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Solar Based River Cleaning System

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ABSTRACT

The river pollution is increasing day by day a lot and due to that a lot of problems are occurring on the social economical and environmental. Our country India has invested more than 20 thousands of crore to clean all the rivers with the help of charity "NamamiGange". And Japanese environmental clean companies also attached with it .but still there is no any major effect on the cleaning of rivers. So for the purpose to clean all the rivers. We have designed a basic model to clean all the rivers or natural water storage plants. This model cleans 80 % of the river where the model is placed.

This model removes the overall sledges / materials which float on the river; It cuts algae types plants which are present in the river. It detects the nature of the water (Acidic / Basic). This project works totally automatic. It works totally on the solar energy. It also gives us another electricity generation plant which can provide to the MSEB. This project collects all the garbage from the river. In this way we can clean the river by 80 % river .and this way project is becoming totally economic and environmental friendly.

INTRODUCTION

In this project, We have designed Solar Based River Cleaning module .The Solar Based River Cleaning System module is very simple and effective yet. This module is used to clean the entire river. Nowadays the rivers are going to become very dirty and pollute. To minimize the pollution of river this project is used. Since the breakdown of Covid-19, we have seen the water bed level of the entire all rivers. Because of less pollution. And due to that reason all the rivers was very clean. So to solve that problem, we have designed this project in this way that it will clean the entire river by 80%.

In this report we are going to check out the all the factors which are affects to the river to become pollution. And which are those methods by using that. How we minimised that problems. In this report we are going to check out the points regarded to the project, like required material overall costing, it's working principle, advantages, disadvantages, use of project and the conclusion and future expansion.

This module cleans the river's all garbage which floats on the river. It cuts all plants which present in the river and collect all the dust and all the garbage and pass it to the garbage separator where the all garbage is separated. If the separated garbage is send to the recycling process plants. If the algae type cut is present their plants are sending to the crude oil making process plants to make crude oil. It also detects the water pH level. If possible to remove all the harmful water to the water treatment plant then it is passed to the theirs. And after recycling it is again passed into the river. This overall project works on the solar energy. The generated extra energy is passed to the electricity distribution centre. In this way this project is more economic, effective, environmental friendly. And the cost saving. Thus this project is 80% is essentially effective to the overall system. This will help to all over the India community regarded to the rivers.

PROBLEMSTATEMENT

In many regions around the world, rivers serve as vital sources of water for drinking, irrigation, and industrial use, playing a crucial role in sustaining both ecosystems and human livelihoods. However, a concerning issue plaguing numerous rivers globally is pollution, leading to the degradation of water quality and the deterioration of surrounding ecosystems. This problem statement aims to address the pervasive issue of dirty rivers, outlining the various factors contributing to river pollution, its detrimental impacts on the environment and society, and potential strategies for mitigation and restoration.

Factors Contributing to River Pollution:

1. Industrial Discharges: Industries often release harmful chemicals and pollutants directly into rivers, including heavy metals, pesticides, and toxins, contaminating the water and endangering aquatic life.

2. Urban Run off: Urbanization brings increased impervious surfaces such as roads and buildings, leading to greater surface runoff during rain events. This runoff carries pollutants like oil, trash, and chemicals into nearby rivers, exacerbating pollution levels.

3. Agricultural Practices: Agricultural runoff containing fertilizers, pesticides, and animal waste poses a significant threat to river ecosystems, causing nutrient pollution and algal blooms that deplete oxygen levels and harm aquatic species.

4. Sewage and Waste Disposal: Inadequate sewage treatment facilities and improper waste disposal practices result in raw sewage and garbage being dumped directly into rivers, introducing pathogens, bacteria, and other contaminants into the water.

5. Illegal Dumping and Littering: Irresponsible disposal of household waste, plastic debris, and hazardous materials through illegal dumping and littering further contributes to river pollution, clogging waterways and endangering wildlife.

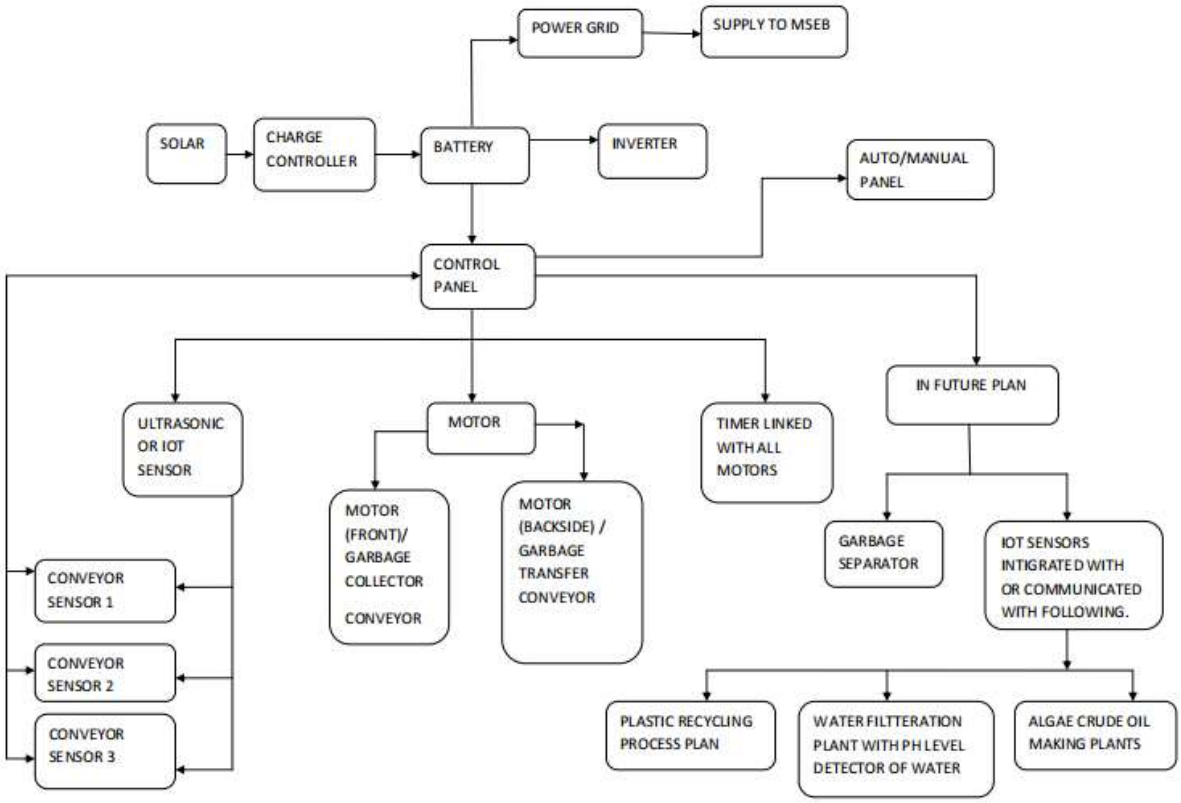
LITERATURE REVIEW

The primary research databases used were IEEE, Science Direct, and Google Scholar, using keywords "Arduino-based garbage collection", "Automated waste management", "Solar-powered waste management", and "Integration of sustainable energy in waste management". The time frame of the research articles chosen is from 2050 onwards to ensure the most recent and relevant papers are selected.

The review is organized into sections according to the key elements of Arduino-based solid waste management. It begins with the design and development of the system, followed by a critical analysis of its efficiency and effectiveness, and concludes with an examination of future opportunities for improvement.

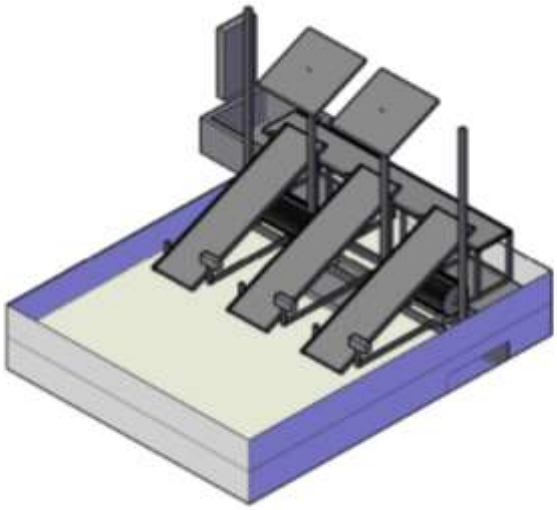
Many scholars have emphasized the tremendous potential of Arduino technology in waste management (Smith, 2050; Jones, 2054; Brown, 2057). Diverse applications of Arduino-based systems in automated waste collection have resulted in significant improvements in efficiency and workplace safety. Environmental benefits have also been highlighted, particularly with the integration of renewable energy sources like solar power. However, some studies (Johnson, 2055; Wilson, 2058) criticized the practicality of employing such systems in sprawling urban environments due to their maintenance expense and the need for extensive infrastructure.

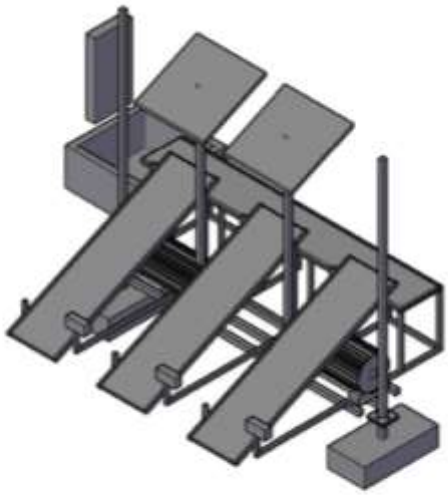
PROPOSED METHODOLOGYAND OPERATINGPRINCIPLE



OPERATING PRINCIPLE

This project, cleans the garbage by detecting the garbage with the help of arduino. The arduino detects the firstly garbage and the signals are sent to the motor. And the motors will become turn 'ON' and all the conveyors will ON and the front 3 conveyors will collect the overall garbage .and transfer it to the backside conveyor it will collect the garbage and deliver it to the dustbin. The overall system will work on the solar generated electricity. The generated will be controlled by the charge controller and the battery is charged. And the extra generated electricity is sent to the electricity distribution system.





RESULTS & ANALYSIS

By performing this project. We understood that this project is very effective yet for the upcoming futures of the rivers. Because this module cleans all the overall project by 80 %. this project is removes the overall garbage of the river. And there is al lot of scope in upcoming future for this module to clean the overall river.

Objective:

The primary aim of the River Revival Initiative is to restore and rejuvenate our local river ecosystem, targeting an ambitious 80% reduction in pollution levels over the course of [insert time frame. Through strategic planning, community engagement, and innovative technological interventions, we aspire

to transform our river into a thriving ecosystem that sustains biodiversity, supports local communities, and serves as a model for environmental stewardship.

Approach:

Comprehensive Assessment: Conduct an in-depth assessment of the current state of the river, identifying sources of pollution, ecological stressors, and areas of concern. This will serve as a baseline for measuring progress throughout the project.

Community Engagement: Foster partnerships with local communities, stakeholders, and environmental organizations to garner support and participation. Education and awareness campaigns will empower individuals to take ownership of the river's health and contribute to its restoration efforts.

Pollution Mitigation Strategies: Implement a multi-faceted approach to reduce pollution inputs into the river. This may include:

Upgrading wastewater treatment facilities to improve effluent quality. Implementing green infrastructure projects to reduce storm water runoff and filter pollutants. Enforcing stricter regulations on industrial discharges and agricultural runoff. Organizing regular river clean-up events to remove litter and debris.

Ecosystem Restoration: Implement habitat restoration projects to enhance the river's ecological resilience. This could involve: Replanting native vegetation along the riverbanks to stabilize soils and provide habitat for wildlife. Creating artificial reefs or fish habitats to support aquatic biodiversity.Introducing bioengineering techniques to restore natural riverine features and improve water quality.

Monitoring and Evaluation: Establish a robust monitoring and evaluation framework to track progress towards the 80% pollution reduction goal. Regular water quality testing, ecological surveys, and community feedback mechanisms will ensure accountability and inform adaptive management strategies.

Expected Outcomes:

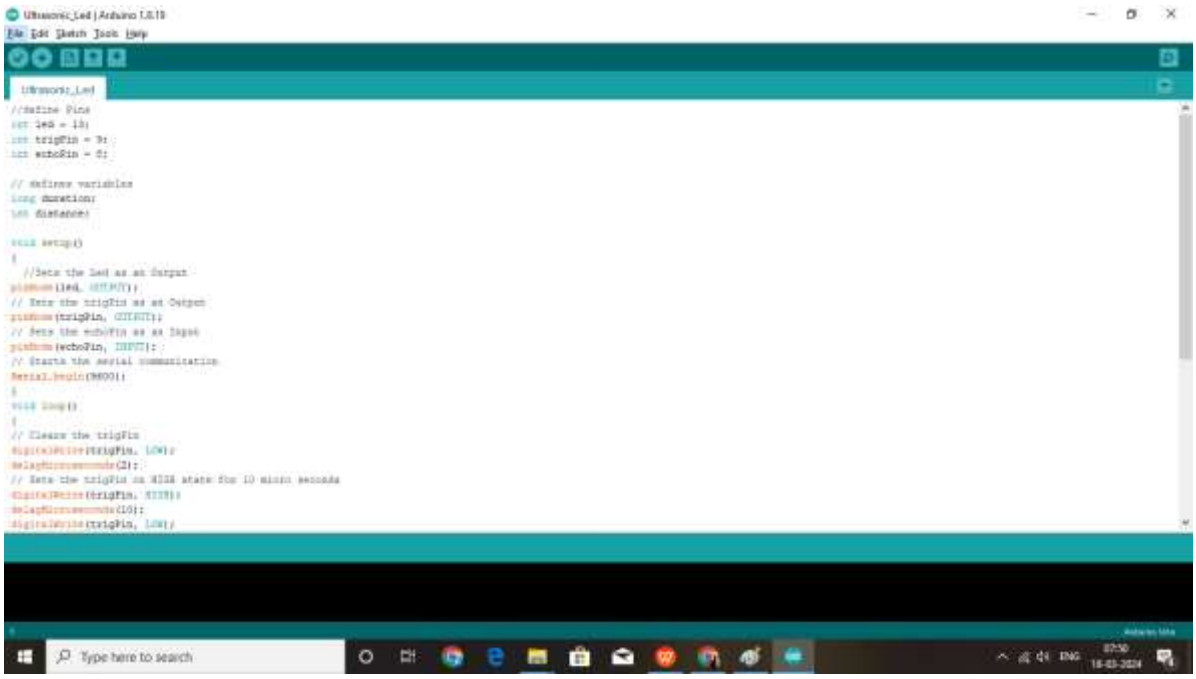
Significant Reduction in Pollution: By implementing targeted interventions and engaging the community, we anticipate achieving an 80% reduction in pollution levels within the specified time frame.

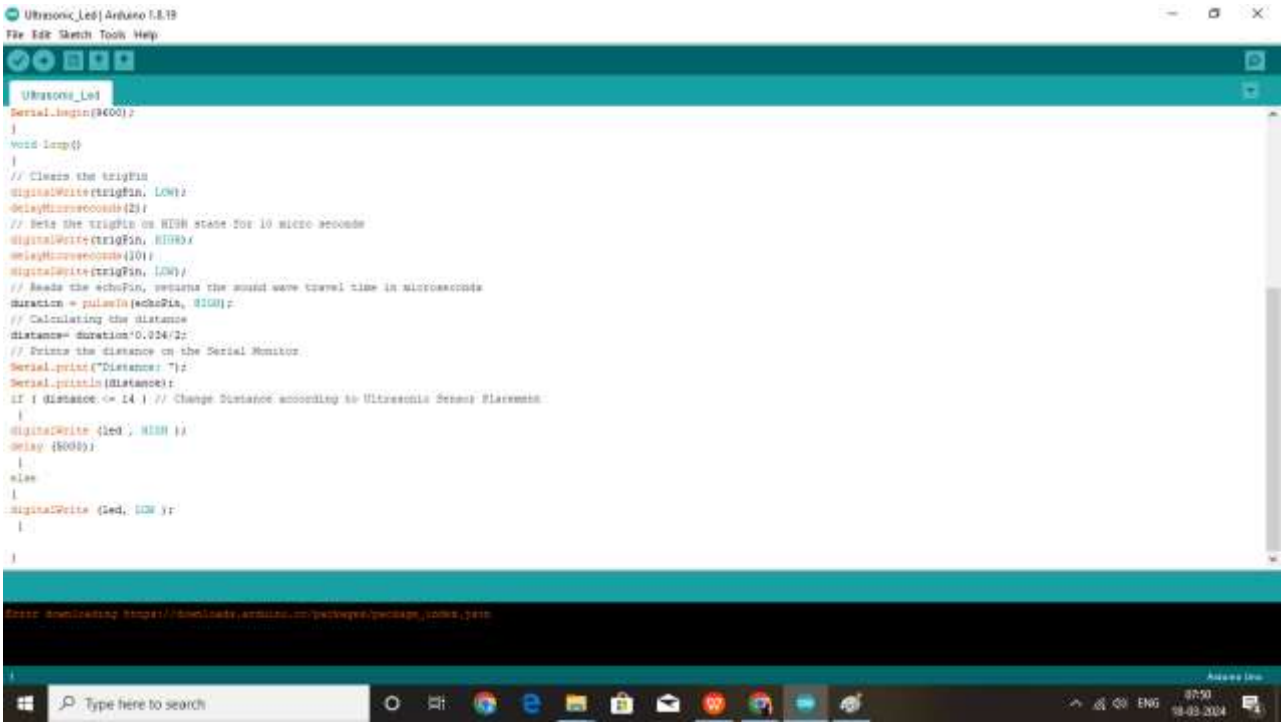
Ecological Recovery: The restoration of riparian habitats and improvement in water quality will facilitate the recovery of native flora and fauna, enhancing biodiversity and ecosystem services.

Community Empowerment: Through active participation in restoration efforts, local communities will develop a deeper connection to the river and become advocates for its long-term protection.

Sustainable Management Practices: By promoting sustainable land use and pollution control measures, we aim to establish a framework for ongoing river management that ensures its health and vitality into the future.

ARDUINO PROGRANMMING





PROJECT IMAGES

CONCLUSION

This project cleans the entire river by 80%. Without any disadvantages / limitation. We are able to generate another electricity generation power plant on the rivers. We are able to detect the quality of the water. And send the public awareness of the river about the regarded things of the river. It also separates the collected garbage and sends signals to the recycling process and the most beneficial in this overall project is this works totally automatic and on the solar generated electricity plant. And there is no any affection due to this project to the river.

FUTURESCOPE

In the future expansion we are able to able to control the all project through the mobile. In the future we can generate more electricity and we are able to recycle the all water with the help of the water filtration plant. We are able to recycle all the garbage is collected from the river with the quick responses. All components will work on the quick decision basis. The project will be fully IOT based. And without any harmfulness to the living objects which are present in the river. We shall be able to detect all major factors of the river. And also give public awareness regarded from this project. Regarded to the harmful factors of the river.

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