

CONFERENCE PROCEEDING**Removal of Macro and Micro Wastes using Water Boat Collector**

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Abstract

In the 4th industrial revolution era, vital income of most countries comes from factories such as oil companies, electronic industries, dye factories, paper industry and etc. However, the desperation of these industries to gain profit has diverted their focus and interest to the environmental care, thus brings catastrophic affect such as uncontrollable waste disposal. This irresponsible action will lead to breeding of pathogens, viruses, and bacteria that further initiate global pandemic. Islam also instructs in surah Ar-rum verse 41, where human will suffer from their irresponsible activities if no actions taken. Therefore, environmentalist and green chemists are expected to develop and innovate various treatments to combat this problem. Our project focuses on the adsorption and removal of wastes such as macro- and micro-garbage, oils, pesticides, polyaromatic hydrocarbons (PAHs), heavy metals and etc in river using boat waste collector. This boat is auto-generated by chemical energy and operated by latest version of Arduino, Uno R3 sensor with ArduinoDroid-Arduino/ESP8266 IDE programmer. For waste collector, we used conveyer belt covered with polyvinyl alcohol (PVA) nanofiber film. This is the first project that utilized PVA nanofiber membrane to adsorb and remove organic pollutants and heavy metals. The economical sensor, and eco-friendliness of solar energy of this boat would help to preserve and protect our environment thus secured optimal health for all living things.

Keywords: *Boat, Macro Waste, Micro Waste, Arduino*

INTRODUCTION

In 2002, The National Policy on the Environment was established which outlines strategies to enhance country's growth trends towards safe and sustainable development which embarks the three pillars which are social development, economic development, and environment protection. Realizing the importance to facilitate a coordinated and comprehensive approach in managing natural resources and environment, the Ministry of Natural Resources and Environment (NRE) was formed in 2004 (Percy & Landrum, 2014). With regards to the water pollution, generally in Malaysia it is caused by point and non-point sources. Point sources comprise sewage treatment plants, manufacturing and agro-based industries as well as animal farms. Non-point sources are made up of diffused sources such as agricultural activities and surface runoffs.

The government recognized that water is life itself and without it we cease to exist. Moreover, the demand of water increases and pollution depletes more of our water resources. Therefore, the Ministry has spearheaded initiative to ensure the water environment been properly manage, among others, by reviewing existing laws, restructuring of water-related agencies, drafting a new national policy on water,

nationwide public awareness campaigns and also enhance research and development in the field of water resources management.

Although we know the importance of water, yet there are still suffer from water pollution. About 80% of the wastewater are untreated and polluted and this can bring catastrophic affects to our health. It is reported that polluted water kills more life compared to all wars and other forms of violence combined (Xue et al., 2021). Meanwhile, only 1% of Earth's freshwater is consumable for human and it is expected that demand for freshwater will be increased to 1/3 greater than it is now (Prathapanen & Detroja, 2020). It is also reported that most tap water consist of harmful and toxic contaminants such as arsenic, copper, lead, and even polyaromatic hydrocarbons (Yu et al., 2017). Therefore, in this research we designed and invented a boat which can collect harmful macro and micro-waste in water.

MATERIALS AND METHODS/ METHODOLOGY

Material

Arduino Uno, Arduino Sensor, DC Motor, Conveyor belt, Blusher Screw, Corner Bracet, Arduino Servos, Powerbank, Arduino R3 (include Bluetooth), Solar Panel, Blucontrol Android APP

Designing and Manufacturing of Boats, Collecting of Waste Using Boat]

In this system we are using the boat which is auto generated and we attached the sensor under the belt conveyor to detect and collecting the garbage present in the small and big lake. With the help of this conveyor we can collect the garbage like plastic bags, plastic bottles, beverage cans, food wrappers, paper bags, straws, (marine debris) etc. We can use this pedal operated boat beside the slum areas where we can find lakes, rivers or dam and also because of which this slum area uses this water for drinking purposes due to which health issue will not get affected. With this water boat, sources such as fuel, diesel, petrol can also be saved.

RESULTS AND DISCUSSION

Designation of Boats, Collection of Waste

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 in the river. The project carried out by us made an impressing task in the environmental purpose and it is very useful for the small scale works. Although this system able to collect the garbage rom the lake with human intervention.

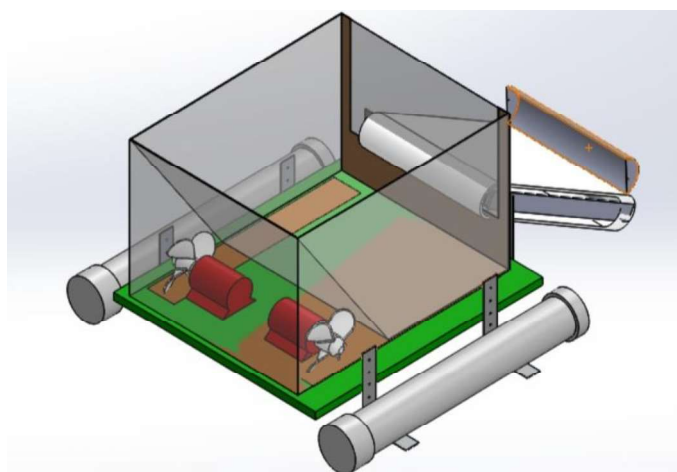


Figure 1. 3D model of water boat

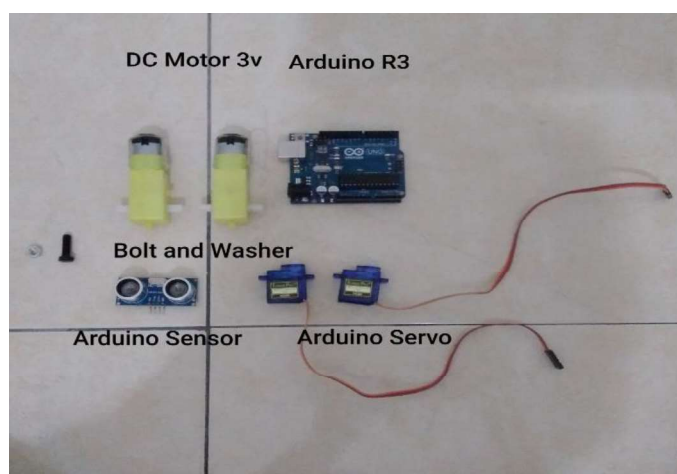


Figure 2. Materials for designing of boat

CONCLUSION

This project focused on modelling, design and control of pedal operated boat, with emphasis on lightweight and portable appliances. An innovative method of minimizing manual stress and thus stabilizing the collection of garbage in the boat. The project carried out by us made an impressive task of preserving and protecting our environment from harmful waste. This is importance as to ensure that we provide a sustainable world for the next generation.

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