



ADDING VALUE TO PLASTIC WASTE

PLASTIC RECYCLERS SACCO LTD.

INTRODUCTION

Plastic Recyclers SACCO Ltd. was started in 2005 with the help of Practical Action. The cooperative brings together many organizations in Nairobi that focus on waste reduction and recycling.

In 2007, the cooperative received four machines from funding given by the Embassy of France in Kenya. These machines allow the cooperative to add value to plastic waste and produce marketable and competitive products. This document briefly outlines the value-adding process and the machines used by the cooperative.

VALUE-ADDING PROCESS

1. COLLECTION



The first step in turning waste into wealth is to acquire the waste. This includes door-to-door household collection, collection from schools, industries, restaurants, and even picking waste up off the street. Once collected, waste should be brought to a centralized location

2. SORTING



Plastics must be sorted by type. Common plastic types include polypropylene (PP), high density polyethylene (HD), low density polyethylene (LD), and polyethylene terephthalate (PET). Mixed plastics should be sorted as the higher quantity plastic in the mixture.

For more information on the different characteristics of recyclable plastics, please refer to the Plastic Recyclers SACCO Ltd. Sorting Manual.

3. CLEANING

Dirty plastics must be cleaned. This includes:

- Draining fluids from containers
- Removing stickers or labels
- Removing bottle caps
- Washing all plastics with detergent or soap
- Drying, often done by leaving in the sun

4. CUTTING AND SHREDDING



The goal of cutting and shredding is to reduce the size of the plastics so that they can be processed. Cutting is necessary for pieces that are too large to be immediately shredded. Shredding machines feed the materials into a rotating blade via a hopper. The result is coarsely shaped plastic flakes.

5. AGGLOMERATION



The agglomerator chops the coarse materials into thin flakes, and heats them until they start to melt together into "crumbs", or agglomerate.

6. PELLETIZING



The agglomerated crumbs are then fed into an extruder, heated, and forced through a die. The output is long strands of plastic that resemble spaghetti. This can then be cooled and chopped into pellets, which is the recommended input for the injection molding machine.

7. INJECTION MOLDING



The pelletized plastic can be molded in a variety of ways. The cooperative uses an injection molding machine, which forces the plastic along a heated tube using a screw. The plastic is then forced through a nozzle into a mold. Currently, the cooperative is molding plastic plates.