Image Source: Toll barrier on the highway connecting Seoul to Incheon new town and logistics area in South Korea. The orderly lanes, multiple indications and signs including on the road, are also a symbol for regulated economic flows and yet, such linear systems offer little room for recycling and for circular models, notwithstanding interaction with the civil society (2021). Image by Nicolas J.A. Buchoud, all rights reserved ©.

BENDING THE LINEAR ECONOMY

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ON PLASTICS

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Bending the linear economy

Christoph PODEWILS (CP): Why did you choose to focus INTERSECTING on circular economy and, in particular, on plastics?

Nicolas J.A. BUCHOUD (NB): The first series of INTER-SECTING was about questioning and raising sustainable responses to the COVID-19 crisis, a topic far larger than typical cities or infrastructure approaches. We have used hashtags to keep sight of multiple angles applied to a single issue. For instance, the issue of 'infrastructure' has been associated with the issues of 'distribution' and 'inclusion', referring to several articles and policy briefs we have produced in parallel to the INTERSECTING process.

Crises, be it the COVID-19 crisis or the plastics waste crisis (after seventy years of production of this synthetic material) are not natural events. Between 1950 and 2015, the world created 6.3 billion tons of plastic waste, with 9% recycled and 12% incinerated, leaving almost 80% to accumulate in landfills or in nature, often in the oceans. Plastics mainly end up in the oceans through 1,000 rivers, with just 10 of them responsible for over 90% of the emissions, and 20 firms responsible for more than half of the world's plastic waste. This is not the unfortunate result of external circumstances. We are, individually and collectively, part of such crises, and hence, part of the possible solutions.

CP: You mentioned that the plastics crisis is not a natural but a man-made phenomenon. How would you summarize the philosophy of INTERSECTING when applied to plastics and to the circular economy?

NB: COVID-19 and the plastics crisis are two powerful illustrations of the limitations of globalization beyond individual will.

Globalization is a man-made phenomenon. Together, we have cemented systems of interconnections and interdependencies and continue to expand on land, at sea, beneath the oceans and now in space. Plastics symbolically embody over seven decades of growth and development to the extent that and that now, large or small particles, and even chemical elements, are found everywhere, including in food chains. The magnitude of annual plastics production is so massive that we need to understand that the full extent of a crisis goes beyond short-term emergencies. The plastics crisis requires an open, 360 degree approach to tackle market transformations, including producer and consumer responsibility, and public regulations to address the very environmental issues we have collectively created. Only then would we be able to understand the potential changes in polymer and monomer industries, from production to recycling, and get a better sense of the timeframe of the daring ambition to bend the linear economy.

There is yet another challenge. Illustrating the intersections within plastics is very challenging because the public eye is bombarded with pictures of unwanted and discarded plastic items, especially at sea and along seashores. Awareness campaigns are commonplace and we have all seen images of smoking mountains of trash, including plastics, with bulldozers and waste pickers scaling them. Social media is not short of sponsored events such as waste collection or pilot recycling projects, usually accompanied by banners, logos and smiley faces. However, more awareness does not necessarily translate to more enlightened action. For instance, Lifestyles of Health and Sustainability (LOHAS) promote jogging or fitness heavily even though sport sneakers rely heavily on complex mixes of plastics.

INTERSECTING uses three sets of tools: the articles and contributions from a wide variety of guest experts; the quotes that we, as editors, decide to use from their texts or from the Dialogues that preside over the production of INTERSECTING; and the illustrations. The visual material requires specific editorial curation. Understanding the formation of our visual universe is critical as we argue that there is no valuable reasoning without questioning 'what we know about what we know'. This is especially true when it comes to plastics.

Due to the widespread and problematic presence of plastics everywhere, the appeal for immediate, ready-made, sometimes simplistic solutions is very strong. A handful of experimental vessels are currently scouting the seas to collect plastic waste. Start-ups are regularly branding new potentially game-changing technical products or services. Yet, the core of the problem remains: to bend linear economy as a whole. Circular economy is about multiple transformations at the same time, from the high complexity and interdependence of global value and supply chains to policies and experiments at the local level.

CP: To which extent does circular economy shape the current discourse on the transformation?

Markus LÜCKE (ML): I share Nicolas' point of view that the term circular economy is about transformations. It is a term widely used today. Its significance for sustainable economic growth, however, still needs to be sharpened. Some even suspect that the transition to more circularity would hamper economic growth, especially when it comes to emerging and developing countries. But the opposite holds true. Regarding plastics, the circular economy's imperative is about Intersecting and not purely an economic concept. The circular concept aims towards sustainable use and management of limited and precious resources by a balancing interactions between three dimensions: the economy, society, and the environment. After all, sustainable prosperity cannot be reached by any country while neglecting one of these dimensions.

CP: What makes the application of the INTERSECTING perspective in relation to plastics and the circular economy relevant for the context of international cooperation?

ML: The United Nation's sustainable development goals (SDG) are setting the current global agenda for international cooperation. This agenda itself is an expression of intersecting different disciplines, governance levels, and institutions. These goals may only be reached with a paradigm shift, and that is precisely what the circular economy stands for. Attempts to reduce adverse effects by improving linear production and consumption structures while applying traditional end-of-pipe solutions have their limitations. Economic models based on a high-quality products and services as well as responsible use or replacement of fossil resources by closing material cycles need to be applied. Standards for durability, repairability and recyclability of products, mandatory recycled content, and the promotion of innovative recycling technologies may significantly contribute to these goals. Innovative business models such as product-service-systems and take-back schemes may replace the traditional make-take-dispose economy. These systems are designed to maintain responsibility over products and packaging and, hence, are a prerequisite for closing the material cycle. The good news is that many of the necessary instruments are already available and are waiting to be applied.

CP: Are there any unique challenges in the rapid proliferation of plastics in emerging economies, compared to the overall global scenario?

Shuva RAHA (SR): Emerging economies are rapidly embracing plastics as part of their industrialization and modernization trajectories, and are at a different stage of the relationship with plastics than their developed counterparts. For people in emerging economies, plastics are offering a fantastic new range of affordable, safe and versatile solutions for almost every day-to-day need: from hygienic food, water and medical packaging, to weatherproof, lightweight and durable housing materials and furniture, to longer-lasting clothes, shoes, toys and bags, and easy to clean and replace household and commercial items. Plastics are associated with convenience and modernity, and their disposability is a desired outcome of the shift towards more Western, affluent, and consumerist lifestyles. Existing alternatives to plastics such as paper, cardboard, wood, glass, natural fibers, and metals are not only more expensive and difficult to handle and maintain, but also, often dismissed as 'old-fashioned'. Moreover, re-use and recycling tend to be perceived as stinginess, or an outcome of poverty, rather than efforts to conserve material and manage waste.

Consequently, few people are genuinely troubled by the growing mountains of plastic waste in and around both urban and rural centers, nor are many significantly swayed by policy- or civil society-led campaigns against plastic. So, exploring only technocratic solutions, policy-led governance interventions, and industry-centric value chains – linear or circular – will not yield meaningful results in these geographies unless we understand and address this aspirational aspect of plastics and the direct correlation with better living standards and more modern lifestyles.

CP: INTERSECTING is presented as a value proposal. How could that be concretely applied to solve the plastics issue?

NB: At the World Health Summit in Berlin in October 2021 about the socioeconomics of the pandemic and at the Nobel Week Dialogue on 'The future of cities' in Gothenburg, Sweden, in December 2021, I stressed that INTERSECTING is a value proposal. We include an economic perspective along with environmental, social, institutional, ethical priorities, and we are looking at individual and collective factors of system change Our model goes beyond interdisciplinary or transdisciplinary approaches. We are working with disciplines but we also try to understand, collectively, the interactions between different spheres of knowledge, multilateral agendas, and policy frameworks. We want to connect technical and technocratic processes with people's actions and with broader mindsets, and economic or social structures.

In 2018, the share of circularity in the economy was about 9.1% but it fell to 8.6% in 2020. Meanwhile, there is mounting evidence of direct linkages between circular economy and global warming scenarios. Solving the plastics equation is not about 'global' or 'local' action only- a model for sustainability through subsidiarity that has prevailed since the early 1990s. We would like to replace this with an approach that connects scales, systems and agendas.

ML: Externalities and adverse impacts on public goods, such as littering nature with plastic and thereby endangering ecosystems, need to be priced into macro-economic costs and should be borne by the polluter. Clear political commitments need to be translated into tangible international legal and administrative actions. Critically, this applies to global supply and value chains, where social, ecological or economic impacts need to be traceable at any step of the chain and negative consequences must be acted upon.

CP: Are discussions about the social implications of a potential degrowth in the plastics industry, or any other linear industry, on the CESD's agenda? What lessons have the CESD elicited about jobs created, or potentially lost, in a circular economy?

Alexander CHARALAMBOUS (AC): The Circular Economy Solutions Dialogues (CESD) builds on existing insights, reports and assessments. Let me give you an example. Projections by a recent EU-funded research indicate overall positive employment effects of a circular economy transition in Africa, estimating a net increase in employment relative to the business-as-usual (BAU) scenario of around 2.7% in 2030.¹ This is equivalent to approximately 11 million additional jobs compared to the BAU scenario, with a potential to cut the unemployment rate by 12% or, in other words, from 94 to around 83 million. Building appropriate skill sets in the African workforce is identified by the same study as a prerequisite for these projections.

Such social considerations are well integrated into the CESD discussions, which are forward-looking and analyze

future risks and opportunities of circular solutions. Thus far, the CESD has acknowledged the importance of labor market processes and business trends that are largely grounded on the rise of innovative - usually technology-based and often disruptive - service- (vs. product-) business models for a circular economy transition. Importantly, CESD acknowledges the relatively limited global evidence regarding social impacts of circularity in developing economies.

CP: Is plastic still the elephant in the room? Are we still looking away when it comes to discussing about it?

Konstantinos KARAMPOURNIOTIS (KK): For more than 70 years, we have been verifying its existence and acknowledging its presence. Every single day - every single time we need something durable, safe, lightweight, clean, easy to use and produce and cheap, we look to plastic.

But is it really cheap? It should be, but we live far from a perfect world. We have unsustainable, or rather, not that sustainable plastics production and consumption systems, adversely impacting the environment and the climate during its life cycle. In that sense, plastic has received a lot of attention at least in the past decade, and that too for good reasons. Despite the negative impact as well as the substantial global effort that goes into producing alternatives and improving its life-cycle performance, the production, trade and use of plastics continue to grow as we speak.

All things considered, the elephant has a seat at the table, even if it is not a good one. To put it in another way, it is becoming clearer that instead of pointing a finger at plastics, we should aim at devising strategies to improve its environmental and climate performance, and ensure that its life cycle is indeed a 'cycle'.

CP: How did the Circular Economy Solutions Dialogues (CESD) manage to capture the conversations surrounding the plastics crisis?

KK: Plastic, especially plastic pollution, has produced very strong images all around the world. During the Circular Economy Solutions Dialogues, the only thing left to do was to pick one, select a nice frame and put it on a shelf so that everybody could deliberate upon it.

Plastic is traded in a traditionally well-established, but largely linear value chain, despite global efforts otherwise. Rethinking the future of plastics is what the CESD tries to achieve by breaking down the elements that could accelerate plastics circularity, focusing among others on governance and regulations, innovation and technological solutions, and consumer needs and behaviors. All things considered, the CESD offers a mix of messages, experiences and recommendations, capturing the plastics crisis and momentum, addressing the how's and what's of making the transition to better performing products that may or may not consist of plastics.

CP: During the CESD sessions, participants also debated the future of different plastic recycling technologies and a German company presented a chemical recycling method for PET bottles. Could such recycling processes lead the way out of the plastic crisis?

Martin KOCHHAN (MK): First, it is very good that companies are trying to combat the plastic crisis and at the same time see a business opportunity in a particular market niche. The method which has been presented seems to have fundamental advantages over conventional mechanical recycling processes. The problem with mechanical recycling procedures is that when PET bottles are shredded into pieces and melted into pellets, the quality also degrades. With this recycling method, bottles can only be recycled up to five times.

On the other hand, chemical recycling breaks down polymers into monomers which can then be used to create actual virgin plastic. The problem of degradation is eliminated. Further, the regulatory environment gives PET recycling another push. For instance, the EU set minimum quotas for recycled plastics in new bottles. By 2025, PET bottles need to contain at least 25% recycled material and 30% by 2030.

Major beverage companies are jumping on the bandwagon and have set company-wide targets which are even more ambitious. They aim to use 50% to 100% of recycled plastic for new bottles. Big international consumer goods companies also plan to use up to 100% recycled PET bottles and use it for their polyester clothing.

CP: Recycling does not come first in the EU's waste hierarchy. Are there also downsides of giving a lot of attention to recycling technologies and targets?

MK: The main problem I see here is that talking too much about recycling legitimizes our throw-away, single-use culture. People might think that when something is 100% recyclable, that using more of it is unproblematic. We have seen similar rebound effects in other areas where environmental legislation had made progress, such as in energy efficiency.

Furthermore, we need to keep in mind that no material can be recycled endlessly. Just because a material could be recycled 100% in theory does not mean it is possible in practice. During the recycling process, we will always lose a fraction of the recycled material, be it metal, paper, or plastic. Often, we do not recycle the material; rather, we downcycle it. For instance, paper and carton can be recycled for about five times and with each cycle the quality degrades. This casts some doubt on the proclamation of 100% recycling target for PET bottles by some multinationals. What these campaigns do not mention is that more than one recycled bottle is needed to create an entirely new bottle.

Hence, recycling can be only one answer to the plastic crisis. Prevention and re-use are far more important and powerful tools to get our plastics problem under control. And that is why they come before recycling in the EU's waste hierarchy.²

1. European Commission, Directorate-General for Environment, Rademaekers, K., Smit, T., Artola, I., et al., Circular economy in the Africa-EU cooperation : continental report, Publications Office, 2021, https://data.europa.eu/doi/10.2779/008723

2. https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm

Image Source: A view from street life in the center of Taichung in Taiwan, from the inside of a cab ('please fasten your seatbelt' is written on the dashboard). This route daily scenery also illustrates how difficult it can be to change models when driving business. Moving towards circular economy models also depends on multiple external factors that are not necessarily placed in a fixed, nice order (2008). Image by Nicolas J.A. Buchoud, all rights reserved ©.

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