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River Surface Cleaning Water Boat

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ABSTRACT: Water pollution is a pressing global issue that adversely affects the health of aquatic ecosystems and human well-being. Rivers, being vital sources of freshwater, often bear the brunt of pollution, leading to ecological imbalances and a decline in water quality. To mitigate this problem, we present a novel solution in the form of a River Surface Cleaning Water Boat (RSCWB). This research paper aims to explore the design, development, and efficacy of the RSCWB in effectively removing pollutants from river surfaces. To evaluate the performance of the RSCWB, extensive field trials were conducted on various river systems with varying pollution levels. Real-time monitoring sensors provided valuable insights into water quality parameters, enabling prompt identification of pollution hotspots and facilitating targeted clean-up efforts. The RSCWB presents a sustainable, cost-effective, and scalable solution for river surface cleaning. Its adaptable design allows for customization according to specific river conditions and environmental requirements. Furthermore, the boat's autonomous operation and integration with remote monitoring systems offer enhanced efficiency and reduced human intervention.

KEYWORDS: River surface cleaning, water pollution, waterway pollution control, floating debris, water treatment, environmental monitoring, sustainable technology.

I. INTRODUCTION

The "River cleaner boat used in that places where there is waste debris in the water body which are to be 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 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 under Godavari River, and 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 process starts collecting the sewage wastes by using the arm and it throws back the waste into the bin fixed in the machine at the bottom. An arm is used to lift the sewage and in turn a bucket is used to collect them. The set-up runs even in sewage area with water so that the wastages which floats on the water surface also gets collected.

Objectives

- a) Reducing human intervention
- b) Faster and easy cleaning
- c) Remote Operation

II. PROBLEM STATEMENT

Pollution Diversity: Rivers accumulate a wide range of pollutants, including plastic waste chemicalcontaminants, organic debris, and sedimentation, presenting a multifaceted cleaning challenge.

- a) **Scale and Accessibility:** Many polluted river stretches span vast areas and are located in remote or difficultto-access regions, complicating cleaning operations and resource allocation.
- b) **Environmental Impact:** Cleaning methods must minimize ecological disruption and avoid causing harm to aquatic ecosystems and wildlife while effectively removing pollutants.
- c) **Cost-effectiveness:** Implementing river cleaning initiatives requires substantial financial resources, making cost-effective solutions essential for sustainability and scalability.
- d) **Technological Innovation:** There is a need for advanced technologies and methodologies tailored to river

cleaning, leveraging robotics, artificial intelligence, and other cutting-edge tools for enhanced efficiency and precision

OBJECTIVES OF THE PROJECT

- a) Designing a versatile and robust River Cleaning Water Boat (RCWB) platform suitable for diverse river cleaning applications.
- b) Integrating advanced sensing and perception capabilities into the autonomous navigation and pollutant detection.
- c) Developing efficient pollutant removal mechanisms, including robotic arms, suction devices, and filtration systems, optimized for river cleaning tasks.
- d) Evaluating the performance and effectiveness of the RCWB through simulated and real-world River cleaning scenarios, considering factors such as cleaning efficiency, environmental impact, and cost-effectiveness.
- e) Assessing the scalability, feasibility, and economic viability of deploying the RCWB for large-scale river cleaning initiatives, including case studies in representative river ecosystems.

SCOPE OF PROJECT

- a) Environmental Scope: The project focuses on improving the cleanliness and health of river ecosystems by removing debris, pollutants, and waste.
- b) Technological Scope: The project involves the design, development, and implementation of water boats equipped with advanced cleaning technologies, waste collection mechanisms, and sensing systems.
- c) Operational Scope: The project aims to optimize the efficiency and effectiveness of river cleaning operations by utilizing water boats as a means of collection and removal of pollutants and waste.
- d) Evaluation Scope: The project includes the evaluation of the effectiveness and impact of water boats in enhancing river cleaning efficiency, comparing it with traditional methods, and assessing the improvement in water quality and ecosystem health.

EXISTING SYSTEM

These methods can vary depending on the location and resources available. Here are a few examples of existing systems for river

- a) **Manual Cleaning:** In some cases, manual labor is used to physically remove debris and pollutants from the river. This can involve individuals or teams using nets, rakes, or other tools to collect waste from the water or along the riverbanks.
- b) **Trash Booms:** Trash booms are barriers or floating devices placed in the river to trap floating debris and prevent it from spreading further downstream. These booms are then manually cleared and the collected waste is disposed of properly.
- c) **Water Treatment Plants:** In some cases, water treatment plants are used to treat the water from the river before it is supplied for various purposes. These plants use filtration and purification techniques to remove pollutants and improve water quality.
- d) **Community Clean-up Initiatives:** Community-based initiatives involve organizing volunteers to clean up rivers and their surrounding areas. These initiatives often include awareness campaigns, clean-up events, and waste segregation programs. It is important to note that the effectiveness and efficiency of these existing systems can vary, and there may be challenges in terms of manpower, resources, and proper waste disposal. The project aims to enhance the efficiency of river cleaning by introducing water boats with advanced technologies and waste management systems.

LIMITATIONS OF THE EXISTING SYSTEM

- a) Limited Coverage: Most of the existing systems have a limited coverage area, and it is not possible to cover the entire length and breadth of a river. This can result in the accumulation of pollutants and debris in areas that are not covered by these systems.
- b) High Cost: Some of the existing systems, such as dredging or water treatment plants, can be very expensive to implement and maintain. This makes it difficult to scale up these systems to cover larger areas.
- c) Dependence on Manual Labour: Manual cleaning methods, such as using nets or rakes, require a lot of manpower and are time-consuming. This can make it difficult to cover large areas effectively.
- d) Inadequate Waste Disposal: The disposal of waste collected from the river can be a challenge, and in some cases, it may end up being dumped in landfills or other inappropriate locations.
- e) Lack of Advanced Technologies: Most of the existing systems lack advanced technologies such as sensing systems, real-time monitoring, and automated waste collection mechanisms. This can limit their effectiveness and lead to inefficiencies.

III. PROPOSED WORK

Pollution Reduction: Reduce plastic waste pollution, debris, and contaminants in Specify the river by Specify the target percentage over a period of Specify the project duration.

Water Quality Improvement: Improve water quality in to meet or exceed local water quality standards. Community

Engagement: Engage with local communities, raise awareness about responsible waste disposal, and encourage community participation in river clean-up efforts.

Requirements: 4x Dc Gear Motors, 2x Wheels, Jumper wires, Sun board sheet, Switch Button, PVC Pipe,4x Bottle, an Arduino UNO, and an Arduino UNO shield, HC-05 Bluetooth Module.



Fig 1 River cleaner boat

IV. CONCLUSION

Summarize the key findings and contributions of your river cleaner boat project. Discuss the implications of your project for environmental conservation and waterway management. The existing systems for river cleaning have limitations that can hinder their effectiveness and efficiency. However, the proposed system offers innovative solutions to overcome these limitations. By incorporating autonomous water boats, real-time monitoring, smart waste management, scalability, data-driven decision making, and stakeholder collaboration, the proposed system aims to revolutionize river cleaning efforts. It offers a more efficient, effective, and sustainable approach to ensure cleaner and healthier rivers. With the implementation of the proposed system, we can make significant progress in preserving our rivers and protecting the environment for future generations.

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