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# Remote Operated Floating River Cleaning Machine

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**Abstract -** *This project focuses more on "Remote Operated Floating River Cleaning Machine". In India water pollution is increasing day by day so this is becoming serious problem for rivers, ponds etc. This mainly consist of impurities like waste water debris, plastics, garbage on floating water surface. These impurities mainly affect on health of human being and also affect on life of aquatic animals. Normally this project based on renewable energy sources, so there is reduction in use of non renewable energy sources like oil, petroleum, electricity and all type of mineral sources. So by this non renewable energy sources are saved. So this project helps to reduce the water pollution on floating bodies.*

***Keywords- water debris, aquatic animals, pollution, garbage.***

## 1. INTRODUCTION

Generally, conventional method based on manual basis and it is used for collection of water debris, trash, plastic and all other types of impurities which is floating on water bodies or by collecting this impurity by means of boat, thrash skimmer etc. And removed this impurity near river shore and disposed it. But this conventional method requires more manpower; hence this is risky, costly and time consuming method. By considering this all remote operated floating river cleaning machine is more efficient than conventional method and also this is effective and eco-friendly.

**Fig-1**:Water Pollution

This machine is remote operated so manpower does not required at all. So this machine is really advantageous for reducing the water pollution on Ganga river which is caused by 'Kumbhmela' And also Government of India has taken charge to clean river and pond due to increasing water pollution , and so that they invest huge capital for many river cleaning project like 'Namami Ganga', 'Narmada bachao'. And also developed many project in various cities like Ahmadabad, Varanasi etc.

By taking into consideration, this Remote operated river cleaning machine has designed to clean river floating surface.

### 1.1 SYSTEM DESCRIPTION

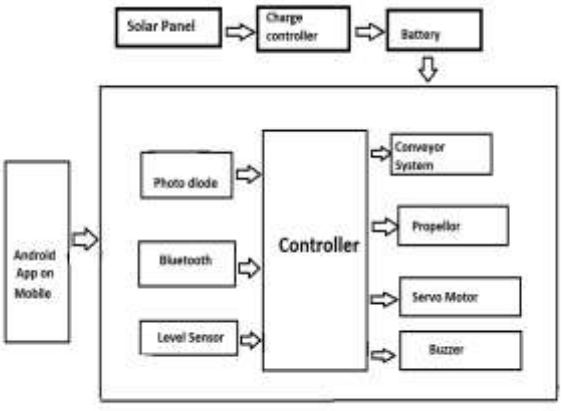


**Fig-2 :**Block diagram of system

We know that solar panel converted light energy into electrical energy which is DC in nature. solar panel output energy is given to the charge controller this controls DC output of solar which is pulsating in nature and fed pure DC to charge the battery. As we know that battery is used to store the energy. This stored energy is given to the all this circuitry for overall operation. This circuitry consists of controller, level sensor, photodiodes, Bluetooth, conveyor system, propeller, buzzer, and servomotor. In this system controller is a main parts it's having input like photodiode, Bluetooth, level sensor and output consist of conveyor system, propeller, buzzer, and servomotor. Android app is used to overall remote controlling purpose.

### 1.2 WORKING

In this project the main aim of this machine is to lift waste debris from the water surface and dispose them in the tray. It consist arrangement of conveyor which is place on shaft of motor. Due rotation of motor conveyor rotated. As the the conveyor is move, it collect water debris, waste garbage and plastics from water bodies. As the machine is placed in the water the waste debris in water will get lifted and it moves in upward direction. As the waste debris reaches the upper extreme position it will get dropped in the tray. Hence this will result in cleaning of water surfaces and safe collection of waste debris from water. Propeller is used to drive the machine on the river and run with help of PMDC motor. The total electrical devices are controlled by RF transmitter and receiver which use to control the machine remotely.

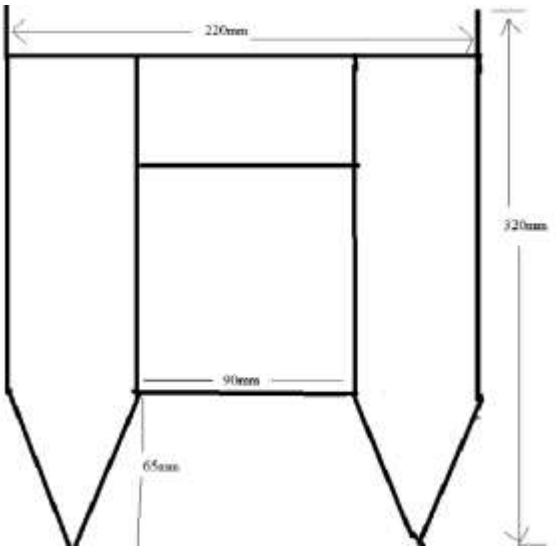


**Fig-3**: Boat Design

Collecting Mechanism is used in our project to overcome real time issue as due to water tension garbage is difficult to collect. By using this four bar mechanism, it rotated at a particular angle intended to collect the garbage for the model. It has two window open and close as user wishes using remote to ON and OFF the mechanism. Water wheel is bolted on shaft which is placed on base frame. The purpose of water wheel (propeller) is to move the machine forward or backward on water. Motor is use to rotate the water wheel with the help of chain drive mechanism.

In this project tracking system is also implemented which is helpful to adjust angle of solar panel with respect to sunrays. So that we get output of solar more.

### 1.3 COMPONANTS USED

1) Arduino Board: Arduino Uno board is based on the ATmega328P. It consist of 14 digital input/output pins in which 6 can be used as PWM outputs, 6 analog inputs, 16 MHZ quartz crystal, a USB connection, a power jack, an ICSP header and a reset button.

2) L293D Motor Driver Board**:** The 293D is used to provide bidirectional drive current up to 600mA and voltage from 5V to 36V.L293D consist the output clamping diodes for protections.

3) HC 05 Bluetooth module: This Bluetooth module designed for transparent wireless serial connection. This can be used in a Master or Slave configuration; it makes a good solution for wireless communication.

4) DC motor: In this machine two PMDC motors are used and these motors are used to control the direction of propeller. Another BO (battery operated) DC motor used to control the conveyor belt and also DC servomotor used for tracking system.

5) Battery: This is a lead acid rechargeable battery. This machine consists of four batteries which gives output such as 2A, 8V for operation of setup.

6) Relay Module: This module provides the protection to the microcontroller from the higher load current.

7) Solar Panel: A solar panel consist no. of photovoltaic cells, which can be used to generate electricity through photovoltaic effect. This energy used to charge the batteries. Solar output is given to the DC Regulators.

8) Conveyor Belt: In this machine we used the polyvinyl Conveyor Belt. This is controlled by the arduino uno system with using motor driver circuit. This collects all floating waste from water surface and discharges it into the dustbin.

9) Blucontrol [android application]: This android application in installed in mobile phones to control the setup automatically which can be downloaded from the android app market in free of cost.

### 1.4 DESIGN CALCULATIONS

Battery-8V/2Amp

Panel-12V/3watt

Current (I) = P/V

I = 3/12

I = 0.25Amp

Charging Voltage = 9V/250mA

Charging Time = (Battery Watt/Panel Watt)*2

= (16/2.25)*2

= 14.22hrs

Discharge Time = (Battery Amp Hr/Total current Consumed)

= 2000mA/1270

=1.57hrs

### 1.5 MODEL OF SYSTEM

**Fig -4**: Top View of Model

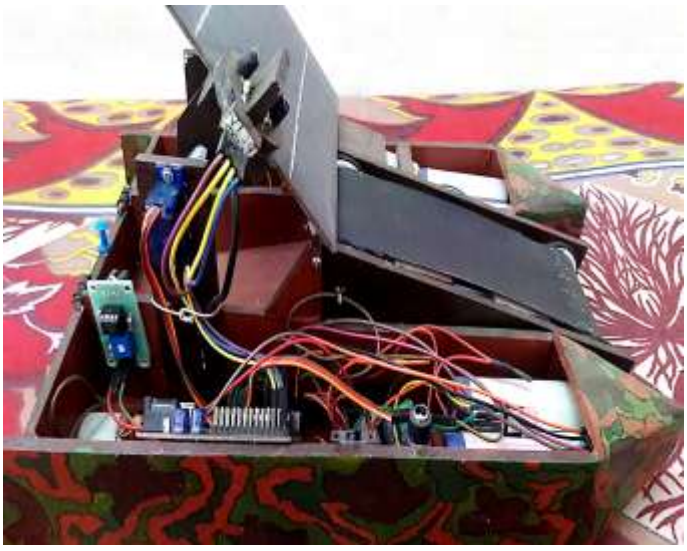

**Fig-5**: Side View of Model

## 2. OBJECTIVES

- To reduce man power.
- Reduce time consumption.
- Reduce pollution.
- Increase efficiency.
- Cost effectiveness.
- Increase reliability.
- Increase life of aquatic animals.
- Reduce use of non renewable energy sources.
- Reduce the pollution of Godavari river.
- Maintain clean and healthy environment.

## 3. ADVANTAGES

- This cleaning system is easy to operate and flexible.
- This system is Eco-friendly.
- This requires less man power.
- This required more use of renewable energy Sources.
- This system is Cost effective (Initial and Maintenance cost is low).
- This is efficient method.

## 4. APPLICATIONS

- Useful to reduce the water pollution in river
- It is applicable to reduce water debris, impurities, and all types of impurities which are floating on water surface in swimming pool.
- It is useful to remove the environmental marine pollution at Godavari River.
- It is useful in fishery plant to collect dead fishes.

## 5. DISADVANTAGES

- Waste collecting capacity is limited.
- Only useful to collect waste which is floating on river surface.

## 6. CONCLUSION

This project is emphasis to provide flexibility in operation. This is easy in operation and cost of maintenance is low. Hence this project "Remote Operated Floating River Cleaning Machine" is mostly designed to make system very much economical and helpful to remove water impurities like plastics, trashes, water debris which is floating on river and pond surface. This is mainly very useful maintaining human health and for increasing the life of aquatic animals.

## 7. FUTURE SCOPE

Now day by day world facing biggest problem of floating garbage. And it is increasing in tremendous amount so it is very difficult to clean all this floating garbage because of more requirement of manpower. so, in future this remote operated floating river cleaning machine has more scope to remove large capacity of garbage automatically as fast as possible. And by making modifications in this machine, this is used for automatically removing garbage from beaches also.

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