

Recycling plastic and how to live with it

An Experts in Teamwork Poster from the village dealing with Ocean Plastic Waste

THE PROBLEM

Current estimates state that as many as 5.25 trillion pieces of plastic waste reside in earth's oceans. An estimated 8 million tons of additional plastic enters the ocean on an annual basis. While there is some direct deposition of plastic into the ocean, rivers are the most dominant avenue through which plastics ultimately end up there. The top-ten ranked rivers by total plastic load transport 88-95% of this amount into the ocean each year. Of these, the Yangtze river in China is by far the worst offender. Estimates show that between 315,000 and 410,000 tons of plastics reach the ocean via the Yangtze catchment each year. The river's basin accounts for 43% of China's population and nearly 42% of National GDP making it a major focus from both an environmental and financial perspective.

Waste collection

The Interceptor by the Ocean Cleanup Company cleans the river for plastic waste. As shown, barriers are deployed in order to lead the plastic towards the mouth of the Interceptor.

The current in the river then moves the plastics into the Interceptor, where it is met by a conveyor belt and transported into containers on board. Sensors decide which container to fill, in order to produce an even distribution of plastics in each of them. When the containers are full, the Interceptor automatically notifies local workers on shore, who upon request arrive with a barge.

The plastic waste is transferred to a barge, which transports the waste to a facility on land. The plastics are now ready to be sent to a facility for recycling

Repurposing

We wanted a solution where (1) we can recycle and store the plastic waste and (2) create products that could benefit less-fortunate communities. Our solution, fulfilling both criteria, is to build houses using bricks made from recycled plastic.

Conceptos Plásticos is a Colombia-based company that transforms recycled plastic into materials for construction of low-income housing in Colombia. The plastic bricks are Lego-like and can easily be assembled and dismantled. This design does not require skilled labors and allows communities to be involved in the construction of their own homes. Using plastic material is a cheaper option for building houses compared to ordinary bricks. It costs 87,000 NOK in total compared to 110,000 NOK for brick houses [in Colombia]. Plastic houses have good strength, fire resistance and acoustic properties. With good insulation, the houses are comfortable for living.

Next steps

Our research has shown that the recycling of plastics is not a profitable venture with current technologies. The sector needs large investments to decrease costs and some reports are of the opinion that first in a 20 year perspective, environmental policies and new technology may make recycled plastics favourable over virgin plastics. The presented solution focuses on tackling the issue today, and describes creative solutions that can create value given the current situation. Our proposed solution consists of cleaning rivers and creating local value through housing and job opportunities, but there are still remaining issues to address. These are further elaborated upon in our supporting document.

Local community

Governments need to be incentivized in order to consider recycling of plastic waste a priority. One such incentive is to make sure that recycling of plastic directly benefits communities in need, such as developing communities.

Our proposition of building houses will benefit the developing communities along the Yangtze river, in three possible ways.

1. Providing a cheap way to build schools and small hospitals will improve living conditions.
2. Asia is the continent with the most natural disasters per year. The effects of natural disasters may be counteracted by preparing for it by investing in expensive, sturdy, storm-proof and water-proof housing.
3. The effects of natural disasters also may be alleviated by making enough building materials for thousands of emergency shelters that can be put up in a matter of days if the need arises.

90%

of plastic waste that reaches the ocean annually stems from rivers.

1.5

million tons of mismanaged plastic waste is generated in the Yangtze river basin each year

50K

the amount of people our solution will house every year once the plastic is retrieved and recycled.