



The Great Bubble Barrier: A smart solution to Plastic Pollution

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ABSTRACT

Plastic waste is being discarded in the waterways, where it brings great destruction to the environment – including human beings. Aquatic animals get knotted in plastic, microplastics pose a health risk from the smallest to the largest organisms and ships suffer damages. Every minute, the corresponding of one full garbage truck of plastic refuse is discarded in the sea approximately 1440 trucks per 24 hours and in total 8 billion kilos per year. nearly 80% of those plastics coming directly from land. Plastic waste in the ocean is a problem irrespective of its size. Marine life can become entangled in large pieces, which can cause awkwardness or, in some cases, death. And smaller pieces can be consumed, which is a certain problem if the plastics have absorbed pollutants on the way. Larger pieces of plastic can continue to cause problems as they degrade into smaller pieces, even past the point of being visible to the eye. Prevailing solutions to halt waste in the rivers have two main disadvantages; they block ship traffic and/or obstruct fish relocation. A new invention to fight plastic pollution is the Bubble Barrier, smart solution that blocks waste in the river but also allows the passage of fish and ships: a barrier of bubbles.

1.Introduction

Over a few decades, humans have managed to dump tons of waste into the ocean. The most worrying elements of this pollution is that plastics takes thousands of years to decay. Due to this, fish and wildlife are becoming intoxicated. As a result, the toxins from the plastics have entered the food chain, threatening human health. In the most unhygienic places in the ocean, the quantity of plastic exceeds the amount of plankton six times over. It is disconcerting that more of cleanup effort is not taking place. The worst part is, these harmful plastics don't biodegrade, so they break up into tiny pieces that are consumed by fish and sea mammals. Plastic is destroying more than 100,000 sea turtles and birds a year from ingestion and entanglement. Plastics pollution has a straight and fatal effect on wildlife. Thousands of seabirds and sea turtles, seals and other marine mammals are killed each year after consumption of plastic. Plastic accumulating in oceans and on beaches has become a global crisis. At existing proportions plastic is expected to outweigh all the fish in the sea by 2050. Toxic chemicals present in plastics are released into the water as well as the atmosphere. Fish certainly become contaminated from the chemicals in the water. This is how plastic chemicals enter the food chain. Plastic in water is becoming an increasing problem [and] has profound effects on the quality of our water and therefore on everything that lives in or near the water

A smart solution to Plastic Pollution: Although the structure may vary based in the sub-topics or review questions being addresses. The theory is that a wall of bubbles released from a perforated tube (which is transporting compressed air at the bed of the canal) can trap plastic waste without obstructing boats or aquatic wildlife. The bubbles, which are factually just air bubbles, not only stop the flow of waste, but can drive submerged matters to the surface to be caught. the tube is laid at an angle, so the flow of the river encourages the waste to one side of the canal where it can be caught by a floating platform, to be retrieved and disposed of.

The barrier is made up of a pipe that is about 60m long. Holes are pierced into the pipe and it is laid diagonally laterally the canal bed. Compressed air is forced through the pipe, forming bubbles as it exits the holes. The diagonal position drives the debris to the side of the canal, where a floating platform catches the debris. It's hoped that the barrier will also trap smaller particles of waste that can't be collected by garbage-collection boats. It's claimed that the bubble barrier can even compete the blooming of harmful algae by increasing oxygen levels in the water.

2.Objectives

- To safeguard the global ecosystem from plastic pollution.
- To sustain and develop the quality of life on earth.
- Recognizing the main challenges & barrier for decreasing plastic waste in mixed waste under residual waste stream, hereby encouraging prevention & recycling of plastic waste.
- Oxygen levels within the water increase by a Bubble Barrier, which stimulates the ecosystem and stops the growth of toxic blue algae.

Materials Required for Bubble Barrier

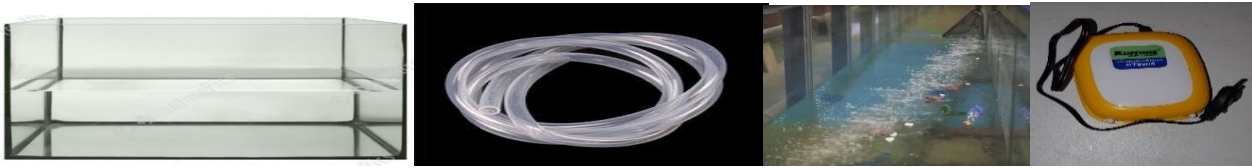


Fig 1: Materials required for the preparing Bubble Barrier which blocks the waste

3. Methodology

- The bubble barrier is created by pumping air through a tube with holes of 2-meter-long which is placed in the bottom of the Glass container.
- Compressed air is pumped through the tube and rises upwards.
- The rising bubbles result in an upwards current which brings the waste to the surface.
- At the surface, the water flow is directed sideways and the waste is being stopped from flowing downstream.
- By placing a Bubble Barrier diagonally in the waterway, the plastic can be blocked from moving downstream.
- The waste accumulates on the side of the glass container where it can easily be collected with a catchment system.
- The system also brings aeration to the water, increasing oxygen levels and improving the health of the ecosystem.
- With these features the Great Bubble Barrier satisfy all the important conditions: it hardly hinders ship traffic, fish movement and the natural workings of the delta.



Fig 2: Schematic view of the Bubble Barrier blocks waste

Societal Relevance

- To uncontaminated plastic pollution in rivers and canals with the assistance of Bubble Barriers to prevent it from flowing towards the ocean.
- Examine and monitor plastic pollution in rivers to collect data about plastic debris and the source.
- Proliferation public awareness about plastic pollution in order to prevent plastic waste and litter.
- Build towards a circular plastic chain to create a shift from a linear to a circular economy in which plastics never become waste.

Probable Outcome

- Monitor plastic waste to transport to the side of rivers and canals.
- Stops plastic on its way to the ocean & is based on existing technology.
- Is an innovative concept & increases the oxygen level within the water
- Does not need any modifications in arrangement or policies.
- Is easy scalable.

Future scope

- STOP! Micro Waste and the STOP! Plastic Academy provide education and a variety of actions to raise awareness about micro plastic pollution.
- Take part in a beach or river clean-up, pick up trash off the streets, refuse single use plastics and to filter wastewater.
- Recycling and reuse of plastic products, and support for research and innovation to develop innovative products to replace single-use plastics are also essential to prevent and reduce plastic pollution.
- There is a pressing need to explore the use of current legally binding international agreements to address marine plastic pollution.

4. Conclusions

Rivers are a major channel of plastic pollution into the world's oceans, transporting up to four million metric tonnes of plastic to the sea per year. Plastic floating in the water is fetching an increasing problem and has intense effects on the quality of our water and also for aquatic organisms. The use of Bubble barrier was found to trap a regular of 86 percent of plastic remaining, inhibiting it from entering the Sea. The strategy

is to scrutinize the stricken waste to witness both the extent and type of plastic waste pollution and the usefulness of the barrier. The bubbles don't hinder with passing boats, and most fish readily pass by taking a short time. The bubble curtains will no doubt disturb the organisms in the adjacent area. Almost all the day, a plastic bag, driven by the wind, will ultimately end up in the water. The debris which starts to get collects in the canals and rivers of cities. Canals and rivers that prime to the oceans, with nothing in their way to stop the trash they carry. The Great Bubble Barrier offers a means to halt plastic waste in the rivers and canals without obstructing the way for ships and fish. The Great Bubble Barrier can afford a visually smart barrier to stop and collect the waste, and can thereby serve as a great tool to enlighten and educate visitors about the problems of plastic pollution. The Bubble Barrier can lessen the quantity of plastic contamination in rivers and can help nurturing awareness in order to avoid further plastic pollution. The Great Bubble Barrier will provide excellent solutions for diverse complications.

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