



Partnership Ready Ethiopia: Recycling Sector

Framework conditions

The relevance of the recycling sector in Ethiopia is twofold: on the one hand, there is a lack of raw material, on the other an informal recycling system takes place. Ethiopia has a general shortage of raw materials like plastic, metal or paper – due to the lack of resources within the country (e.g. Ethiopia only recently began crude oil production) and due to a widespread technology gap. The high dependence on the import of raw materials in combination with the foreign exchange crunch and high transportation costs lead to prices, that are two to three times higher than those on the international market. As a result, the importance of the reuse and recycling as a source for domestic raw material is high. Parallely, there is an informal recycling system in place with one of the highest recycling rates in East and Central Africa, that is comparable to some European countries.

Aside from the recycling of post-consumer waste, the reuse of industrial waste in the production of plastic items is very common. Most production sites have grinders to process the production offcut into reusable re-granulate that is utilized for

production and mostly exported to gain foreign currency. The main reason for this is the technology gap, which prevents the pre-treated feedstock (e.g. PET-flakes, paper pulp) to be processed into raw materials that can be used in the production. Exceptions are post-consumer metal scraps, used to produce reinforcement of bars and billets, as well as thermoplastics other than PET, which are used for producing household wares. The latter cannot be exported as the materials do not meet the needed quality requirements.

→ LEGAL FRAMEWORK CONDITIONS

There are no laws in Ethiopia, which directly regulate recycling in terms of statutory recycling quotes or restrictions for use of recycled materials. However, certain materials such as packaging materials meant for food contact are checked by regional laboratories for toxic substances. It is highly recommended to abide to EU or US standards when using recycled materials. The handling of solid waste is regulated in the “Solid Waste Management Proclamation” from 2007, empowered by the Environmental Protection Agency. Responsibility is passed down to the lowest administrative levels of the local governments, with the objective



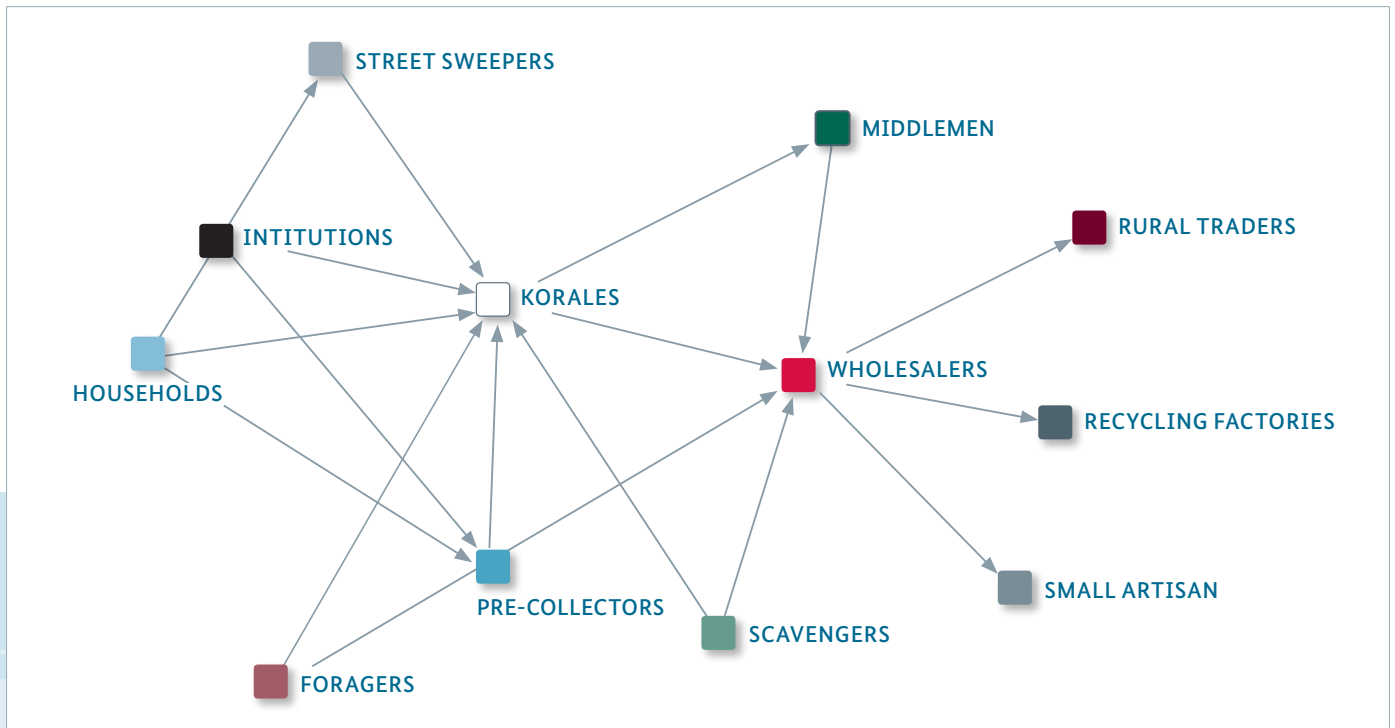


to include also private households and public participation in the waste segregation. Also, the “Solid Waste Proclamation” partly prohibits the import of waste with some exceptions regarding the sustainable treatment of materials. As stated in the EU Waste Shipment Regulation, the import of red, yellow or green listed waste from the EU is not allowed. A corresponding request from the EU was declined by Ethiopian authorities in 2000. Aspects of “Extended Producer Responsibility” (EPR) are also implemented, as producers and importers of tin cans and glass containers should be taken responsible for the return and recycle of their products. Unfortunately, these laws are poorly implemented. Only six out of eleven regions had established regional environmental authorities until 2014. Regions that established authorities lack strategies and implementation due to a lack of staff and organization.

→ GENERAL WASTE COLLECTION

In practice, municipal waste is collected by the municipal waste management companies and brought to landfills. It consists mainly of organic waste with small amounts of plastic, paper and metal waste. The recycling of municipal waste is executed by the informal sector: informal collectors and so called “Korales” gather all kinds of recyclables from streets and landfills. Recycled

materials are not only restricted to plastic, paper, glass, and metals, but also contain biomass, textiles, rubber, silt, ash, dust and waste oil, since the demand for these raw materials is high. However, the policy, collection and technology for recycling is still a challenge. Polyethyleneterephtalate (PET) is mostly collected from hotels and gastronomies. The informal collectors sell the segregated waste to middlemen, who supply the recycling companies with the materials. The informal sector is loosely organized and in parts subsidized by the Solid & Hazardous Waste Compliance Monitoring Directorate, as the collectors get a subsidized price for the raw material. At the beginning of 2018, over one hundred informal collectors died on a landfill near Addis Ababa due to a big landslide of waste. Recycling is directly promoted through subsidies for the informal sector and indirectly encouraged via federal policies like the Ethiopian Environmental Policy (1997) and the Climate-Resilient Green Economy (CRGE) Vision. Some of the economic policies like investment and industry policies promote recycling by providing incentives, such as tax exemptions. Services of start-ups, mostly founded by the youth engaged in the recycling sector, are tax free. This is an extension of the policy for employment by promoting micro and small enterprises (MSE). Recyclers organized as MSE are encouraged and supported by public bodies through trainings that offer technical know-how and literature.



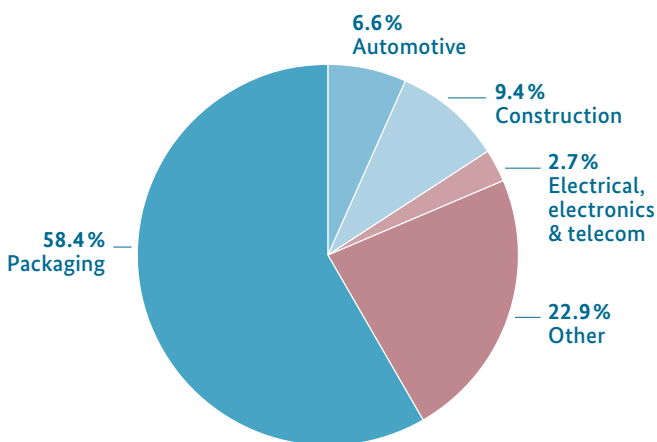
Waste material exchange network among informal actors in Addis Ababa.



Plastic

→ PLASTIC INDUSTRY

The plastic industry in Ethiopia is growing fast. The consumption of plastic products is increasing in double digits annually since 2011 and has more than tripled in total since then. The main business segments are the packaging industry (58,4%), the construction (9,4%) and automotive industry (6,6%).



Plastic consumption in Ethiopia in kilo tons. The numbers are estimated from 2016 onwards.

The lack of domestic resources and technology leads to Ethiopia being East and Central Africa's second largest importer of plastic raw materials, packaging machines and printing machines. Saudi Arabia is by far the largest importer of plastic raw materials, followed by China and the United Arab Emirates. The total sum of imported plastic raw materials from the top twelve supplier countries was around 270.000t in 2016. For more facts on the Ethiopian plastic, print and packaging market please visit www.ppp-ethiopia.com/ethiopiaplastprintpack.html.

Import Partner	Netweight (tons)
Saudi Arabia	136.900
China	34.100
United Arab Emirates	28.333
Thailand	26.712
India	11.233

Top 5 suppliers of plastic raw materials in Ethiopia and their net import in 2016.

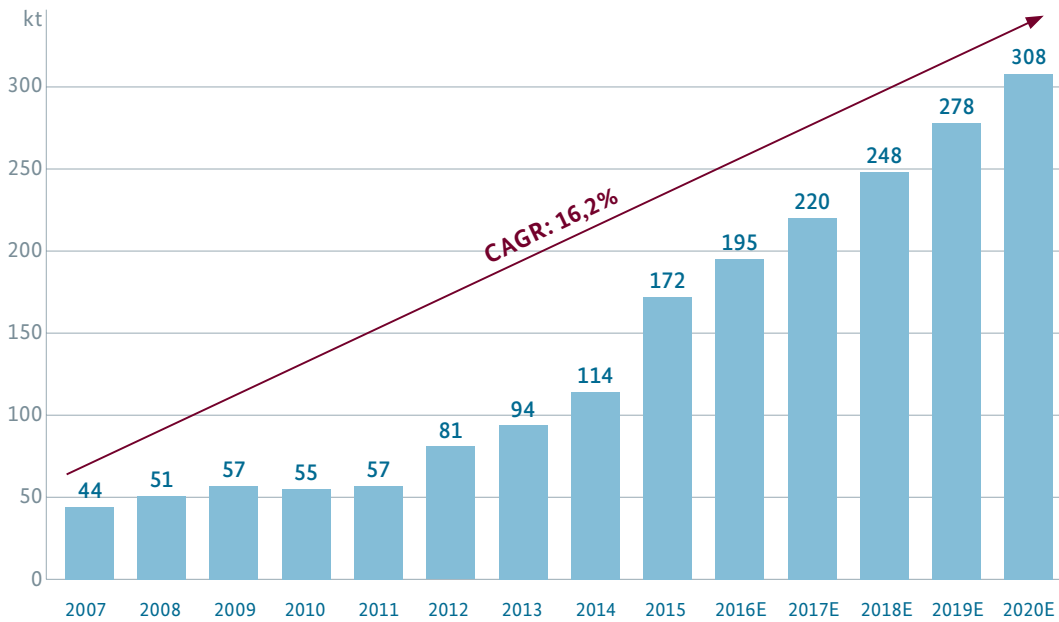
To this point, recycled plastic raw materials are only utilized in the production of household wares. However, depending on their prior use they could be easily utilized in the construction industry, with the exception of water pipes for tap water, as recycled materials can emit toxic substances. The most common uses would be irrigation water pipes, cable conduits or insulation panels (HDPE, PP and PVC). Recycled mixed thermoplastics from Ethiopia are mainly used in injection molding.

→ PLASTIC RECYCLING

Plastic recycling can be classified into two categories: PET-recycling and recycling of other mixed thermoplastics, mostly polyethylene (PE), polyp ropylene (PP) and Polyvinylchloride (PVC). Around 30–40% of the plastic wastes are recycled or reused; a total of 60 000–65 000 tons per year.

Informal recyclers gather PET-bottles mainly from hotels and gastronomies. General qualities are good, but occasionally suffer from inappropriate storage in bright sunlight. Most of the material has a light blue color, due to the previous use as single-use water bottles. Recyclers still pay prices up to 300 US\$/ton and the recycling plants are not subsidized. Currently the estimated number of PET-recyclers in Ethiopia is around ten. The bottles are mainly recycled into flakes by a cold wash process, while two recyclers use hot wash processing to obtain flakes of higher quality. The flakes are not used in the domestic production, but rather exported to generate foreign currency. This is mainly due to a lack of technology, experience and investment, as well as the increasing forex crunch. For recycled materials, the access to the new state-owned railway from the Modjo Dry Port to the sea port of Doraleh in Djibouti is still denied, resulting in high transportation costs.

To this point there is no bottle-to-bottle recycling, filtered extrusion or electrospinning in Ethiopia to process the flakes into materials that can be used in the production again. Considering how fast the textile economy is growing and that 60 water companies in the market are selling around 3.5 billion bottles of water per year, there is a high potential for recycled plastic in the local market. The use of recycled material in electrospinning to textile fibers is only limited by the quality (e.g. chain length) of the flakes.



Estimated plastic consumption in Ethiopia in 2017 by application (a) and processing method (b). Source: EUROMAP

While PET can be collected in good qualities, all other thermoplastic materials are collected from landfills. Most common scraps are from high density PE (HDPE) and PP, but also PVC and PS are picked. Unfortunately, the types of materials can only be separated on a basic level through a swim/sink procedure, as there is a lack of technology. There are no near infrared (NIR) sorting systems available in Ethiopia, yet. Other than PET-flakes, the mixed regrinds cannot be exported due to a lack of quality. The regrinds are used domestically in the production of household wares. Limitations of use are due to color, quality and material history. It is very difficult to obtain colorless or white regrinds in sufficient qualities and quantities. More common is the coloration of mixed scraps with carbon black (CB).

There are around 10 to 40 recyclers, who process mixed thermoplastics. The total production volume is around 60.000–65.000 tons/year. The materials are sold as regrinds for around 25–30 Birr/kg gross (0,88–1,05 USD/kg). Virgin material prices for all kind of polymers are around 60–65 Birr/kg gross. Prices strongly depend on the forex situation and can vary greatly within short time spans. E.g. in early 2018, prices for virgin materials were estimated around 45 Birr/kg. Shortly after that they increased up to around 70 Birr/kg during the tightening of the forex situation in Ethiopia in early and mid–2018, falling back to the current level at the end of the year.

Besides the recycling of thermoplastics there are efforts to reuse rubber from wasted tires. Some companies are specialized in fixing small damages and selling the repaired tires. If damages are beyond repair, the tires are shredded to flakes and used as fuel in energy extensive productions like the cement industry.

COBA Impact Manufacturing PLC is a leader in glass bottle crates manufacturing in Ethiopia, a joint venture between a local and a Swiss company. COBA Impact supplies almost the entire local beverage industry, for example SABCO Coca Cola, SAB Miller, BGI (Castel Group), Heineken, Diageo and other local producers. COBA Impact intends to produce PET preforms and HDPE closures for flat water and carbonated soft drinks, as well as collect and recycle PET and HDPE into reusable flakes for export markets. The company is proud to announce the opening of the first collection center for PET bottles in Legetafo region of Addis Ababa, run and owned entirely by new local entrepreneurs.



→ PAPER

Paper recycling in Ethiopia is mostly done in the same way as PET-recycling: paper is sorted and processed into pulp and then exported to generate foreign exchange. There are only a few paper-to-paper recycling companies in Ethiopia, like Penda Paper or Suzo Industry PLC due to missing technology, investments and experience. The use of recycled paper, whether for printing paper or as sanitary products, is not common. The largest portion of paper in the country is imported from abroad, leading to price increases in cardboard and other paper products. Ethiopia imports more than 100 million USD worth of raw materials for the paper industry every year. Currently more than 200,000 tons of paper and carton waste per year is dumped at landfills, burned or simply left as garbage on the streets. The current rate of using local recycled raw materials stands at around 5% relative to 15% in Kenya.

Penda Paper is a paper recycling company in Addis Ababa, Ethiopia. It has grown to a network of 7000 people collecting paper all over the city and processing it to be sold as pulp to paper mills to produce new paper products. Their mission is to give new life to paper and carton waste, turning them into recycled resources. In 2018 Penda installed 40 mobile paper waste deposit sites around the city called 'Worke' that allow residents to dispose their paper waste for 2 birr per kilo. Penda has created in a partnership with the Addis Ababa City Administration full-time jobs for 90 individuals, in addition to extra income creation for its 7000 micro-enterprise waste collectors. www.giz.de/en/worldwide/81450.html

→ STEEL INDUSTRY

According to the Ethiopian Association of Basic Metals and Engineering Industries, main part of metal industry and recycling metal is the steel industry, that can be categorized into basic steel industry and the production of engineering parts. The former produces mainly reinforcement bars from primary resources, while the latter produces more demanding items from stainless steel, like machine parts, assemblers and fabrication. The steel industry in Ethiopia consists of around 130 companies, employs 30.000 to 40.000 people and has a capacity of around 5 million

tons/year. The actual production of the whole industry is only around 40–50% of the capacity. The main reason for this is the shortage of raw materials, caused by the foreign exchange crunch. The resulting high prices make recycling very attractive. As of today, the recycling rate for steel is around 30–40% (360.000 to 480.000 tons per year in 2018). The main challenge for metal recycling is the missing waste segregation as well as keeping recycling rates low. The effort to collect metal scraps by magnets in landfills and scrapyards for the informal collectors is very high. In addition, some scrapyards are government controlled and therefore a permit is needed to enter them. The largest sub-sector of the metal market is recycled steel that is only used to produce reinforcement bars. The twelve companies on the Ethiopian market have a combined production capacity of 3 Million tons/year (2018), while in 2003 it was only around 15.000 tons/year. The fast increase of the production capacity of reinforcement bars over the last 15 years represents the extremely fast economic development of the country.

→ ALUMINUM AND COPPER

Besides steel, there is also a small aluminum industry in Ethiopia with around 7 companies producing profiles and household utensils. Recycling of aluminum is practiced on a very informal level. Aluminum scraps are collected and melted at home in small furnaces into new billets, used solely in the domestic industry. The copper industry is even smaller than the aluminum industry. Copper recycling is done in the same way as aluminum recycling. The theft of copper wires and pipes from infrastructures on a big scale has been the reason for the government to ban the export of metal billets from recycled metals some years ago.



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The booklet shows companies the economic potential of future markets as well as the funding and consulting opportunities offered by the German development cooperation. “New Markets – New Opportunities: A Guide for German Companies” is supported by the Federal Ministry for Economic Cooperation and Development (BMZ). All issues are published on the websites of GTAI and GIZ. You can find selected issues, for example on Ethiopia also at

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