



# STATIC PONDS WASTE REMOVAL AND DISPOSAL MACHINE

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**ABSTRACT-** In Recent Days the rivers, lakes and ponds are contaminated by garbages like plastic wastes, green waste algae and aerial lotus etc,. Removal of waste on static ponds are challenging task for municipality corporations in the current scenario. Proper disposal of sewages from industries and commercials are still a challenging task. The manual effort for cleaning work on ponds, river and lake cleaning should be reduced and replaced by automated system. Automation plays a vital role in all industrial applications. In this project the proposal the replacement of manual work on ponds, river and lake cleaning by automated system. We designed our project for the way to control the disposal of wastages and removal of solid wastages from ponds, rivers and lake by using automatic system controlled

machine. This machine is portable and easy to operate by mobile phone.

## I.INTRODUCTION

The "ponds and river clean up machine" used in that places where there is waste debris in the water body which are to be removed. This machine is consisting of water will driven by conveyor 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 cleaning

upper water waste debris. From this project we hope to clean the surface water debris from bodies. Similarly, they are lots of problems of water pollution under Godavari river, nashik which affect the acoustic, human life and beauty of Godavari river. Some photo graphs are showing the water pollution near Godavari river, nashik.



**Fig 1. Water pollution in Godavari River at Gandhi Talav Nashik**

It affects healthy badly and also causes skin allergies. The mechanism which can auto collect floating garbage and solid waste from the water surface and collect it into its floating bin. It can be programmed, scaled up to any size and can operate remotely. The system is indigenous and efficient to take river cleaning cause.

## II. LITERATURE REVIEW

**Ganesh U L, et.al.[1] showed the usage of mechanical drainage cleaner** to replace the manual work required for drainage cleaning system. Drainage pipe are very dirty. Sometimes it is harmful for human life while it's need for cleaning drainage system. To overcome this problem, they implement a mechanical semi automatic drainage water cleaner and so the water flow is efficient because of regular filtration of wastage with the help of that project. different

kind of environment hazards reduced with the help of drainage system machine.

**Dr.K. Kumaresan, et.al. [2] explained manual work converted to automated system.** Drainage using for disposal and it may be loss for human life while cleaning blockage in the drainage pipe. To overcome this problem, they implemented, "automatic sewage cleaning system". They designed the project different way clearance of gaseous substance are treated separately so the flow of water efficiently. This project may be developed with the full utilization of men, machine, and materials and money. they made their project economical and efficient with the available resource. They used automation technology concentrate with his application of mechanical, electronics, computer based systems to operate and control production .

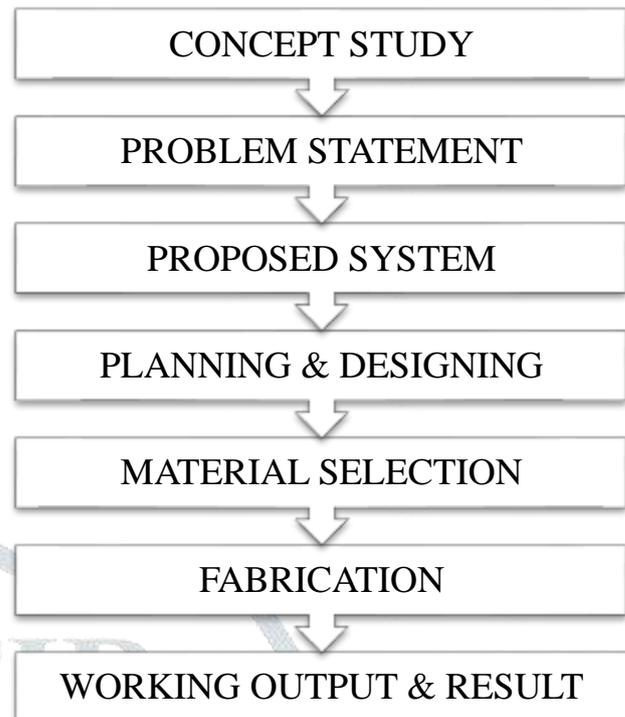
**Mr.Abhijeet., et.al. [3] Design and fabrication of river cleaning system.** India is holy country & during lots of festival like ganeshvisarajan, navratridurga puja & mainly siahnsthkumbhmela there is lots of Godavari river at nashik. the water pollution is very important problem in rivers, ponds and 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 many skin diseases to human kind are observed. So that to reduce the water pollution we are trying to

make river clean up machine. "River clean up 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 debris, plastics & garbage from Godavari river at nashik.

### III. OBJECTIVE OF THE PROJECT

1. To reduce the pollution in water bodies.
2. To overcome the difficulty of removing waste particulate floating on water surface.
3. To maintain the automation during working towards cleaning river.
4. To perform the fast & reliable operation during cleaning river.
5. Improve the water quality of a godavari stream or river.
6. To work for society for cleaning up a section of a stream or river.
7. To record the amount of garbage removed from the water way & give solution to local nashik municipal corporation , reduce the pollution of Godavari.

### IV. METHODOLOGY



### V. PROBLEM STATEMENT

- 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.
- The very basic idea should be satisfied that is to avoid the interference of the operator. This will happen only by the adoption and the sustained usage of technology in the workspace.
- Another important easy removal of waste which are collected in the collecting box.
- It should not harm be aquatic animals. It must not have any property that has adverse effect on the water source.

## VI. PROPOSED METHOD

The existing system is completely a mechanical based project. It is a stationary system, simply kept in the sewage area to collect the wastes passing over it. The belt is used to conveyor movement, which has fitted fork plates to collect the waste from the sewage. The rotation of the belt along with the plates will collect floating waste and put off the waste in the bin that is placed at the back side of the system.

The designed our project in order to use it in an efficient way to control the disposal of wastage along with regular filtration pond, river and lake.

## VII. PLANNING & DESIGNING

Methodology shows systematic way to do work. It is standard process of describing process, how it is done simplest manner. Design consists of application of scientific principle, technical information, and imagination for development of new mechanism to perform specific function the total design work has been split into parts.

## VIII. MATERIAL SELECTION

The followings are the components to be used in our project which is going to fulfill a requirements of our "Static Ponds Waste Removal and Disposal Machine"

- Bucket conveyor
- Motor
- Battery
- Propeller
- Pipe
- Control unit
- Frame structure

## BUCKET CONVEYOR:



**Fig 2. Bucket conveyor**

Bucket conveyors move products (typically aggregate or bulk) vertically via reciprocating buckets. The conveyor is made of an interconnected loop of troughs/buckets that stay level when moving from horizontal to vertical, preventing their contents from spilling out. The conveyor is loaded with material at the front, or "boot", and each bucket automatically deposits at the end of the run, also known as the discharge. Bucket conveyors are non-accumulating and come in C, S, Z, or vertical arrangements, depending on the type. The bucket conveyor is collect the wastages from the water bodies.

## MOTOR:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields.

Specification-

DCMotor -

RPM=100

diameter=10 mm

## WIPER MOTOR:

12V DC Motor used in lorry wipers is to be placed above the inclined section to provide torque to rotate the conveyor belt. M16 shaft is connected to the motor shaft to transmit power.



**Fig 3. Wiper Motor**

## DC GEARED MOTOR:

DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances.



**Fig4. Geared DC motor**

## DC MOTOR PRINCIPLE:

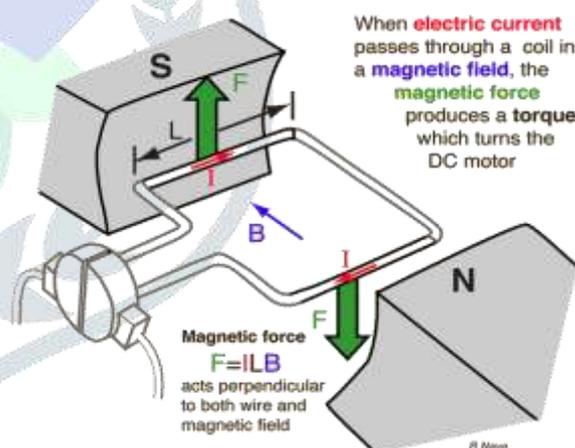
A machine that converts DC power into mechanical power is known as a DC motor.

Its operation is based on the principle that when a current carrying conductor is placed in a magnetic field, the conductor experiences a mechanical force. The direction of this force is given by Fleming's left-hand rule and magnitude is given by;

$$F = BIL \text{ Newto}$$

## WORKING OF DC MOTOR:

Consider a part of a multi polar DC motor as shown in Figure below. When the terminals of the motor are connected to an external source of D.C. supply:



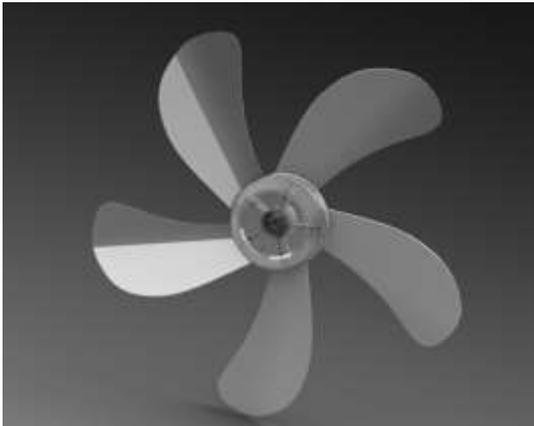
**Fig 5. DC Motor Circuit**

1. The field magnets are excited developing alternate N and S poles.
2. The armature conductors carry currents.

All conductors under N-pole carry currents in one direction while all the conductors under S-pole carry currents in the opposite direction.

**PROPELLER:**

It is a mechanical device used to develop thrust inside the water for propelling the floating body.



**Fig 6. Propeller**

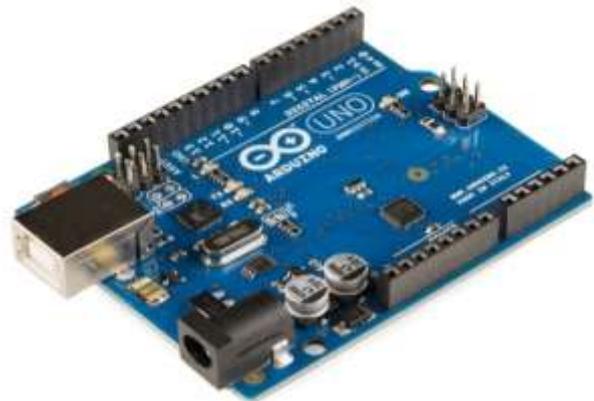
**BATTERY:**

**Fig 7. Battery**

Provides electrical power to run 12V DC Lorry Wiper Motor, 12V DC Propeller motor and for electronic parts (automation process). The purpose of the battery in a series circuit is to give the circuit a source of energy. The purpose of a switch in a series circuit is to make it easy to open or close the electrical circuit, turning the flow of electricity on or off. Specification-12v 7.5-amp ups battery.

**CONTROL UNIT:****ARDUINO UNO:**

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.



**Fig 8.Arduino UNO**

**GSM MODULE 900A:**

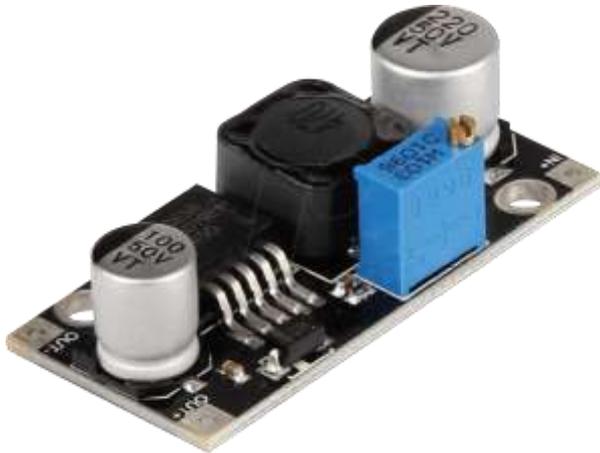
There are two ways of connecting the GSM module to Arduino. In any case, the communication between Arduino and GSM modules is serial.



**Fig 9.GSM module**

If you are going with the first method, you have to connect the Tx pin of the GSM module to the Rx pin of Arduino and the Rx pin of the GSM module to the Tx pin of Arduino.

#### DC-DC converter:

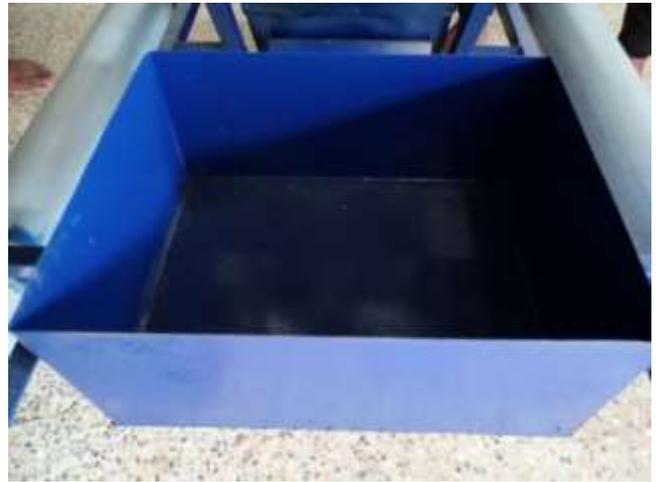


**Fig 10.DC-DC converter**

This is an LM2596 DC-DC converter step-down power module with the high-precision potentiometer, capable of driving a load up to 3A with high efficiency, which can work with Freeduino UNO, other mainboards, and basic modules.

#### COLLECTOR BIN:

Baskets are used to collect waste products from water separately. The process of sorting will be done by the belt conveyor and perforated plate. At the end of belt conveyor having collecting basket to collect the water waste products. It was made with a 1.3mm thin plain steel sheet by folding the sheet at a certain dimension.



**Fig 11.Collector Bin**

#### FRAME STRUCTURE:

Frame structures are the structures having the combination of beam, column and slab to resist the lateral and gravity loads. These structures are usually used to overcome the large moments developing due to the applied loading.



**Fig 12. Frame Structure**

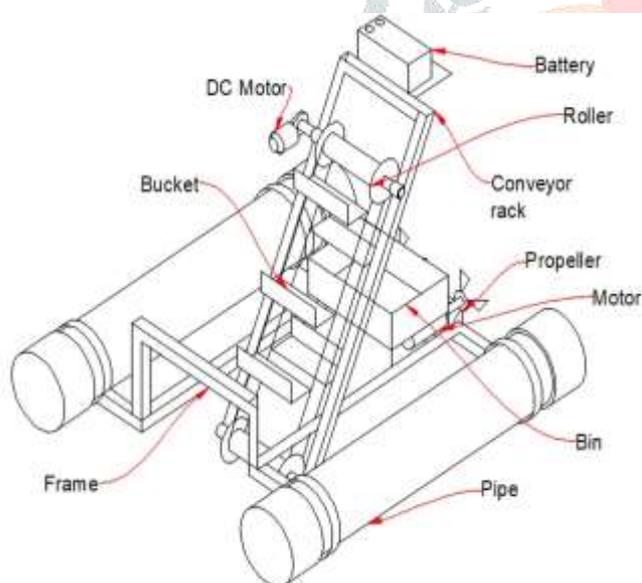
### IX. FABRICATION PROCEDURE

1. The project consists of a motor operated propeller to run the project.
2. It has two DC motor of 12V, 7.6 Ampere.
3. The device which is running the project is belt drive coupled having collecting plate.

4. The components are rest on frame serve as main body of the project.
5. The steel pipe with pressurize air generates pressure heat to run the project on water surface.
6. The fabrication storage tank is used to store the waste fulfilling the purpose of the project.

## X.WORKING PRINCIPLE&OUTPUT

The machine “waste removal from river and ponds” consists of vehicle structure, control unit, bucket conveyor, waste collector bin, motor, battery,etc. a bucket conveyor is connecting in DC motor. When it rotates the bucket , the conveyor will collect dust.The DC power motor is coupled for running the conveyor and propeller. Controller unit is used to operate the DC motor through GSM.



**Fig 13. Fabrication layout**

It will pass dust to collecting bin which placed at back of machine. The solid waste from running water have collected by conveyor and through into bin. Plastic PVC pipe is used to float this vehicle Set up.The result is successful in the project and the machine is run automatic to be done.



**Fig 14. Output**

## XI. CONCLUSION

In this project “static ponds waste removal and disposal machine” is successfully done. I learned from this project working of this proposed system as well as waste material cleaning system for river side. Today the water is making major role at every human life. This project is to clean the dirty water which meant by river water and separate into solid waste and water. The solid waste is to be holding on machine. Here no need to handle riverside garbage’s and drainage waste by hand everything is to be cleaned to operating machine only using our mobile phones. So it can avoid unnecessary diseases, which is main purpose of inventing this machine.

## XII. FUTURE SCOPE

- In future this project can be improved to sort more categories of waste.
- In this system we can use advance conveyor system and conveyor material for increasing the efficiency of collection of ponds.
- To modify the size of boat according to its waste collecting capacity in increases.

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