Project SAFI: Sustainable Aquatic Floating Islands !

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Abstract

Have you ever walked past a drain so polluted that it is literally named after its pollution? Well, I have. The Ganda Nala Nagar near Punjabi Bagh is a community in New Delhi that is named after the long, polluted and extremely smelly drainage that it is built around. These waterways, choked with sewage and industrial effluents, have become toxic scars in our cities. This was the motivation behind SAFI (Sustainable Aquatic Floating Islands) which is an affordable, scalable and most importantly STUDENT LED solution designed to clean polluted water while also creating usable space for greenery and plants.

What is SAFI ?

SAFI is a low-cost floating platform built from recycled PVC pipes, jute, and coir mats, designed to float on the surface of contaminated, static waterbodies. The platform is planted with aquatic vegetation such as Syngonium, Water Hyacinth and Money Plants which act as natural biofilters. The plants absorb excess nitrates, nitrites and phosphates from the water, improving the water quality while simultaneously using these compounds to grow themselves! We built an Arduino-based sensor system (integrated with pH, turbidity, and dissolved oxygen sensors) that continuously monitors water parameters, allowing us to assess how effectively the island is cleaning its environment in real time.

Each SAFI module is designed to be 3m x 3m in size, lightweight, and modular, so multiple units can be joined together for larger waterbodies. The main structure uses Bamboo (for buoyancy), jute ropes (for support), and coir/jute mats (to hold soil and plants). The average cost of one platform is ₹350, making it affordable for urban municipalities and even local communities. The Arduino sensor kit costs an additional ₹850, but since it is reusable across multiple platforms, it keeps long-term costs low. SAFI is designed to last for months in harsh conditions with minimal maintenance.

Impact and Recognition:

SAFI is not just a theoretical concept, it has already gained national attention. It won ₹20,000 in funding at KIIT Ideathon 2025 and secured 1st Place at DPS RK Puram's Science Fest out of 50+ schools. The project was also published in the Hindustan Times, bringing it to a wider audience, and I was invited to speak about SAFI at the Youth Social Impact Summit in Mumbai, where I was selected by the Times of India to represent young innovators. The project has also been showcased at innovation fairs where it received positive feedback from researchers and environmental policymakers. By combining sustainability with practicality, SAFI addresses two urgent challenges at once: water pollution and lack of greenery in congested urban settings.