and less costly and has lot of room to grow more economical. This project "River water Cleaning Machine" is designed with the hope that it is very much economical and helpful to river and Pond cleaning. This design and estimating cost and availability it is very cheap and very useful for the society.

### 3. SYSTEM MODEL & DESIGN

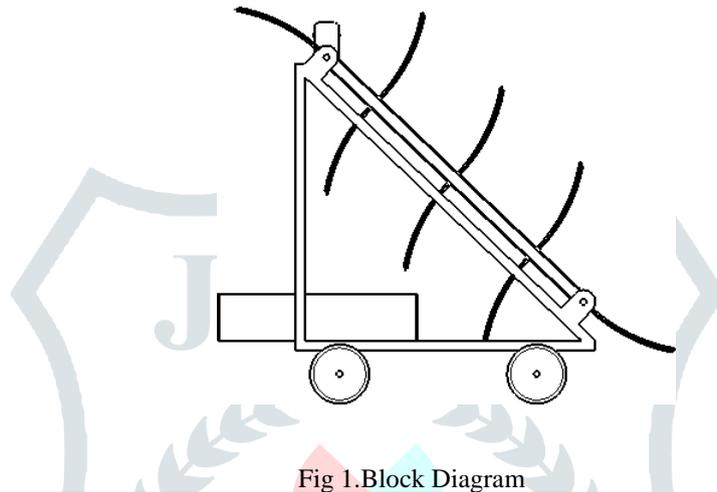


Fig 1. Block Diagram



Fig 2. Catia Model

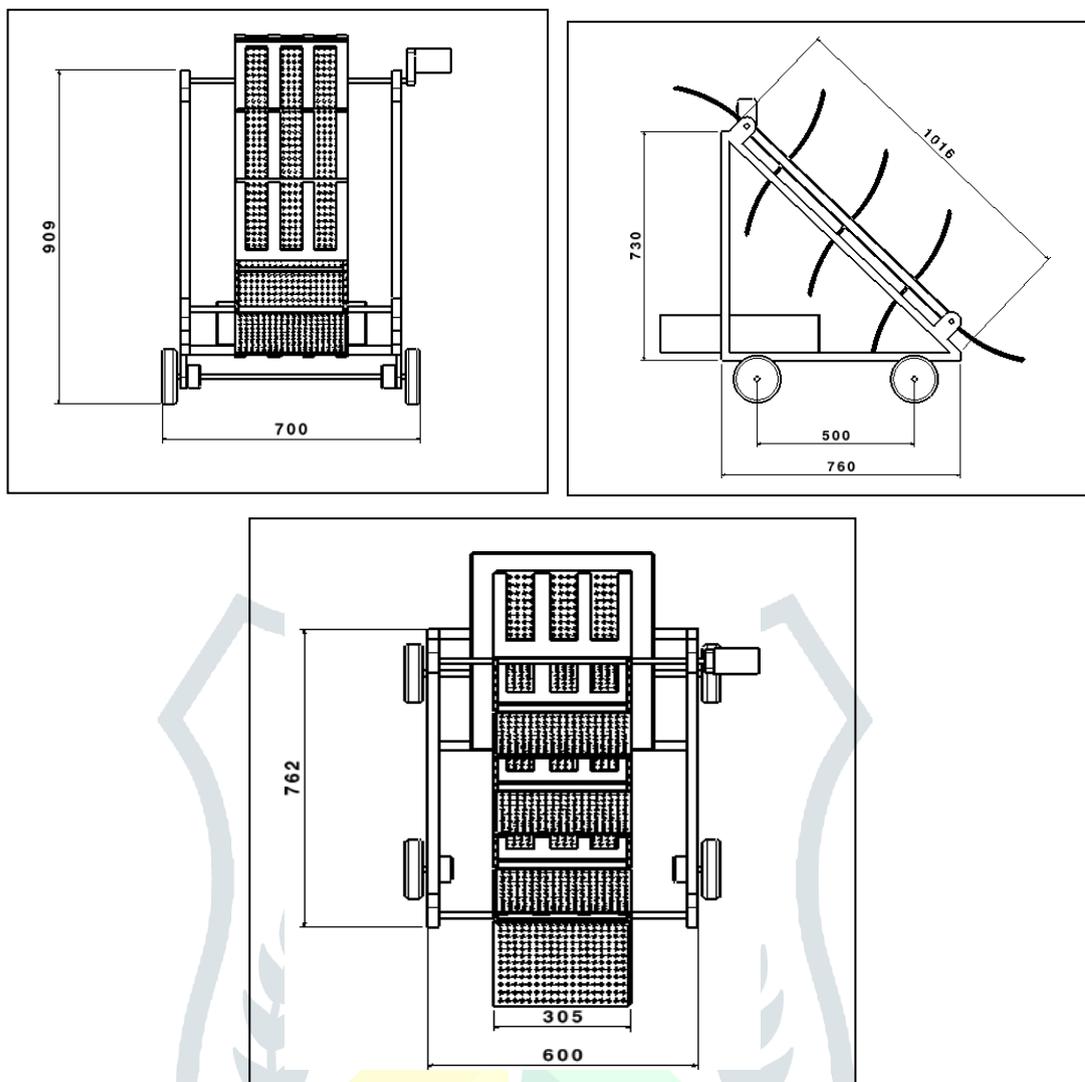


Fig 3. Drafting Model

#### 4. Working Principal

The device is placed across a river and sea so that only river sand can get through the lower basement. Floating waste like bottles, plastic cans, covers any kind of waste etc. is lifted by lifters which are connected to the chain. The chain revolves with the sprocket wheel which is driven by the motor. The energy provided to the motor is electrical energy. When the motor runs the chain starts to circulate making the lifter to lift up. The waste material is lifted by lifter teeth and stored in the collecting box. Once the collecting box is full, the waste materials are removed from the box. There is a 45 to 50-degree bend plate which is assembled at the bottom of the box. It is mainly used to level the river surface.

The two rollers are connected apart from each other through a belt drive on which perforated buckets are mounted through a riveting joint. As the system is allowed into drainage, the roller starts rotating the buckets will move inside the drainage which will go up to material inside the drainage block. The bucket will pick up the waste material and floating material from the drain block. The bucket allows water to flow out as being perforated and only waste part will be collected into the storage collector behind the belt drive.

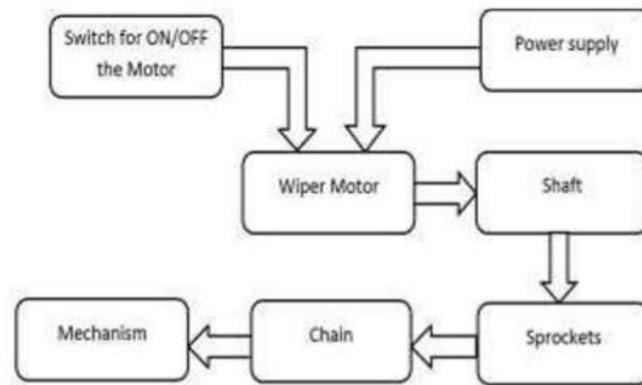


Fig. Working Flow Chart

## 5. Conclusion

This Project design and fabrication of river water cleaning machine is fabricated on the basis of literature and research on different journal and paper relevantly available and fabricated in accordance so it can provide flexibility in operation. This innovation is easy and less costly and has lot of room to grow more economical. This project “River water Cleaning Machine” is designed with the hope that it is very much economical and helpful to river and Pond cleaning. On the basis of spot design and estimating cost and availability it is very cheap and very useful for the society.

### 5.FUTURE SCOPE

1. Instead of battery power, the motor can be run using solar power, by fitting solar panels to the setup.
2. During the real time application, the size of the machine will be big so that more lifter pans can be fixed to the chain and a bigger motor can be used to increase performance and rate of collecting waste.
3. A sensor can be placed in the collector bin. As the collecting bin becomes full, it gives an alert. Plastic bottles are used in most places and are thrown as such into the sewages.
4. This project will be very useful in cleaning these areas.
5. In future, it is possible to make it a fully automated system by the implementation of control algorithms. Thus, this project helps in making our nation clean and healthy.

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