International Journal of Advance Research in Science and Engineering
Volume No.08, Issue No.05, May 2019
www.ijarse.com
IJARSE
ISSN: 2319-8354

LAKE HEALTH MONITORING AND WASTE COLLECTING AQUABOT

Puneeth E Raikar[1], Rahul P[2], Shridhar H C[3], Tharun T[4], Dr Rajashekhar B S[5].

[1]Associate Professor, [2,3,4,5]*U. G students, Dept. of Electronics and Communication, Sambhram Institute of Technology, Bangalore Karnataka, India*

ABSTRACT

This paper emphasis on design and fabrication of the river waste cleaning machine. The idea 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. The government of India has taken charge to clean rivers and invest huge capital in many river cleaning projects like "NamamiGange", ''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. Automation plays an important role in mass production. In this project we have fabricated the remote operated river cleaning machine. The main aim of the project is to reduce the man power, time consumption for cleaning the river. In this project we have automated the operation of river cleaning with help of a motor and partially submerged cage 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, robotics s forms an attractive medium for low cost automation.

Keywords: Rf transmitter and receiver, Remote operated, Automation, fabrication.

I. INTRODUCTION

The model used in places where there is waste debris in the water body which are to be removed. This machine is consisting of a partially submerged cage 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 this will ultimately result in reduction of water pollution and lastly the aquatic animal's death to these problems will be reduced.

This project will be made in rivers, ponds, lakes and other water bodies for to clean the surface water debris from bodies. Similarly, they are lots of problems of water pollution under Godavari River, Nasik which affect the acoustic, human life & beauty of Godavari River. Some photo graphs are showing the water pollution near Godavari River Nasik.

Waste water is defined as the flow of used water from homes, business industries, commercial activities and institutions which are subjected to the treatment plants by a carefully designed and engineered network of pipes. The biggest impact of cleaning the chemical wastes can cause respiratory diseases and it plays a challenging issue for the municipality officers Water damage is classified as three types of contaminated water. They are clean water, grey water and black water. Clean water is from a broken water supply line or leaking faucet. If not treated quickly, this water can turn into black water or grey water, depending on length of time, temperature, and contact with surrounding contaminants.

A drainage ditch is a narrow channel that is dug at the side of a road or field to carry away the water. Nowadays, even though automation plays a vital role in all industrial applications in the proper disposal of sewages from industries and sewage cleaning is still a challenging task. Drainage pipes are used for the disposal of sewage and unfortunately sometimes there may be loss of human life while cleaning the blockages in the drainage pipes. The municipality workers are only responsible to ensure that the sewage is clean or not. Though they clean the ditches at the side of buildings, they can't clean in very wide sewages. The municipality workers need to get down into the sewage sludge to clean the wide sewage. It affects their health badly and also causes skin allergies.

II. LITERATURE SURVEY

Pollution and Conservation of ganga river in modern India by Basant Rai ref [4]

According to a World Bank Sponsored Study (State of Environment Report- U.P.), pollution levels in the Ganga are contributing 9-12% of total disease burden in Uttar Pradesh (U.P.). The coliform bacteria levels are in excess of 2 lakh MPN as against the national water quality standard of 5000 (Mallikarjun, 2003). The report estimated total health damage on account of water pollution in up to is around 6.4 million dailies (Disability Adjusted Life Year). According to the CPCB survey report, the total municipal sewage generated in the identified 25 towns in 1985 was of the order of1340 million litres per day (mld). Apart from this sewage, 260 mld of industrial wastewater, runoff from 6 million tons of fertilizers and 9,000 tonnes of pesticides used in agriculture within the basin, large quantities of solid waste, including thousands of animal carcasses and human corpses were being released into the river every day. Out of this, works corresponding to 873 mld only (65%) were taken up under the first phase of GAP. The remaining sewage was to be taken up under the 2nd phase of GAP which is already in progress. water quality analysis of samples collected at 16 stations on River Ganga during 1986 and 2008 shows improvement in Dissolved Oxygen (DO) levels at 4 locations namely up and down streams of Allahabad and Varanasi. All the 16 stations except Patna downstream and Rajmahal show reduction in Biological Oxygen Demand (BOD) values.

Efficient Lake Garbage Collector by Using Pedal Operated Boat by Prof. N.G.Jogi, Akash Dambhare, Kundan Golekar, AkshayGiri reference[5]

The most sacred river in the world and the national river of

India "Ganga River." Ganga is the soul of India and is Holly River in India. If we look at current status of our national river it is very shocking we dump about 29 crore litres of sewage in Ganga which is loaded with pollutants, toxins. [9] We also dump tones of municipal solid waste. The government Of India takes charge to clean rivers

Ahmadabad, Varanasi, etc. All of us know about the Ganga Abhiyan. Similarly, the villages in all state of India which joint with small & big lake and maximum villages does not use the water of lake for farming as well as drinking and daily uses due to the maximum amount of garbage present in the lake water by taking this into consideration. The main motive is to clean the lake water for that purpose we are making efficient lake garbage collector by using pedal operated boat. In this we are using pedal operated boat with the conveyor attached to it for collecting garbage from the lake. The water surface trash collection boat can work in river or lake, it can collect the floating garbage and some other equipment for weed cutting, it harvests the aquatic weed from lake. This is really a good solution for the aquatic weed management. (Font size 10 Times New Roman)

III. OBJECTIVES

- To raise awareness in youth about the rapid decline in our availability of lakes and usable water.
- To avoid large scale pollution that could harm the society and future generation i,eBellandur lake incident.
- To convince our government or NGO to find alternate methods of cleaning and maintaining our lakes and the flora and fauna present in them
- To make an easy and cost-efficient method of removing waste from our lakes and finding appropriate methods of recycling them

IV PROPOSED SYSTEM

The subjects of the investigation were waterways and water bodies in our territory which were influenced by the issue of plastic waste flotsam and jetsam, for example of plastics from the branches of knowledge and did profound examination on sort of plastic that been found. In the examination we discovered waste examples contains plastics plastic packs which we use in everyday life having microns going from 40microns or more.

International Journal of Advance Research in Science and Engineering
Volume No.08, Issue No.05, May 2019
www.ijarse.com
IJARSE
ISSN: 2319-8354

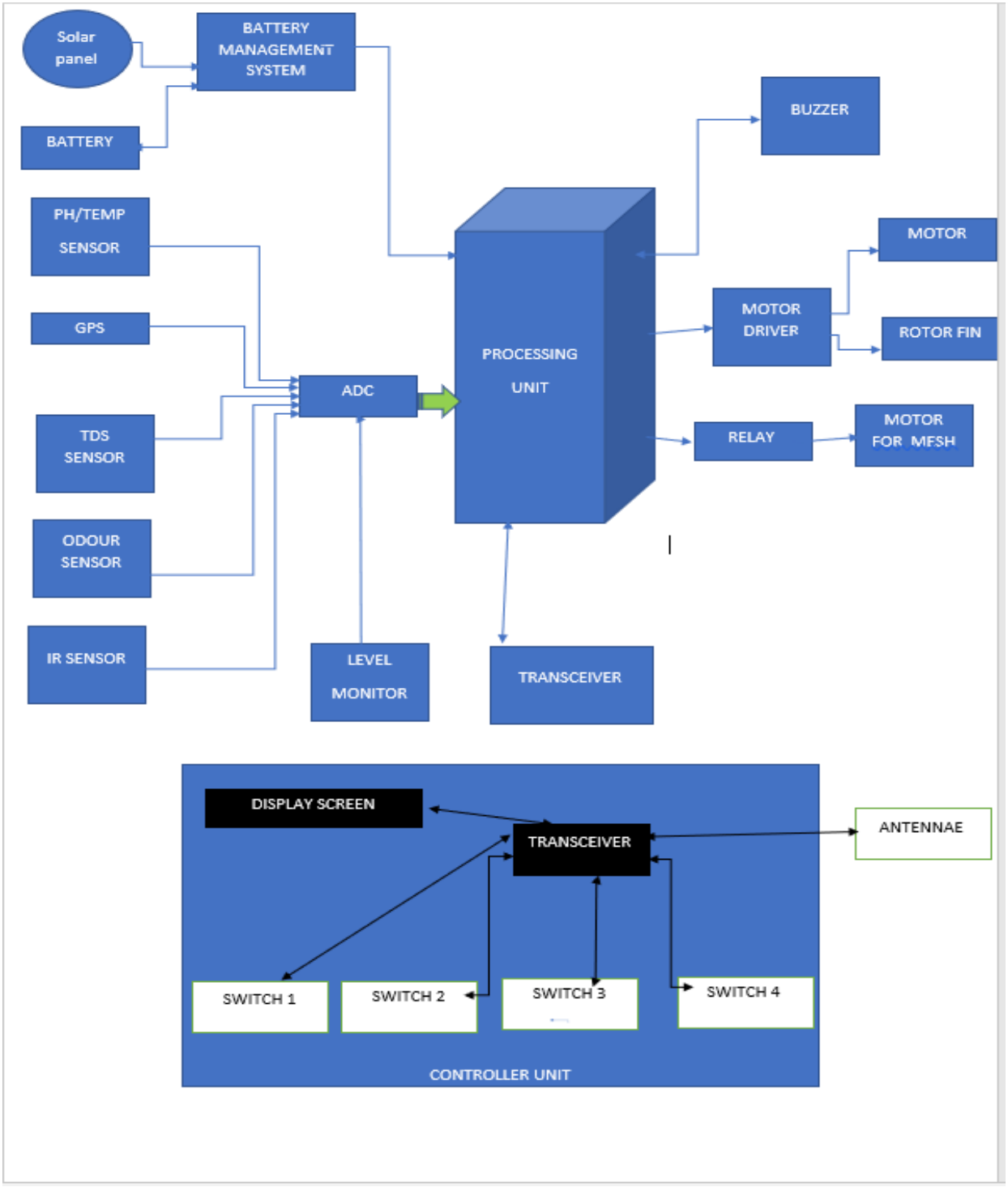

Figure 1: Block Diagram

V WORKING

The model consists of a cage which is partially submerged in water. The model moves around the water collecting floating derbies which gets accumulated into the cage. The level sensors help to determine if the cage is filled or not. The PH and Turbidity sensors gives the values of ph content and the pollution level present in water.

This helps to determine the major hotspots present in water and also helps to determine the solution needed to clean the water.

The pH/temperature sensors, TDS meter and pH sensor helps in monitoring the pH/Conductivity values, acidic values, temperature and the water quality respectively. To determine the quality and pH Value to measure the acidic value of water. A TDS meter indicates the total dissolved solids (TDS) meter indicates the total dissolved solid particles. Dissolved ionized solids, such as salts and minerals, increase the electrical conductivity of solution. Because it is a volume measure of ionized solids, EC can be used to estimate TDS level of less than 600mg/litre is generally considered to be good for drinking water becomes significantly and increasingly unpalatable at TDS levels greater than about 1000 mg/litre. An acidic solution has far more positively charged hydrogen ions in it than an alkaline one, so it has greater potential to produce an electric current in a certain situation – in other words, it is bit like a battery that can produce greater voltage a pH meter takes advantage of this and words like a voltmeter, it measures the voltage produced by the solution whose acidity we're interested in, compares it with the voltage of a known solution, and uses the difference in voltage between them to deduce the difference in Ph.

The level monitor helps to monitor the level of waste collected/filled in the cage. The RF transceiver is used to control the model. The odor sensors are used to detect any harmful odor is present in the water body. By collecting all these data values, we can keep the lake clean and also help us to find the exact source from where the pollutants are mostly entering from and determining the exact spot in the lake. This helps to maintain a constant check on the pollutants present in the lake.

VI SYSTEM IMPLEMENTATION

The System implemented using following hardware components,

A. Arduino UNO

The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits.

International Journal of Advance Research in Science and Engineering
Volume No.08, Issue No.05, May 2019
www.ijarse.com
IJARSE
ISSN: 2319-8354

Figure 2: Arduino UNO

B. PH Sensor

A pH meter is a scientific instrument that measures the hydrogen-ion activity in water-based solutions, indicating its acidity or alkalinity expressed as pH The pH meter measures the difference in electrical potential between a pH electrode and a reference electrode, and so the pH meter is sometimes referred to as a "potentiometric pH meter". The difference in electrical potential relates to the acidity or pH of the solution.[3] The pH meter is used in many applications ranging from laboratory experimentation to quality control.

Figure3: PH Sensor

C. Relay Module

The relay module is a separate hardware device used for remote device switching. With it you can remotely control devices over a network or the Internet. The Relaymodule houses two SPDT relays and one wide voltage range, optically isolated input.

International Journal of Advance Research in Science and Engineering
Volume No.08, Issue No.05, May 2019
www.ijarse.com
IJARSE
ISSN: 2319-8354

Figure 4 Relay Module

D. 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 emitted by an object and detecting motion**.** Infrared technology is found not just in industry, but also in every-day life. Televisions, for example, use an infrared detector to interpret the signals sent from a remote control. Passive Infrared sensors are used for motion detection systems, and LDR sensors are used for outdoor lighting systems. The key benefits of infrared sensors include their low power requirements, their simple circuitry and their portable features.

Figure 5: IR Sensor

E. Gear Motor

A small motor (ac induction, permanent magnet dc, or brushless dc) designed specifically with an integral (not separable) gear reducer (gear head). The end shield on the drive end of the motor is designed to provide a dual function. The side facing the motor provides the armature/rotor bearing support and a sealing provision through which the integral rotor or armature shaft pinion passes.

International Journal of Advance Research in Science and Engineering
Volume No.08, Issue No.05, May 2019
www.ijarse.com
IJARSE
ISSN: 2319-8354

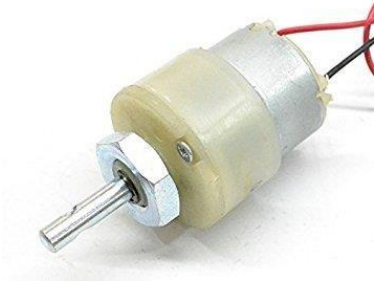

Figure 6: Gear motor

F. Motor Driver

It is a little current amplifier , the function of motor drivers is to take a low-current signal and then turn it into a higher-current signal that can drive motor.

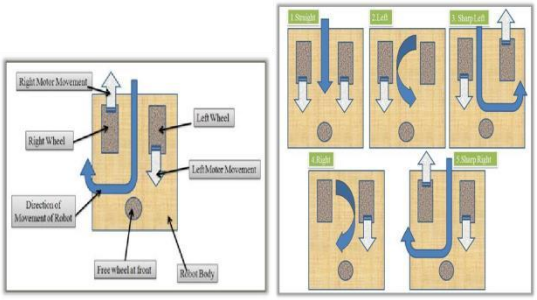

Figure 7: Motor driver

G. RF Module

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. This wireless communication may be accomplished through optical communication or through radio frequency (RF) communication. For many applications the medium of choice is RF since it does not require line of sight. RF communications incorporate a transmitter and a receiver. They are of various types and ranges. Some can transmit up to 500 feet. RF modules are widely used in electronic design owing to the difficulty of designing radio circuitry. Good electronic radio design is notoriously complex because of the sensitivity of radio circuits and the accuracy of components and layouts required to achieve operation on a specific frequency. In addition, reliable RF communication circuit requires careful monitoring of the manufacturing process to ensure that the RF performance is not adversely affected. Finally, radio circuits are usually subject to limits on radiated emissions, and require Conformance testing and certification by a standardization organization such as ETSI or the U.S. Federal Communications Commission (FCC). For these reasons, design engineers will often design a circuit for an application which requires radio communication and then "drop in" a pre-made radio module rather than attempt a discrete design, saving time and money on development.

International Journal of Advance Research in Science and Engineering
Volume No.08, Issue No.05, May 2019
www.ijarse.com
IJARSE
ISSN: 2319-8354

Figure 8: RF Module

H. Solar Panel

Solar panels are those devices which are used to absorb the sun's rays and convert them into electricity or heat. Description: A solar panel is actually a collection of solar (or photovoltaic) cells, which can be used to generate electricity through photovoltaic effect. ... Solar panels wear out extremely slow.

Figure 9:Solar Panel

I. Battery

Battery It is used in a circuit to power other components. A battery produces direct current (DC) electricity (electricity that flows in one direction, and does not switch back and forth).

Figure 10: Battery

International Journal of Advance Research in Science and Engineering
Volume No.08, Issue No.05, May 2019
www.ijarse.com
IJARSE
ISSN: 2319-8354

J. WI-FI Module

The ESP8266 WiFi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processo**r**

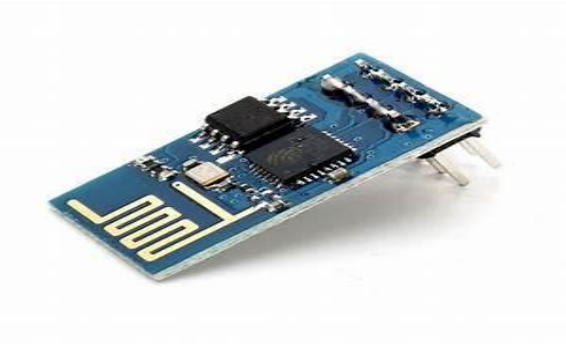

Figure 11: W-FI Module

‘

VII ADVANTAGES

- It is a non-conventional river cleaning system.
- It’s initial & maintenance cost is low.
- Skilled Worker not required to drive the system.
- Environment friendly system.
- Easy in operation.

VIII APPLICATIONS

- It is applicable to reduce water pollution in rivers & ponds.
- It is useful to remove the sediments present in swimming pool to keep it clean.

IX CONCLUSIONS

About 71% of the earth’s surface is water-covered and only 0.3 percent of our freshwater is found in the surface of lakes, rivers, and swamps. Aqua Drone was designed with an intention of the water debris floating on the lake, by using our drone we can collect many floating wastes like plastic bottles, bags, flowers without any human interference and then dispose of the waste easily. One can clean the lake just by operating it with the help of remote control. Also, our product help in reducing the water pollutants to a certain extent. The product is socially helpful for the Laboure’s who clean the lake and economically available. If the product is used in large numbers, it would be a perfect example for “Technological application in environmental protection”

X FUTURE SCOPE

The product right now is remote controlled but through automation techniques such as sensor technology, it can be made self-automated. The product can be used for many other purposes in the future. It can be modified to throw life jackets during rescue operations. We can also give solution for the cleaning of the water by adding appropriate chemicals using AI to determine the cleaner to the pollution accordingly.

REFERENCES

[1]. M. Mohamed Idhris, M. Elamparthi, C. Manoj Kumar, Dr.N. Nithyavathy, Mr. K. Suganeswaran, Mr. S. Arunkumar, "Design and fabrication of remote-controlled sewage cleaning Machine", IJETT – Volume-45 Number2 -March 2017

[2]. Rajendra Patil, Rahul Itnar, Sagar Ahirrao, Amol Jadhav, Ajay Dhumal, Study of river harvesting: trash cleaning machine, International journal of innovative research in science & Engineering, Vol.No.2, March 2016, pp.422-431.

[3]. OsianyNurlansa, Dewi Anisa Istiqomah, and MahendraAstuSangghaPawitra, "AGATOR (Automatic Garbage Collector) as Automatic Garbage Collector Robot Model" International Journal of Future Computer and Communication, Vol. 3, No. 5, October 2014.

[4]. Basant Rai, "Pollution and Conservation of ganga river in modern India", International Journal of Scientific and Research Publications, Volume 3, Issue 4, April 2013 1 ISSN 2250-315

[5]. Prof. N.G. Jogi, Akash Dambhare, Kundan Golekar, AkshayGiri, Shubham Take, "Efficient Lake Garbage"

[6]. 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", IJSER, Volume 8, Issue 3, March-2017 ISSN 2229-5518.

[7]. Bellandur Lake: a story of toxic froth and fire: Bengaluru's failure in managing solid waste and lack of a sewage management plan explain repeated incidents of Bellandur lake catching fire By Sushmita Sengupta, Aparna Pallavi, Subhojit Goswami