Plastic recycling : Bottles to flip-flops

Stopping Biodiversity Destruction and Ecosystems Degradation

Here 4 You - 13 December 2018

Note of Intent

The problem

The plastic pollution is a major issue that is pointed out since decades, however no sustainable solutions have been found yet to stop this threat to the environment. As the United Nations highlighted on international environment day with its slogan ''Beat Plastic Pollution'', it is paradoxal because single-use plastic objects are the type of polluting items that can be the most easily suppressed. Over 8.3 billion tons of plastic created since 1950, only 9% have been recycled and 12% incinerated. The rest is stocked either in rubbish dumps or in the nature, causing all the negative externalities we know on the wildlife. Among the 28 European countries, France is ranked 25th when it comes to recycling plastic. From this perspective, it is obvious that we missed a fundamental step in the environmental transition, and we should understand how we could have failed on this essential challenge. When we talk about plastic pollution in general, we should keep in mind that there are many technical constraints, essentially caused by the complexity of each individual plastic items. However, when it come to plastic bottle, France only recycle 56% of them, while countries like Germany already reached the 90%. This data is particularly striking when we consider that 1 million of plastic bottles are sold every minute! Thus, it seems that France should focus on this dimension, first because it would have a real impact, but also because this first step is easily achievable. One approach would be to raise individual awareness by taking action within the local scale.

Proposed concept

Name : MORPHE

What does it mean? Morphe comes from the ancient Greek epistemology which had a meaning of form and outward appearance. We have chosen this name as it directly links with our purpose of shifting a problem and forming something new out of the contribution of plastic bottles. We believe it appropriately symbolizes the shift we aim to have in tourists' minds by creating awareness of the footprint they have on their travel destinations.

What is it? Morphe is at first glance like any other vending machine. However, it has specific attributes that were designed with plastic re-use in mind.

How does it work ? Its very simple. Throw inside some plastic and you will get out something new ! The item that you will get is mean to satisfy a need, it can be a rain coat to use during a rainy day, or some flip-flops in case you forgot yours for the beach !

Expected positive impacts

Plastic waste is the problem that this project aims to ameliorate, in order to contribute to stopping biodiversity destruction and ecosystems degradation. Every year, around 18 billion pounds of plastic waste flows into the oceans from coastal regions. Nearly a million plastic beverage bottles are sold every minute around the world. Furthermore, less than a fifth of all plastic is recycled globally ("Fast Facts About Plastic Pollution." National Geographic, National Geographic Society, 16 May 2018, news.nationalgeographic.com/2018/05/plastics-facts-infographics-ocean-pollution/).

Concretely, the project aims to reduce plastic waste through the transformation of plastic waste into new useful objects, such as flip-flops in the first place, and potentially rain ponchos in an extension of the project. This will tackle plastic waste from coastal regions directly, by installing plastic transformation machines in coastal areas. The aim is to encourage people to use the machines to transform plastic waste into a new product, flip-flops. This is a local measure to reduce waste, and the results will, therefore, be limited to a local impact. It is an area to area solution, where the machine will be destined for the use by individuals in the vicinity. Each pair of flip-flops will be created, according to research conducted, from around 10 plastic bottles. Therefore, the project would in the case of success reduce local plastic waste substantially. By removing plastic waste from coastal regions, improvement could be seen in the local environment, especially in regards to the maintenance of ecosystems, and the pollution of oceans will be reduced. The solution is sustainable, as local plastic waste would be recycled in a direct way by a simplistic machine. The transformation of plastic bottles into flip-flops is a direct form of recycling. Firstly, this will reduce plastic waste by recycling. The plastic waste will be transformed directly into new useful objects, without the use of considerable energy or transport. Secondly, the initiative will educate about the importance of reusing and recycling plastic waste.

Major risks and actions to reduce them

Transforming plastic into more added-value product such as flip flops or raincoats is not risk-free. First, it doesn't reduce the plastic entirely from our ecosystem. Yes, plastic is still there. However, added-value products such as flip-flops and raincoats make plastic life-cycle longer and it is expected to reduce the plastic demand from the market since used plastic products could always be the raw material for other (added-value) plastic products. The right marketing to communicate our mission and raise the public awareness could maintain or even enhance the public participation instead of throwing more bottles into the sea or trash. Secondly, the quality of the product could affect the public perception and behavior towards the product. Imagine when we had the plastic flip-flops and the quality is so low that it damages quickly, thus it ends another waste at shorter time than we anticipated. Selecting the right vendors with the right printing technology and consulting with experts on this matter could help to improve the quality of our product. Having the product with a good quality will also prevent our product becoming waste somewhere else. Thirdly, the risk also comes from profitability side. As a new social business idea, the profitability will be tested over time. The business model is expected to create the value for all stakeholder: the client (government or company as CSR) and the society. It is paramount to conduct the thorough market research, investment analysis, and potential partnership model to solve this issue. Lastly, from technical point of view, there are thousands of different types of plastic. Different combinations of dyes and additives can be added to the basic resin to produce a desired color, shape and texture in the final product. These variations in the manufacturing process lead to different melting points and other properties within the same resin code. To be made into another product, plastic must be carefully sorted by type. It is imperative to clearly define what plastic type that could be thrown into our machine. The effort must be supported by government to combat this issue. Without stricter policy, plastic producers and suppliers will keep flooding the market, hence the effort to minimize them will become less and less effective.

Deployment strategy and major milestones

The initial steps of this initiative would involve surveying and collecting primary and secondary data on the potential locations (Paris and Nice), developing partnerships with tech companies, advertising companies, sponsors (CSR) and suppliers. Developing strategic partnerships with local governments, tourist centres and local businesses might also aid in achieving our aim.

After surveying Paris and Nice, waste collection stations would be installed in different parts of the cities, based on the data collected on the levels of tourism and plastic disposal. The machine crushes the plastic bottles into blocks of plastic. The blocks of plastic waste collected from each of these stations would be sent to the factory, where they are shredded into smaller flakes. These flakes are then cleaned and partially melted into smaller pellets, which are extruded into a yarn. The yarn is then used to make flip-flops and potentially, rain-coats.

Our major milestones would include manufacturing around three million pairs of flip-flops by the end of the first year of implementation, and start manufacturing and building a demand for raincoats. In the future, we hope to expand our product line to include bags and sports apparel and eventually establish ourselves as a social enterprise dedicated to solving social and environmental problems.

Return on investment analysis

As our main objective is not to become a conventional profit-maximizing plastic recycling company, but rather to effectively advance the re-use of plastic in the overall economy with the inclusion of consumers, the general return on investment analysis, determined by gains minus investment costs over investment costs is not pertinent in our case. Nevertheless, a significant portion (around ⅓) of the plastic waste put into the machines will not be transformed into flip-flops or raincoats, but will be sold to plastic recycling companies in order to sustain our company. The investment costs will be determined by the number and price of the acquired machines, maintenance costs, the costs associated with renting public space to place those machines and advertisement costs. Additional potential gains could be made through partnerships or sponsorships with local businesses and retail stores.

Organization

Phase 1 : Definition of the master plan

Organization of Project Team I composed of representatives from the public and private sector to deal with bureaucracy and to study potential sites according to local levels of tourism and pollution in order to determine first installation areas.

Phase 2 : Definition of the assignments and the scope of responsibility

Organization of Project Team II in charge of BPO (Business project outsourcing) activities for getting the machines and planning their technical maintenance along with a general monitoring plan of the project in synergy with Project Team I.

Phase 3 : Operational implementation:

Installation of printers in main beach/city sites with highest level of tourism and pollution. Deployment of advertising activities through various media channels.

Phase 4 : Monitoring and continuous improvement

Follow up of installed units, quality of the product, and environmental impact. Project Expansion to other cities.

Resources and skills required :

- Plastic bottles, 3D printers
- Advertisement to build awareness and teach people about the initiative
- Technicians for the installment and maintenance of the machines

Partners and sponsors : Local governments / municipalities.

- State or city level initiative : The project should be built in partnership with town-halls of touristic cities, starting with the south of France in beach areas, and Paris.
- Local SMEs : Partners to help the town-hall raise the necessary capital for getting the machinery and their maintenance.
- If possible other local/regional SMEs : Towards which we could sell recycled plastic gathered from the project (in case of surplus of material collected) for them to turn it into raw materials.

Innovation

What solutions exist already, how can we make it better ?
Is it scalable, so can many countries/cities use it as well?

The principle of our concept is reducing both plastic waste and new consumption by transforming them into needed, desirable objects again. It is important that the new products made from recycled plastics do not become a new form of undesirable waste, discarded after a single use. That would be missing the point of recycling. In existing successful solutions, we see that the newly composed objects need to process three important qualities of being desirable, durable and of a good quality. The Adidas and Parley for the Oceans collaborations transformed each 15 plastic bottles, collected from Maldives into a pair of popular design trainers. The project is developed further with a collection line of swimsuits in the same recycling manner. Another similar project makes trainers with soles made of recycled chewing gum taken from the streets of Amsterdam, available for sale on www.Gumshoe.Amsterdam. In the above existing solutions that have renown worked, it largely involves complex and long process of first gathering a large sum of plastic waste, and them transport the quantity to another location where capable machineries and facilities are set up for decomposing, process, remodeling, and eventually manufacturing into desirable and product of consumer value to be introduced to the market. They are made durable and quality by the manufacturing process mastered by the brand itself, and they are made desirable through two ways. The first is through exquisite, aesthetical designs and the second is through communication campaigns that make the product “in trend”, cool and thus desirable, make recycling a new “fashion cult” that drives the market. On the other hand, the process is long, and requires a large collaboration, and a big initial investment, while the public participation is low. The barrier of entry for creating similar products is high.

Our project takes a different path that is faster, more convenient and public engaging, without forgiving the three important qualities important for transformed products of recycling material. The quality of the final product will be insured by the technology of 3D printing. The product is desirable and durable to our target group, the tourist, as it is attached to the identity of the city, and becomes an object of attachment and memory to the tourist experiences. Firstly we will collaborate with local artists in designing aesthetically which makes a product an "unusual" souvenir with cultural values. Secondly, we serve to the idea of "needs", with the final products being raincoats and flip-flops. These products will only be produced when the need occurs, therefore we do not face the problems of staggered stocks. Moreover, the advantage of our project is the idea of publicly engaging process of "on-site transformation" of an obsolete, unwanted material being de-constructed and re-moulded into aseptically-pleasing products in needs that has educational value. This experience will transform public visions of the original, obsolete material, and refrain them from throwing it away. The public are engaged by their efforts of contributing the original material itself, and finds their own fulfillment in the responsibility of solving the issue as well. The low barrier of entries means that everyone can participate, without the financial requirement to afford a purchase of the 200 dollars/a pair Adidas X Parley trainers.