Sustainable Plastic Recycling

Plastics for Piedritas y Lobitos

Group 27

By Plastics For Peru

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1. About Us

- Despite good amounts of tourism in the area the communities of Lobitos and Piedritas struggle from high levels of poverty. This is partly because much of the money generated from this tourism goes to foreign investors instead.
- In order to improve the quality of life of people in the region we plan to recycle their plastic waste into several solutions which can be used to help the community and several items which can be sold to tourists, generating capital which can then be reinvested into our project and allowing the local community to benefit more from the tourism industry.
- As plastic is so versatile it can be used to address a range of issues the communities faces from rainwater collection to school supplies. Our project also allows new solutions to be created as new issues come up.

2. Design Matrix

CRITERIA DESCRIPTION	Criteria 1: Cost	Criteria 2: Build Difficultness	Criteria 3: Sustainability	Criteria 4: Practicality	Criteria 5: Safety	Criteria 6: Effectiveness	TOTAL SCORE
OPTIONS	Score	Score	Score	Score	Score	Score	
Omni processor	1	2	8	4	6	10	31
Transport link	2	2	7	5	9	8	33
Bio Farm	1	5	8	6	9	7	36
Plastic recycling	7	7	6	7	6	7	40
Desalination	1	5	7	5	8	8	34
Human Power	7	6	7	4	7	3	34

3. SWOT Analysis

Strengths
- Reduces plastic pollution
- Creates useful items out of waste
- Reduces amount of waste being improperly disposed of
- Improves overall quality of life

Weaknesses
- High initial cost
- Design must be outside for ventilation
- Largely reliable on the return of tourists

Opportunities
- Large amounts of waste plastic already congregated
- 90% of waste in Peru is not recycled of which every 1 in 10 kg of this is plastic, allowing massive room for expansion

Threats
- High chance of theft
- May not receive all projected funding
- Dependent on a community effort

4. Long Term Plan

Stage 0
- Source Funding for the project
- Assemble and ship the required goods
- Acquire land and develop the facility
- Begin a training scheme for unemployed locals

Stage 1
- Place Recycling collection points & collect all available recycled plastics
- Begin production on face shields & classroom supplies
- Distribute items amongst Lobitos & Piedritas
- Measure success at this stage, can we progress?

Stage 2
- Diversify our production, making water bottles, keyrings and recycling bins.
- Sell keyrings to tourists, recycling all money earned back into production.

Stage 3, 4 and 5
- Through measuring the success of the previous stage, upscale production in order to make both, more, and larger items.
- Increase the amount of machinery and solar panels in order to sustain a healthy manufacturing process.

5. Processes

Waste is collected from three key areas:
- The towns
- The local dumpsite
- The beach

The plastic can also be Imported from other areas of Peru if the supply was too low from the local area.

- It is then taken to a local collection point.
- Here, the plastics are inspected and sorted into the various plastic types.
- A mobile collection van can also be used to take the plastic to the recycling centre.

- The plastics are then received from the collection point.
- They are processed into a form where they can be reused.

The recycled plastics will be used to make various items, such as:
- face masks
- key chains
- rulers

6. Machines

The Shredder

The Injection Moulder

The Extrusion Machine

Generating items from waste plastic involves 3 steps.
1. Shredding of the plastic into smaller parts.
2. Melting the shredded plastic.
3. Pumping the melted plastic into a mould and letting it set.

The 3 Machines

The Shredder – Breaks larger plastic objects down into small parts, easier and more consistent to melt

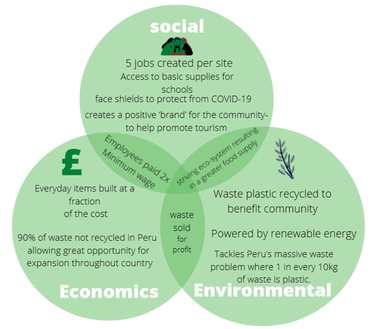
The Injection Moulder – Both melts the plastic and moulds it, producing more intricate 3D items.

The Extruder – Melts the plastic and moulds to produce a beam of specified shape, can be 2D, or 3D.

7. Energy

- A 25kV Hybrid Solar System was chosen based one energy requirements
- Peru receives consistent high-intensity sun that provides a valuable source of energy
- Hybrid solar system to ensure a constant supply of energy

8. Sustainability

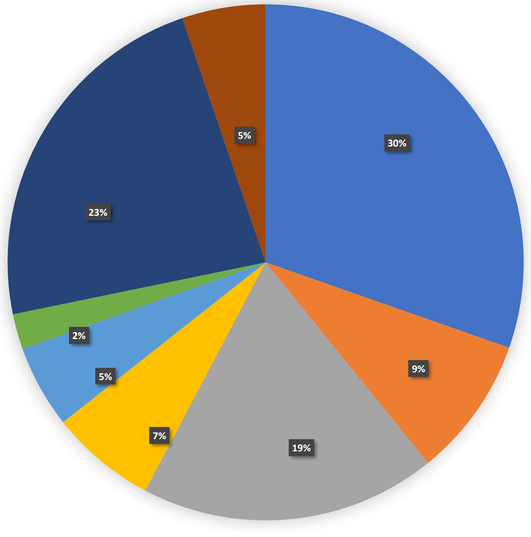


9. Risk and Safety

- Distanced
- Entanglement
- Maintenance
- Sharp objects
- Toxic fumes

10. Map of Lobitos Locations

11. Economics



Costs	GBP	Sol
Solar Panels	£19,810.97	S/ 94,819.09
Fencing	£5,744.15	S/ 27,492.60
Salaries	£12,102.24	S/ 57,508.86
Machines	£4,333.22	S/ 20,739.62
Molds (stage 1 - 3)	£3,389.82	S/ 16,224.33
Collection Points	£1,439.65	S/ 6,890.44
Shipping (estimate)	£15,000.00	S/ 47,519.19
Misc	£3,415.00	S/ 1,995.53
Total	**£65,235.05**	**S/ 239,143.86**