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# **INTENTIONALLY DESIGNING SUSTAINABLE CONSUMPTION AND PRODUCTION POLICIES AND PRACTICES TO REDUCE INEQUALITIES**

*A Think Piece by the International Resource Panel*



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# **INTENTIONALLY DESIGNING SUSTAINABLE CONSUMPTION AND PRODUCTION POLICIES AND PRACTICES TO REDUCE INEQUALITIES**

# ACKNOWLEDGEMENTS

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# SUSTAINABLE CONSUMPTION AND PRODUCTION SYSTEMS CAN AND SHOULD BE INTENTIONALLY DESIGNED TO REDUCE INEQUALITIES AND SEEK EQUITABLE AND JUST OUTCOMES FOR ALL.

The way resources are extracted, processed, consumed, and disposed of, and the inequalities<sup>1</sup> this leads to, are fuelled by today's global economy and the linear consumption and production systems that underpin it. The association between issues of equality, equity and justice, and global natural resources is not new. These issues are indeed historically bound to consumption and production systems, including as they relate to the history of colonialism<sup>2</sup> and multilateral trade systems. On the production side, issues of equality, equity and justice are inherent to, inter alia, the extraction and processing of natural resources, the associated pollution, and the unequal distribution of its environmental and health impacts. On the consumption side, they relate to unequal access to and unequal benefits from natural resource use, and the unequal impacts of their disposal.

The International Resource Panel (IRP)'s Global Resources Outlook 2024 (United Nations Environment Programme [UNEP] 2024) documents the extent of the unequal benefits derived from resource extraction, processing, and consumption, and the unequal distribution of environmental and health impacts. These are often borne disproportionately, especially by the poor, women, and other marginalized groups (United Nations Department of Economic and Social Affairs - United Nations Development Programme [UNDP] 2014). Resource extraction and processing depletes natural resources and results in impacts on people and planetary health, leading to up to 60 per cent of global greenhouse gas emissions, 90 per cent of global biodiversity impacts, and 40 per cent of particulate matter health-related impacts (UNEP 2022).

This nexus between social and economic inequalities and the environment has become a central topic in recent years. Notably, the Intergovernmental Panel on Climate Change (IPCC) has emphasized the criticality of equity in addressing climate change in its Sixth Assessment Report (2023). The human right to a clean, healthy, and sustainable environment is also enshrined in the United Nations General Assembly Resolution A/RES/76/300 (2022). Resource extraction and use can have an impact on individuals' enjoyment of their human rights, such as promoting inequalities of opportunity which continue to persist, within and between countries, and which may deprive future generations from reaping the same benefits of these resources. It may also have a long-term effect on the health of Indigenous peoples and local communities, thereby increasing inequality (Zhang *et al.* 2024).

## Box 1: Definitions— Equality versus Equity

Inequality is a multidimensional concept generally understood as the state of being unequal, especially in terms of status, rights and opportunities (Clark *et al.* 2022). Equality refers to the situation where all members of society have the same access to the available resources, which does not necessarily result in the same outcomes. Equity aims to ensure that everyone gets the needed support to have access to resources. Equity addresses fairness in the societal distribution of burdens and benefits, across determinants and outcomes, to reduce disparities for the most disadvantaged, by, for example, race/ethnicity, income/class, gender identity, migrant status, or age (Clark *et al.* 2022). This think piece will focus mainly on economic, social, and environmental inequalities and in line with Sustainable Development Goal 10 which aims to reduce inequality within and among countries.

While tremendous gains have been made in improving the quality of life and standard of living for many across the planet, this has been achieved at a cost to the environment and with benefits and costs not evenly distributed. Recent data shows that global inequalities have increased (UNDP 2024). Addressing inequalities in all forms, including intergenerational and those related to gender, within and among countries, is urgent because rising

<sup>1</sup> Inequalities in this paper refers to social and economic inequalities.

<sup>2</sup> The Sixth Assessment Report of the Intergovernmental IPCC cites "ongoing patterns of inequity such as colonialism" as drivers of vulnerability to climate change (Nature, 2022)



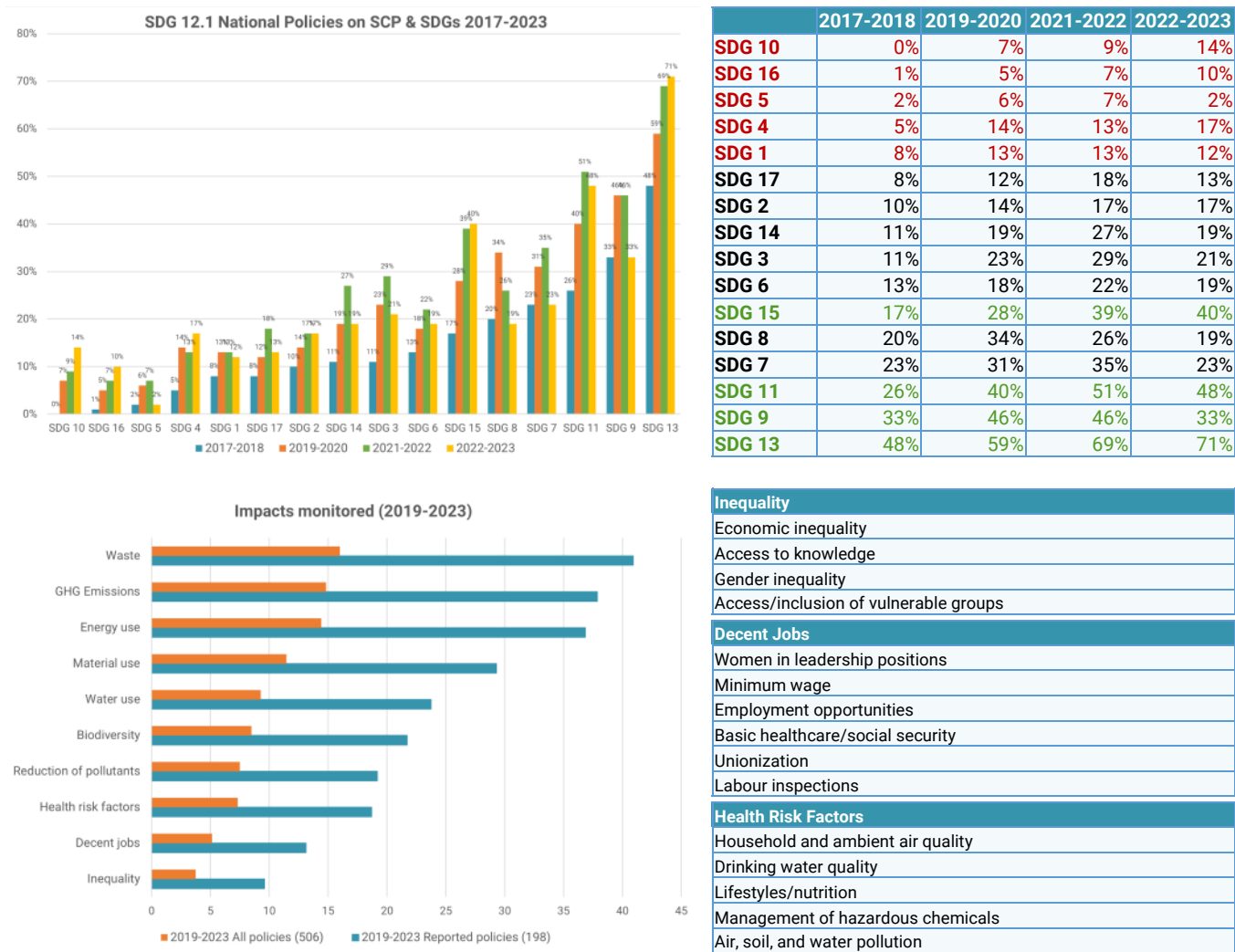
inequalities can bring adverse social, economic, and political consequences (United Nations (n.d.)). It is also an important barrier to reducing poverty (European Commission: Directorate General for International Partnerships 2021) as well as to sustainability transitions.

Reducing inequalities is one of the main priorities of global, regional, and national development agendas. The 2030 Agenda for Sustainable Development’s transformational promise of ‘leaving no one behind’ speaks to the centrality of the global community’s aspiration to tackle inequalities. Addressing inequalities is also at the top of regional and national agendas: The Africa We Want of the African Union’s Agenda 2063 aspires to pursue development that addresses all needs (The African Union Commission (n.d.)); under its G20 presidency in 2024, the Government of Brazil has prioritized three pillars: the fight against hunger, poverty and inequality, sustainable development in its economic, social and environmental dimensions and energy transitions, and the reform of global governance (Brazil Ministry of Labor and Employment 2024); the European Union Green Deal aims to leave no person or place behind (European Commission (n.d.)), and a perusal of several national development agendas shows that reducing inequalities is a recurring aspiration.

Sustainable consumption and production (SCP) systems can and should be intentionally designed to reduce inequalities and seek equitable and just outcomes for all. However, policies that seek to make consumption and production sustainable have a ‘social gap’ that should be addressed. This trend is clear through an analysis of the annually reported policies to the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP) on the development, adoption or implementation of policy instruments aimed at supporting the shift to sustainable consumption and production as part of reporting on Sustainable Development Goal (SDG) 12<sup>3</sup>.

(Figure 1)

Figure 1: Analysis of the SDG12 National Policies on SCP & SDGs 2017-2023 reported to the Secretariat of the 10YFP.



Source: Secretariat of the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns.

<sup>3</sup> SDG 12 Target 12.1: “Implement the 10YFP, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries”



The analysis demonstrates limited connections between SDG 12 and social SDGs including SDG 1 (poverty), SDG 5 (gender) and SDG 10 (inequalities). Despite an increase in the number of reported policies identified as relevant to those SDGs, only 14% were associated with SDG 10 in 2022-2023, 12% with SDG 1 and 2% with SDG 5, while 71% were considered relevant to SDG13 on Climate Change for example. When impacts of policies are reported, which remains the case only for a minority, social indicators are most often not being considered: of all the policies reported between 2019 and 2023, less than 20% monitored impacts on health risk factors, less than 15% considered decent jobs indicators and less than 10% considered their impacts on reducing inequalities from various angles (economic inequality, access to knowledge, gender inequality, vulnerable groups).

The issue of inequalities is complex, and the scope of this paper is a select number of areas wherein designing for equity is critical as we map out policies and technologies for the sustainable consumption and production of natural resources. The underlying premise is that intentionally designed sustainable natural resource consumption and production policies and practices can help reduce inequalities. The paper presents some key messages, which draw on the IRP's previous work and the publicly available scientific knowledge on the subject matter within the framework of SDG 10 (reduce inequality within and among countries) and SDG 12 (responsible consumption and production) while acknowledging the relevance of the other goals. A sample of potential action points (not exhaustive) follows each message. The paper identifies key considerations for promoting equity and sustainability in the consumption and production of resources and presents these for consideration at the One Planet Network Forum 2024.



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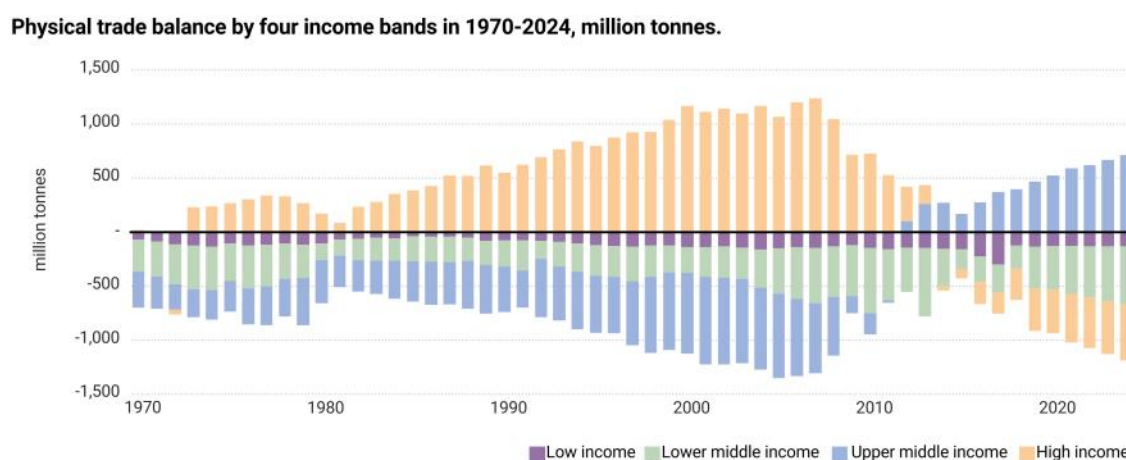


# KEY MESSAGE 1

## Inequality is a driver and a consequence of unsustainable consumption and production patterns.

The spatial source of natural resources will always be unequal based on geologic and climatic conditions in the countries of origin, while the consumption patterns of countries converge. Trade aims to mitigate these inequalities. The lower-income<sup>4</sup> and (lower and upper) middle-income countries (LMICs) have historically supplied material resources to higher-income nations, with this trend changing only for the upper-middle income countries around 2014 (UNEP 2024). The lion's share of global materials is extracted in upper-middle-income countries that, in 2020, also had the highest per capita extraction rate (UNEP 2024). The group of upper-middle-income countries, which includes the large economies of China, Brazil, Mexico, and South Africa, extracted 55.8 billion tonnes of materials (equivalent to 21.3 tonnes per capita) (UNEP 2024). This reflects both the demand for materials to build up the infrastructure required for newly organized and industrializing countries and the outsourcing of material- and energy-intensive stages of production by higher-income countries to the upper-middle-income group of transition economies (UNEP 2024). The relocation of resource-intensive processes to middle-income countries is likely to have been driven by lower environmental standards and cheaper labour costs than in higher-income regions (UNEP 2024).

**Figure 2:** The physical trade balance (PTB) by four income bands (1970-2024, million tonnes). When the PTB is categorized into wealth bands, it becomes evident that low-income and lower-middle-income countries have consistently supplied material resources to higher-income nations.



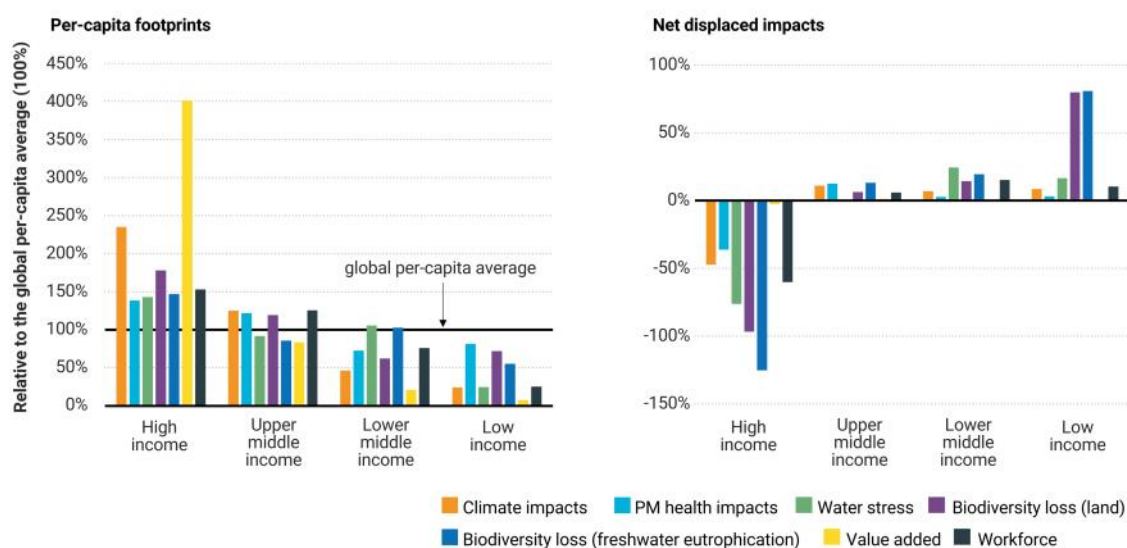
Source: Global Materials Flow database (UNEP 2023)

From the consumption perspective, in addition to the net resource outflow of material resources, energy, and land from lower-income to higher-income regions, associated environmental impacts are unequally distributed (UNEP 2024). High-income countries displace environmental impacts to all other income country groups, which means they import resources and materials that cause environmental impacts in the exporting regions (see **Figure 3**). On a per capita level, significant differences in the environmental impacts of consumption remain between country income groups. High-income countries cause ten times more climate impacts through consumption than low-income countries. The idea that inequalities perpetuate unsustainable consumption and production patterns is also supported by international legal frameworks. For example, the Convention on Biological Diversity (CBD) and the Nagoya Protocol underscore that inequities in access to resources and technology exacerbate environmental degradation, especially in poorer regions.

<sup>4</sup> This Think Piece uses The World Bank Group classification of the world's economies to four income groups: low, lower-middle, upper-middle, and high. The World Bank Group classification is similarly used in the International Resource Panel's Global Resources Outlook 2024 and 2019 publications. For more information see the Annex of United Nations Environment Programme (2024) available at: <https://www.resourcepanel.org/file/3292/download?token=053XaKRv>



**Figure 3:** Left: Per capita environmental impact footprints (climate change, PM health, water stress, land-use related biodiversity and biodiversity loss from freshwater eutrophication) and socioeconomic benefits (value added, employment) by income group (consumption perspective). Right: Global net trade impacts per capita ordered by income group countries, represented as a share of global per capita impact. Reference year 2022.



Source: UNEP 2024

In 2022, more than half of global land-related biodiversity loss occurred in Africa and Latin America, but less than 10 percent of global value-added was generated in these regions (UNEP 2024). Conversely, almost half of the global value-added was generated in Europe and North America, although less than 10 percent of global water stress and biodiversity loss happened in these regions (UNEP 2024). This opposing pattern of lower domestic environmental impacts and higher value added is partially a sign of higher environmental standards, but also a consequence of impact displacement to other regions. Europe and North America import goods that cause climate, biodiversity, and water stress impacts elsewhere. For instance, land-related biodiversity impacts are more than twice as high from a consumption perspective compared to a production perspective (UNEP 2024).

The displacement of environmental costs from high-income to low-income countries contradicts the principles of a human rights economy (United Nations Sustainable Development Group (n.d.)), which advocates for equitable sharing of both the benefits and burdens of resource use and the principle of environmental justice. These principles strive towards the goal that no single community bears a disproportionate environmental impact.

## Actions:

1. Stringent environmental regulations that are effectively enforced should be implemented to prevent, address, or mitigate the negative impacts of resource extraction on the environment, ecosystems, and affected communities. This will support sustainable and responsible resource management, including restoration and compensation for affected communities.
2. Promote economic diversification in LMICs to reduce vulnerability to market fluctuations and ensure sustainable and equitable economic growth, while policies and infrastructures aimed at enabling local resource value retention in producer countries should be put in place.
3. National consumption and production patterns of natural resources should be monitored and the reporting of footprints of materials, water and land promoted.



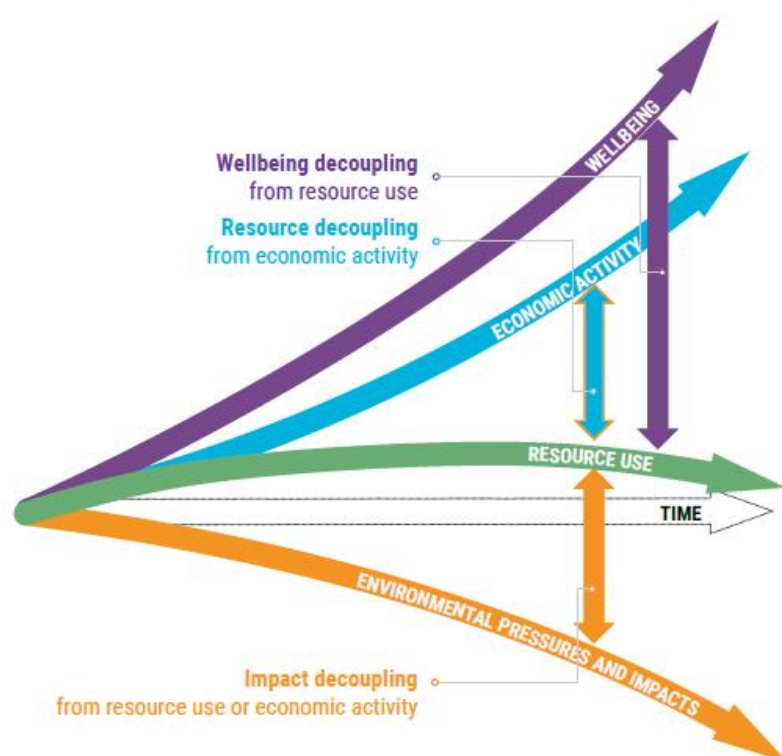


# KEY MESSAGE 2

## Developing and implementing targeted and coordinated policies can significantly reduce resource extraction and consumption and their related environmental impacts.

IRP analysis (UNEP 2024) demonstrates the potential for integrated policy action to decouple pressures and impacts across multiple energy- and resource-use domains, while improving well-being outcomes and reducing economic and resource-use inequalities. Crucially, the analysis finds that an integrated approach, combining action on resource efficiency, energy and climate plus food and land, achieves significantly greater positive effects than any one of these policy packages would in isolation. This builds on previous findings suggesting that resource efficiency increases the effectiveness of actions to reduce greenhouse emissions while reducing economic costs. Policies need to aim not only at improving production (e.g., by reducing pollution) but also to mitigate the consumption footprints of countries. The concept is not a one-size-fits-all approach. For the parts of the population with the highest resource consumption footprints (countries or fractions in a national population), actions should lead to absolute decoupling (reduction of resource use). For the contexts where resource consumption is expected to grow to enable dignified living, the aim should be relative decoupling (where resource consumption increases more slowly than human well-being outcomes) (UNEP 2024).

Figure 4: The concept of decoupling.



Source: UNEP 2024

Decoupling should not be seen as a refitting exercise, but rather, it should be seen as an opportunity to advance equality and the full enjoyment of human rights and well-being for all by intentionally addressing both the physical and social elements of consumption and production systems. In all cases, equity should be a central consideration (Clark *et al.* 2022).

The differential paths for resource consumption and decoupling are linked to the concepts of sufficiency and a 'fair consumption space'. These concepts aim to achieve human well-being through systemic changes to the way resources are used to deliver human needs, rather than through the current model of additional material consumption. Coupled with the provisioning systems approach, which provides a holistic consideration of material and political-economic dimensions that interact to transform resources to meet human needs, the concept emphasizes demand-side solutions that address requirements for energy, materials, land, water, and other natural resources. According to UNEP (2022), a 'fair consumption space' aims to "curb overconsumption while ensuring consumption opportunities needed for meeting basic needs, decent living standards, and human dignity," thus supporting the well-being of all without endangering our planet's ecological systems and resource capacities. Notably, such approaches make it possible to counteract the 'rebound effect', where the benefits resulting from the increase in resource use efficiency are wiped out by the continuously growing demand (Bianchi and Cordella 2023; Hickel and Vogel 2023). Crucially, just as decoupling, sufficiency and fair consumption space measures must be applied in a differentiated manner that accounts for present disparities in living standards and resource consumption.

### **Actions:**

1. Policies should be explicitly (re)designed to address inequalities and equity, enabling populations in vulnerable situations to benefit from sustainability initiatives, in line with the human rights principles of equality and non-discrimination.
2. Quantifiable sufficiency targets should be incorporated into national policies, such as per capita material consumption limits and demand reduction goals.
3. Action plans should be developed to ensure credible and transparent information on the environmental and social performance of products and services is available, as well as to improve access to and promote affordable and sustainable options (sustainable lifestyles and consumer information).









# KEY MESSAGE 3

## Reforming the financial system is essential to more equity, equality, and justice in resource use.

The global financial architecture plays a key part in setting the rules for producing and consuming natural resources. For example, advancing a just energy transition globally is critical to achieving climate and other sustainability goals. However, although investments in renewables have nearly tripled since 2015, most of the money has gone to developed countries (United Nations Trade and Development [UNCTAD] 2023).

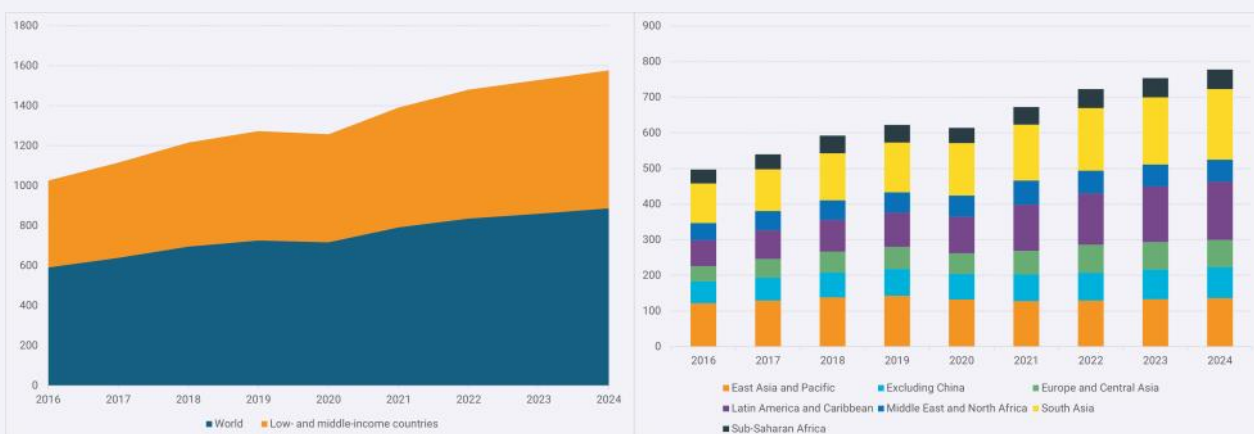
Various financial tools can address equity, equality and justice issues including inter alia through women's cooperatives, diaspora bonds, and sustainable critical mineral futures and options. As an example, **Box 2** shows the volume of migrant remittances worldwide which could be redirected to, for example, climate financing, especially in LMICs.

### Box 2: Establishing diaspora bonds from migrants' remittances.

Migrants are forecasted to remit about US\$690 billion in 2024 to lower- and middle-income countries (panel a of **Figure 5**), surpassing the foreign direct investment (FDI) to these countries by about 250 billion US\$ in the same year. The 2024 forecast indicates that the top three recipients of remittances will be South Asia, Latin America and the Caribbean, and East Asia and Pacific (panel b).

The crucial point of potential policy intervention concerning migration, equality, and the consumption and production of resources is to promote a change of lens around migration. Migrants should be seen as agents of change via the remittances they provide. Remittances can be leveraged in financing sustainable resource management including through diaspora bonds. In terms of consumption, migrants function as conduits of norms around sustainable consumption patterns both to origin and destination communities. Returning migrants can bring back skills and knowledge of sustainable consumption and production approaches. Migrant workers can play a critical role in the green transition (International Organization for Migration 2024).

Figure 5: Remittances by migrants (2016-2024).



Source: World Bank Group and KNOMAD (2023).

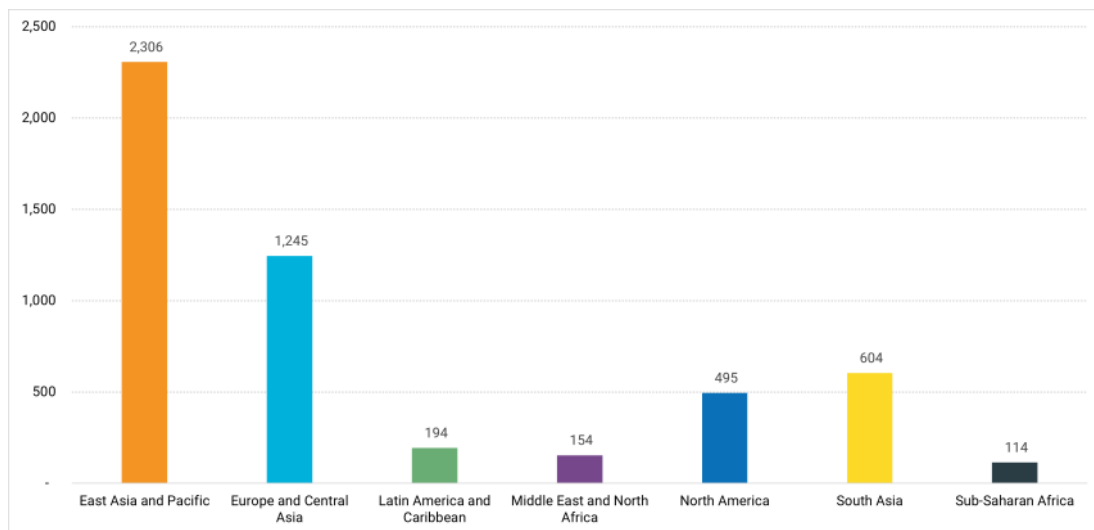
Taking the idea further, Frimpong *et al.* (2017) propose a mixed investment-linked diaspora revenue bonds model (ILDRBM) which generates diaspora investments, which are not used to service sovereign debts, instead directing such investments towards projects, programmes, or sectors with high economic and productive returns and developing hybridized institutional frameworks of private-public and foreign-domestic actors to manage this investment. Relevant authorities could redirect these bonds to finance the extractive industry to contribute to achieving the SDGs as outlined in the forthcoming IRP report with an emphasis on ensuring equality of outcomes.



From another perspective, decoupling can create the fiscal space for improvements in welfare and equity. Resource extraction often leads to environmental damage, such as deforestation, water pollution, and biodiversity loss, which disproportionately affects Indigenous Peoples and communities who depend on these ecosystems for their livelihoods. There is a potential for an increase in economic productivity and welfare (and subsequent reduction of inequalities) that the global community can achieve by eliminating environmental harm. This includes ensuring that prices reflect the social and environmental costs of resource extraction. Addressing environmental degradation creates the fiscal space for gains in Gross Domestic Product (GDP) to be used in social programmes, consequently reducing inequalities.

For example, **Figure 6** presents the results of a study by the World Bank (2016) which shows that the global welfare losses from PM<sub>2.5</sub> and O<sub>3</sub> exposure amounted to USD 5.11 trillion. The message here is unambiguous: net savings can be made by tackling PM2.5 and O3 exposure. These savings can be re-directed and used for societal well-being.

**Figure 6:** Estimates of global welfare losses from PM<sub>2.5</sub> and O<sub>3</sub> exposure by region (in USD billion).

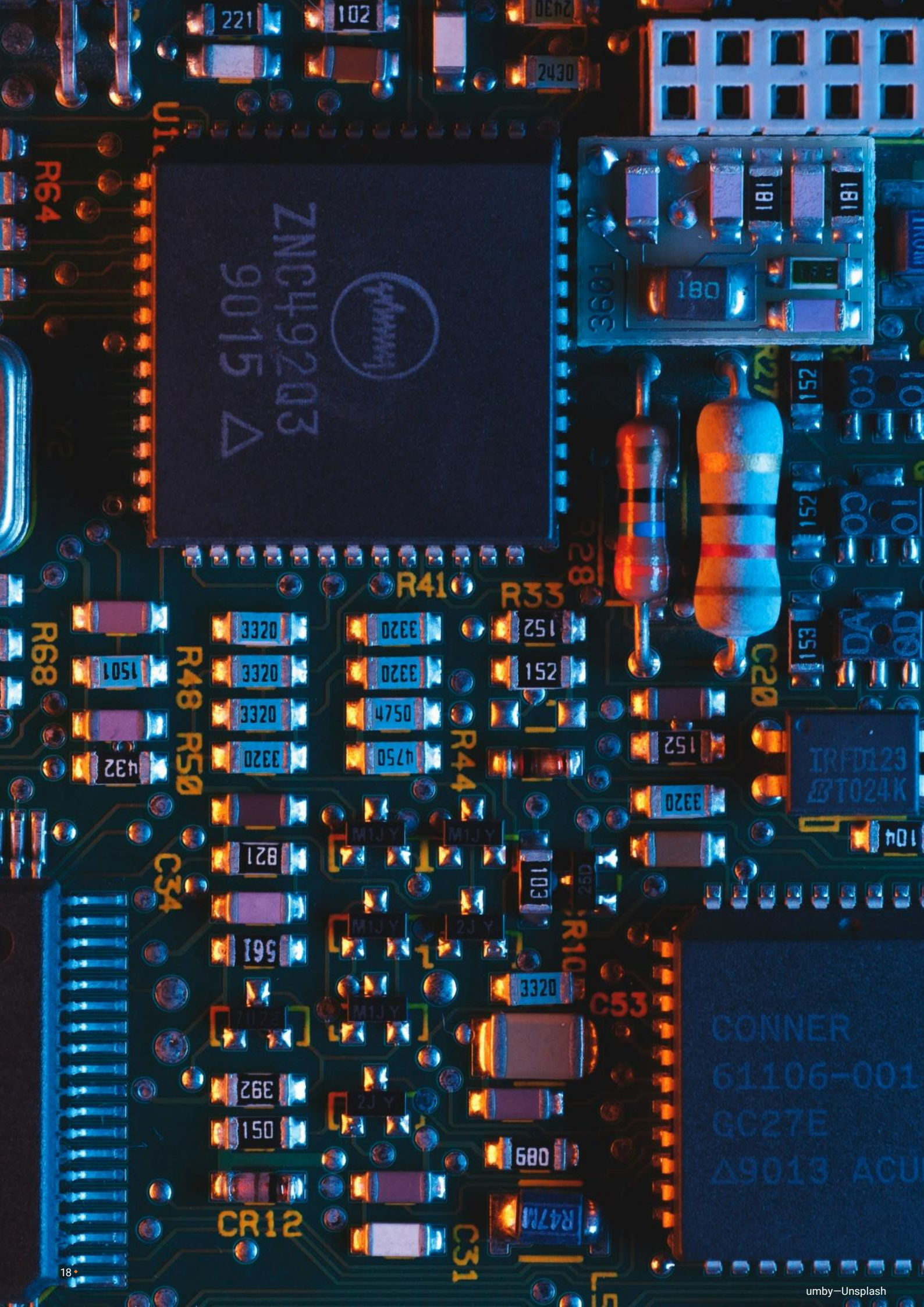


Source: World Bank Group and Institute for Health Metrics and Evaluation (2016).

## Actions:

1. Reform the international financial architecture, i.e., the Multilateral Development Banks (MDBs), International Financial Institutions (IFIs) and the Bretton Woods Institutions to address crises of climate change, biodiversity loss, pollution, and waste and to support just transitions based on equity and equality.
2. Enhance international cooperation to combat illicit financial flows, including tax evasion and transfer pricing by multinational corporations, for resource-rich countries to benefit through transparent and fair taxation practices. This includes fair taxation and stronger international tax cooperation to combat the corrosive effects of tax evasion and unfairly distributed tax revenues from multinational companies, with States engaging constructively on the proposed United Nations Framework Convention on International Tax Cooperation.
3. Identify and implement policies (and incentives) that can reduce inequalities, which may include investing in human capital (health and education), channeling private finance towards sustainable resource use, and international cooperation supporting LMICs to attract more investment for sustainability transitions.





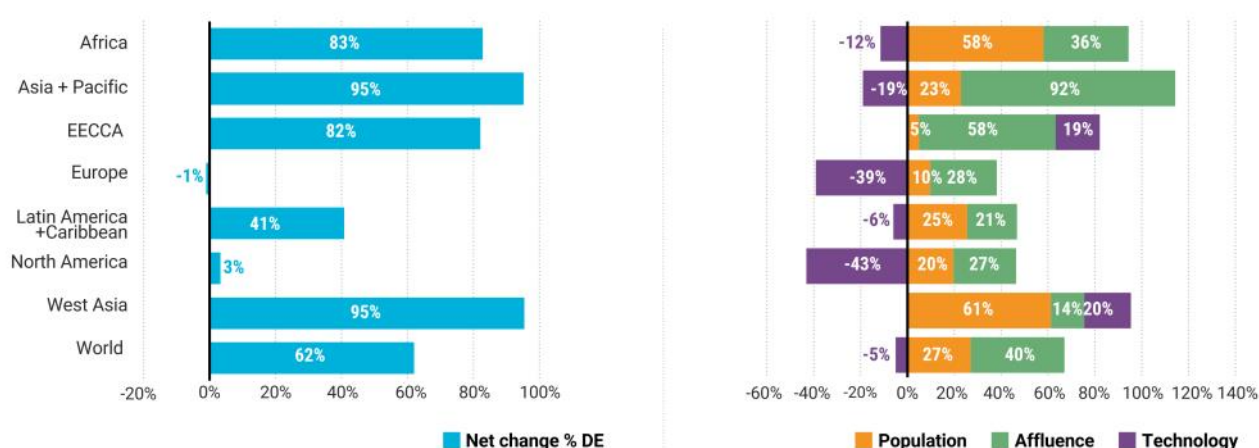


# KEY MESSAGE 4

## Technological innovations and adoption increase resource efficiency but may also increase vertical and horizontal inequalities.

Technology plays a key role in mitigating or exacerbating environmental impacts of resource production and consumption. Technology can contribute to increasing the efficiency in the use of resources helping in decoupling (in the context of reducing the use of resources). Evidence suggests that technological improvements can increase resource efficiency and reduce the pressure on natural resources (Liu and Liang 2024). Between 2000 and 2022, technology<sup>7</sup> mitigated material footprint drivers of population and affluence in North America and Europe by 43 and 39 per cent respectively<sup>8</sup>. However, globally, on average, technology has only mitigated 5 per cent of those same drivers in that same period (Figure 7).

Figure 7: Drivers of material footprint, 2000-2022, percentage.



Note: Net changes might vary from the sum of the impacts of population, affluence, and technology due to rounding.

Source: UNEP 2024

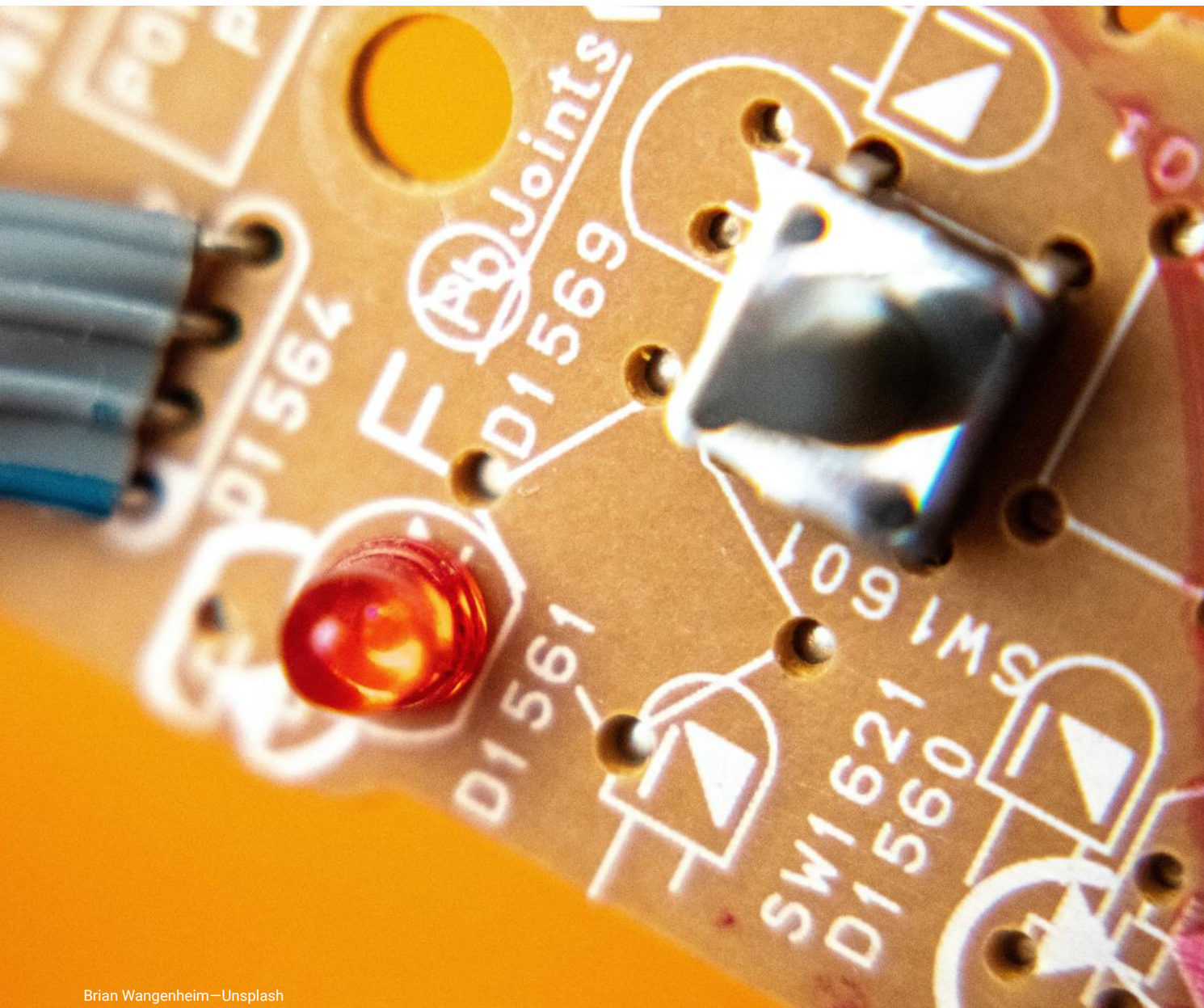
Recycling, solar panels, better energy storage systems, green technology, sustainable sourcing and digitalization are examples of technologies that can increase resource efficiency. Voluntary technology and knowledge transfer on mutually agreed terms to enable the uptake of these essential technologies to mitigate the drivers of material footprint globally is an important aspect of enabling just and fair transitions to sustainability for all. The impact on equity is positive where access to technology is common and negative where access to technology is rare (Skare and Porada-Rochoń 2022; UNCTAD 2021). Trade can help transfer clean technologies needed for local industries; and access environmentally preferable goods and services that contribute to decoupling, including reducing CO<sub>2</sub> emissions. It should be noted that technological innovation shapes both production possibilities/efficiencies as well as the structure of profits, margins, and returns to labour and capital (Acemoglu and Johnson 2023). Technology innovation and adoption are both design and policy choices that governments should make.

<sup>7</sup> It is important to note that the T in IPAT is not strictly speaking about technology but reflects all drivers other than population and per capita income combined (UNEP 2024).

<sup>8</sup> It is recognized that there could be a rebound effect. However, this is beyond the scope of this paper.

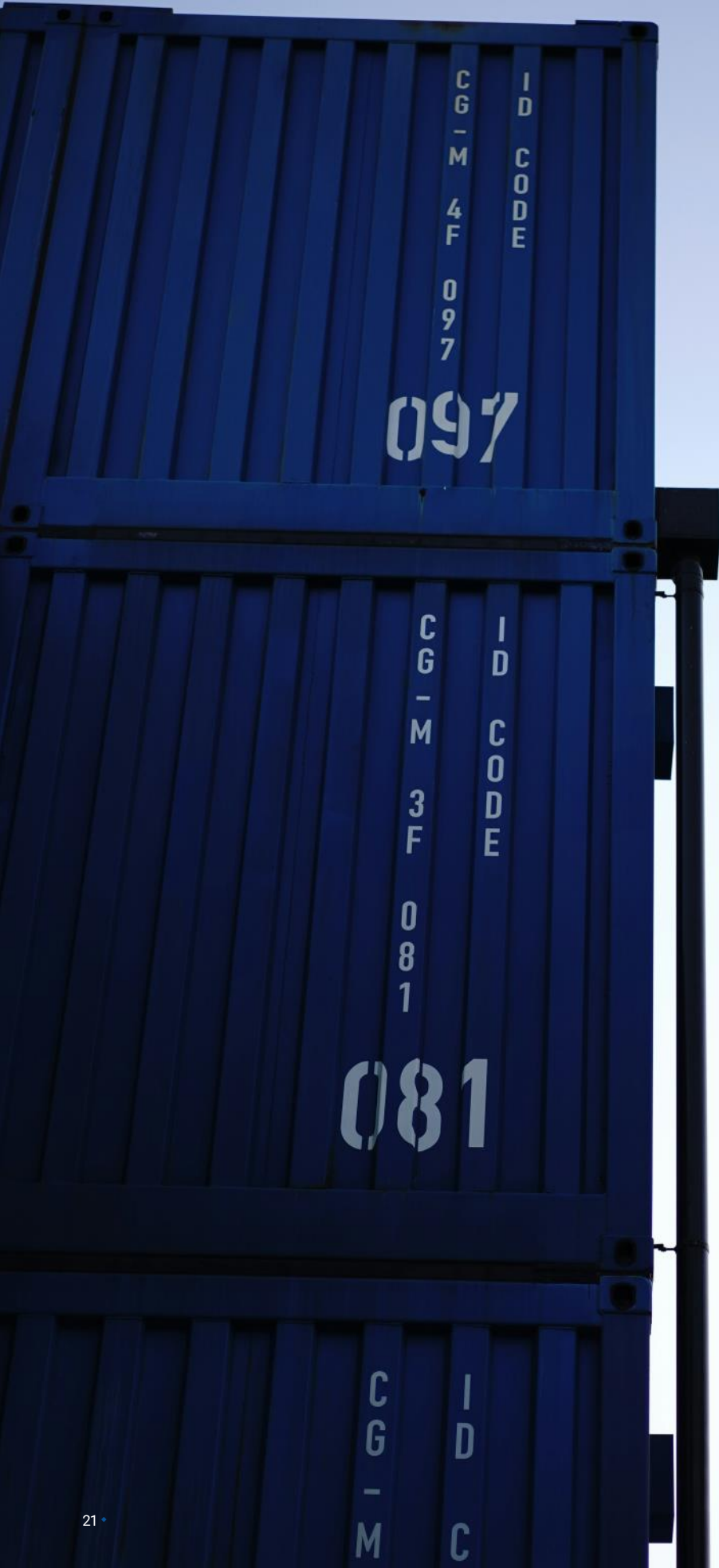
## Actions:

1. Countries need to urgently identify the technologies necessary for sustainability transitions, and mechanisms needed to fast-track the voluntary transfer of these technologies on mutually agreed terms including strengthening international cooperation for technology adoption and capacity-building.
2. Governments should provide incentives to develop and promote technological innovations and ensure that LMICs have access to green technologies that support equitable development and help bridge the technological gap, fostering sustainable and inclusive growth. This could include reviving the 'infant industry model' which shields new industries in a country from global competition. This action could also include supporting voluntary technology transfer across regions that is accessible and affordable (for LMICs) and suitable for application in the local context.
3. Development partners should assist national stakeholders in fostering skills development, focusing on women and marginalized groups, and assisting them to learn new skills and adjust to new practices and knowledge.



Brian Wangenheim—Unsplash





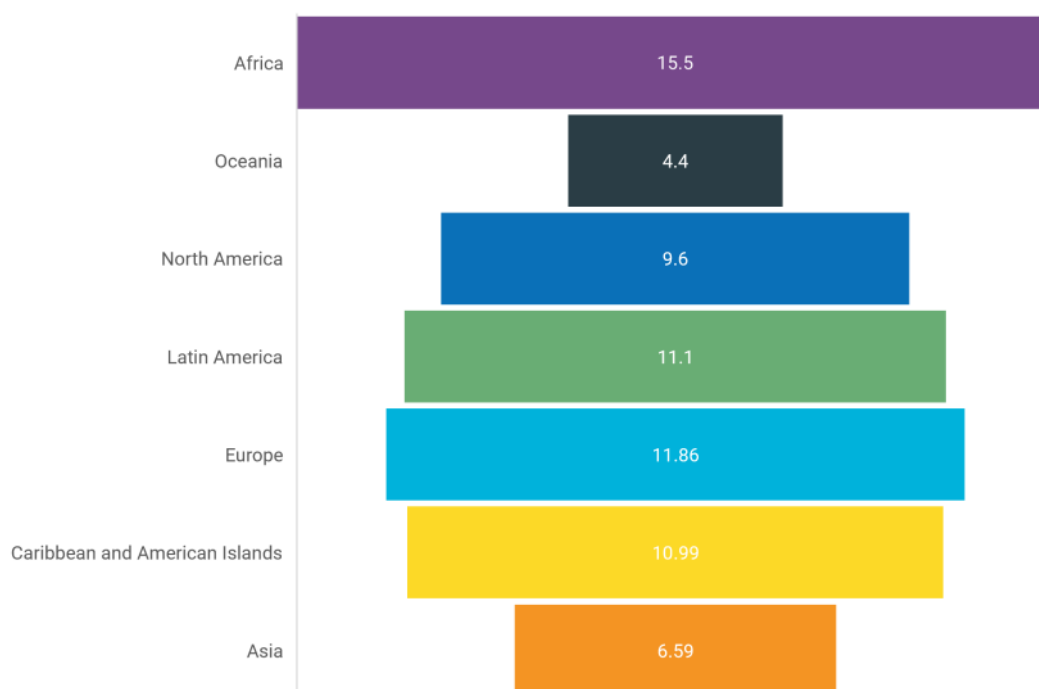
# KEY MESSAGE 5

## Trade and trade policy can support decoupling, but illicit trade in natural resources, unequal exchange, and illicit financial flows can exacerbate inequalities within and between countries.

Empirical evidence shows that international trade has reduced poverty among millions and reduced inequalities between rich and poor countries. Trade has benefited many by increasing economic efficiency, consumer purchasing power, and product varieties (UNCTAD 2019). Trade and trade policy can support decoupling environmental pressures and emissions from GDP and reducing inequalities. Trade can help transfer clean technologies needed for local industries; and improve access to environmentally preferable goods and services that contribute to decoupling, including reducing CO<sub>2</sub> emissions. Trade produces revenues, which can be directed towards supporting public policies promoting sustainable development, especially just transition, education, capacity building, and reducing inequalities. At the same time, trade-related policies enabling sustainable consumption and production could lower pressures on the environment while also supporting social development, therefore reducing inequalities, particularly in those countries most in need.

Illicit trade of natural resources through inter alia trade mis-invoicing, transfer pricing, tax avoidance, corruption, and illicit trade in food can be drivers of inequalities. For example, the scale of trade mis-invoicing and tax avoidance by multinational corporations and corrupt officials is high in Sub-Saharan African countries (Asmah *et al.* 2020), and tax-loss amounts to 15.5 per cent of health expenditures in Africa (see [Figure 8](#)). Arresting the leakage can create the fiscal space for social programs that can tackle inequalities.

**Figure 8:** Percentage of health expenditures that tax losses could cover (2023).

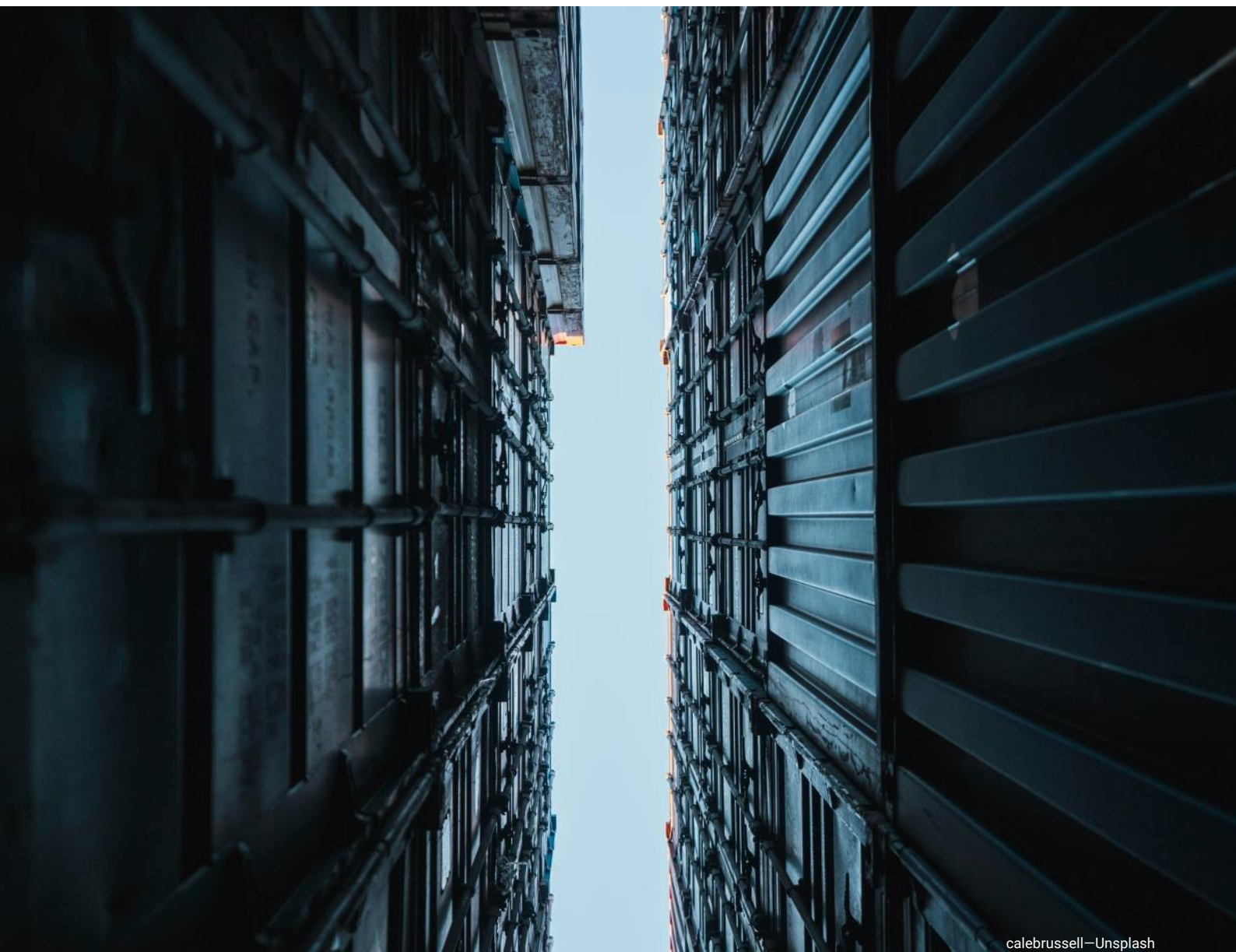


Source: Tax Justice Network 2023



## Actions:

1. Support LMICs and foster international cooperation that promotes fair trade practices and equitable economic relations and financial systems, ensuring that resource-rich LMICs benefit adequately from their resources.
2. Governments should make trade and trade agreements the driving forces behind sustainable resource use. Through trade facilitation, government procurement, and regulatory standards, governments can play a pivotal role in reducing inequalities by improving access to environmental goods and services, and clean technologies, and supporting sustainable consumption and production. Therefore, policies need to aim not only at improving production (for example, by reducing pollution) but to mitigate the consumption footprints of their countries.
3. Governance structures should be improved to ensure the fair and transparent allocation of resource extraction rights, revenue distribution, and regulatory oversight. This improvement includes implementing and enforcing anti-corruption measures and ensuring that revenues from natural resources are used for sustainable development and re-invested into local development to promote the enjoyment of human rights. In addition, corporate policy should emphasize the importance of responsible sourcing of critical raw materials.



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# KEY MESSAGE 6

**The international community urgently needs to develop a new metric of progress beyond GDP that incorporates human well-being and other distributional issues, as the current measures are inadequate in capturing these crucial aspects.**

What society measures shapes what is collectively valued and pursued – and what society values and pursues determines what is measured. GDP measures market production. The GDP metric has several limitations, including among others excluding measures of human well-being, not taking into consideration negative externalities, non-market activities, natural capital (Ramos and Mossé 2021), social capital (Systemiq and the Club of Rome 2020) and the informal economy. It also does not consider the resilience, efficiency, and adaptability of economic systems (ibid.). However, it is often treated by policymakers as a measure of success and well-being. To date, it is the single most important indicator to capture economic activity.

The shortcomings of GDP as a measurement of economic success have been recognized by SDG target 17.10 which aspires to, by 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement GDP, and support statistical capacity building in developing countries. The most recent report by the Special Rapporteur on Extreme Poverty covers this issue stating that “current focus on increasing the gross domestic product is misguided (... and that) as long as the economy is driven mainly by profit maximization, it will respond to the demand expressed by the richest groups of society, leading to extractive forms of production that worsen social exclusion in the name of creating more wealth, and it will fail to fulfil the rights of those in poverty.” (United Nations Human Rights Council 2024)

The international community has been actively working to develop alternative measures to GDP. Earlier attempts include Bhutan’s Gross National Happiness Index, the World Happiness Report, and the Legatum Prosperity Index. Other significant efforts have resulted in the creation of the Human Development Index (HDI), the Social Progress Index, and the Human Capital Index. The recent introduction of a measure by the UNDP of a planetary-adjusted HDI is a testament to this commitment (UNDP 2024). Other indicators that could contribute to this endeavour include Eurostat’s Quality of Life indicator, the Netherlands Monitor of Well-being, and New Zealand’s Well-being Budget (Concord 2019).

In summary, GDP is not a measure of the indicator of the good health of societies and ecosystems (Ramos and Mossé 2021). It is a poor proxy for societal well-being, and an economic indicator that eventually depends on an ever-increasing consumption goal (Ward *et al.* 2016). Therefore, this metric for measuring economic well-being and inequity should be carefully reconsidered.

## **Actions:**

1. The international community should collaborate and build consensus on an alternative to GDP, in line with the SDGs, as a metric to measure progress and well-being, as well as on a set of indicators, aligned with the new metric, to monitor the impacts of SCP policies on social and individual well-being.
2. Government, development partners and civil society organisations should work together to develop mechanisms to monitor, evaluate and report on the social impacts of sustainability policies should be established, and the availability of data, particularly disaggregated data, that could enable assessing the impact of policies on specific groups, including in the early stages of implementation. Populations in vulnerable situations should be the focus of this monitoring.
3. Governments can conduct impact assessments and equity audits to identify gaps that need to be filled.





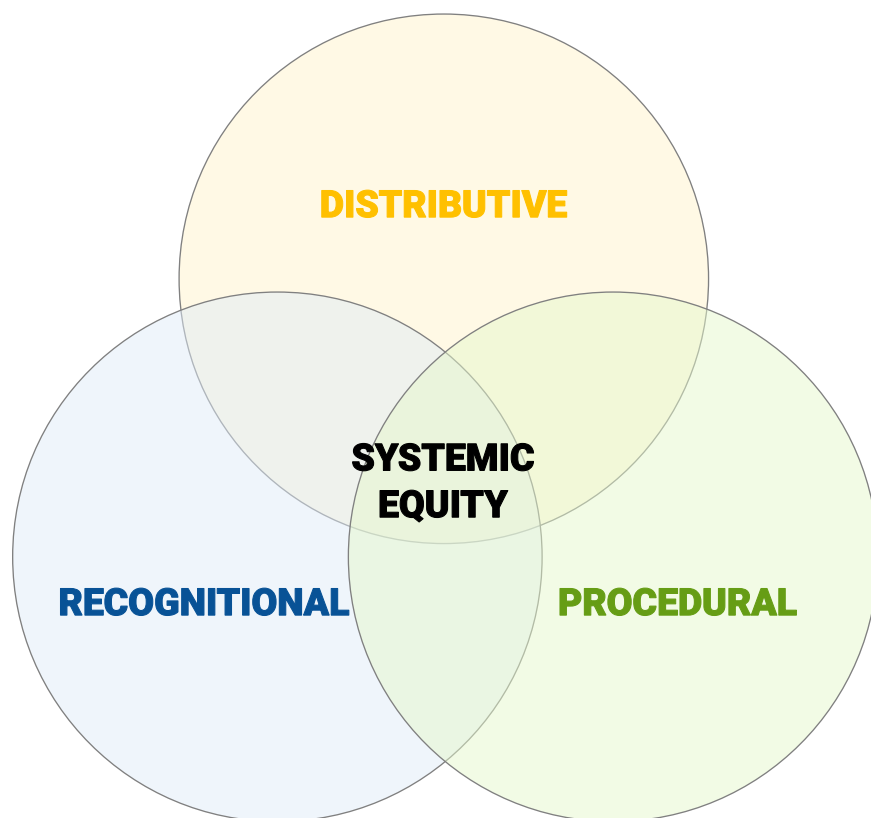
# KEY MESSAGE 7

**Just, transparent, and participatory processes and good governance are essential in designing sustainable consumption and production to reduce inequalities and inequity.**

Designing for equity requires an integrated approach given that equality, equity and justice have several dimensions including those that relate to gender, intra-generational, inter and intra-nation states, rich-poor, race, caste, and class, to name a few. Processes to design, implement, monitor, and evaluate sustainable consumption and production policies and processes must be just, transparent, participatory, and driven by the desired outcome of meeting three conditions: distributive equity, recognitional equity, and procedural equity. Following Bozeman *et al* (2022) and Mendez-Barrientos *et al* (2024), distributive equity seeks to provide resources to an individual or group in a fair manner. Recognitional equity addresses the ‘psychological, emotional, and cultural needs of the systematically marginalized where bias and disadvantage are embedded or evident.’ Procedural equity measures strive to use ‘procedures and decision-making activities that facilitate the allocation of resources in an unbiased and fair manner’.

The three dimensions mentioned above are critical in addressing equality, equity, and justice issues. These conditions (**Figure 9**) must be met for the production and consumption of natural resources to help reduce inequalities and inequity. Equity will not happen on its own and policymakers need to design it in procedures and other technological solutions. In addition, policymakers need to ensure that the policies are inclusive and equitable by engaging with all stakeholders to gather feedback and input, thus leaving no one behind.

**Figure 9:** Dimensions of Equality, equity, and justice



Source: Adapted from Bozeman *et al.* (2022).

Communities affected by resource extraction often lack information and are frequently excluded from decision-making processes. This can lead to outcomes that impact their human rights and do not reflect their interests, or needs, exacerbating inequalities. Strong institutions, access to information and appropriate skills are critical to enhancing equity. Savoia and Sen (2021) show that policy responses and the kinds of institutions play a critical role in the potential of resource rents to reduce income inequalities. The authors note that it is 'the institutional context in which this sector develops, and natural resources are exploited that determines the types of distributive, health, and education outcomes that resource-rich countries experience' (ibid., p. 17).

Public participation and access to information and capacity building provide a fertile ground for promoting equity measures. The right to participate in public affairs and the ability to access information contribute to the enjoyment of human rights<sup>9</sup>. The importance of access to information is, for instance, fully embedded in the UN guidelines on consumer protection (UNCTAD 2016). Unequal access to information on the environmental impacts of products and services leads to further inequalities, such as those related to risk exposure, but also to the capacity to make informed decisions or to promote a sustainable environment. Engaging stakeholders at all levels enhances ownership and leads to the co-creation of knowledge.

Good governance is crucial for upholding human rights, as it ensures that policies and decisions are made in a manner that respects, protects, and fulfils human rights. Transparent and accountable governance structures help prevent corruption and enable the effective use of resources to reduce inequalities. Institutional changes should reflect distributive, restorative and procedural measures through a natural resource lens.

The Sustainable Development License to Operate (SDLO) proposed by the IRP (2020) seeks to ensure that the processes are right, specifically as related to mineral extraction. The paradigm ensures that there is a level playing field for all actors. For a transition to be just, it requires social dialogue as well as policy coherence (ILO 2015) and needs to make efforts to overcome patterns and processes of marginalization and exclusion (Just Transition Research Collaborative 2018).

### Actions:

1. Facilitate effective stakeholder engagement, supported by robust governance frameworks and inclusive partnerships, so that affected communities, especially Indigenous Peoples, are actively involved in decision-making processes related to resource extraction, including respecting the principle of Free, Prior, and Informed Consent.
2. Governments should facilitate access to essential resources such as clean water, energy, and sanitation which are fundamental to realizing economic, social, and cultural rights. The prevailing system's failure to provide equitable access impacts the enjoyment of these rights.



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<sup>9</sup> See the International Covenant on Civil and Political Rights, the Escazu Agreement, and the Aarhus Convention.





# CONCLUSION

The global community is not on track to achieve the 2030 Agenda for Sustainable Development. Indeed, a recent report by the Independent Group of Scientists appointed by the Secretary-General (2023) indicates that in terms of current progress, only 12% of the targets will be completed by 2030. Rather than reducing inequality in all its forms, from intergenerational to intragenerational, we are heading towards a more unequal world.

This paper identifies certain issues that are often “inconvenient” to discuss. It suggests several transformations to how we produce and consume natural resources that the international community must make to address inequalities. These changes must occur at the supra, sub-national, and national levels. Absolute and relative decoupling of resource use from economic growth and social well-being is necessary along the whole production chain to the consumption of natural resources.

This paper argues that the global community must (re)design systems for sustainable consumption and production of natural resources to reduce inequalities, noting that sustainable consumption and production cannot happen independently. These systems will need to explore distributive, recognitional, and procedural measures. The report identifies several actions related to how we produce and consume our resources, address the global trade imbalance, promote institutional changes and good governance, create the fiscal space to improve human well-being and support societal changes, incentivize technology adoption, and rethink the metric for measuring societal wellbeing. Designing for equity in the consumption and production transitions must be deliberate and requires processes that are just, transparent, and participatory. We call on the One Planet Network community, programmes, and partners to work tirelessly to continue integrating issues of equality, equity and justice into every international, national and local initiative or policy supportive of sustainable consumption and production patterns, as a necessary condition for impacts and success. Without the recognition and consideration of the deleterious effects of inequalities on society, individuals and the environment, these policies and initiatives will not be able to express their full potential. Together with other platforms leading on sustainable socio-economic transformations, the One Planet Network should promote the implementation of the actions recommended in this paper, whenever permitted by the respective mandate of its members, but also identify further actions that can form a collective, ambitious plan to achieve the full integration of the human rights, inequality and sustainable consumption and production agendas.



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# GRASSROOTS ECO-SOCIAL INNOVATIONS DRIVING INCLUSIVE CIRCULAR ECONOMY

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## ABSTRACT

The paper discusses research results on waste governance and circular economy, conducted with waste picker cooperatives in the metropolitan region of São Paulo, Brazil. Two cases have been selected, from a pool of 21 waste picker organizations, to video document their grassroots eco-social innovations that have improved local waste management and the lives of the cooperative members. The videos support knowledge sharing with key actors in waste governance and the circular economy. Social grassroots innovation theory focuses on livelihood opportunities beyond the formal labour market, pursuing social inclusion by creating meaningful work for individuals who were considered left out and in vulnerable situations. Transitioning to sustainability necessarily goes beyond socio-technical innovations but rather integrates eco-social perspectives. After first introducing grassroots innovation theory and the concept of eco-social innovations the paper describes the empirical frame and presents two cases where organized waste pickers were successful in operationalizing innovations that address the circular economy and contribute to sustainability transitions. Key findings highlighted are cooperative governance, long-term partnership building, improved productivity and increased income.

## 1. INTRODUCTION

In the global South the informal (Coletto & Bisshop, 2017) and the organized waste picker sector (Kaza, Yao, Bhada-Tata & VanWoerden, 2018) constitute the main motor that feeds the recycling chain. In this part of the world hundreds of thousands of workers collect, classify and sell diverse recyclable materials, salvaged from everyday garbage flows to provide for the recycling industry, which depends on this work (Gutberlet, Carenzo, Kain & Azevedo, 2017). Waste pickers organize in many different forms, e.g., cooperatives, associations, networks, unions, federations or other community based organizations (Gutberlet, 2015). While they significantly contribute to material recovery, their working conditions in most cases remain precarious and their income at the poverty line or below (Dias, 2016; Morais, Corder, Golev, Lawson and Ali, 2022).

There are experiences of waste picker organizations that stand out and can be framed as grassroots innovations. Often these innovations are not recognized as such by other key actors in this field, who may see waste pickers as work force but not as developers of technologies. These experiences encompass technological, organizational or structural changes made by the group which have resulted in different accomplishments, facilitating their work, increasing the income, reducing occupational risks, im-

proving the organization and management of their group, enhancing human relations or reducing conflicts within the cooperative, just to mention some. Grassroots innovation theory (Hossain, 2016; Seyfang & Smith, 2007, Smith, Fresoli, Abrol, Around & Ely, 2017) helps explain the community-based process of developing and nurturing successful experiences. The key bottleneck is always whether and how these practices can be replicated and amplified, increasing their beneficial impact.

The key objective of the research presented in this paper was to digitally capture grassroots innovation among Waste Picker Organizations (WPOs), in order to tackle a gap in knowledge sharing and mobilization. The research builds on long-term community engagement with WPOs in Brazil and specifically on the results accomplished for the Brazilian case study under the Recycling Network and Waste Governance project. Since 2018 this project has applied a mixed methods study with WPOs in five different countries (Argentina, Brazil, Kenya, Nicaragua and Tanzania), generating data sets on diverse social science attributes and processes regarding WPOs in these locations. In Brazil, 21 representatives of WPOs were surveyed and interviewed in 2018, to learn about their innovation experiences. While many WPOs had some novelties and improvements to report, only few of them were able to demonstrate resil-

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ience and continuing sustainability of the innovation; which served as one of the selection criteria for participating in the documentary. Two experiences were selected, based on their outstanding scope, durability, replicability and results demonstrated over several years. A professional film maker, was involved in the production of these innovation videos (produced in Portuguese with with subtitles in English, Spanish and Swahili) showcasing grassroots social innovation and serving the purpose of mobilizing knowledge among key waste actors and inspiring other waste pickers worldwide to adapt and multiply these experiences.

Circular economy is one of the key foci in this research, based on ideas that have emerged during interviews and the survey application with WPOs. Given the current climate and environmental crisis and for a sustainable present and future, it is imperative that the circular economy becomes the new dominant regime (rules, physical structures, governance format) which shapes planning, design, production and waste management. Circular economy is defined by the Ellen MacArthur Foundation (n.d.) as driven by design and based on three key principles: elimination of waste, circularity and regeneration. The present research argues for social valorization of waste and waste workers as a key element in circularity and underscores the necessity to expand the existing framework for the circular economy, contemplating the social dimension. It is essential to include all key actors in the co-production of the circular economy and in the re-definition of the waste regime (building on the concept of waste regime by Gille, 2012). Given the prominent participation in material recovery and diversion, waste pickers are among the key stakeholders in the waste regime. Waste pickers constitute links between resource discard and recovery. They are key grassroots actors of the circular economy (Barford & Ahmad, 2021; Sousa Dutra, Yamane & Siman, 2018; Gutberlet & Carenzo, 2020). Particularly when organized, these collectives have the potential to become powerful entrepreneurs in the waste management sector, moving the transition towards sustainability (Gutberlet et al., 2016; Damásio, 2008). How can these organizations be strengthened, their actors be empowered and the work flows improved, resulting in higher income for the workers, safer working conditions, more secure livelihoods and a cleaner environment where less materials are wasted? These are some of the questions asked throughout the article. To transition towards sustainability the focus can not only be on social and technical innovations but must include ecological perspectives. In the context of social work, Stamm, Hirvilammi, Matthies and Närhi define eco-social innovations as “social innovations with a clear and consistent ecological approach that are improving both social and ecological sustainability” (2017, p. 202). Grassroots eco-social innovations are important in public policy making, which goes beyond sectoral and embraces eco-social policy making (Wallimann, 2013).

In the following section grassroots innovation theory will be introduced, under consideration of transition studies, to support the discussion on WPOs driving the circular economy. Then a description of the research methodology and research tools will be given, followed by the discussion of main research results. The final section briefly highlights some of the conclusions of this research.

## 2. GRASSROOTS INNOVATION THEORY

Social innovation theory broadly describes those innovations that offer livelihood opportunities beyond the mainstream labour market, targeting social inclusion for individuals in precarious situations (O’Riordan, 2013). Grassroots efforts and the involvement of new agencies are central in driving social innovations and in challenging existing top-down paradigms. As such social innovations have the potential to endorse social sustainability, based on terms of equity and justice (Parra, 2013).

Grassroots innovations (GIs) are bottom-up, small-scale and evolve as social experiments based on the knowledge, experiences and skills of communities, networks and individuals who lie outside the formal institutions of education and research to solve local problems (Reinsberger et al., 2015). Thus, they may often emerge from the margins such as the peripheries and communities. Innovations can result in new technologies, values, institutions and specific forms of organization or governance (Seyfang & Haxeltine, 2012). According to Seyfang and Longhurst (2016), GIs distinguish themselves from mainstream innovations at least in the following manners: (a) they are initiated by a social need, (b) they are driven by ethical commitment instead of purely profit seeking, (c) the niche where they develop embodies the local values and culture contexts, (d) they are created in collective ownership structures (e.g., cooperatives, networks, voluntary associations, community organizations), (e) they dependent on voluntary contributions, grants, or mutual exchange, and (f) operate in a social and solidarity contexts (summarized by Hossain & Anees-ur-Rehman, 2016, p. 975).

GIs tend to respond to local challenges considering the interests of the communities, and the results can directly benefit individuals, groups or even society at large (Grabs, Langen, Maschkowski & Schapke, 2016). Examples of GIs include alternative energy projects (Smith et al., 2017), food production and networks (Smith, 2006, Kirwan, Ilbery, Maye & Carey 2013), local material recycling (Carenzo, Goodluck, Gutberlet, Kain, Oloko, Pérez Reinoso, Zapata & Zapata Campos, 2022), repair movements (Zapata Campos & Zapata, 2017), community-based water and sanitation (Smith, Fressoli & Thomas, 2014) or alternative banking (Zapata Campos, Carenzo, Kain, Oloko, Reynosa, Zapata, 2021). GIs promote new forms of organization, and systems of provision (Seyfang, 2010).

GIs start small and develop in niches, outside of the dominant system and often under extremely deprived circumstances (the terms regime and niche are used here in association with the socio-technical transition literature, see e.g., Geels, 2005). Mutual trust between grassroots actors is vital in the collective development of any GI and if well disseminated, in an accessible language, they are able to trigger wider societal transformations. These niche experiences are often captured by the social and solidarity economy (Gutberlet & Carenzo, 2020; Gutberlet, Besen & Morais, 2020), which highlights the network formation, capacity building, cooperative values, collective learning and the empowering aspects of grassroots actors involved in innovation processes. Successful niches can influence a

regime by replicating innovations, installing multiple small innovations, scaling up and growing to attract and include a wider public and eventually turn a niche innovation into the mainstream (Hoppe, Graf, Warbroek, Lammers & Leping, 2015). Research has shown how these initiatives operate dynamically in developing and recombining resources, rationales and relations to create and maintain social innovations that drive change (Zapata Campos & Zapata, 2017). Carenzo (2020) demonstrates how waste pickers are also central in the design and manufacturing of their own technological devices, going beyond the traditional work in collecting and separating recyclable materials.

Matthies, Stamm, Hirvilammi and Närhi have complemented the discussion by emphasizing sustainability outcomes and by introducing the concept of eco-social innovations, referring to *“grassroots level social innovations that combine ecological and social goal setting”* (2019, p.2). This enhanced perspective of GIs will be applied in the development of this research.

Societal systems are complex and adaptive and in order to understand, prepare and influence for change, it is important to know how transitions work. Transition literature has investigated in detail the different paths and processes under which transition happens, highlighting the close link between structures (encompassing the formal, physical, legal and economic aspects in society restricting and enabling practices), cultures (cognitive, discursive, normative and ideological aspects) and practices (routines, habits, procedures and protocols) (de Haan & Rotmans, 2011). Transitions can be thought of as sequences of patterns that occur under specific conditions, generating so called transition paths. De Haan and Rotmans provide a comprehensive definition of a transition *“as [being] a fundamental change in the structures, cultures and practices of a societal system, profoundly altering the way it functions”* (2011, p. 92). Further, the authors claim that *“[a] societal transition is the process through which a different constellation becomes the dominant one, shifting the functioning of the whole societal system, ....a regime change”* (Ibid, 2011, p. 93).

In order to gain visibility and to allow bottom-up initiatives to become upscaled, they require support from regulatory, political and industrial perspectives (Hess, 2013). Consequently, their success also depends on the partnerships with government, universities, NGOs, informal networks, social movements and other different actors, as well as their visions and leadership that support these grassroots (Feola & Nunes, 2014). Hargreaves, Hielscher, Seyfang and Smith (2013) point out that intermediaries such as NGOs or universities can become important support mechanisms that help document innovative practices, disseminate the created knowledge and promote the transfer of the innovations to other localities.

Grassroots actors frame their innovations differently (a) as the emergence of new ideas and solutions (ingenuity framing), (b) as the empowerment of local communities (empowerment framing), or (c) as a form of addressing structural problems and questioning conventional innovation (structural framing) (Smith et al., 2017). Often these frameworks are applied concomitantly. The relevance of

GIs is recognized as driving force substituting existing unsustainable cultural and economic paradigms and values (Matthies et al., 2019; Seyfang & Haxeltine, 2012).

### 3. RESEARCH METHOD

The study is empirically informed by the Recycling Networks & Waste Governance international research projects, involving a large multidisciplinary team of international researchers and students that examine waste governance and grassroots innovations developed by WPOs and networks in different parts of the world. In 2018, the multinational research team conducted surveys with more than 100 waste picker organizations (WPOs) in Argentina, Brazil, Kenya, Nicaragua and Tanzania, examining the history and characteristics of these initiatives, their governance structures, funding and equipment situations, types of work conducted, characteristics of the workers and the working conditions, network relations, and general challenges and innovations of WPOs (Kain, Zapata, de Azevedo, Carenzo, Charles, Gutberlet, Reynosa and Zapata Campos, 2022). The study also included 100 in-depth interviews with a selection of WPO members, with key informants in local governments and with other waste governance actors. The researchers took an ethnographic and participatory approach to the data collection. The author of this paper is responsible for the fieldwork and analysis of the data collected in the metropolitan region of São Paulo in Brazil. At two international workshops, one held in Kenya (2018) and another in Tanzania (2019), the findings were analyzed and discussed by the team of researchers and several WPO representatives from the countries involved as well as by Kenyan and Tanzanian municipal officers and politicians working with environmental and waste management. The purpose of these workshops was to co-create knowledge and to conceptualize solutions and policy recommendations (for results on these workshops see: Azevedo et al., 2018 and Goodluck et al., 2019).

The survey prepared for the Recycling Networks & Waste Governance project was applied by the author and one research assistant in Brazil, between October and November in 2018, to 21 waste picker organizations. We started with those WPOs to which the author already had established contacts from previous research projects and then used snowballing to include more WPOs in the region. In addition, 7 waste picker networks and a representative from the National Waste Pickers Movement (MNCR) were also interviewed following the same key topics and interview questions posed to the 21 groups, in addition to questions that focused specifically on the context of networks and social movements.

All information collected via participant observations, survey and interviews were tabulated into Excel spreadsheets and analysed using qualitative, thematic content analysis to identify key themes and unique experiences. The results from the thematic analysis bring to light the waste pickers' perspectives.

In a follow-up project, in partnership with Argentina, Brazil, Kenya, Sweden and Tanzania and funded by Formas (Swedish Research Council for Sustainable Development),



WPOs were chosen for further in-depth study in each of these countries. The two Brazilian WPOs chosen were invited to participate in the production of the documentary, with the purpose of capturing and disseminating the unique innovative experiences. All videos showcase the contribution of waste pickers to the circular economy and to waste management at large. We take an arts-informed research frame building on exploration and experimentation of new ways of collecting data and disseminating results. It is “a mode and form of qualitative research in the social sciences that is influenced by, but not based in, the arts broadly conceived” (Cole & Knowles, 2008, p. 59). The key purpose is to increase and facilitate the understanding of whatever human phenomena or condition needs to be communicated, by using complementary empirical tools and processes which will then allow to reach diverse audiences. These authors describe how for them “trying to get closer and closer to human experience and to communicate it in a way that seemed truer to its original form and to those who may be involved”, was the motivator to push the boundaries of conventional scholarship (Ibid., p. 58).

Documentary filmmaking is our selected tool for knowledge mobilization and to make scholarship more visible and accessible (Cole & Knowles, 2008). Documentary and ethnographic film making has made its way into academia as additional form of scholarly publication, but also to make research results more accessible to the general public, practitioners and specifically to decision and policy makers (Petarca & Hughes, 2014). As part of participatory and community-based research epistemologies it is essential to make our work available to a wider public and to seek out different formats of communication (Amauchi et al., 2021), beyond academia (Eisner, 1997).

For the video production in Brazil a young professional film maker was involved and together with members from the two cooperatives a story board was developed and key interviewees were defined for the film. These preparatory conversations happened online through WhatsApp and over Zoom meetings. Fieldwork was delayed until the beginning of 2022, due to the Coronavirus pandemic. Finally, in February 2022, we were able to conduct the filming in-person. The research has received ethical approval from the University of Victoria's research ethics board and followed the requirements for informed consent, specifically regarding the captured images and film (Protocol Number: 21-0261). After finalizing the filming process, several hours of material were edited by the filmmaker into a short clip of less than 10 minutes. The clips were sent to the two cooperatives for viewing, asking for feedback, which was then incorporated into the final version, approved by the two WPOs. Since then, the clips have been uploaded (see: <https://www.cbri.uvic.ca/videos>), disseminated among research participants and organizations on list serves targeting waste pickers in Brazil and shown during public events. Future public viewings in association with discussions are being planned.

In the following section the results of the interviews and surveys conducted since 2018 on GIs will be presented. The key findings are portrayed in the two videos cited above.

## 4. RESULTS

The two WPOs selected as case studies are Avemare and Coopercaps, both located in the metropolitan region of São Paulo, Brazil. The cooperative Avemare illustrates outstanding internal governance and partnership development experiences, while Coopercaps (São Paulo), has innovated in design and manufacturing of their own technological processes as well as in socio-productive inclusion.

### 4.1 Avemare: Governance and partnership

With the closure of the controlled landfill in Santana de Parnaíba, waste pickers started to organize and in 2000, the local government provided the space and some basic equipment for the waste pickers to organize as association. In 2007, this original group constituted a recycling cooperative, called Avemare. Since then, the cooperative received support from different partners (Fundação Alfaville, IPESA, FUNASA, Instituto Ecoar and from some industries (Hursley, CEMPRE, ABIPEC, TETRAPAK) primarily for capacity building and the acquisition of equipment. In 2013, supported by the NGO ECOAR and the waste picker network Rede Verde Sustentável, Avemare began negotiations with the local government for a service contract to perform the municipal collection of recyclables. In 2014, they signed a contract for service provision and were paid 220 R\$ (60 US\$) for every ton of separated recyclable materials and they also received an additional 10% (based on the monthly total of commercialized materials) for maintenance expenses (e.g., electrical and water bills, roof maintenance, etc.). Since 2020, they have signed a collaboration agreement with the city (Termo de Colaboração), in which the cooperative in partnership with the city has established goals that need to be reached in order for resources to be transferred to the cooperative. This includes targets in terms of quantity of materials recovered, reduction of materials sent to the landfill (rejeito), as well as targets focused on environmental education (e.g., elaboration of information pamphlets distributed to the community, increased number of households participating in the recycling program, etc.). Major attention is given to sustainability transition parameters, such as expanding the collection and recovery of recyclables for the circular economy and concomitantly reducing the fraction that is sent to the landfill.

The average monthly income per member in 2018 was between 1,200 and 1,300 R\$ (320 – 350US\$), while in the beginning of 2022 it was at 2,300 R\$ (456 US\$). Avemare covers approximately 50% of the city area (in 2018 it was only 30%) with door-to-door household collection. They use trucks for the material collection from households, schools, restaurants, hotels, residential condominiums, commercial businesses and government buildings. They further collect electronic waste from businesses and industries. Currently, Avemare has 82 members, of which 43 are women (7 of 8 members of the board of directors are women). Most members are relatively young, between 18 and 40 years old. Today they collect 400 tons every month and sell 320 tons of materials per month (in 2018 it was between 350 and 400 tons/month). Currently the cooperative has 4 presses, 1 balance, 1 glass crusher, 1 PET crusher,

1 fork-lift, 1 bobcat, as well as 2 moving conveyor belts of 25 meters for sorting. The cooperative owns 5 trucks and shares additional 3 trucks with the recycling network (Rede Verde Sustentável). The many capacity building activities the members have participated in, as well as the recognition by the local government and consequent higher income of the waste pickers were instrumental in promoting the innovation to invest in the livelihoods of its members and in participatory waste governance.

One of the main goals of Avemare is to promote social inclusion and to contribute to urban sustainability, considering equity and justice, by offering low barrier jobs and by providing door-to-door resource recovery. Avemare has defined human development for its members as a key target and they have prioritized human development actions for cooperative members and their families. Achieving this goal begins by providing fresh and healthy, nutritious food to the members; *"so at least once a day the people eat well"*, says Ionara, the coop leader. The cooperative has a clean and spacious refectory and a cook that prepares healthy meals.

Avemare engages in social work and provides specific support to individuals (e.g., child support, social assistance, financial support, conflict resolution, etc.). General assemblies or extraordinary meetings are conducted over the month, to address gender specific issues or to tackle internal conflicts. If a member has a problem, they first try to solve it within the cooperative, as highlighted by Ionara: *"we are kind of a mother, a psychologist.... Sometimes the person only wants a hug, a friend's shoulder to release, or ask for advice, and the cooperative is welcoming about it ..."*. *"Our biggest result is when we see lifes transformed within the work of the cooperative"* (Ionara). The cooperative has recovered several individuals who were involved in drug trafficking and are now 'clean' and working as regular members. Further, during the door-to-door collection waste pickers engage in community education and also participate in environmental education programs, involving schools and pre-schools. Avemare maintains a 2nd hand shop (Bazar), where they place reusable or repaired items (e.g., electronics) for low cost to members.

Avemare has built a strong partnership with the city hall, where they are now seen as more than just service providers but rather as partners in waste management and in tackling several of the Sustainable Development Goals (SDGs). A government occupational health and security agent works on a regular basis with the cooperative, making sure that medical exams and routine check-ups are done by the members. They also help schedule medical exams through the government's social assistance and health promotion secretariats. The city runs educational campaigns in partnership with Avemare, to improve recycling rates and to increase the cleanliness of the city.

Capacity building takes time and participants usually have to leave their 'comfort zone' in order to apply the learned lessons (e.g., change work behavior and work equipment to comply with occupational risk prevention measures). However, there is still a lack of knowledge and awareness among many cooperative members related to the necessity to innovate (e.g., members are unaware of

relevant legislation and regulations that influence selective waste collection and recycling). *"Both, environmentally speaking and in regards to the transformation of people we seek to improve even more, until today"* (Ionara). Avemare seeks to establish partnerships with different stakeholders (business, government, university, NGOs) for capacity building to increase their level of knowledge.

According to the leadership and confirmed by individual members, the high level of satisfaction of members has resulted in low membership rotation, an issue other WPOs often face. The cooperative claims to have effectively integrated several members who were ex-prisoners, ex-drug addicts or had suffered from extreme poverty and to have contributed to reduced levels of conflicts among members, overall improving the work environment. These innovations in social development particularly target those in society that have been historically marginalized and stigmatized. Avemare admits new autonomous waste pickers wanting to join the cooperative. Often individuals who can not find another job, have addiction or other health problems and the cooperative can help address these issues. Some of the waste pickers who today have a strong voice within the cooperative, in the past were also most vulnerable.

Avemare is part of the National Waste Pickers Movement (MNCR) and a member of the network Rede Verde Sustentável and participates in regular meetings with these organizations. Avemare actively helps other cooperatives who are not yet or newly established to address their challenges. The leadership recognizes that they also had learned from other peers and now they want to give the same support to other WPOs. Avemare has adapted a 'remuneration by production system' which is a form of fair pay according to the work conducted. This system was first experienced by Cooper Viva Bem, another waste picker cooperative in São Paulo, who has taught Avemare the implementation of this system. Avemare sees it as their mandate to help diminish disparities among the WPOs in the region (*"nívelar os grupos"*), whose working conditions and outcomes are still quite unequal. There are many very small groups that have no infrastructure and no bargaining power. These groups benefit from partnerships and peer learning with well-established WPOs. Finally, the leadership of Avemare mentioned repeatedly how important participation and transparency were for the successful management of the cooperative.

## 4.2 Coopercaps: Networking, technical innovations and social inclusion

The seed of the cooperative Coopercaps was planted in 2001, when a group of eight autonomous waste pickers in Interlagos, the south of the city of São Paulo, agreed to work collaboratively instead of on their own. In 2003 the cooperative was legally created and since then has been continuously expanded their activities. Over the time they have developed partnerships with different NGOs and government agencies. Central Unica dos Trabalhadores, the main national trade union and the largest union in Latin America, early on provided capacity building on cooperatives and, in addition, the local city administration offered



a space for them to work, support with transportation and basic food items for cooperative members.

Since then, many other partners support the cooperative, including the NGO called GAIA SOCIAL as well as some industries (BRASKEM, PEPSIKO, the Brazilian Association of the PET Industry - ABIPEC). The Brazilian Beverage Association (ABRABE) has helped in the formalization of the group, and nowadays conducts the inspection of all required documents to guarantee the health of the workers.

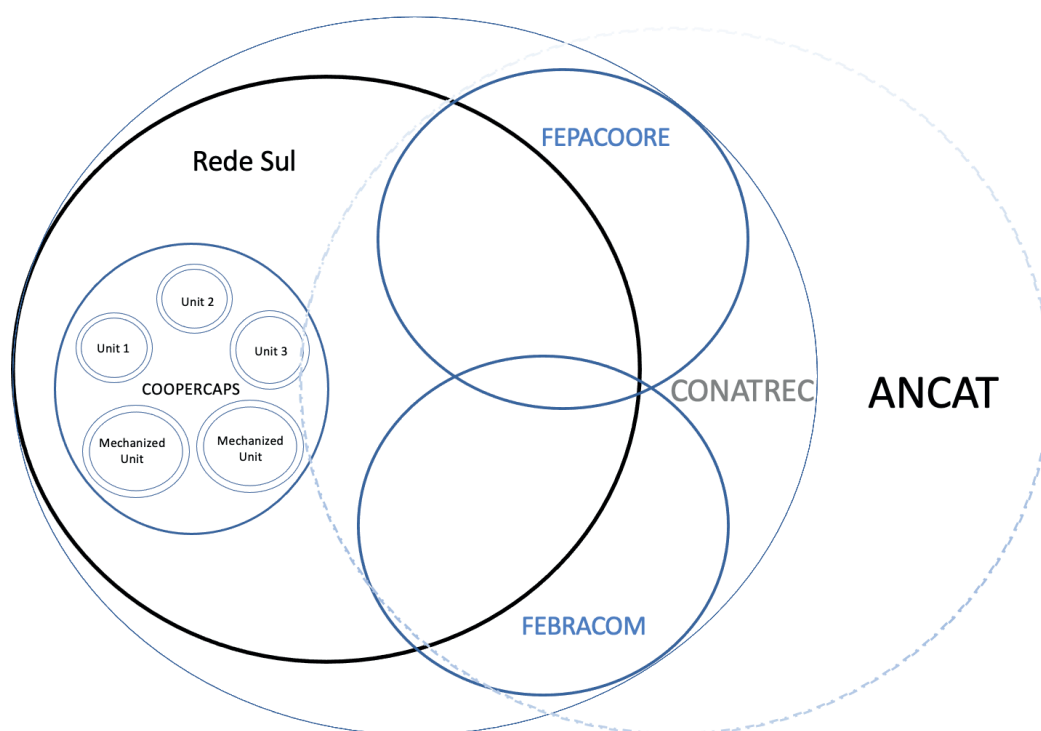
Today a total of 347 members (of which approximately half are women) are working in five units that compose Coopercaps. These units include the initial cooperative space with manual separation (Unit Matriz), two additional manual separation units (Socorro and Paraisópolis) and two mechanized plants implemented by the city of São Paulo (Unit Carolina de Jesus and Unit Ponte Pequena). The three manual separation plants together process approximately 250 tons/day; material that comes from household collection, residential condominiums, schools, businesses and public buildings. Since 2018, Coopercaps has continuously expanded, from 128 members to 347 members today. The average income in 2018 was 1,750 R\$ (427US\$) and is now around 2,604 R\$ (517.-US\$).

Coopercaps is a leading member of Rede Sul, a network of 13 WPOs, covering the south of the metropolitan area and the city of Campinas. Rede Sul integrates approximately 800 waste pickers. The network was formalized in 2012 for collective commercialization, allowing the members to sell directly to the industry and to thus avoid middlemen or scrap dealers. It is noteworthy to mention that Rede Sul has currently formed another overarching network called

CONATREC (Confederação Nacional de Cooperativas de Trabalho e Produção de Recicláveis), which integrates the two networks of WPOs in the larger region (FEPACOORE - Federação Paulista de Cooperativas de Reciclagem and FEBRACOM - Federação das Cooperativas de Catadores de Materiais Recicláveis) - see Figure 1 - and has partnered in 2021 with ANCAT (Associação Nacional dos Catadores e Catadoras de Materiais Recicláveis), the other nationwide association of WPOs. These networks allow for negotiation with policy makers and industries and have the potential to promote structural change and sustainability transitions.

The regional network Rede Sul allows for collective sales among its members and also supports their voice in policy decisions. Rede Sul provides capacity building and expertise on increasing and maintaining quality standards in material separation, crucial for selling to the industry. Waste pickers have differentiated skills, since they can quickly tell apart PAD and PEAD plastics among other materials, while automatized separation can not. In addition, the network supports associated cooperatives on administrative and legal issues and seeks funding for infrastructure and equipment in order to benefit its members.

Coopercaps is taking the lead in strengthening this network and also engages in the research of alternative solutions for materials that reach the cooperative but are not recyclable. In partnership with research institutes (University of São Paulo, USP) Coopercaps searches for solutions for those materials. According to Pablo, *"our innovation at this point, is just this research done about the materials to know what can be and what can't be done with them"*. In 2018, e.g., a new milk container made of mixed materials, was showing up on the cooperative's separation belt, which



**FIGURE 1:** Multilevel Waste Picker Organizations in the state of São Paulo.

was separated but had no market and was thus piling up in the yard. During our visit in 2022, we were informed that after conducting a study they had found a niche for these packaging materials. According to the cooperative leader, approximately 20% of rejected materials, mostly dirty or organic materials and pieces that are too small to capture as recyclable, are considered rejected materials and are sent to the landfill. However, at the automatized separation plant this figure is significantly higher.

Coopercaps also has a mandate to support social inclusion, by providing low barrier jobs to individuals with difficulties to become employed, such as immigrants, refugees, expats, ex-prisoners or drug addicts.

*It's social change [neh], the change that happens in a person's life when he succeeds. I'll give you a clear example of that. We have a support network, ... a recovery house called Fraternidade, located in Parelheiros. We went there, and there are about 10 people inside that will be hired by Coopercaps to work in here. One of the men is called Anderson, ...he has an interesting life story. He was a drug user, he went to Cracolândia, [uh]... taken out of there by this priest, he went through the recovery house, he went through his period of treatment, which is 6 months, he stayed for another 3 months, and then what did he do? He was hired by Coopercaps. .... Now, Anderson has already rented a little house for him to live. So, I would say Anderson is our clearest example of social transformation that we have here today in the cooperative (Pablo).*

Furthermore, one of Coopercaps' units (Unit Socorro) has been specifically proactive in including LGBTQ+ individuals and has created awareness about the vulnerability of these groups. Unit Ponte Pequena has received several refugees from Sudan and Unit Matriz has specialized in receiving and supporting particularly elderly and handicapped waste pickers.

## 5. DISCUSSION

The two examples for GIs presented in this paper, reiterate the observations made by Geels (2012) that learning occurs over time, in various dimensions and that early visions and ideas turn into more lasting outcomes. Both cooperatives started out between 2000 and 2003 with a group of informal waste pickers, who had a vision of collectively improving their livelihoods. Both cooperatives engaged early in building partnerships, involving the local government and NGOs, that allowed them to grow. These results are not easy to achieve. Resistance and overcoming obstacles as well as manoeuvring power dynamics and imbalances shape the aims and scope of the waste pickers' innovations (see also Carenzo, 2021).

Avemare has been strong in negotiating with the local government, over different legislations, consistently improving the situation for the cooperative. Coopercaps, in particular, has expanded its multilevel networking capacity and collaborations also with other waste picker organizations and with businesses, particularly since the Coronavirus pandemic in 2020. Coopercaps is a strong partner in the discussion of the role of WPOs in reverse logistics and the circular economy. Feola and Nunes (2014) have also

observed that a strong vision and leadership, as well as the engagement in partnerships with different local formal and informal actors is crucial for the success of transition towards more sustainable systems. The two experiences underline the importance of continuity and persistence. The gains these groups could achieve over the past 20 years are built on perseverance and dedication, dialogue and negotiation skills in the definition for better working conditions and fair remuneration of the services provided by the waste picker cooperatives, and also demonstrate the "informal" experimental praxis of trial and error, involving a peer based practical pedagogy towards social innovations (Carenzo, 2020).

Being able to access appropriate funding or microcredits is necessary to stimulate local innovations (Hoppe et al., 2015). The two cases have also relied on funding opportunities supplied by previous federal governments, specifically by the Social and Solidarity Secretariate between 2003 and 2016, under president Lula and president Dilma Rousseff (Gutberlet, Besen & Morais, 2020). More recently, particularly due to lack of support and even the dismantling of existing support mechanisms (funding, policies) by the government of ex-president Bolsonaro, some of the leaders among WPOs (Coopercaps) had narrowed the dialogue and negotiations with industry partners, reiterating their key role within the circular economy, similar to what has been discussed by Barford and Ahmad (2021) as an example for a socially restorative circular economy.

The success of Avemare is linked to the internal governance structure with high levels of participation and transparency, the management structure based on fairness and inclusion, as well as the human values directed towards the recovery of the citizenship of its members. Avemare particularly builds on democratic decision-making among cooperative members and on continuous conflict resolution efforts done by the cooperative administrative board. The monthly general assembly, extraordinary meetings and individual conferences offer a space for members to become informed, to speak up, to share ideas and to solve problems. Conflict situations occur frequently among large numbers of co-workers. However, dealing with these conflicts in a democratic, transparent and neutral perspective is not easy. In both cases peer-to-peer knowledge dissemination (Feola & Nunes, 2014) is being practiced continuously, among members and among different WPOs and networks. Combining formal and informal science is imperative for GI to develop and consolidate (Gupta, 2012). Over the years, particularly Coopercaps who is at the forefront of Rede Sul and a key founder for CONATREC, has dedicated time and energy to peer learning and the dissemination of peer learning. One of its leaders (Carioca) has been a continuous driving force, bridging knowledge gaps in different cooperatives and networks, solving specific administrative, organizational or technical problems in different cooperatives.

An important preparation for WPOs to thrive has come from capacity building and peer learning about cooperatives (cooperativismo), strongly supported and implemented by the larger networks such as the national waste pickers movement (MNCR) and regional networks such as Rede



Verde Sustentável and Rede Sul. MNCR applies a method called from waste picker to waste picker, in the dissemination of knowledge, which is peer-to-peer learning, valuing the knowledge and experiences waste pickers bring and that is being disseminated. They have produced didactic materials for this grassroots educational process. Fruits from this process are the strong identity waste pickers nurture with the values and objectives of cooperatives. Many of the organized waste pickers and particularly the leaders are proud of being part of a collective and are struggling to constantly improve their livelihoods, their working conditions and the impacts of their work. Since the mid 2000s, waste pickers have emerged as a collective of organizations, called networks (Cooperativa de 2o Grau) generating innovative solutions for many pressing challenges (Feola & Nunes, 2014). Waste picker leaders have identified new opportunities that have arisen with growing awareness of the environmental and social impacts related to inappropriate handling of waste, particularly by engaging in environmental education in their communities, giving talks at schools or at businesses (Gutberlet, Sorroche, Martins Baeder, Zapata & Zapata Campos, 2021).

The two examples in this article highlight the transformative power of WPOs and their potential to make unprecedented contributions to the transition to sustainability (Leach, Rokstrom, Raskin, Scoones, Stirling, Smith & Olsson, 2012) and to thus tackle some of the United Nations Sustainable Development Goals (SDGs) (Gutberlet, 2021; Hajer, et alii., 2015). Some scholars in grassroots innovation theory have observed that transitions to sustainability in general tend to depend on particular conditions. De Haan and Rotmans (2011) e.g., understand these as (a) cultural (normative, ideological aspects) and structural tensions (problems with the physical, infrastructural, economical, formal and legal aspects); (b) a degree of internal inconsistencies (the dominant way is unable to provide the societal needs); and (c) pressures from inside or outside of the regime. The authors also speak of a multi-pattern approach, where “[t]ransitions can be considered sequences of patterns that occur under certain conditions, producing transition paths” (De Haan & Rotmans, 2011, p. 100).

The GIs described here showcase two innovation paths which have allowed the two groups to shift over time from a marginal to a more entrepreneurial organization as they seek to emerge from a niche to a regime as has been theorized by Martin and Upham (2016). The two cases presented highlight the need for recognition of the social valorization of waste workers along the waste value chain. WPO include individuals that have fallen through the cracks, were long-term unemployed, drug dependent or live in poverty. The circular economy framework should also capture these social dimensions of waste.

New GIs can challenge incumbent regimes, by first introducing alternative practices in marginal ‘niches’, demonstrating that the innovation might better serve the priorities of communities and local leaders (Boyer, 2014). The two cases have shown how these groups have undergone processes of transition, following the sequential pattern previously highlighted (De Haan & Rotmans, 2011), with empowerment, re-constellation, adaptation and finally becoming

materially and cognitively installed and shifting the regime to accommodate the innovation.

Over the years, despite changing local governments, Avemare has been able to solidify and expand its participation in the city’s selective waste collection; introducing grassroots knowledge on waste management and building on diverse local partnerships. They have been able to tackle the United Nations Sustainable Development Goals, particularly by providing decent low barrier jobs and improving working conditions (goal number 8) and pay (goal number 1 and 10), enhancing human development of its members (goal number 2, 3 and 5) and contributing to a cleaner environment (goal number 11, 12 and 13). The transparent and bonding relationship between Avemare and the local government has allowed them to become recognized for their contributions to sustainable development.

The final version of the video was shared through social media with all participants and related social networks. Particularly Coopercaps, who has recently inaugurated a new educational space at their main location Unit 1, has expressed interest in using the videos for training and pedagogical purposes. Both groups want to work with the videos to widen their public support and to demonstrate their specific roles in the city’s waste management systems. Specifically, the local government in Santana de Parnaíba has already used the documentary for dissemination. The film was first publicly screened during a workshop in April 2022, to an audience of waste pickers and supporters (NGOs and universities) in São Paulo. Next steps will include widening the scope of dissemination within different regions in Brazil and internationally (in countries that speak Spanish, English and Swahili) and by introducing the documentary as educational tool and as source during debates on inclusive circular economy.

## 6. FINAL CONSIDERATIONS

The research results reveal how WPOs contribute to the socio-productive inclusion of workers who have been stigmatized and excluded, providing a livelihood for individuals that were homeless, abused, substance dependent and living in poverty and without work. Both cooperatives have a policy of including and supporting vulnerable individuals, addressing their personal challenges and recovering their citizenship (Gutberlet, 2008). The documentaries highlight some of the eco-social innovations of cooperatives and the resulting environmental benefits. Coopercaps has developed new techniques to maximize resource recovery, by finding opportunities for materials that were considered unrecyclable or didn’t have a market. In partnership with the city, Avemare engages in environmental education at the household level, targeting better separation at the source and the reduction of rejected materials. Both examples contribute to less waste being sent to the landfill and more materials entering the circular economy, thus diminishing the pressure for natural resource extraction.

The novel practices discussed in this article have emerged from a marginal ‘niche’ context. These eco-social and socio-technical innovations are being disseminated through existing networks of WPOs and of their allies,

reaching the progressive mainstream (e.g., the city hall in Santana de Parnaíba, recycling industry partners, university partnerships). In some countries, such as Argentina, Brazil or Colombia waste pickers are part of a larger social movement involved in transferring knowledge (and GIs) for the implementation of sustainable practices (e.g., increasing material recovery and diversion into the circular economy, building more awareness in the community about socio-environmental dimensions of separate waste collection and recycling or struggling for social inclusion and remuneration of recycling services). Waste picker leaders are aware about their role in the circular economy and are proud of the differentiated knowledge and skills they possess on waste diversion and in material-product chains for material transformation, design, recycling and reuse (Carenzo, 2020).

Avemare is a case where innovations have been scaled-up and translated into changes in the structure (institutional) and practice (routines, procedures and protocols at the municipal and cooperative level). Similarly, Coopercaps has proven their capacity and skills in managing the recyclable fraction of waste for part of the megacity São Paulo, increasing diversion rates. Diverse changes in practice and technical GIs have contributed to increase the value of materials (by finding markets for materials that did not have a value) and to share the new knowledge with other cooperatives via networks and waste pickers' social movements. These processes are shaped by situated power dynamics and, of course, don't happen without tensions, stresses and conflicts. The long-term value shifts and the consolidation of the GI towards a transition to greater recognition of the role of waste pickers in the circular economy, can make up for the many obstacles and setbacks these WPOs encounter along their transition path. As Hoppe and co-authors (2015), suggest, successful niches can further influence a regime by the replication of the innovation, by installing multiple small innovations, scaling them up and growing to attract more participants and eventually turn a niche innovation into a mainstream system. According to the waste pickers' perspectives, these innovation videos should contribute towards replicating and upscaling the specific learnings, making the experiences available to the mainstream. The documentaries inform policy makers about the role change from waste pickers as workers in the recycling system, to waste pickers as developers of new technologies and social innovations in work practices and governance.

The circular economy framework requires a revision in order to accommodate the social valorization within the value chain of waste, recognizing the diverse eco-social contributions of waste pickers in the waste system. Undoubtedly, new challenges will arise in waste management and for waste picker organizations. How can waste pickers' contributions, as demonstrated in the GI examples provided in this article, be rightfully included in an updated circular economy framework? How do GIs in solid waste management impact the official and mainstream actors within the circular economy? These and other questions need to be answered to be able to evaluate the resilience, adaptability and sustainability of these innovations but also to find solutions for the persistent hurdles and the bottlenecks of GI transitions.

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