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Review on design of automatic river cleaning system

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***Abstract*—This project emphasis on design of automatic river cleaning system. The motive of this project is used to remove the waste substance like debris and aquatic plants on the surface of the water bodies. The work has done looking at the current situation of our national rivers which are dump with crore liters of sewage and aquatic plant, bottle, debris etc. The government of India has taken charge to clean rivers and invest huge capital in many river cleaning projects like "NamamiGange" and many major and medium projects in various cities like Ahmadabad, Varanasi etc.**

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 river cleaning system. 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 debris cleaning with help of a motor, cutter, conveyor and chain drive arrangement. Some needs of automation are described below. Here using RF transmitter and receiver are to control the components.

Index Terms— Chain drive, Conveyor, Cutter, Collector, Motor, Propeller, RF transmitter and receiver.

I. INTRODUCTION

Water bodies like ponds, lakes, river, sea etc are the main source of water. The excessive growth of the water living type plants and disposal waste substance in the water leads to get polluted and it leads to major loss of water content from earth's surface. By implementing our cleaning systemthe waste weed and debris in the water body which gets removed. This machine is consists of waterwheel driven conveyer 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 to clean the surface water debris from bodies. Similarly they are lots of problems of water pollution. The biggest problem of cleaning the wastes can cause diseases and it plays a challenging issue for the municipality officers. Waste substance has the major resource from homes, business industries, commercial activities and institutions which are subjected to the treatment plants by a carefully designed and engineered network of pipes on the bases of flow. Water damage is classified as three types of polluted water. They are clean water, gray water and black water. Clean water is from a broken water supply line. If not treated quickly, this water can turn into black water or gray 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 automation plays a vital role in the applications of the proper disposal of sewages from industries and sewage cleaning is still a challenging task. Drainage pipes are used for the disposal of the waste substance unfortunately sometimes there may be loss of human life while cleaning the blockages in thepipes. The municipality employees 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 such as skin allergies.

II. LITERATURE REVIEW

[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"-The motive of the project is to automate the sewage cleaning process in drainage, to reduce the spreading of diseases to human. The black water cleaning process helps to prevent pest infestations by reducing the residues that can attract and support pests. It also improves the shelf life and sensory quality of food products. In the proposed system, the machine is operated with remote control to clean the sewage. Hence, this system avoids the impacts from the sewage wasteand its harmful gases. This helps to prevent the mosquito generation from the wastage. The system has a wiper motor that starts running as soon as the set-up is switched on.Two power window motors are connected to the wheel and it is driven with the help of the remote control set-up. The working starts with collecting of the sewage wastes by using the arm and it put the waste into the bin fixed in the machine at the bottom. An arm is used to lift the waste and the bucket is used to collect them. The set-up runs even in sewage area with water (limited to a particular amount) so that the wastages which floats on the water surface also gets collected. The garbage which affects the drainage is also picked up and removed. This system has limited human intervention in the process of cleaning and in turn reduces spreading of diseases to mankind. Modern services are becoming polarized.

[2]Mr.Abhijeet.M. Ballade, Mr. Vishal.S. Garde, Mr.Akash.S. Lahane and Mr.Pranav.V.Boob,"Design and Fabrication of River Cleaningsystem"- India is holy country and during lots of festival like ganeshvisarjan, navratridurga puja & mainly Siahnsthkumbhmela there is lots of water pollution 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 a machine which involves the removing the waste debris from water surface and dispose it from the water body. The river cleanup machine works on hydropower to remove the waste water debris, plastics and garbage at Nashik.

[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"- This paper tells about design and fabrication of the river waste cleaning machine. The work 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", and many major and medium projects in various cities. By taking this into consideration.This machine has designed to remove the river waste from the water surface. Traditional methods used for collection of floating waste are manual basis. And deposited near the shore of rivers which is a risky operation, expensive and time consuming. By considering this parameters of river surface cleaning systems and eliminating the drawback of the methods used earlier, the remote operated river cleaning machine has designed which helps in river surface cleaning effectively, efficiently and eco-friendly. The "River waste cleaning machine" is used where there is waste debris in the water body which are to be removed. This machine consists of DC motors, RF transmitter and receiver, propeller, PVC pipes and chain drive with the conveyor attached to it for collecting wastage, garbage and plastic wastages from water bodies.

[4] Pankaj Singh Sirohi, Rahul Dev,ShubhamGautam, Vinaykumarsingh, sarojkumar, "Review on Advance River Cleaner"- River water which is used for irrigation of the plant and it gives in return food to the people. They also maintain the ecology of region and bring prosperity. We decided to do this project to clean the river. After implementing this project we can control the pollution of river it is very beneficial for our society and environment. In this project turbine rotates by flow of river water and through the mechanical gear arrangement we arrange two conveyor belts. The first conveyor belt is used to pick solid waste from river and the second conveyor belt is used to draw solid waste out of river for solid waste management. Water is the essential source for life. It covers 70% of the Earth. But only a small portion of this precious natural resource is fit for the use of human consumption. Out of the earth's total water 97% is salt water which cannot fit to use it for human consumption.The further 3% is stored in various sources like glaciers, rivers, lakes and under-ground aquifers. An area without a river is considered to be poor. Unfortunately, during the past two decades water quantity and quality has deteriorated at a rapid pace. One of the major reasons for this is the solid waste being thrown to the rivers, turning them to be a dirty drain. The Ganga and the Yamuna, is the two most holy rivers of our country are no exception to it. Thousands of crores of rupees is being spent to save the rivers through various plans by the government. Now days we can see river pollution is biggest issue of our

planet so we introduce our society with an advance river cleaner. This is an advance river cleaning system. They make this project to improve the current condition of the water surface by cleaning the river.

[5]Ndubuisi c. Daniels "Drainage System Cleaner A SolutionTo Environmental Hazards"- The Drainage system cleaner is a machine which helps to protect the environment from different kinds of environmental hazards through the promotion waste management by the removal of garbage from the drainage system. These wastes when not removed end up settling in residential places where these wastes are burnt thereby causing climate change otherwise these wastes block the drainage systems thereby causing flooding. The machine is designed in such a way that it generates motion for its functions by itself through the action of running water thereby cutting out the dangers of the powering the machine by other sources of power because of the harshness of the rain on these other sources. The drainage system cleaner has three major parts which are the Propeller, the Cleaner and the Pan all make up for its effective functioning. The Drainage system cleaner was tested on three different days in the first day it rained in the months of September, October and November 2012 respectively. Based on the findings made after the test the Drainage system functioned well when there is maximum load. I therefore recommend the use of this system by various individuals, government companies and waste recycling companies for prevention of environmental hazards and also encouraging waste management. Drainage systems are blocked most times by garbage like nylon, plastic bottles, and empty cans which cluster together and find their way into the drainage systems. If these garbage are allowed to flow the will end up flowing down to recreational beaches used for tourism purposes making a scene not pleasurable to the eyes (Larsen et al 2009) else these garbage flow to residential sites where they are burnt in a way of getting rid of them, thereby causing climate change. Overflow of water drainage system occurs when there is a blockage of an end of the drainage system forcing the water to find its way elsewhere apart from the mapped out drainage system, therefore the running water spills over the horizontal height of the drainage systems spreading to regions alongside the drainage system, thereby causing problems such as pushing down of structures such as fences, water logging of farm lands and residential buildings etc.

[8] Huang Cheng, Zhang Zhi "Identification of the Most Efficient Methods For Improving Water Quality In Rapid Urbanized Area Using the Mike 11 Modelling System"- The Liangtan River basin is shared by Jiulongpo, Shapingba and Beibei district in Chongqing, China. The Liangtan River pilot project comprised identification of key pollution sources leading the Liangtan River basin pollution and the most efficient projects and technology for improving water quality in rapid urbanized area using the MIKE 11 modeling system. Ammonia-N (NH4 -N) and chemical oxygen demand (COD) were found to be most illustrative representing nutrient load from municipal and diffuse rural sources and industrial sources, respectively. The scenario modelling for2015 shows that in terms of improving the water quality, the different sectors should be addressed in the following order: Urban wastewater, industrial pollution load, rural wastewater, livestock pollution load, domestic solid waste and fertilizer pollution load. The largest improvements to water quality by 2015 can be achieved by enhancing municipal wastewater treatment to meet higher wastewater discharge standards for nutrients and by supporting investment in clean technology at the 50 largest industrial enterprise.

[9] Emaad Mohamed H. Zahugi, Mohamed M. Shanta and T. V. Prasad "Design of Multi-Robot System for Cleaning Up Marine Oil Spill"- Oil or "black gold" is still the largest source of power used by the industry sector. The demand for oil is increasing day-by-day and is substantiated by expanding submarine oil pipelines, distribution of oil and its derivatives by using tankers to carry it to many destinations. This leads to increased chances of oil leakage in the sea either by leakage from submarine oil pipelines or accidents with the tankers. In the past, such mis-happenings lead to major disasters of oil leakage in the high seas. Oil spills threaten the wildlife in the sea and hence, there is necessity for research on cleaning up oil spill quickly and efficiently has become very important issue by researchers and companies concerned. Last such disaster was the British Petroleum (BP) oil disaster in the Gulf of Mexico in USA during April 2010.

[10] Prof. N.G.Jogi,AkashDambhare, Kundan Golekar,AkshayGiri, Shubham Take "Efficient Lake Garbage Collector by using Pedal Operated Boat"-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 liters of sewage in Ganga which is loaded with pollutants, toxins.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

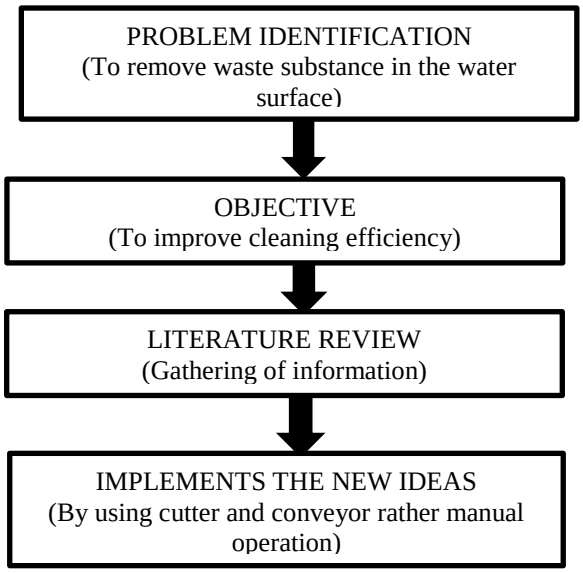
daily uses due to the maximum amount of garbage present in the lake water by taking this into consideration. Our main motive is to clean the lake water for that purpose we are making efficient lake garbage collector by using pedal operated boat. In this we are using pedal operated boat with the conveyor attached to it for collecting garbage from the lake. Several companies offer equipment to garbage out of river lakes and harbors. We are making the boat which is operated by pedal and clean the waste present in the lake. In this boat the conveyor collect the waste present in lake and then collect it in box like structure present in lower side of the boat. We are trying to collect the waste like polythene, food material, and the waste occurs due to religious festival.

[11]AnkitaB.Padwal, Monica S. Tambe, Pooja S. Chavare, Reshma K. Manahawar, Mitali S. Mhatre "Review Paper on Fabrication Of Manually Controlled Drainage Cleaning System"-The problem of flooding and climate change has become outrageous because of its recent trends in our environment today. This has become a cause of major concern to the world, especially the developing countries. Water running through a water drainage system mostly carries along waste materials most which are non-biodegradable which not only cause flooding but also climate change. Overflow of water drainage system occurs when there is a blockage of an end of the drainage system forcing the water to find its way elsewhere apart from the mapped out drainage system, therefore the running water spills over the horizontal height of the drainage systems spreading to regions alongside the drainage system, thereby causing problems such as pushing down of structures such as fences, water logging of farm lands and residential building, etc. The impurities present in water can cause hazardous and disease. As long as the draining system is considered the function of the main drainage system is to collect, transport and dispose of the water through an outfall or outlet. Impurities in drainage water can be only like empty bottles, polythene bags, papers, etc. This paper focuses more on Automation of Drainage Cleaning System. There is a problem of mobility and space, to overcome this problem Automation of the system is necessary. Our concept is to use this in efficient way to control the disposal of wastages and with regular filtration of wastages. Introduction of autonomous vehicle is been done to make the system mobile. The system does require man power only to control the motion of the system.

III. SUMMARY OF LITERATIVE REVIEW

1) In the remote sewage cleaning system the solid waste which has been thrown in the sewage where get cleaned with the help chain arrangement and motor.
2) In the design and fabrication of river cleaning system which is used to remove the waste debris, plastic waste and garbage waste with the help of the water wheels, conveyor, open and close belt drive.
3) In the design and fabrication of river waste cleaning system which is used to the collected waste is thrown on the water surface. Propeller is used to drive the machine on the river and run with help of PMDC motor to increase the performance.
4) In the advance river cleaner the solid waste where get collected with the help of two conveyor and four bar chain mechanism.
5) In the drainage system cleaner a solution to environmental hazard, where the waste substance in the drainage system is directly linked to the Main big drainage system.
6) In the rapid urbanized area the mike 11 modelling system is used to have an efficient method to improve the water quality form industrial and domestic waste management.
7) In the design of multi-robot system for cleaning up marine oil spill, the robot dispatched the water and collect the oil spill with the help of motor, PCB board and sensing system.
8) In the efficient lake garbage collector by using pedal operated boat, the waste where get collected in the boat form collector which is operated by the applying the pedal force.
9) In the manually controlled drainage cleaning system, the waste where get collected with chain which is connected with gears.

IV. METHODOLOGY



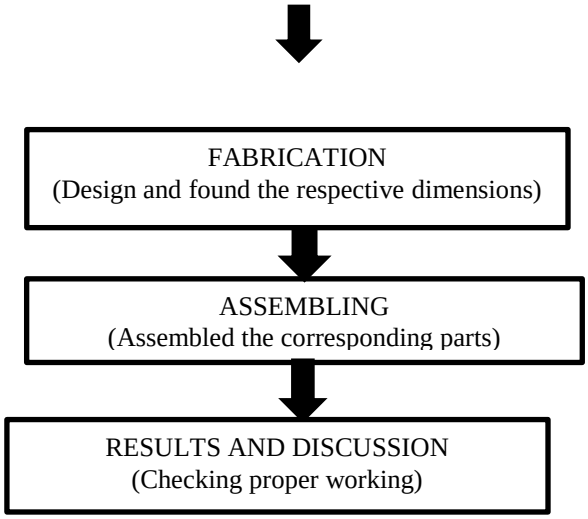


Fig. 4.1- Methodology

By studied from the previous literature review we were decided to do project on cleaning system in river with high efficiency and eco-friendly.

V. CONCLUSION

Our literature review highlights the ongoing advancement in the river cleaning system. Many specific empirical studies have been carried out and categories such as cleaning system and its automation have been studied to a great depth. We focus more on making the system mobile in the cleaning operation.

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