"If the materials that are being reused through the circular economy do not necessarily help mitigate broader relations of inequity among communities, should these processes still be categorized as being constitutive of the circular economy?"

—Gökçe GÜNEL

Quote from the article "On Status Quo Utopia, Technocratic Dictatorship, and Constitutive Processes of the Circular Economy" in Intersecting Vol. 9 by Gökçe Günel (Rice University, United States of America) and Gunnar Hartmann (New Dialogues, Germany). Image Source: The development of Riyadh, the capital of the Kingdom of Saudi Arabia, now includes major investments in public transportation to offset a car-oriented, resource-consumption-intensive (including land) growth model. 2020. Image by Nicolas J.A. Buchoud, all rights reserved ©

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Intersecting Technology, Circularity and the Economy

The circular economy can equally enrich micro, hyperlocal processes in small communities and vast, interlocked global value chains spanning many products and places. Improvements can vary from small tweaks to simplify the distribution or collection systems of local handlers to save time and effort, to major design and engineering alterations that yield substantial resource efficiencies and investment gains.

The value proposition is the opportunity to use the intersections of resources, products, processes, people, and places to integrate circularity into value chains. The circular economy was once approached procedurally, to minimize and manage the end-of-life waste of the linear economy. Efforts were aimed at recycling or repurposing materials, components, and products to keep them in circulation, thereby maximizing resource gains. The idea is better understood now, and encompasses the design, engineering, production, transportation, distribution, use, and end-of-life management of each process and product in the value chain.

A value chain, irrespective of its length and complexity, needs to be deconstructed into logical and manageable segments to introduce circularity using a mix of policy, financing, capacity building, and technology levers. Successful integrations must also foster political will across local or international jurisdictions; alter existing markets or create new ones; adapt to local environments; leverage traditional expertise; and garner public acceptance. At the heart of successful circular economy revolutions is a creative blend of technologies: traditional and modern, analogue and digital.

Thoughtful product and process technologies help us select better resources, gathered via more sustainable extractive processes or recycled from other value chains, and use these with greater efficiency. Innovations like blockchain and the Internet of Things – online networks of physical objects connected by sensors and software – improve the tracking and management of resources and products, and production, transportation, use, and disposal systems. Real-time, continuous, and accurate metrics reduce data gaps and errors.

Technology can also improve people's involvement in, and experiences with, the circular economy. Automation reduces human effort and risk in unsafe, unhygienic or exhausting processes. E-learning systems deliver content, especially

audio and video in local languages, to homes and mobile phones, allowing people to learn and apply new skills, or hone existing ones. Digital inventories and payment systems can bring remote populations and the weaker sections of society into the mainstream, especially in emerging and developing economies. There is also a slow but steady rise in the consciousness of product developers to include local resources, traditions, experiences, and expertise to enhance the effectiveness of technologies in specific geographies, whether urban metropolises or small communities.

The emerging area of nature tech, which aims to sustainably deploy nature-based solutions at scale, and ecosystem-based approaches to protect communities and preserve landscapes and biodiversity from the adverse impacts of industrialization and climate change, could help bolster the circular economy. As Markus Lücke notes in his article, "On circularity and international cooperation," strategic decision-making must include monetary valuation of the environment and natural resources, and its inclusion in legal and administrative actions.[1]

New-gen technologies like virtual reality and artificial intelligence are compelling us to revisit our theories, policies, and practices, and helping us find better ways to sustainably grow our economies and improve our quality of life. Indeed, as Himkaar Singh asks in his "Case study of composting in South Africa," can we imagine how a society 500 years hence will manage waste?[2]

Will they use more and bigger trucks to transport waste to landfills and oceans in a dreadful escalation of our habits, or will they have a system to process their own waste, using technologies that minimize resource use and maximize ease of disposal and reuse?

The success of the circular economy also hinges upon the parallel development of supporting technologies like clean energy systems, resilient infrastructure, and sustainable transport. This needs a whole-of-government-and-economy effort, with all gears of the circular economy rotating in sync.

We must, however, guard against the overemphasis on technological interventions. We lead tech-intensive lives with a diverse, complex array of electrical, electronic, and digital appliances and devices. This ubiquitous envelope of technology, plus the outsized influence of technocratic policymakers and infotech celebrities flush with public funding and private investment, has created a skewed dependence on technology to solve virtually all problems.

This global subservience to "technocratic dictatorship," as noted by Gökçe Günel and Gunnar Hartmann in their article, "On status quo utopia, technocratic dictatorship, and constitutive processes of the circular economy," has seeped into the arenas of sustainable production and consumption, socioeconomic development, and climate action.[3]

Such techno-centrism banks on scientific problem-solving and process engineering to unravel the complex intersections of resources, people, the environment, and the economy. When applied indiscriminately in countries and communities, it excludes their varied priorities and stages of development, policy and regulatory landscapes, resource and finance availability, technological and human capacities, and the nuances of traditions and cultures.

Technology, deployed without adaptation to a specific purpose, place and people, will rarely, if ever, deliver to its full potential. The integration of technology in the circular economy must also be rooted in the ethos of Sustainable Development Goal 12, which endeavors to ensure sustainable consumption and production patterns. Design and technology choices that promote the planned obsolescence of products and materials by shortening their lifespans to drive replacement sales must be eschewed. This requires introspection into the profit-centric economic models and market mechanisms of the day. Another hazard of policy-technology entanglement is the techno-mercantilism of technology owning countries that devise policies to maximize exports and minimize imports. They strategically wield their technological prowess by leveraging intellectual property regimes, creating exclusive ecosystems and impeding the circular economy of global value chains.

International diplomacy and cooperation must actively discourage such siloes of supremacy, and promote technology co-development between developed, emerging, and developing economies. This way, all parties can adopt and adapt technologies as per their circumstances and capacities without compulsions, helping rebuild trust amidst fracturing multilateralism. Technology must enable us to creatively integrate best practices into the circular economy. Technology must equalize, with unbiased processes and platforms for all. And technology must empower us to maintain, and build upon, our cultural heritage and traditions, as we create a productive, inclusive and sustainable world for tomorrow, today.

This curation of INTERSECTING articles illustrates some pathways.

References

1. Markus Lücke, On circularity and international cooperation (Intersecting, Bending the Linear Economy: On Plastics, Volume 07/2022).

2. Himkaar Singh, Case study of composting in South Africa (Intersecting, Bending the Linear Economy: On Urban Metabolism, Volume 09/2022).

3. Gökçe Günel and Gunnar Hartmann, On status quo utopia, technocratic dictatorship, and constitutive processes of the circular economy (Intersecting, Bending the Linear Economy: On Urban Metabolism, Volume 09/2022).