Can developing countries benefit from the circular economy?

Developing countries have not benefited from the linear economy, the economy in which goods are manufactured from raw materials, sold, used, and then discarded as waste. They have poor access to cheap goods to improve the quality of life of their populations. **They do not take advantage from the extraction and exportation of raw materials to developed countries**: almost 80% of resource-driven countries have a per-capita income below the global average(source: McKinsey Global Institute). Conversely, **they have large quantities of waste brought in from developed countries**: more than 90% of discarded computers from the developed world are exported to developing countries such as Ghana, Pakistan, and India (UN, 2010).

Can developing countries better capture the value of the circular economy? It might seem a stretch. Developing countries have not built

stocks of infrastructure and goods, which they can recycle, repair or reuse. However, they fortunately produce far less waste than industrialised countries (a region such as sub-Saharan Africa is responsible for only 5% of the world's waste while OECD countries produce almost half of it, according to a World Bank's 2012 report).
Very little analysis has been conducted so far to assess the potential benefits of the circular economy for developing countries. But these opportunities are worth exploring. Some early initiatives seem indeed to demonstrate a promising potential. Relying on underdeveloped industries and infrastructures, some of these initial initiatives may be rudimentary, such as recycling or repairing used assets. But some others can address, on the long term, economic, social, and environmental challenges of developing nations.

Improve waste collection and recycling performance

In low-income countries, solid waste management is characterised by poor collection and **improper disposal of municipal solid wastes**. 59% of waste is not collectedand typically ends up in informal waste dumps. Landfilling is still the predominant means of disposal. Recycling operations, primarily managed by the informal sector, use inappropriate techniques that severely jeopardise the health of the workers and cause major environmental harm.
Yet, solutions exist to improve the economic and environmental performance of waste collection and processing. **Organic waste** is probably the most untapped resources in low-income countries. While, according to the World Bank report, 64% of municipal solid waste is organics(28% in high-income ones), composting at scale is rare despite its relative simplicity and compelling economic and environmental benefits. Organic waste composting creates jobs and generates revenue. In sub-Saharan Africa, it is also a viable alternative to phosphate fertilisers which farmers cannot afford to counter the continent's low soil fertility.
With respect to **technical materials such as plastic, glass, or paper**, many entrepreneurs and communities are processing them through artisanal but efficient recycling operations. In **Senegal** for instance,

Proplast produces 15 tons of plastic resins per month from plastic waste collected locally. However, most developing countries **lack access to technologies and investments** required to transition from artisanal to industrial recycling operations. To address this issue, the **African Development Bank** is financing, for example, the implementation of a plastic waste collection and recycling infrastructure in **Ivory Coast**. Using innovative recycling technologies, this operation not only provides local industries with raw materials, it also supports the social and economic reintegration of 2 000 ex-combatants.

In their transition towards a more circular economy, developing countries can also better leverage their **informal sector.** Using **waste pickers** to collect trash in landfills cannot be a desirable outcome, because in particular of terrible working conditions. However, during a transition period, waste picking could be organized and supported to create jobs and reduce poverty. In **Mexico**, Danone has built, outside the landfill, a sorting centre where waste pickers can sort waste more efficiently and safely. As a result, over 400 families have seen their income risen by 30% and their health care covered.

Strengthen the repair and refurbishing sector

While few emerging countries have developed high performing recycling operations, many have established robust **repair industries.** Because they cannot afford brand new goods, such as electronic equipment or cars, many developing countries import used ones from industrialized countries. In **Nigeria**, for example, **95% of cars are second hand vehicles**(Daily Times Nigeria, 2014). A vibrant repair and refurbishing sector has developed in most countries to repair and maintain these goods.

The practice of **importing used goods from Europe or North America** is often criticized due to the lack of appropriate recycling infrastructures in the developing world. However, all imported pre-owned assets do not have to be recycled. In **Ghana** for example, **80% of the second hand electronic products** (such as cooling and freezing equipment, computing equipment, TVs, and mobile phones) **are not recycled but re-used,**

repaired or refurbished (Basel Convention, 2011). In the capital of Nigeria, Lagos, two refurbishing clusters, Ikeja Computer Village and Alaba International Market, supply refurbished equipment not only to Nigerian households, but also to other West and Central African countries. A great deal can be done to improve the economic and environmental performance of the repair and refurbishing industry, including **building the capacity of self-taught repairers and refurbishers**, and implementing proper recycling operations for used goods when they reach their end of life. For instance, HP, Dell, and Lenovo all make information readily available for repair technicians. In **Nigeria**, the government is working with the Japan international Cooperation Agency to draft a Nigerian end of life vehicle recycling law, and establish an automobile recycling system in order to manage more than 400 000 vehicles that reach their end of life every year. In **Kenya**, Hewlett-Packard, Dell, Philips, and Nokia have jointly worked to set up a network of 50 collections points and an electronic waste recycling facility with strict recycling standards.

Build resources efficient agricultural value chains

Hopefully, recycling, repairing, and refurbishing used goods imported from developed countries are not the only circular economy opportunities. Developing nations can also build **resources efficient industries**. In developed countries, industries have been built, overs years, to optimise the linear economy, making transition towards the circular economy sometimes very challenging. Many emerging countries, not yet locked in the linear economy, have the opportunity to design and build new farms, businesses, and industries for the circular economy. In particular, they can build resources efficient agricultural value chains.
Malawi, Mozambique and Zambia are experimenting with **agro-ecology,** the agriculture that is not inspired by industry but by nature. In Porto-Novo in **Benin**, the Songhaï farm has developed a closed-loop system where all farming by-products are reintroduced in the production process. The farm produces 3.4 tons of rice per hectare, compared to only 1 ton of rice per hectare at its beginnings.

In **Brazil**, the cosmetics maker Natura has invested in a 1.7 million square meter industrial park in the Amazon region aimed at attracting companies interested in developing sustainable businesses. The facility intents to develop a closed-loop system by selling the bi-products of cosmetics production from Amazonian fruits, oils, and berries to other co-located companies in complementary industries.
Emerging nations can also improve the resource efficiency of their agricultural supply chains. The **coffee** value chain, for example, is far less mediatized than e-waste recycling in Ghana (in places like Agbogbloshie for instance). But its impact on environment is far worse. The processing of 1 kg of green coffee generates 2,5 kg of by-products, pulp and peel (African Development Bank Group, 2015). These by-products, highly toxic, are regularly released into rivers, affecting aquatic fauna and flora as well as downstream communities putting the health of the public at risk. They also generate considerable amounts of greenhouse gas emissions, particularly methane. Yet, wastes from coffee processing can be turned into various resources: feeds, compost, biogas but also beverages, vinegar, caffeine, or protein. In **Central America, farmers convert coffee waste into biogas**. In **Colombia**, large coffee farms use the compost produced with pulp as an **organic conditioner of soils** (FAO, 2006). In **Mexico and Vietnam**, farmers supply with coffee pulp to a U.S. based company, Coffee Flour, which converts the **pulp into flour.**

To date, aside from a few local programs, international development organisations have paid a limited attention on the benefits to be derived from the circular economy. Yet it could be a fantastic means to **help achieve the UN development goals**. To begin with, development agencies should assist emerging countries to assess the full potential of the circular economy. Inefficient use of resources is a luxury neither developed countries nor developing ones can't afford.

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