

**Engineering and social justice in practice**  
**Developing capacity in low income cooperatives in Buenos Aires**  
**from waste plastic and fibre**

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Villa 20, a 25,000-resident shantytown on Buenos Aires south side

After the economic crisis in 2000 80,000 cartoneros or ‘cardboard pickers’ were found throughout Buenos Aires city, collecting up to 66 tpd. A new law on ‘Integral management of Solid Urban Waste’ which the group Greenpeace helped draft went into effect late 2005. This law, better known as ‘Zero Garbage Law’ was additionally intended to bring about decent working conditions for the many informal garbage collectors or ‘cartoneros’. The law stipulates that the amount of garbage in landfills is to be reduced by 50% and to reach that goal the Buenos Aires city government has sponsored the organisation of cooperatives of garbage scavengers and provided space for the first warehouse [1,2]. A leader in this area is El Ceibo cooperative who are asking residents to separate their waste so they can collect it [3]. El Ceibo has a collection and sorting facility, a sales agreement and an average monthly earning of US 200. They cover 10,000 houses in the Palermo area of Buenos Aires city [4]. However there are many other disorganised and family run cartoneros teams that still exist. Currently the estimate is anywhere between 5,000 and 20,000. It is still the case that over 90% of the city’s recyclables are collected by the cartoneros, informal and unpaid workers who live in the shantytowns and enter the city centre by night to find the waste [5].

Much of the recycling that is collected is sold directly to agents at a price of about 8c/kg. Some more organised cooperatives sort and sell the materials directly to industry and others sort and reprocess, and in some cases recycle. However, few create final products and therefore income generated is very low. The potential is very high for composites made from upgraded plastic, particularly forms which have found no other market, such as plastic bags and some plastic containers, however no such technology is currently utilised in the recycling circles in Buenos Aires. Fibres in the city that could be used to reinforce the plastic include cardboard waste and wood chip.

This paper will discuss the project Waste-for-life which ran between July and December 2007. Following on from similar work in Lesotho, Africa, it was decided to first conduct a series of needs analysis interviews and group discussions with local stakeholders such as cartoneros, local government, landfill managers and workers cooperatives. Was the idea of making composites

from waste a useful one? Did the groups collect enough plastic? How would they wash it? Did they have storage space? Did they have a source of fibre? What product would they make and who could they sell it to? Would it be cost effective for them? What equipment would they use to process the composites and how could they afford this?

We knew that the latter question would be key from our previous experience in Lesotho, hence we had begun to design a low cost hotpress which might be manufactured locally. The challenge became who would build the hotpress, who had the skills and how would they be funded.

We will describe the outcomes of the project and the potential that natural fibre composites have to serve a need in upgrading plastic waste and providing an additional income stream to waste pickers and other low income groups worldwide. We will also consider the lessons learned about doing engineering which is aimed at enhancing social justice.

## **BIBLIOGRAPHY**

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