

## **DESIGN AND IMPLEMENTATION OF TRASH AND OIL REMOVAL SYSTEM IN WATER SURFACE**

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### **ABSTRACT**

Trillion tons of trashes and oil floating on water bodies around the world. These trashes will cause a severe problem to the environment and is a big risk to the future. This unwanted suspended object will cut of the oxygen, hence oxygen deficiency which directly affects the marine life. Our project emphasis and fabrication of skimmer boat make use of the solar power to remove the floating trashes and MS disk to collect the marine oil spills. The device is placed across the water body so that flow occurs through lower grids. Trashes are collected by using silicon net. The trashes like plastic bottles, cans, bio-debries etc., the skimmer boat traveled using submersible jet pump on water surface. Photovoltaic cells used to coupled with storage batteries for full day working. 30 rpm gear motor with MS disk is used to remove oil over the sea. This system will be also helpful for pond, river and sea.

**Key Words:** *Plastic pollution, Submerisable jet pump , solar panel , marine oil spills, MS disk, silicon net.*

### **INTRODUCTION**

Disposal of plastic waste and oil has emerged as an important environmental challenge in this world where plastics make up as much as one-tenth of the solid waste stream. Plastic waste in the region is continuously increasing due to increasing use of plastic in day to day life. The plastic waste disposal is a major challenges due to non-bio degradable nature of plastic and such wastes are visibly present in landfill sites for a long time. It is hampering the aquatic animal and make their life in danger. The “cleaning machine” used in the places where there is waste debris in the water body which are to be removed. This machine consists of submersible jet pump to driven skimmer boat and collect & remove the wastage from water bodies. This also reduce the difficulties which we face when collection of debris takes place. A machine will lift the waste surface debris from the water surface, this will ultimately result in reduction of water pollution and lastly the aquatic animals death to these problem will be reduced. The project can be implemented for both flowing and stagnant water. In this project we have store the energy in the battery and used this energy for river cleaning with the help of a solar battery and motor. 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.

### **ENVIRONMENTAL IMPACT**

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. Tiny floating plastic also resemble zooplankton, which can lead filter feeders to consume them and cause them to enter the ocean food chain. In samples taken from the north pacific Gyre in 1999 by the algalita Marine Research foundation , the mass of the plastic exceeded that of zooplankton by a factor of six. Toxic additives used in plastic manufacturing can leach into their surroundings when exposed to waterborne hydrophobic pollutants collect and magnify on the surface of plastic debris, thus making plastic more deadly in the ocean then it would be on land.



**Figure 1: Environmental impact**

### EXISTING SYSTEM

This is already exist but cannot remove all the waste in water bodies. The initial cleanup efforts used manual methods to skim the trapped oil and these efforts indeed helped recover range amount of oil. The main drawback is more man power is needed. When it is clean manually they are affected by more diseases. more time to taken clean debries manually and also increasing cost. so that's why we are going to the our proposed system.



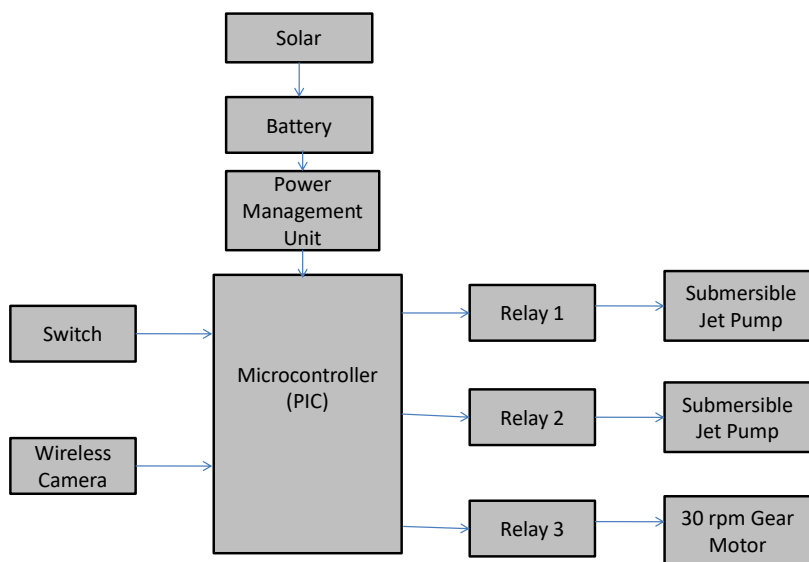
**Figure 2: Existing system**

### PROPOSED SYSTEM

Techniques for collecting and removing marine debris include the use of debris skimmer boat. Devices such as this can be used where floating debris presents a danger to navigation. It is built from aluminum and designed for ease of operation and low cost ownership. The boat can filter a water surface of

92\*92meters per hour. The filter system can be adjusted to collect different size of flotsam. These techniques are available in fresh water and salt water versions. In silicon net is capture system that deliver debris to silicon net.MS disk to collect the oil from sea. Variable speed control at the operator's finger tips.

Whole system works on two voltage levels, 5v and 12v generated by voltage regulator. Renesas microcontroller controls and co-ordinates the whole system. wireless camera detect the floating wastes.



**Figure 4: block diagram for proposed system**

The signal will be transmitted from the control unit and receiver will receive the signal.

## MATERIALS AND METHODS

### MICROCONTROLLER:

PICs have high performance RISC CPU as it operating frequency DC 20Mhz clock input and 200 ns instruction cycle. In this PIC micro controller has 40 pins,5 ports,33 I/O ports. The microcontroller used here is PIC which is initially referred is PERIPHERAL INTERFACE CONTROLLER.These operating frequency is DC 20 MHz I/O ports: ports A, B, C, D, E. Micro controller is used to control the input and output units.



**SOLAR PANEL**

Used to generate power 12V/2A Solar radiation, often called the solar resource, is a general term for the electromagnetic radiation emitted by the sun. Solar radiation can be captured and turned into useful forms of energy, such as heat and electricity, using a variety of technologies



**METAL SENSOR:**

Operating voltage 4-24dc. Output depends on input. Used to sense metal based object. Used to guide the box for recycle. Working under electrical function of induction.



**IR SENSOR:**

An infrared sensor is an electronic instrument that is used to sense certain characteristics of its surroundings. It does this by either emitting or detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitting by an object and detecting motion.



**RELAY:**

A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism but other operating principles are also used. Relay is used to opening & closing purpose of the trash can. Relay has 5 pins (2 coil, 1 no, 1 nc, 1 common pin).



**BATTERY:**

Convert chemical energy into electrical energy by a chemical reaction. Usually chemicals are kept inside the battery. It is used in a circuit to power other components. It is also useful for things that move, such as electric vehicles and mobile phones.



### **FUTURE ENHANCEMENT**

In future this project can be improved by using some deep cleaning technology and also will use some indicators for oil leakage identification. To modify the size of boat according to its waste collecting capacity is increases.

### **CONCLUSION**

On calculating and experimenting the result are very satisfactory. on the basis of these result we can conclude that it is an innovative method of minimizing manual stress and thus very much reliably stabilizing the river and sea. The project carried out by us made an impressing task in the environmental purpose and it is very use full for the small scale work. although this system able to collect the debries and oil from the lake, river, sea with human intervention. The object of this project is successfully achieved.

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