

“DESIGN & DEVELOPMENT OF AQUATIC WEEDS COLLECTING MACHINE”

Prof. Sanjay Sajjanwar¹, Nehal Meshram², Shubham Rachhore³, Harshal Thombare⁴, Abhishek Kadu⁵, Hrushikesh Kadu⁶, Kailash Sinha⁷

¹Assistant Professor, Department of Mechanical Engineering, Jhulelal Institute of Technology, Nagpur, Maharashtra, India.

²⁻⁷UG Students, Department of Mechanical Engineering, Jhulelal Institute of Technology, Nagpur, Maharashtra, India.

Abstract: This stress on style and fabrication of the stream waste cleanup machine. The work has carried out viewing this nation of affairs of our country wide movement that location unit dump with core litre of savage and loaded with waste product, toxic material, debris, etc. The government of India is taken cost to wash movement and invest significant capital in could circulate cleanup comes in like “Namami Bachao”, “Nramada Bachao” and lots of predominant and medium comes in assorted cities like Ahemadabad, Varanasi, etc. By taking this into concept this computing device has been designed to wash circulation waste surface. There were a number of methods to gain the above-named objective and the other hand during this evolution paper we have a tendency to shall talk about an automatically convenient however reasonable technique. And also, with an attempt to minimize human intervention during the technique by using automating it. Nowadays, automation plays a indispensable role in production. During this project, we have designed a water-propelled stream improvement machine. The most important aim of the challenge was once to return up with an routinely effortless similarly electronically effortless mechanism that moreover scales returned manpower and time spent in cleaning water bodies whilst attaining the purpose of floating waste elimination from sewage streams.

Key Words: PVC pipes, conveyor belt, bearings, propeller, weeds & garbage collecting tank, battery, motors, sensors, etc.

1. INTRODUCTION:

Nowadays, atmosphere troubles occur in countless cities in India these problems return on with the aid of creating things to do like the construction of homes, office, and oneof-a-kind enterprise areas. The atmosphere problems appear thanks to many reasons they're as the low price range allocation for atmosphere administration and public cognizance to protect the atmosphere. The atmosphere difficulty that comes up from 12 months to yr and nonetheless can now not be solved is related to garbage and waste from numerous places disposed into rivers. That dustbin clogs water flow, induces the water come to be dirty, smelly, thus many instances and infrequently overflow so then offer and result floods. For an assortment of floating

waste, traditional methods are used on a manual basis or by machine suggestion, such as thrash skimmer, and placed close to riverbanks. These methods are dangerous, costly, and time consuming. The remote operated stream collecting weeds & garbage machine was built by taking into account all of the parameters of stream surface cleaning system and eliminating the disadvantages of previous methods. A cleaning that is effective, quick, and environmentally friendly. This machine is made up of a waterwheel-driven conveyor system that collects and removes waste, garbage, and plastic waste from bodies of water. This also Page 1 reduce the issues that arise when a large amount of scrap accumulator. A machine can lift discarded surface scrap from water bodies, which will result in less pollution and, as a result, fewer aquatic animals deaths. In 2008 John Kellett created watercourse trash collection machine in a city in the united states. And in 2014, Kellett created a larger machine that could handle more material and command two dumpsters. On the twenty-first day of the Gregorian calender months of 2015, when the first major violent storm stuck this project was abandoned.

2. PROBLEM STATEMENT :

- In the absence of disposal facilities, the practice of dumping rubbish into nearby water bodies has been increasingly popular in recent years, with semi permanent harmful effects on a range of realms as well as the natural environment.
- Many animal that live on or in the ocean eat wreckage by accident because it looks similar to their normal prey. The big plastic piece could become permanently lodged within those animal's biological process tracts, impeding food transit and causing death by malnutrition or infection.
- To obtain a clean water body in order to reduce watercourse pollution and to accomplished the Godavari watercourse's wonder through clean water bodies.

3. OBJECTIVE:

1. To remove trash from small and large bodies of water.
2. To reduce the use of garbage collector.
3. Plastic is prevalent in aquatic bodies to address the problem of food.
4. To safeguard aquatic wildlife by removing weeds and rubbish from polluted water.
5. To reduce the amount of human effort required to clean the lake.

4. METHODOLOGY:

In this system, we employ a battery-operated equipment with a belt conveyor to gather rubbish from small and large bodies of water. We may gather rubbish such as plastic bags, plastic bottles, food wrapper, paper bags, straws and marine debris with the help of this conveyor. This equipment can be used near slum areas where there is a lake, river, or dam. People living in these slum neighbourhood may be harmed because they utilized this water for daily purposes such as bathing, washing clothes and dishes this technology allows for the conservation of resource such as gasoline and diesel.

5. CONSTRUCTION:

In terms of the machine, we need to make it less corrosive. As a result, we built a river cleaning equipment out of nonmetallic materials. When the boat start collecting weeds and garbage from the river or lake, may section, such as frame and conveyor, will come into touch with the water So, the machine consists of the following parts:-

- 1) Frame
- 2) Conveyor
- 3) Propeller
- 4) Remote
- 5) Tank (collector)

1) Frame: -The skeleton of machine is the frame on which the tank, propeller, and conveyor will be installed. We chose PVC pipes for the machine's structure because of its lightweight and anti corrosion properties. There are so many advantages of PVC like;

- PVC is radially available and relatively inexpensive.
- PVC is very dense & thus very hard so their resist impact is very well compared to other plastics.
- PVC has very good tensile strength.
- It is very well resistant to chemicals & alkalizes.
- Size of frame: - 1. Height = 500mm

2. Length = 1300mm

3. Breadth= 1000mm

2) Conveyor: - The conveyor is to lift waste that has accumulated on the surface of rivers, lakes. There are many other types of of conveyor in use, but we used a plastic net flat belt conveyor for our machines. The beginning piece of the conveyor is placed in the water and comes into direct touch with the water, as seen in the image. If we use metal conveyor, it would rust and we will have to replace it much sooner; also, metal conveyor are very expensive, so we are employing plastic net conveyors.

- Size of conveyor:- 1.Length = 700mm
2.Width = 400mm

Propeller:- the thrust power to move the machine on the sea surface in a forwarding direction by the propeller is being developed in this project, we used

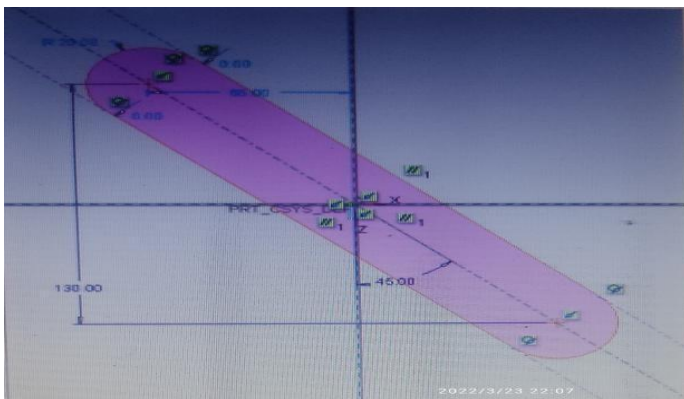
2) propeller fan with a diameter of 73 mm and motor speed of 400 RPM to drive it.

3) Remote:- As far as human life concerned, we are using remote control to operates this machine . the DPDT switch(double pole double throw toggle switch) completes the circuit of the remote.

4) Collector tank: - We are collecting the waste garbage that is floating in the water in the collector

6. WORKING:

The machine's primary goal in this project is to transport waste surface and dispose of it in the merchandising yard. The machine is made up of a conveyor that is supported by motors and wheels on two shafts. Because the shafts are made of PVC, the motors are DC motors with a speed of 200 RPM and are placed on the shaft. The conveyor is operated by two DC motors, and as the conveyor moves, it collects trash, and plastic bottles from the water surface. Because the machine floats on the water's surface, the trash on the surface will be raised in an upward direction. The trash garbage will be collected in the tank as it reaches the topmost point. This will result result in the cleaning of water bodies as well as a safe environment in the water bodies. Although there is no human interaction with the actual operation of machine, it is controlled by remotely. As a result, there are no human risk. We are particularly concerned about human life in this project, which is why we are using a remote control to operate this equipment



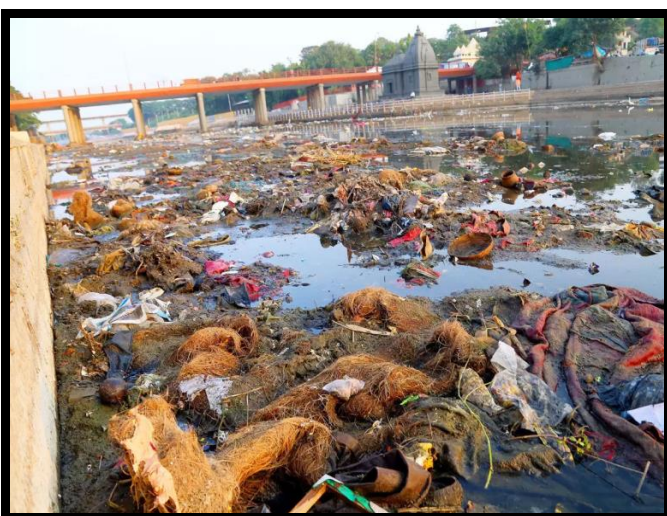
7. ADVANTAGES AND APPLICATION:

7.1: ADVANTAGES:-

1. It is a non-conventional river cleanup system.
2. Its initial and maintenance cost are low.
3. Skilled workers are not required to drive the system self-propel.
4. Proper timing of mechanical control operation can improve control and reduce the spread of propagates.
5. Environment-friendly system.

7.2: APPLICATION:-

1. it is applicable to reduce water pollution in rivers, ponds, and oceans.
2. It is useful to reduce the environmental marine pollution at Godavari river, Nashik.
3. It is also useful in fishery plantS to collect dead fishes & solid impurities from wastewater.
4. It is useful to remove the sediments present in the swimming pool to keep it clean.



8. CONCLUSION:

While final this report, we tend to feel fulfill immeasurable sensible expertise throughout the production schedules of the operating project model. We tend to be happy that our information has been used for financial aid. Though the planning criteria with drawback definitions were overcome by exploitation references & lecturer's tips. The selection of raw materials helped the US in the machining of the varied element to terribly closed tolerance and thereby minimizing the extent of equalization drawback. We are going to do efforts throughout the machining, fabrication, and assembly work of the project model to meet the requirement of the project.

9. REFERENCES :

- 1) Mohamed Idris, M. Elamparthi, C. Manoj Kumar Dr.N. Nithyavathy, Mr. K. Suganeswaran, Mr. S. Arun Kumar, DESIGN AND FABRICATION OF REMOTE CONTROLLED SEWAGE CLEANING MACHINE. [1]
- 2) Pankaj Singh Sirohi, Rahul Dev, Shubham Gautam, Vinay Kumar Singh, Saroj Kumar Review on Advance River Cleaner. [2]
- 3) Mr. P. M. Sirsat, Dr. I. A. Khan, Mr. P. V. Jadhav, Mr. P.T. Date Design and fabrication of River Waste Cleaning Machine. [3]
- 4) Prof. N.G.Jogi, Akash Dambhare, Kundan Golekar, Akshay Giri, Shubham Take Efficient Lake Garbage Collector by Using Pedal Operated Boat. [4]
- 5) Ankita B.Padwal, Monica S. Tambe, Pooja S. Chavare, Reshma K. Manahawar, Mitali S. Mhatre Review Paper on Fabrication of Manually Controlled Drainage Cleaning System. [5]
- 6) Osiany Nurlansa, Dewi Anisa Istiqomah, and Mahendra Astu Sanggha Pawitra, "AGATOR (Automatic Garbage Collector) as Automatic Garbage Collector Robot Model" International Journal of Future Computer and Communication, Vol. 3, No. 5, October 2014. [6]
- 7) Prof. N.G. Jogi, Akash Dambhare, Kundan Golekar, Akshay Giri, Shubham Take, "Efficient Lake Garbage Collector By Using Pedal Operated Boat", IJRTER Volume 02, Issue 04; April 2016 ISSN: 2455-1457. [7]