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## The beauty of circular value chains

Both the value chain and the circular economy concept have their unique attractiveness. In the 2016 Annual Reflection we published the article *From value chains to circular economic systems* (Cunningham, Jenal & Harmes-Liedtke, 2016), where we argue that value chains often optimise efficiency at the product level but fail to provide resource efficiency at an overall system level. As an example, we referred to food waste in economic systems based on highly optimised value chains.

In this article we focus on the practical aspects merging both approaches for our work in development. We believe the value chain concept could benefit from a circular, environmentally friendly vision, whereas the

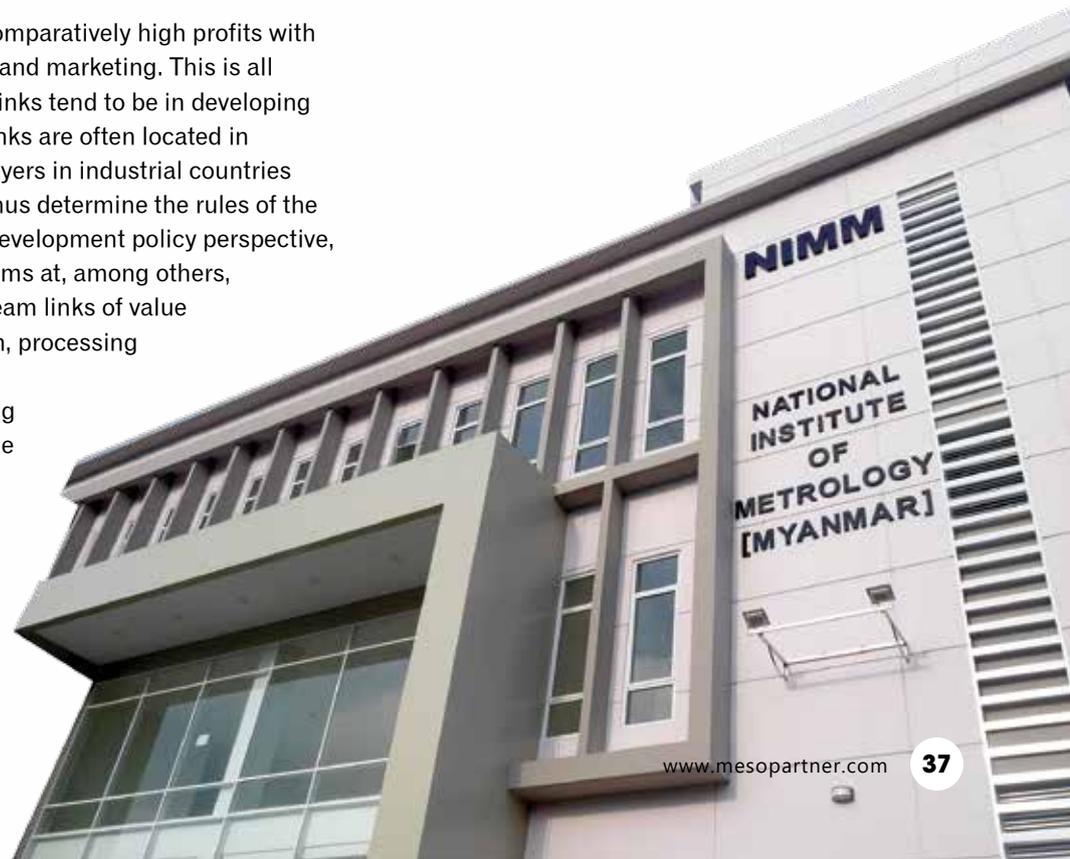
circular economy discussion could engage more strongly with development aspects, such as distributive justice, equality and inclusion.

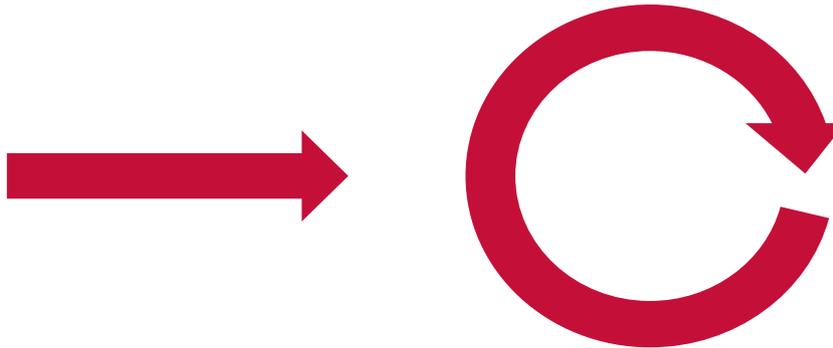
The value chain concept, originating in business management (Porter & Advantage, 1985), is frequently applied by international development agencies (see <http://www.value-chains.org>). The basic idea goes back to the combination of different links in the production of a product, such as in food production from cultivation, processing and distribution to the purchase by the end customer in a supermarket. In each link, values are created that accumulate with each value chain actor transforming the product on its way downstream to final consumption.

The global value chain approach puts the concept in the context of globalisation and trade (Gereffi, 2018). Here a particular focus is on questions of power and distribution. Mostly the producers of raw materials and agricultural products receive only a small share upstream of the value chain, whereas links closer to



consumers manage to generate comparatively high profits with add-on services such as branding and marketing. This is all the more important, as upstream links tend to be in developing countries, whereas downstream links are often located in industrialised countries. Global buyers in industrial countries manage whole value chains and thus determine the rules of the game to their advantage. From a development policy perspective, the global value chain approach aims at, among others, increasing value creation in upstream links of value chains, thus enhancing production, processing and related services in developing countries and ultimately generating job and income opportunities in the developing world.





A more recent concept is the circular economy (MacArthur, 2013). It is based on an ecological idea aimed at avoiding waste in the production process. Similar to the cycle in a natural ecosystem, such as a forest, there is no beginning and no end, but a permanent process of growing, thriving and decaying, in which the residues of a previous process are the fertilisers for new growth. Nature does not know any waste; all substances are continuously reused. Ideally, production and consumption should follow the idea “from cradle to cradle” (McDonough & Braungart, 2002) as opposed to “from cradle to grave”. In this respect, the circular economy is not only environmentally friendly, but also economically effective and profitable.

From a methodological viewpoint, it does not seem difficult to transform the linear value chain logic into a

circle. Researchers even esteem the “beauty of the circularity of the value chain” (Shaharia, 2018). The chain does not end with consumption but re-integrates the consumed end-product into an upstream linkage of a new production process of the same or even a different product.

In several of our activities and tools, we tend to use the value chain logic. Therefore we are now facing the question of whether and how we should integrate the logic of circularity in our work related to value chains. For instance, this is relevant for a stronger consideration of the sustainability concept in the CALIDENA approach ([www.calidena.org](http://www.calidena.org)), a rapid, participatory methodology to stimulate quality in value chains, which was developed jointly by the German Metrology Institute PTB and Mesopartner.



Initial ideas on how to answer this question include:

- Adding circularity and sustainability criteria to the list of product selection criteria in CALIDENA
- Greater consideration of sustainable forms of production and of compliance with sustainability standards
- Stronger emphasis on recycling in value chain work from the outset, and consistent consideration of the ideas of the 5 Rs (Reuse, Reduce, Recycle, Repair and Recover)
- Widening the range of stakeholders to include the recycling industry and environmental regulators
- Systematic reference to sustainability standards, such as the British Standard BS 8001, which helps to implement the principles of the circular economy in

organisations, or ISO standards on circular economy, eco-design and life cycle assessment

- Broadening the quality concept in CALIDENA to include quality aspects such as sustainability, reusability and recyclability of products and the avoidance of negative externalities on the environment and climate in the production process.
- Explore how a circular economy could be achieved more easily and rapidly through digitalisation in terms of material flow between companies, resource conservation, durability of products, ease of repair, recycling etc.

The following diagram shows how the idea of circular economy can be integrated into a traditional value chain mapping (see Figure 2). Circularity is taken into account by various feedback loops along the value chain (Preston & Lehne, 2017). Innovations can occur all the way from the material input stage to the “end-of-first-life” stage.

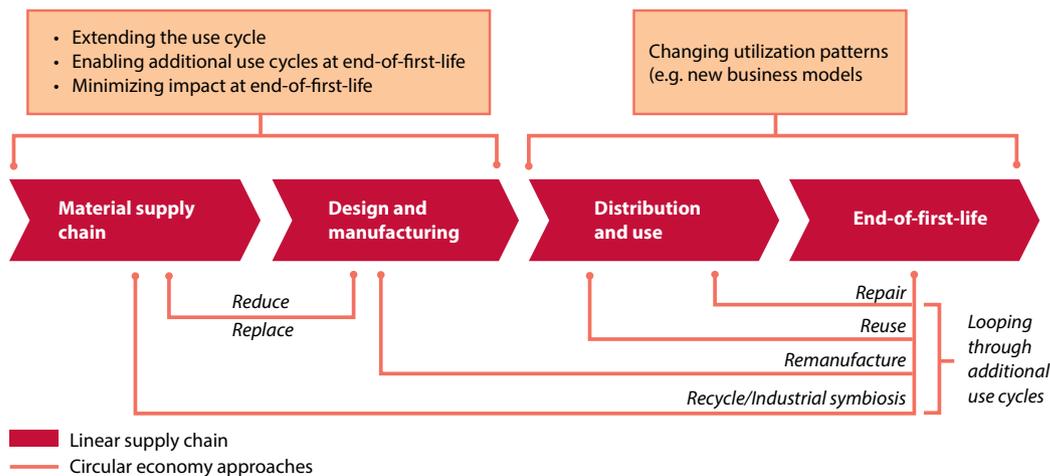


Figure 2: Integrating ideas of circular economy into traditional value chain mapping

Source: Preston & Lehne, 2017

This allows questions of ecological sustainability to be systematically taken into account within the framework of value chain analysis.

The analysis helps to make the value chain more efficient and opens up additional opportunities for value creation. The four principles of the circular economy outline the specific potential of value creation (MacArthur, 2013):

1. The power of the inner circle, which refers to tighter feedback loops in the different steps of production and leads to higher energy and resource efficiency.
2. The power of circling longer relates to longer product life cycles and more durable use.
3. The power of cascadic use describes the opportunity after using a material in one product to reuse it as a substitute for a virgin input in another product.
4. The power of pure, non-toxic, or at least easier-to-separate inputs and design, which facilitate repeated use and extend the use cycle.

These principles also extend the idea of value creation beyond its economic origin and recognise its ecological value.

What is now the particular advantage of the circular value chain for developing countries? Developing countries often tend to use resources less efficiently, so that we recognise particular opportunities for





promoting resource efficiency and eco-based value creation in those countries. This is first and foremost about avoiding losses, e.g. in agricultural production that suffers from post-harvest losses to the extent of half of the production (Guillou & Matheron, 2014). This also applies to the processing industry, where the consideration of resource efficiency is a key factor in becoming internationally competitive.

In developing countries in particular, a throwaway mentality is pervasive, and in most cases formal recycling systems are still not in place. The consequences are the wasting of scarce resources and the pollution of the environment. In addition, industrialised countries are used to exporting selected waste to developing countries, thus exacerbating the problem for the local population and the environment. Against this background, strengthening circular value chains and making a circular economy a reality needs to address all the above issues in parallel. This would ultimately contribute significantly to the achievement of the Sustainable Development Goals, especially to SDG goal 12, to promote more responsible production and consumption.

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