Case Study: Plastic Collective

ECOSYSTEM BUSINESS MODEL FOR SMALL COMMUNITIES AND A RENEWED SENSE OF VALUE INHERENT IN PLASTIC

A. Background

Plastic Collective started in 2016, when Louise Hardman decided to launch a start-up that would stop plastic pollution. Spurred to action by the sight of a turtle that was found to have ingested 30 different kinds of plastic in its stomach (the turtle died three days later), Louise decided on a plan that would make use of these same plastic wastes and turn it into a resource with economic value.

Louise launched her efforts designing, and then working with engineers to build a machine that could process plastic waste and recycle them into usable material. Armed with common sense and clear vision of what she wanted, the first Shruder, a combined shredder and extruder machine, was built not long after. With her passion and with this prototype, Louise pitched the plan to investors, and secured funds for the machine's commercial development.

Today, Plastic Collective (PC) provides purpose-built plastic recycling machinery and the newly developed 'Shruder Recycling Stations', plus training and technical support that empowers remote and vulnerable communities. The areas PC works in includes Australia, Cambodia, Indonesia, Malaysia, Thailand, and Timor-Leste. The bespoke 'hardware stack' which makes up the Shruder Recycling Stations are an integral part of a business model that allows communities to take control of their plastic waste, keep their environments clean, and improve the health of their communities as they create and operate their own plastic recycling micro-enterprises.

B. The Issue

According to Ocean Conservancy, there are about 8 to 12 million metric tons of plastics entering our ocean every year, on top of the estimated 150 million metric tons already in our marine environments. 74 per cent of this plastic trash comes from Asia, with many communities burning, burying or dumping waste plastics directly into the oceans and environment.

Remote communities in Asia-Pacific often have low GDP's, with people earning less than USD 5,000 a year. As such, these communities have no access to waste collection facilities, and no financial capacity to setup their own. This results in up to 100% of their plastic waste ending up in the ocean.

Marine pollution threatens biological ecosystems that support coastal livelihoods. The combined infrastructure problem and the decentralized nature of management in the islands and remote regions dictate the need to plan for small, remote infrastructure that can be run independently of irregular and unreliable electricity supply.

C. The Strategy

The strategy for market transformation involves coordinating both the supply and demand sides for recycled plastic.

THE SUPPLY SIDE

Education

Plastic Collective works with communities which are often forgotten by the rest of the world, as they struggle to hold back the tide of plastic waste engulfing their environment. These communities include three pilots which were organized in Mantanani Island (Borneo Malaysia), Les Village (North Bali, Indonesia), and

Whitsunday Islands (Australia). The communities had population densities between about 1,000 and 40,000 people.

Community visits and education programs that encourage plastic to be a valuable recyclable resource rather than rubbish, were targeted to match people's capacity to learn, and were integrated into schools and plastic recovery stations in these locations. Flexible online learning (pedagogy around communities that don't have literacy but have high visual skills) support people in the communities who have been identified to learn and eventually are able to train the rest of the community.

Infrastructure

There are a number of off the shelf solutions that are easily scalable and fitted to the needs of the community. The Shruder machines and other equipment used are light enough and sized appropriately, to enable easy transport within containers onto the islands which often can be a challenge (as these small islands usually will have no harbors or ports, limited landing areas, etc.). This limitation in infrastructure availability also requires that any material that comes out from these islands needs to be small and compact enough in volume for easier handling.

Shruder Recycling Stations are mobile, robust, turn-key and fit-for-purpose. Easily transportable, they can fit into either a standard 6 x 4 trailer or a 20ft shipping container, depending on the equipment stack required. As electricity supply in these locations is mostly irregular and unreliable, the machines can be powered either by mains power (single phase) or by 3-phase generators. The machines are containerized, as usually there is the absence of decent, safe, dry locations to set up the equipment (single-phase).

The Business Model

With a package of technologies, machinery, training and support, these communities are in the process of establishing a profitable plastic recycling micro-enterprise that allows them to be part of the recycling supply chain.

- In the pilot communities, plastic materials come through 4 collection areas including households, businesses, organizations or special programs, with various modes of transport delivery and personal collectors, making up a diverse combination of recovery channels available. These channels are evaluated, which helps establish the collection capacity of the communities. Given the low population densities, discarded plastic material volumes are also limited, at about 10 tons average, per month for up to 10,000 people.
- Plastic materials are processed and sold to markets which have been previously identified. 60 per cent of the output materials are recycled plastic shreds, pellets or flakes, which can be sold. With more processing, the material prices can be higher by about USD2-3/kg.
- 40 per cent of the usable materials are turned into local products with values starting at $4/kg.
- The collection and recycling process is certified according to the Global Plastic Standard, (link here is 3R Initiative), a plastic accounting standard which not only validates the material mass, polymer types and forms, location where collected, and the energy and water consumption to collect that plastic, but also ensures that the communities conform to the specified ethical, environmental and fair trade standards. A transparent and measurable means for determining the amount and value of plastic retired from the environment allows for a clear basis for the creation of the plastic credits.

THE DEMAND SIDE

Selling Plastic Neutrality

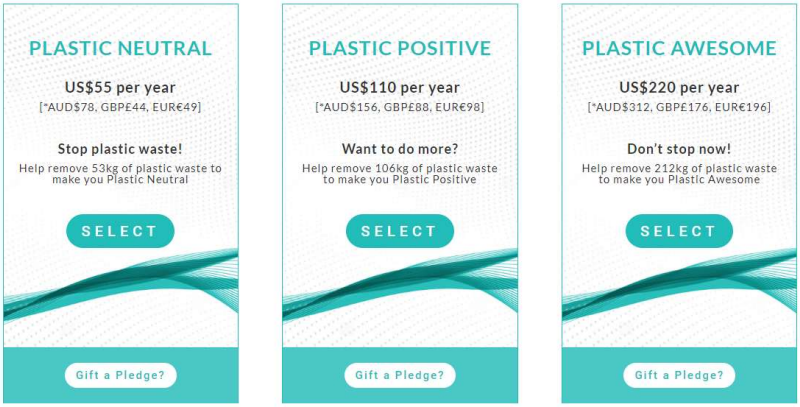
Through Plastic Collective's plastic credit program, companies who are aware of their plastic footprint are introduced to a strategy that helps them reduce their plastic consumption. Plastic credits backed by the community projects from both Mantanani Island, Les Village and Whitsunday provide an option for

companies to address the final balance of their plastic footprint, after implementing internal reduction, reuse, and recycle activities.

Companies like the Global Good Collective, for example, sought to purchase plastic credits to offset the sale of 1 million units of toilet paper. Using the anticipated number of units sold per year by the product plastic footprint of (or the plastic weight of the product unit = plastic in the actual product itself (TP) + plastic used in the primary (customer facing) packaging), a target for equivalent plastic credits was determined.

Purchasing credits supported product brand-neutral claims for 12 months. If the company sells less than it forecasts, the matching unused credits can roll over to next year. If more is sold, the company will purchase more.

The credits are sold on the website:



The profits from the sale of the recycled plastic and plastic credits are ploughed back into the communities as payment for the waste materials brought in by the community and for the maintenance of the equipment.

D. The Challenges

Community buy-in

Community involvement is critical for the program to succeed. Working closely with the community on how to plan and approach the plastic pollution issue – and the potential for using these as resources for a collective micro-enterprise is part of the ongoing effort to build awareness. Community capacity is supported by providing training commensurate to the learning capabilities and style of the participants.

Scaling

Small and remote communities can't pay for the cost of the equipment and hence, seed funding from patrons and sponsors are necessary to start the projects. For sustainability, it is crucial to demonstrate that returns from selling recycled materials and plastic credits can support the investments in the micro-recycling equipment. There is a clear need for a financing vehicle that will provide the capital upfront, to buy and install the equipment for the community, with the returns to be recovered from the sale of plastic credits.

Critical mass to justify economic returns

Plastic material volumes from many of the smaller communities are not enough to justify the investments. The experience from the two pilot projects highlights the fragility of the economics, given low plastic volumes, and limited opportunities with the recycled outputs and upcycled materials.

Hence, PC is looking at building capacity within a network of islands to have scale, where the main processing takes place in the biggest islands (or that nearest the mainland), which would be the 'hub'. The smaller islands (or 'spokes') are organized to collect the material, undertake a light level of processing, and then send the materials to the hub.

Dramatic economies of scale are also realized with more participants, especially considering the cost of transporting the goods across islands.

E. Impacts

Creating employment and generating greater profit for the community.

The community can then employ local staff (6--12+ people) to run the resource recovery micro-enterprises, generating a profit for the good of the community. Educating and creating awareness among more families and their children helps in reinforcing the value of reducing single use plastic and recycling higher value plastics.

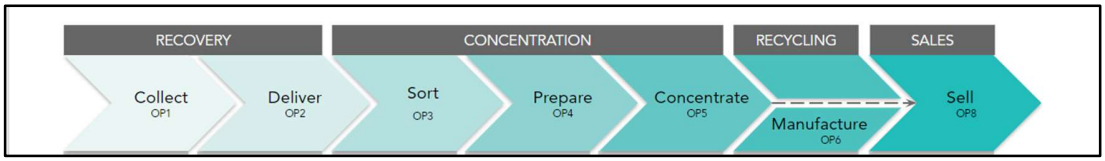
Social benefits

Co-benefits from the pilot project include better health and sanitation from a cleaner environment, empowerment through collective enterprises that not only address waste management but also provide a livelihood source for the community, and a sense of pride and the well-being it affords for the residents of Mantanani Island, Les Village and Whitsunday islands, are some of the social impacts the projects have resulted in.

F. What's Next? - Moving Forward

Promoting a Hub and Spoke model

As not all island communities can justify the investment, or may not have enough plastic material available to match the machine capacity, it becomes economically unviable for communities to invest and expect returns. This is where the 'hub and spoke' model would enable these communities access to the solutions.



Smaller islands can be equipped with recovery: collection and sorting processes which allows for valuable and simpler processing. These island spokes would then send these sorted materials to the larger island hubs, where the Recycling Stations would concentrate and recycle materials into raw and finished products.

Machine improvements

The ability to upgrade the Shruder Recycling equipment to increase output and capacity is also an option, as the modular nature of the design would provide a range of suitable equipment from baling, granulating, extruding, compression moulding and injection, as well in increasing power consumption to 3-phase and other product options. A greater range of processing equipment would also allow for an expanded product portfolio, with product design, mould and dies also available with PC's expert recycled product technicians

New Markets

Many FMCG companies are expressing interest to include plastic offsets in their arsenal of plastic use reduction efforts. Footprint calculation for products can be simpler, and hence is low-hanging opportunity for plastic neutrality.

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Quotable quotes/ Messages (Louise Hardman):

The fly in the ointment is the license to continue, and what you have done, or how transparent your best endeavors are to do everything that is possible to reduce your plastic footprint ***before*** *you take your license to continue with the credits.*

The right to produce is a business issue. It's buying businesses' credibility by offsetting which can be controversial. I explain it as the option of last resort for a company: do everything first, then you do neutrality.

There is one element that needs to be really thoroughly developed with any plastic standard: the solution needs to be traceable and there needs to be highly qualified components of the certification (the best efforts to reduce).