



DECENT WORK IN THE CIRCULAR ECONOMY

An overview of the existing
evidence base

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International
Labour
Organization



FOREWORD

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CIRCLE ECONOMY

The circular economy provides the opportunity and tools needed to change how we live and work. It can allow us to redistribute the benefits of moving towards low-carbon and regenerative economies across borders and all areas of society. However, decision makers need the evidence base to build resilient, environmentally sustainable and socially just economies to enable this systemic shift. This is work we have been pioneering through our Circular Jobs Initiative.

Decent work in the Circular Economy carries critical messages and calls to action. Having better data and evidence to understand how the circular economy can create better quality jobs in different industries around the world is crucial for a just transition. Also, the circular economy is still seen as an environmental agenda, and its social and economic benefits are yet to be fully embraced, despite the importance of this topic. Finally, we need to work in partnership to create and put evidence of its socioeconomic impacts in the hands of practitioners and decision makers.

This is why we at Circle Economy are proud to partner with the International Labour Organisation and the World Bank on Jobs in the Circular Economy, a multi-year initiative to generate and share evidence and data to better understand how the circular economy can help lead to a more just and inclusive world.

THE INTERNATIONAL LABOUR ORGANISATION

There is no doubt that a circular economy can help us reach our climate goals. However, the links between circularity and the achievement of social and economic progress remain overlooked. The shift towards a more circular economy offers significant opportunities for the world of work, such as the creation of new jobs and sustainable enterprises. However, fully unlocking the potential of this new economy requires a just transition that addresses the current inequalities and suboptimal working conditions currently present in the circular economy. If not managed properly, these issues could continue to impede progress towards a more equitable and sustainable future.

Designing and implementing policies for a circular economy that is just and inclusive is a challenging task, and it requires a deep understanding of various aspects of this large systemic change. This report is a first step towards developing evidence-based research to assist policy makers in shaping circular economy policies that create the win-win situations that we so urgently need for our planet, its prosperity and its people.

NAMITA DATTA

Program Manager
Solutions for Youth Employment
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WORLD BANK GROUP

The shift to a circular economy will support environmental goals and could also help provide new opportunities for the world of work. Recycling, remanufacturing, and repair (circular jobs) are labour intensive and could provide more opportunities for informal workers to get better jobs connected with value chains. This link between environmental sustainability goals and human development and jobs has often been overlooked, especially in the context of developing countries where most workers are clustered in the informal sector, which is characterised by low quality, low paying jobs. In developing countries, circular concepts of cost efficiency (frugality) and extending the life cycle (use) of a product are often enmeshed in their socioeconomic functioning. It is not as much the concept of circularity that needs an introduction in these economies, but instead the focus would be on addressing the low quality, low paying jobs in the informal sector, with hazardous working conditions and exposure to toxic materials, that are associated with circular activities like waste management, recycling, repair, and reuse. The shift to more circular approaches calls for policies that ensure that the jobs created are not only good for the environment, but also good for workers. But this integration will require intentional and adequate policies, as well as further evidence to understand the impact of the circular economy on people's livelihoods, especially those in developing countries. A truly just transition to the circular economy will require reskilling and upskilling opportunities for workers to access better job opportunities.

This report systematically documents the literature on circular economy and jobs, identifying gaps and suggesting ways to simultaneously promote environmental sustainability and good quality jobs. The report will provide valuable insights for policy makers to move towards a better environment that is just for all.



ABOUT CIRCLE ECONOMY

Circle Economy is a global impact organisation. We empower governments and industry with practical and scalable solutions to put the circular economy into action. Our vision is an economic system that ensures the planet and all people can thrive. To avoid climate breakdown, our goal is to double global circularity by 2032. The Circular Jobs Initiative aims to ensure the transition to the circular economy is positive for work and workers. We are committed to promoting this mission by working with employers, workers, governments, multilateral organisations, education institutions and research organisations to shape this future.



ABOUT S4YE

S4YE is a global program housed in the Jobs Group of the Social Protection and Jobs Global Practice. It consists of a network of over 35 private companies, a network of 44 high-potential and innovative youth employment projects, a group of talented and enterprising global youth that provide youth voice on the design of youth employment programs of S4YE and the World Bank, and has a network of 150 World Bank youth employment projects in 69 countries. S4YE Steering Committee provides high-level strategic guidance on the work program. It includes representatives from member organizations.



ABOUT THE ILO

The International Labour Organization (ILO) is the United Nations agency for the world of work. It was founded on the conviction that universal and lasting peace can be established only if it is based on social justice. The ILO brings together governments, employers and workers of 187 Member States to set labour standards, develop policies and devise programmes promoting decent and productive work in conditions of freedom, equity, security and human dignity. The unique tripartite structure of the ILO gives an equal voice to workers, employers and governments to ensure that the views of the social partners are closely reflected in labour standards and in shaping policies and programmes.

EXECUTIVE SUMMARY

More evidence is needed to understand how the circular economy impacts people and their livelihoods. Within the last decade, the circular economy has become an increasingly established framework for achieving prosperity and social value while operating within the planetary boundaries by efficiently using materials. With this growing popularity, an increasing number of companies, national governments and multilateral organisations are seeking to adopt circular economy interventions to tackle environmental pressures and enhance social and economic resilience. However, current research is limited to the Global North and primarily focuses on net job creation.

This report provides an overview of the status quo and the existing evidence on decent work within the circular economy—to identify research gaps and leverage points for just and labour markets in the circular economy. It summarises the current circular economy discourse and how it relates to decent work. It describes the evolution of this research area, the main types and levels of analysis currently being conducted, and their application. Additionally, it explores key recurring themes related to decent work found in research and identifies corresponding research gaps that should be addressed to advance practice and support a just transition toward a circular economy.

To support a just transition for all, research on the circular economy must consider decent work and other socioeconomic factors. Promotion of the circular economy is currently taking place amid a global backdrop of growing employment precarity, socioeconomic inequalities and political instability. A large body of research focuses on the circular economy as a pathway for economic prosperity and growth via resource use and efficiency. This includes how circular economy interventions can support material flows needed to keep society running with less environmental impact, and the environmental and economic impacts of circular business models. But, there is little exploration of how the circular economy may impact people and their livelihoods and also how this new economic model could protect

against the current persistent challenges of work quality, for example. These concerns are important because circular economy interventions tend to rely on labour-intensive activities, such as reuse. Additionally, as the activities shift from being in the extractive sectors to more service-oriented sectors that ‘keep materials in the loop’—recycling and repair, for example—workers will need to be redeployed in a safe and supportive way. By emphasising the need for conditions that can create decent work, circular economy interventions can support a transition to a sustainable low-carbon society.

This report is the first output under the Jobs in the Circular Economy initiative of Circle Economy, the ILO and the World Bank’s S4YE Programme. This initiative aims to address many gaps in the evidence base identified in this paper through collaboration with an international community of research institutions, industry representatives, social partners, governments, and public bodies.

The responsibility for opinions expressed in this work rests solely with its author, and publication does not constitute an endorsement by the ILO of the opinions expressed in it.



Five key themes underpin current research into decent work in the circular economy: these represent some of the crucial opportunities and challenges and should be considered for the circular economy to lead to a more just and inclusive society.

1 • LABOUR MARKET AND SECTORAL TRANSFORMATION:

Employment and job creation are often described as the most important social and economic contribution of the circular economy. Based on the comprehensive 2018 ILO study, global employment growth was estimated to be driven by Latin America and the Caribbean (over 10 million jobs) and Europe (around 0.5 million jobs) due to new jobs in recycling and reprocessing. The region expected to have most employment gains is the EU, benefitting from the ‘first mover advantage’ compared to the rest of the world.

2 • INFORMALITY AND THE CIRCULAR ECONOMY:

The informal economy is estimated to employ 60% of the world’s population, yet most studies and policy approaches assume that the economy is part of a regulated formal economy. This is especially significant in the Global South, where the reuse, repair, waste collection and recycling sectors provide ample employment to low-income workers. Yet, the informal economy is not sufficiently included in the Global North’s circular economy agenda and existing research does not adequately consider the wide-ranging circular activities operating informally in the Global South.

3 • WORK REALLOCATION AND SKILLS DEVELOPMENT:

The successful reallocation of workers from linear to circular sectors is dependent on access to training and related policy measures. Gaining the ‘deep skills’ required for circular interventions relies on employers’ and educational institutions’ knowledge of circular business models. Lack of knowledge can result in a ‘deep skills’ gap, including in low-income countries where access to STEM skills for remanufacturing and related sectors may be lacking.

4 • WORKING CONDITIONS AND SOCIAL PROTECTION:

The circular economy has been proposed as a solution to eradicate poverty (SDG 1) by some academics and practitioners. Still, research on poverty alleviation is lacking. Most occupational health and safety concerns relating to circular activities are associated with the global waste trade and second-hand goods flowing from Global North to South, where workers are often exposed to toxic waste.

5 • GENDER DISCRIMINATION AND SOCIAL EQUITY:

Projections show that the transition to a circular economy will increase female employment globally. Beyond gender equity, concerns relating to the social blindspots of circular economy interventions among underrepresented, circular actors—migrant workers, and youth—were only studied in-depth three times, revealing a significant knowledge gap.

Research gaps, a eurocentric focus, and limitations in data and modelling spotlighted in this paper must also be addressed. Existing research on the work-related implications of the circular economy predominantly focuses on job creation. This report also finds that the design and implementation of circular economy interventions must consider the working conditions in established circular sectors, with a particular focus on marginalised and disenfranchised groups, particularly in the Global South—where the majority of circular activities are. However:

- There is limited country or regional-level analysis of the socioeconomic impacts of the circular economy in the Global South—compared to similar studies in the Global North, which represented 84% of the studies reviewed.
- Furthermore, circular activities often include atypical forms of work—temporary, flexible, informal—associated with precarious employment, limited or absent collective bargaining and social protection schemes. Yet, there is limited research into these types of employment and their implications for workers. The informal sector drives many circular economy interventions worldwide and is estimated to employ 60% of the world’s population and house 80% of enterprises worldwide.

- Circular economy policies are highly interdependent due to their impact on global value chains and trading relationships.
- Given the gaps in research on decent work and the circular economy in Global South in general, there is a risk that these policies are currently being formulated from a Global North perspective, excluding essential actors from decision-making and governance systems.

This paper suggests key actions needed to realise the full potential of circular economy interventions. If managed well, they can help to tackle issues ranging from climate change mitigation and adaptation and social inequality to biodiversity loss and pollution.

MORE IN-DEPTH AND INCLUSIVE RESEARCH ON DECENT WORK AND THE CIRCULAR ECONOMY.

- More research on the impact of the circular economy on key actors and marginalised groups and ensure their inclusion in the development and implementation of circular interventions.
- More localised, city-level, quantitative studies on the potential shortcomings and opportunities of circular economy interventions.
- Review and adjust the current circular economy modelling methods, including assumptions and policy scenarios.
- Compensate insufficient quality data for scenario modelling by employing mixed method approaches to analysing sectoral or country-level policy impacts and gathering data from alternative sources.
- Create globally relevant indicators of employment and decent work in the circular economy.

GLOBAL AND SOCIAL JUSTICE-LED RESEARCH AND POLICY.

- Collection and dissemination of circular economy best practices across value chains in countries and regions in the Global South.
- Deep dives reporting into circular economy challenges and opportunities in different countries and value chains around the world, including areas of overlap.
- Study existing and upcoming policy measures, making sure they include social requirements and the participation of affected workers in key policy dialogues such as trade and economic cooperation agreements, EPR schemes, European [Corporate Sustainability Reporting Directive](#).

JOINT ADVOCACY AND DATA PARTNERSHIPS.

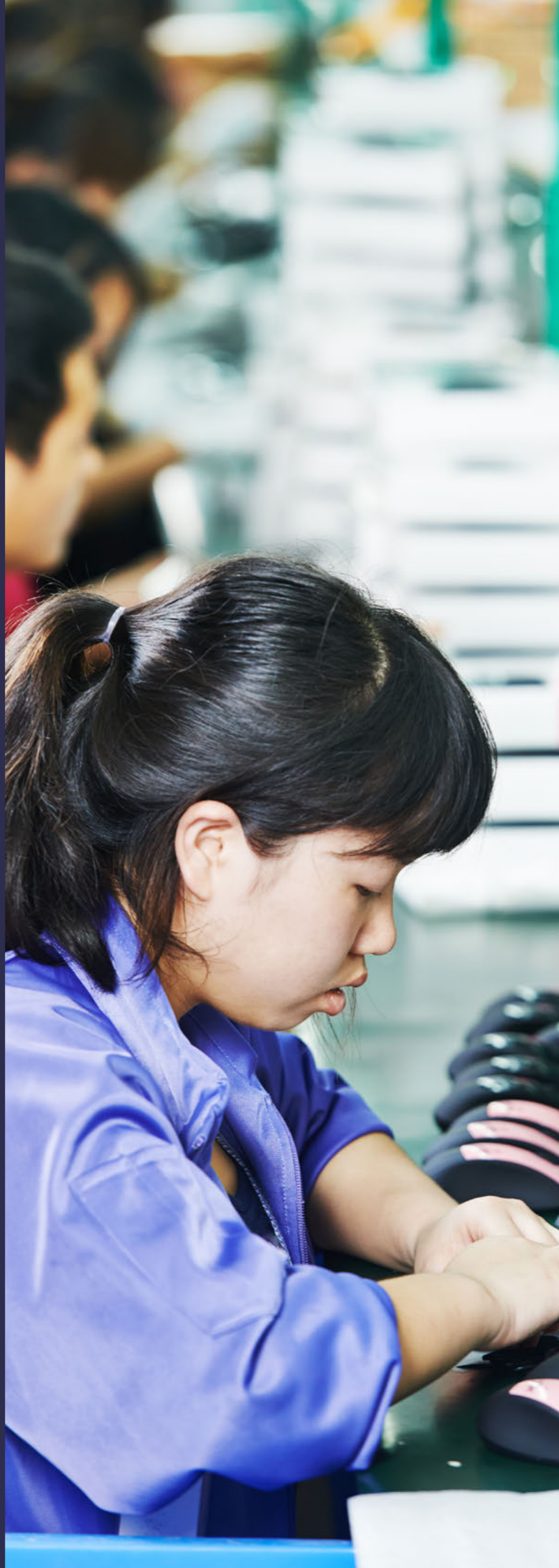
- Develop partnerships with social and localised circular economy stakeholders to co-formulate and evaluate circular economy policies.
- Create partnerships for data collection and analysis, revise international and national industrial classifications and find solutions to the omission of key circular actors/activities in current databases.
- Ensure circular economy advocacy is adding value to, and not competing with, existing well-established ‘green/’ climate’ partnerships.

This report outlines a growing body of evidence into how and under what conditions the circular economy could support decent work and address social inequities more broadly. It also identified gaps in the evidence base, which must be filled to inform truly transformational circular economy policy supporting a just transition for all. Alongside investment in more inclusive and participatory mechanisms to design and implement circular economy interventions and enabling policies across countries and global regions, the evidence base and tools for supporting these policies and interventions must be strengthened.

The circular economy has the potential to support the move to a low-carbon and more sustainable economy, in line with the principles of a just transition. Better evidence on how to create decent work in the circular economy is a vital step for this transition to be just.

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1. BACKGROUND

Circle Economy, the International Labour Organisation (ILO) and S4YE (a World Bank-led global programme) have come together to create evidence and tools to unlock the potential of the circular economy in promoting innovation, sustainable enterprise, and ensuring decent work for all.

This joint initiative—Jobs in the Circular Economy—was born from the need for better data and evidence to understand how the circular economy can lead to a more just and inclusive world. This concerns both global progress towards this goal and the challenges and opportunities posed in specific countries, sectors and value chains. As such, the initiative aims to develop comprehensive, consistent and compelling evidence on current work in the circular economy and support pathways towards more socially fair and just environmental and economic policies and interventions.

As the uptake of the circular economy gains momentum, a better understanding of what it entails for workers around the world must be built. This report is the first output under the Jobs in the Circular Economy initiative. Its objective is to provide an overview of the status quo and the existing evidence on decent work within the circular economy—to identify research gaps and leverage points for a just labour market in the circular economy. This report summarises the current state of circular economy discourse and how it relates to decent work. It describes the evolution of this research area and the main levels of analysis, as well as their application. Additionally, it explores key recurring themes found in research—as well as the corresponding research gaps that should be addressed.

The next step from this first report will include deep-dive studies into what the circular economy means for people and work in key value chains and countries. Alongside this, we will conduct a systematic review of methodologies used in modelling studies and develop indicators and models that build a comprehensive picture of work in the circular economy and the first authoritative review of jobs in the circular economy. We invite and encourage collaboration from stakeholders around the world on this initiative.

2 • CURRENT STATE OF THE CIRCULAR ECONOMY AGENDA

2-A

A CIRCULAR ECONOMY ROOTED IN INDUSTRIAL ECOLOGY

We are living in a time of rampant pollution and waste, resource scarcity, biodiversity loss and warming global temperatures. From wildfires and storms to floods and droughts, a cascade of alarming environmental events has swept the globe in recent years. It is 50 years since the landmark Club of Rome report, *Limits to Growth*, warned of the dangers of natural resource use and endless economic growth.¹ And in 2015, the *Paris Climate Agreement* established a ground-breaking and global vision for sustainable development. However, according to Circle Economy's *Circularity Gap Report 2022*, over the six years between the climate conferences of COP25 in Paris (2015) and COP26 in Glasgow (2021), 70% more virgin materials were extracted by the global economy. Latest estimates have found that the world has warmed 1.1 degrees since the pre-industrial era and that society also breached boundaries for extraction, consuming 100 billion tonnes of resources.²

However, rising material use and the pursuit of economic growth have not been found to reduce unemployment or inequalities.³ Partly due to the covid-19 pandemic aftermath, the global unemployment rate declined significantly in 2022 from 5.8%, or 205 million people, down from 6.9%, 235 million people, in 2020. At the same time, a multitude of socioeconomic challenges, accelerated by Russia's invasion of Ukraine, have fed into an economic contraction, and real GDP per capita growth has receded from 5% in 2021 to 2.2% globally in 2022.⁴

Moreover, the wealth gap between the rich and poor continues to grow: the richest 10% of the global population owns 75% of total wealth, against 2% owned by the poorest.⁵ Meanwhile, inflation and the increasing costs of living impact lower-income households the most, leading to a decrease in the real value of minimum wages in many countries.⁶ If we continue to consume beyond the limits of the planet and as global temperatures rise, poverty and inequalities are likely to increase. They will affect disadvantaged and vulnerable populations the most and in regions with disproportionately higher risks. Millions of people could be displaced by 2050 due to climate impacts on natural and human systems.⁷ Now that we have reached a world population of eight billion, the need for transformative systems change is even more pressing.



CIRCULAR ECONOMY INTERVENTIONS FOR CLIMATE MITIGATION AND CHANGE ADAPTATION

The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) stated—for the first time—that global warming is unequivocally driven by human activity. For the first time also, it highlighted the circular economy (Box 1) as an important mitigation approach, particularly when applied within cities.⁸

While the systems theory, which considers growth and energy dynamics in open and closed systems, can be traced back to 1950's,⁹ the concept of circular economy was first introduced in research in 1989.¹⁰ The concept has moved from the fringes to the centre of policy¹¹ and corporate discourse over the last 25 years, reflected in an increasing body of research dedicated to it.¹² However, its application for combatting socioeconomic issues remains far from being the norm.¹³

The circular economy is nature's equivalent of 'living within our means.' Just as living beyond our economic means can be risky and lead to issues that can affect our daily lives, living beyond our planetary means threatens the planet and how safely it can function. The circular economy can also be used to meet a more holistic set of needs in society, including socioeconomic goals.¹⁴ Many circular economy interventions can lower barriers to access to more sustainable solutions and increase community building. For example, the more efficient use of local resources, sharing of resources and the decentralisation of governance systems can support resource security and collective resilience.¹⁵ The cross-sectoral, interdisciplinary and systems approach of the circular economy requires new forms of collaboration to serve universal societal needs.¹⁶ Its mimicry of natural systems, such as nutrient-sharing networks and interconnectedness, can help facilitate respect, connection to and value for nature. Circle Economy's latest *Circularity Gap Report* finds that with circular economy interventions, we can fulfil people's needs with only 70% of the materials that we use globally today—within the safe limits of the planet. This one-third (34%) reduction can also keep global warming temperatures below 2-degrees.¹⁷

PERSPECTIVES ON THE CIRCULAR ECONOMY

A large body of research focuses on the circular economy as a pathway for economic prosperity and growth via resource use and efficiency.¹⁸ This includes research on how circular economy interventions can support material flows needed to keep society running—but with lesser environmental impact—and the environmental and economic impacts of circular business models.¹⁹ Yet, circular economy interventions will not support social equity by default. A growing field of study takes a critical perspective on the circular economy and its societal contribution potential.²⁰ It argues that current circular economy interventions and policies prioritise the attainment of environmental goals and are more focused on a technocratic agenda that develops strategies for industry and products. Social considerations are neglected: class relations and power asymmetries in the global economy, and the role of reproductive (or domestic work) in an economy that adopts circular strategies, for example.²¹

Within this field of research, four key narratives on the potential for a sustainable circular economy have been identified:²²

1. **The optimist narrative** implicitly links the circular economy to the betterment of decent working conditions.
2. **The reformist narrative** portrays the circular economy as a transformative process, which will unlock social benefits if certain policies are adopted.
3. **The sceptical narrative** argues that the circular economy is an elusive concept and calls for a radical rethinking of the underlying capitalist and consumerist paradigm.
4. **The agnostic narrative** mainly includes technical and descriptive studies, which rarely focus on decent work and other social considerations.

Regulatory pressure in the EU and other higher-income nations will trigger societal and ethical consequences as we move to circularity; blind spots, particularly on how countries in the Global South and emerging markets will be affected, must also be addressed.²³

BOX 1 • DEFINING THE CIRCULAR ECONOMY

While there is no single agreed-upon definition of the circular economy, the Ellen McArthur Foundation defines it as a system solution framework that looks beyond the current economy and its linear process of taking materials from the Earth, making products from them and throwing them away as waste.

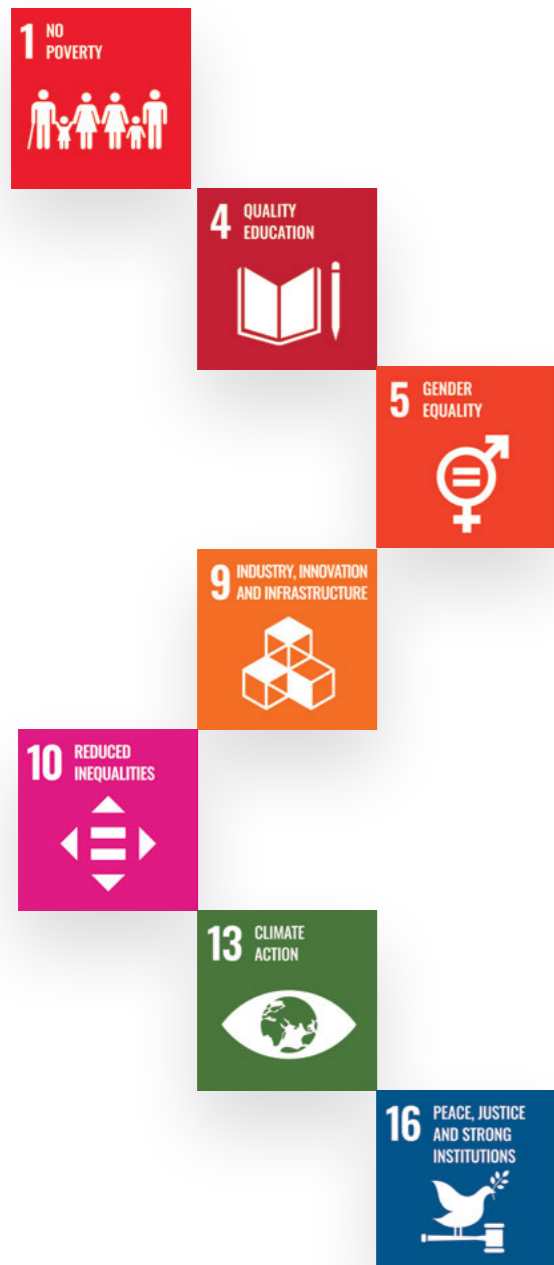
Underpinned by a transition to renewable energy sources, the circular model is based on three principles:

- Eliminate waste and pollution
- Circulate products and materials
- Regenerate nature

Source: Ellen McArthur Foundation.

Retrieved from: [Ellen McArthur Foundation website](#)

THE NEED FOR A SOCIALLY JUST CIRCULAR ECONOMY



First formulated by the ILO in 1999, the *Decent Work Agenda* was approved by State Members during the 2005 UN World Summit. It considers four pillars—employment creation, social protection, rights at work and social dialogue—crucial to support fair globalisation.²⁴ The decent work concept (Box 2) entered the EU development agenda in 2006 and was institutionalised in the ILO *Declaration on Social Justice for a Fair Globalization*.²⁵ During the UN General Assembly in 2015, decent work and the four pillars of the Decent Work Agenda became integral elements of the new 2030 Sustainable Development Goals (SDGs).²⁶ Additionally, in 2015, the ILO developed guidelines for a just transition towards environmentally sustainable economies and societies.²⁷

In 2017, the European Consensus on Development aligned the EU's development policy with the UN 2030 Agenda for Sustainable Development. The 8th SDG focuses on ensuring full, productive, and decent employment, universally and inclusively.²⁸ On the other hand, decent work is directly and indirectly linked to, amongst others:²⁹

- **SDG 1 on poverty eradication**
- **SDG 4 on education**
- **SDG 5 on gender equality**
- **SDG 9 on innovation and infrastructure**
- **SDG 10 on non-discrimination**
- **SDG 13 on climate action**
- **SDG 16 on just and peaceful societies**

Sustainable development includes three dimensions: environmental quality, economic prosperity and social equity. The circular economy can be used to operationalise multiple SDGs.³⁰ As part of this, it is vital to ensure that progress towards individual goals does not create trade-offs for progress towards another. For example, SDG 12 on responsible production and consumption and SDG 8 on decent work and economic growth.^{31 32}

DUAL CHALLENGES: HUMAN CAPITAL REQUIREMENTS AND HUMAN IMPACTS OF THE CIRCULAR ECONOMY

The circular economy is increasingly used to achieve desired socioeconomic outcomes—as described in the SDGs—within planetary boundaries.³³ When framed as a means to an end,³⁴ the circular economy can be implemented within various socioeconomic frameworks and meet ambitious and wide-ranging development objectives, such as improved industrial competitiveness³⁵ to promoting social inclusion³⁶ and ensuring sustainable livelihoods.³⁷ Treating the social dimension of the circular economy as a secondary consideration—as it has been to date—comes with risks.

People are essential for driving circular economy interventions. Without a skilled workforce, strategies to tackle environmental issues and achieve environmental targets cannot be adopted: textile waste cannot be sorted, buildings cannot be retrofitted and innovative methods to extend the lifetime of products cannot be explored.³⁸ Additionally, failing to comprehensively understand the circular economy's social dimension also risks exacerbating outcomes for people.³⁹ We should be cautious not to conflate jobs that are 'good for the environment' with 'good for workers':⁴⁰ the circular economy may create several 'green jobs' (Box 3), but these are not guaranteed to be of better quality.⁴¹ For instance, many early-stage circular interventions like waste collection, sorting and recycling in the Global South are often described as low-quality and demanding.⁴²

BOX 2 • DEFINING DECENT WORK

According to the ILO definition, work is considered decent when...

...it pays a fair income

...it guarantees a secure form of employment and safe working conditions

...it ensures equal opportunities and treatment for all

...it includes social protection for the workers and their families

...it offers prospects for personal development and encourages social integration

...workers are free to express their concerns and to organise

Source: International Labour Organization. Retrieved from: [ILO website](#)

Global second-hand trade is a phenomenon increasingly referred to as 'waste colonialism'⁴³: how implementing circular economy interventions such as reuse and recycling efforts in the Global North can undermine the quality of jobs and livelihoods in the Global South. This is worrisome as these jobs are labour-intensive in nature, and some are conducted in conditions that can expose workers to hazardous working environments—exposure to toxic materials, little to no social protection, and a lack of stable or living wages, for example. It is said that this phenomenon could even impede Global South countries to become more circular, a trend which could be further amplified as many new circular business models and strategies rely on extensive technology and data infrastructure, thereby potentially limiting the equitable access and availability of circular products and services for people around the world.⁴⁴

Ultimately, more comprehensive and compelling evidence on circular economy interventions is needed to unlock the potential of the circular economy and address growing inequalities to promote climate justice. This includes their impact on employment and other socioeconomic outcomes in different socio- and geopolitical contexts.



3 • CURRENT STATE OF THE CIRCULAR ECONOMY AGENDA

BOX 3 • DEFINING GREEN JOBS

The ILO defines 'green jobs' as jobs that contribute to preserving or restoring the environment, be they in traditional sectors such as manufacturing and construction or in new, emerging green sectors such as renewable energy and energy efficiency.

Green jobs help...

- ...improve energy and raw materials efficiency
- ...limit greenhouse gas emissions
- ...minimise waste and pollution
- ...protect and restore ecosystems
- ...support adaptation to the effects of climate change

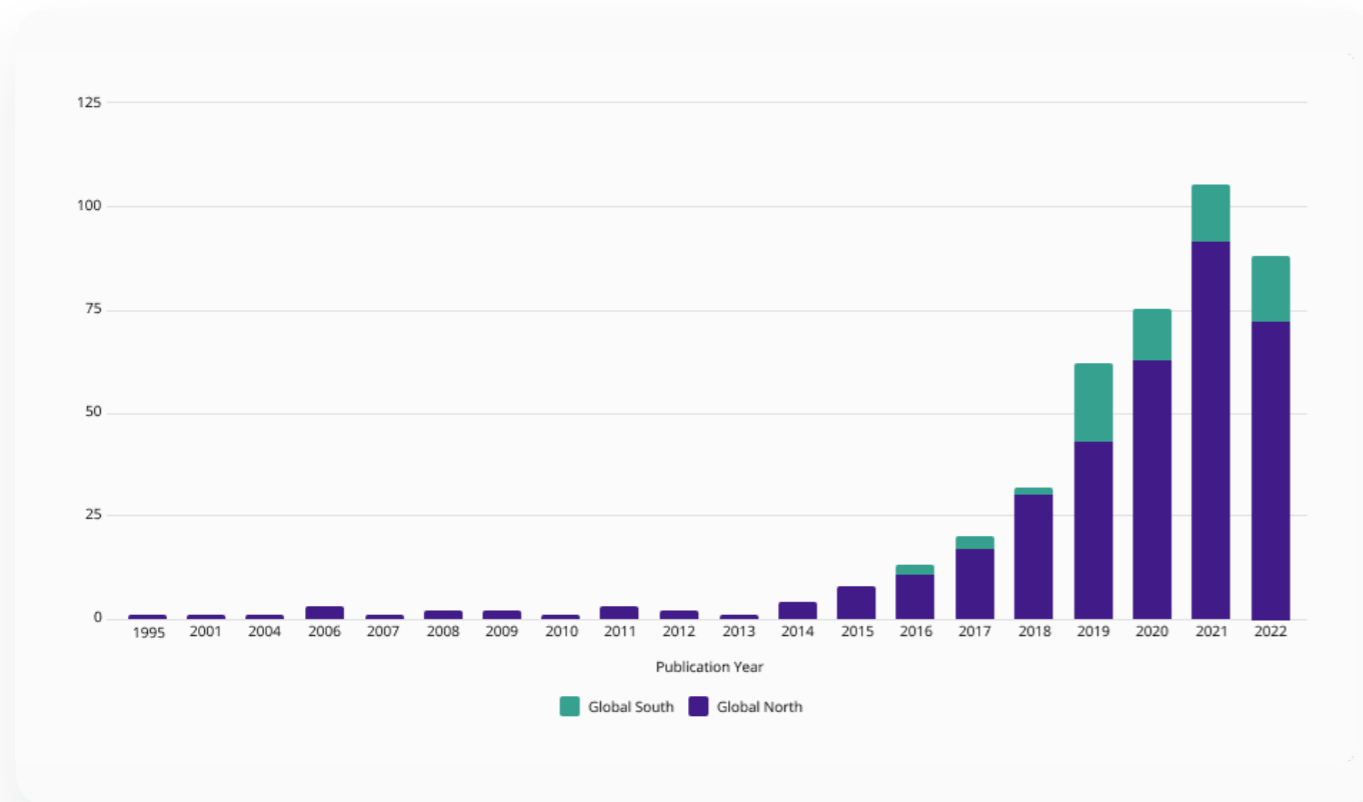
Source: International Labour Organization.
Retrieved from: [ILO website](#)

LITERATURE LANDSCAPE

3.A.1 EVOLUTION OF THE RESEARCH AREA

To create an overview of current understandings of decent work in the circular economy, we reviewed research that considered both decent work and the circular economy between 1995 and 2022 (Appendix). In total, 425 academic publications were found and reviewed from a total of 30,543 academic publications on the circular economy.

FIGURE 1 · Publications that combine decent work and circular economy concepts between 1995 and 2022
from the perspective of countries in the Global North and the Global South.



Between 1995 and 2014, decent work in the circular economy was still a nascent area of research (Figure 1). The first academic article was written in 1995 by Renstrom and Roszbach and focused on a new economic arrangement based on employee share ownership. It explores the sharing economy and trade unions' role in wage negotiations and in leading to an equal distribution of stock capital.⁴⁵ This body of research has significantly increased between 2019 and 2022—peaking at 105 publications in 2021. While this trend demonstrates a growing interest in how decent work can be achieved in the circular economy, 425 publications represent only 1.39% of the total number of circular economy publications between 1995 and 2022. This supports the view that the socioeconomic dimensions of the circular economy are still less understood compared to its environmental benefits.

The general geographic focus and sectoral perspective in the studies are narrow:

- 84% of the academic literature reviewed covered the Global North.
- Publications that had an explicit focus on the Global South were predominantly focused on the waste management sector (53 publications), compared to five publications focused on a country or region and their role within global circular value chains.
- Publications on the circular economy in the Global South were unevenly distributed: 11 were focused on India, seven on Brazil, seven on Nigeria and two on Ghana.
- Sub-Saharan Africa, East Europe, and the Middle East and North Africa were the least represented regions.

LITERATURE LANDSCAPE

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MAIN LEVELS OF ANALYSIS AND THEIR APPLICATION

In addition to the 425 academic publications, 80 reports and articles were also reviewed (Appendix). This brings the total number of publications reviewed to 505. Across all publications, three main levels of analysis—micro,⁴⁶ meso⁴⁷ and macro⁴⁸—were identified (Table 2). The majority were focused on macro-level analysis (80%), compared to 11% for micro-level and 9% for meso-level. Table 2 provides an overview of the three levels of analysis and summarises their focus, the data that was collected, the research methodology used and examples of their primary applications.



TABLE 2 · Overview of the three levels of analysis · micro, meso and macro

used to explore decent work in the circular economy

MICRO-LEVEL ANALYSIS			
FOCUS	DATA SOURCES	METHODOLOGY	PRIMARY APPLICATION
The social impact of circular products, companies and consumer choices or in-depth case studies on the (lack of) social or decent work considerations of specific circular activities	Eurobarometer Flash 456, firm-level Survey Data e.g. Eurostat's Community Innovation Survey (CIS), Material Circularity Indicators (MCI)	Qualitative: case studies, interviews, focus groups, discussions and mixed-methods approaches Quantitative: (Social) Life Cycle Assessments and Material Flow Analysis (MFAs), econometric modelling	Product or company assessments which include social considerations such as employment, community impact performance and impact of circular businesses
GAPS	<p>Quantitative company-level analysis studying the effect of circular economy interventions on employment are scarce: only four publications in scope were found. These studies used econometric regression analysis for the employment estimates.</p> <p>As corroborated by previous studies,⁴⁹ the assessment and monitoring of circular interventions is a nascent, yet growing, field, and the relevant indicators appear to be limited. This is potentially due to:</p> <ul style="list-style-type: none"> • Circular economy indicators being used to predominantly monitor economic business performance (for example, key performance indicators) and environmental indicators. They have not yet connected to social progress or outcome indicators. • Most circular indicators related to employment and decent work are still in the early stages of development and are not used widely. 		

MESO-LEVEL ANALYSIS			
FOCUS	DATA SOURCES	METHODOLOGY	PRIMARY APPLICATION
Developing a broad understanding and impact assessments on circular businesses on employment via industrial symbiosis initiatives, such as eco-industrial parks and industrial clustering within a sub-region	Survey questionnaires, interviews, firm-level survey data, I-O tables, for example, UK Government's Office for National Statistics (ONS) Business Register Employment Survey (BRES)	Empirical: LCA, Input-Output (I-O) models, network analyses, interviews and surveying, case study approach or mixed-methods approach Conceptual/theoretical studies linking circular economy interventions with sustainable industrial development Literature reviews on circular economy sector studies or on industrial symbiosis as a circular economy intervention in Europe	Action-oriented: aimed at informing industrial policies or private/industrial sector(s) insights into future growth avenues. Some studies are more theoretical and thus are well suited for the academic realm
GAPS	<p>There were 45 Meso-level publications. They mainly focused on the employment potential or occupational health and safety standards (OSH) considerations within particular sectors or industrial clusters. The most recurring sectors were electronics, agri-food, plastic, and green remanufacturing. Only three publications briefly mentioned decent work as an impasse, which was presented as a relevant consideration when pursuing SDG 8.^{50 51 52}</p>		

MACRO-LEVEL ANALYSIS			
FOCUS	DATA SOURCES	METHODOLOGY	PRIMARY APPLICATION
<p>Focus is wide-ranging: (a) quantifying the impact of circular policies on material consumption and environmental footprint in various contexts or (b) non-quantitative studies that review existing literature or (c) on the relevance of and advocating for the social dimension or decent work within a circular economy; ranging from concerns of well-being and exploitation to collective bargaining and wages improvements</p> <p>The geographical focus ranges from country-level, multi-country, regional or global</p> <ul style="list-style-type: none"> • Due to limited data in many countries, regional and global studies tend to rely on data from a comparable country to other countries of the region by grouping or using a data-rich country for the totality of a regio 	Quantitative: Eora MRIO database, MRIO database EXIOBASE/v.3 (outside Europe), GTAP/GTAP-circular economy databases, National Labour Surveys, Eurostat circular economyIndicators, or PSILCA & Social Hotspot Database	<p>Conceptual or theoretical approach: systems thinking, discourse analysis, and political economy approaches</p> <p>Literature reviews: systematic literature, bibliometric reviews, or meta-regressions</p> <p>Macroeconomic scenario modelling⁵³ rely on ex-ante impact assessments with specific assumptions and informed by policy scenarios</p> <ul style="list-style-type: none"> • Most common macroeconomic models are E3ME model or GINFORS • Computable General Equilibrium (CGE) are mostly static, yet there are new dynamic CGEs. • Static Single/ Multi-regional (I/O) modes are popular and have high internal consistency 	<p>Inform and influence policy decisions and public debate. Although theoretical or conceptual research can have an advocacy component, its sphere of influence is within academia or research organisations.</p> <p>Macroeconomic models are mainly used for the short and mid-term analysis of macroeconomic policies.</p> <p>The new dynamic CGE scenario models are economy-wide and offer more reliable results to policymakers.</p> <p>Static I/O models are generally less costly and can be 'extended' in larger CGE models to include socio-environmental aspects for policy assessment reports.</p>
GAPS	<p>19 of the publications in scope focused on macroeconomic modelling of the employment changes of circular economy interventions. However, only one publication considered future circular scenarios and their effects on decent work. It focused on the textiles and clothing sector.⁵⁴ Other studies briefly mentioned the importance of labour standards compliance and ensuring decent working conditions along value chains in specific regions.</p> <p>No robust ex-post modelling efforts and subsequent publications were found on the socioeconomic consequences of circular economy policies at a country- or regional-level, probably due to insufficient ex-post data for empirical assessment.</p> <p>According to an article from 2018 on existing circular modelling, not a single regional assessment was conducted in countries with large extractive sectors. This is a literature gap which persists in early 2023.⁵⁵</p>		

DATA COLLECTION, QUALITY AND METHODOLOGICAL APPROACHES

A comprehensive and compelling evidence base is critical to ensure an up-to-date and accurate understanding of the impacts of circular economy interventions in different contexts and the conditions needed for decent work and just transition.

LACK OF DATA ON SPECIFIC ISSUES

While central to the circular economy, the contribution of atypical and often informal workers is underestimated in current studies. Data on these types of workers, and on formal actors like social enterprises and non-profit organisations active in repair and reuse, is rarely captured in national labour statistics, surveys, circular modelling studies or impact assessment reports.

LACK OF DATA GRANULARITY

The lack of a standardised definition of the circular economy and the widespread use of rigid industrial classifications databases hinder granular understandings of employment in established circular sectors (such as waste management). This also makes it difficult to capture circular activities in other less established circular sectors, such as repair and reuse. The lack of granularity is heightened in countries where statistical capacity is lower or where global databases (such as EXIOBASE) don't cover the complexity of economies, such as in OECD countries.

Most of the global or regional coverage of circular macro modelling is obtained by extrapolation or inference of similar-country comparisons—at the expense of in-country accuracy and sectoral nuance. This data limitation explains why comprehensive studies on circular economy employment dynamics are absent in non-EU countries and regions. Despite the growing implementation of the circular economy

in policy, there is a lack of robust empirical assessment studies focused on the ex-post analysis of their socioeconomic impact. For example, the local, regional, national and global implications of implementing circular trade policies lack monitoring. Established policies on technological change and resource taxes are considered, but not yet measures such as disposal bans, recycling quantity standards, Extended Producer Responsibility schemes, eco-design standards, or green public procurement.

ISSUES WITH DEFINITIONS IN DATA AND CLASSIFICATIONS

The availability, robustness, reliability, and coverage of data used to conduct baseline employment and circular activity analysis is a significant limitation in the field of study. The effectiveness of the model is based on its ability to discriminate—separate data into classes—and be well calibrated—the latter referring to how the model predicts what is observed, thus relying on quality baseline data.

Most popular circular economy modelling approaches use assumptions to define their baseline scenario. Yet, these assumptions are not often explicit, do not distinguish between economic output and material use, or are not informed by new policy measures.

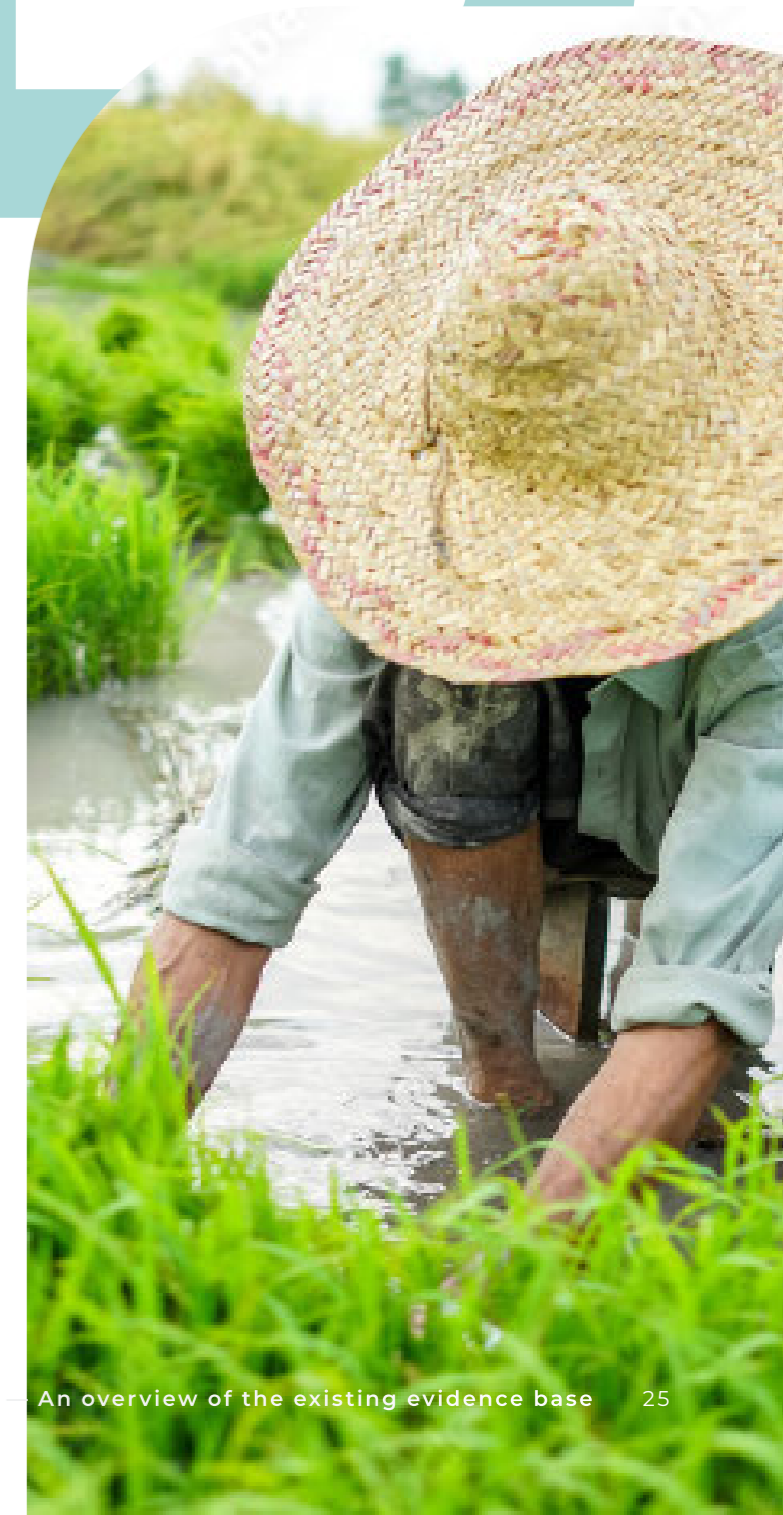
Assumptions on consumer preferences (towards more sustainable choices) and the success of exogenous soft future policies without any causal explanations are among the unvalidated assumptions made by circular modelling approaches.

No modelling studies reviewed considered decent work indicators in their future scenarios. Also, current circular economy modelling studies do not consider how different regions and countries will be affected by circular economy policy measures and the diversity of circular measures beyond the EU-led circular economy agenda. Only one study considered circular economy policies implemented globally or outside the EU in their circular economy scenarios.⁵⁶

3

KEY THEMES UNDERPINNING DECENT WORK IN THE CIRCULAR ECONOMY

Five key themes underpin decent work in the circular economy, according to our review. These themes represent some of the key opportunities and challenges that should be considered for the circular economy to lead to a more just and inclusive society. These themes are outlined alongside related research gaps and limitations that require addressing in order to advance understanding and action in relation to these themes.



LABOUR MARKET AND SECTORAL TRANSFORMATION



VARIABLE NET EMPLOYMENT ESTIMATES

As shown in Table 3, employment and job creation are often described as the most important social contribution of the circular economy. Numerous studies conclude that the net employment effects of the circular transition of renewable energy will be positive.^{57,58} Yet, estimates vary—from optimistic to less optimistic outcomes—depending on the applied methodology. Such discrepancies can be due to the choice to include environmental tax reform in policy scenarios, the estimated shift of economic activity to sectors with higher labour intensities, and the modelling studies' overall heterogeneity. Two of the most prominent global employment assessment studies on the circular transition were written by the ILO (2018)⁵⁹ and updated in 2019⁶⁰ and the OECD (2020).⁶¹ Despite being conducted within a year apart, these studies found diverging magnitudes for job creation. This was due to the organisation's different approaches, particularly their views on what defines a circular transition, the countries covered, the granularity of the data used, and the underlying assumptions and fiscal policy options used in their future scenario modelling.

The ILO report states that a global circular economy scenario will create a net total of seven or eight million new jobs by 2030. The study assumes a consistent 5% increase in the recycling of a select number of materials and, unlike the OECD report, it did not consider potential fiscal responses. Finally, while this study used more desegregated industry data, it covered fewer countries than the OECD study.

The OECD report states that the global reallocation of jobs due to material fiscal reform policies (promoting resource efficiency and the transition to a circular economy) will create a marginal net of 1.8 million new jobs by 2040.

Only one reviewed study found overall global negative employment effects for two circular strategies:⁶² Product lifetime extension and Resource efficiency. Yet their static I-O modelling did not include changes to investments, prices or fiscal stimuli.

TABLE 3 · Summary of studies on employment effects of the shift to the circular economy

AUTHOR	REGION	ESTIMATED NET CIRCULAR EMPLOYMENT EFFECT	TIMELINE	KEY TAKEAWAY
DONATI ET AL, 2020	Global	-5.3%	N/a	Circular economy interventions can deliver environmental benefits The analysis of socioeconomic indicators showed global reductions of 6.3% in Gross Value Added and 5.3% in Employment globally Fiscal stimuli (subsidies or tax changes), investment and price changes were not included
WIEBE ET AL, 2019	Global	+2.4%	2030	Global material extraction is reduced by about 10%, while the impact on employment is small but positive The shift from resource extracting sectors to the service sector will provide more opportunities for highly skilled and female workers
WILLENGHEMS AND BACHUS, 2019	Flanders	+31,000	2030	Scenario limited to shift of metal and electro sector Data analysis indicates that the group of non-working job seekers is disproportionately made up of low-skilled labour and other vulnerable groups, such as older workers, long-term unemployed, non-natives and people with an occupational disability Transition to a more circular economy is expected to positively affect employment for these vulnerable groups and reduce overall unemployment
ILO, 2018	Global	+6,000,000	2030	Almost 6 million jobs can be created by moving from a linear to a circular model It means a reallocation from the mining and manufacturing sectors to waste management (recycling) and services (repair, rent) The scenario includes only recycling of plastics, glass, wood pulp, metals and minerals
COATS AND BENTON, 2015	Italy, Poland, German	+89,000-199,000, +68,000-124,000, +122,000-287,000	2030	There are significant links between the development goals of the water-sewage-sludge sector and the circular economy The circular economy creates new opportunities for water-sewage and sludge management at the local and national level
MORGAN AND MITCHELL, 2015A AND 2015B	UK	+54,000-102,000	2030	Growth in the circular economy can be expected to have lasting beneficial effects on the labour market Circular activities can be relatively intensive in their use of labour, compared with the activities they replace They can create dispersed employment that could potentially be undertaken by those currently unemployed, or those losing mid-level skilled positions due to industrial change

Additionally, the labour implications of the circular transition can manifest differently between and within countries and sectors. According to global and regional studies, transitioning to a circular economy would generate small, 0-2%, net employment improvement.⁶³ Yet, other studies disclosed more optimistic or pessimistic estimates—some even predicting how local economies which are dominated by material-intensive sectors will experience significant losses relative to countries with less dependence on material extraction and processing.⁶⁴

Policy reports tend to present net employment creation more positively than academic studies. This may be because policy reports commonly use I-O methods, which are less computationally complex and have fewer data requirements compared to, for example, computable general equilibrium modelling. These methods do not include induced round effects related to fiscal and labour income reallocation, resulting from price changes in conventional energy sources and increased capital investment in renewable energy, which can lead to fewer capital investments in other parts of the economy.⁶⁵ A more nuanced view of these systematic differences between these two types of reports is needed, in particular regarding coverage, databases used and methods employed.

There is no agreed-upon, exact and quantifiable figure regarding the impact of the circular economy on employment. However, the direction and policy enablers required to ensure an inclusive employment transition have become central to stakeholders in the private sector,⁶⁶ in the new EU Circular Economy Action Plan,⁶⁷ in global policy discussions⁶⁸ and in global research networks.⁶⁹ According to an EU article in 2020, the circular economy could support resilient growth by creating at least one million new jobs at all skills levels.⁷⁰ In addition, there is increased interest in the socioeconomic impact of the circular economy on local economies and in how proactive policy measures, such as sectoral redeployment strategies, can smoothen the transition.⁷¹ In 2020, an analysis of job opportunities resulting from the circular economy revealed that when policies that tackle material consumption are combined with tax reform, there is a net positive employment effect.⁷² The proposed 'material fiscal reform' policy package in the study consisted of a

gradual implementation of excise taxes on metal and non-metallic mineral ores—which can fund subsidies for recycling and for supporting secondary metal productions as the economy matures. These subsidies on recycling and on reprocessing recycled materials help mitigate the negative employment effects of the primary materials taxes.

EMPLOYMENT CHANGES ACROSS REGIONS AND SECTORS

While the uptake of circular economy interventions can boost net employment, it will likely be unevenly distributed across geographies and within regions. The comprehensive 2018 ILO study found that the global circular economy scenario will induce sectoral reallocation with varying effects across regions. Due to new jobs in the recycling and reprocessing of secondary materials (for example, metals, plastics, glass and pulp), global employment growth was estimated to be driven mostly by Latin America and the Caribbean (over 10 million jobs) and Europe (around 0.5 million jobs).⁷³ Moreover, most of the global employment growth was found in the service sector, increasing the share of female workers while also resulting in a small increase in the number of own-account and contributing family workers. In contrast, net employment losses are expected in Asia and the Pacific (around 5 million jobs), Africa (around 1 million jobs) and the Middle East (around 200,000 jobs) if no action is taken to promote economic diversification and active redeployment strategies. It is important to remark that this is one of the very few studies to consider the employment effects of a transition to the circular economy on a global scale.⁷⁴ This identified research gap is significant since while the circular economy agenda is being formulated and executed locally, its direct and ripple effects on employment will affect global value chains.

In Europe, the circular economy aims to revitalise cities and their potential to strengthen local economies and local employment.⁷⁵ This approach is mainly driven by the increased demand in service activities related to maintenance, recycling, repair and reuse as they are particularly labour-intensive and highly embedded within the local economy. Such activities can create more localised economies through clusters

of closed-loop value chains, offer local employment to peri-urban workers and ensure that economic gains at regionally dispersed.⁷⁶ Although approximately half of the world's population currently lives in urban areas, and this may rise to almost 70% by 2050,⁷⁷ only 11 studies address the employment impact of the circular economy on cities. Despite the latest 2022 IPCC report,⁷⁸ which places the circular economy interventions at the city level as a key mitigation strategy to reduce greenhouse gas emissions, social blind spots are not being included in the current discourse.

Sectoral employment estimates, such as the total size of the labour force, the number of locally created jobs and whether a region is already economically depressed, all play a role in determining whether circular economy measures will lead to local economic multiplier effects. Yet, only four identified scenario modelling studies provided insights on the sectoral reallocations of jobs in a circular economy: two focusing on the global economy⁷⁹⁻⁸⁰ and two on the EU region.⁸¹⁻⁸² All four studies predict job losses in sectors that produce and process raw materials (for example, construction, non-metallic minerals, electronics and motorised vehicles). Meanwhile, the reprocessing of secondary steel, waste management, and repair sectors were estimated to receive the most new jobs. However, the magnitude of these negative sectoral employment effects is variable. They depend on the degree to which raw material-dependent sectors proactively engage with re- and up-skilling, resource efficiency improvements, and the extent to which they adopt circular strategies.

Furthermore, based on the publications reviewed, there appear to be few reflections on the different sectoral shifts conditional to the contextual, economic and political realities across countries—and, consequently, the variety of possible circular pathways. This is particularly important as circular economy frameworks are based on a consumption-driven economy, but many circular activities, particularly in the Global South, are based on a production-driven—export and raw material extraction—economy.

On the other hand, the most researched region that is expected to benefit the most in terms of net employment gains is the EU, which would benefit from the 'first mover advantage' compared to the rest of the world. The main drivers of this advantage are the increased technological gains coupled with fiscal material tax reforms, which result in improved resource efficiency and successful sectoral redeployment strategies. This leads to overall increased international competitiveness and is based on the assumption that the resource efficiency of 'the rest of the world' does not change.⁸³⁻⁸⁴

Overall, most of the research found agrees that circular employment opportunities will come predominantly from jobs involved in core circular jobs,⁸⁵ which include activities to enable maintenance, recycling, repair and reuse.⁸⁶ Still, employment benefits remain underestimated. Only the sectors of the economy that are critically interlinked with core circular activities are being researched⁸⁷—either as direct enablers of circular jobs, such as circular equipment engineers or digital information managers or indirect enablers, such as education, reverse logistics and transportation sectors.⁸⁸ This is partly due to the classification of sectors within the data sets used in many studies.

INFORMALITY AND THE CIRCULAR ECONOMY

A PERSPECTIVE BASED ON THE GLOBAL NORTH

Many current circular economy discussions, studies and policy approaches are based on the premise that the economy is part of a regulated formal economy. Thus, the involved stakeholders and the data sets used for estimates are often from—and biased towards—the Global North. That is despite circular economy interventions being commonplace in the Global South and largely operating within the informal economy⁸⁹—particularly within the reuse, repair, waste collection and recycling sectors. This set of locally embedded and predominantly informal activities in low-income contexts has been coined as a ‘necessity-driven based circular economy’.⁹⁰

Circular interventions in such contexts are intertwined with the informal economy, defined by Women in Informal Employment: Globalizing and Organizing (WIEGO)—a global network of activists, researchers, and development practitioners advocating with the working poor in the informal economy—as consisting of a diversified set of economic activities, enterprises, jobs and workers that are not regulated or protected by formal arrangements.⁹¹ The ubiquitous nature of these large informal sectors has become more visible through interventions and research into higher-income countries’ export of textiles,⁹² e-waste and plastics to these regions.^{93,94} The size of the informal economy is large; it is estimated to employ 60% of the world’s population, including 80% of enterprises worldwide.⁹⁵ Thus, while the informal economy forms the largest proportion of the global economy—expected to play a critical role in the circular economy transition—it is not sufficiently included in the circular economy agenda.⁹⁶

Box 4 · INFORMAL ECONOMY IN THE GLOBAL SOUTH

Excluding the agricultural sector, the share of informal employment ranges from 17% in high-income countries to 59% in middle-income countries and 73% in low-income countries.⁹⁷ Globally, informal circular activities are mainly concentrated in urban areas, and the most common informal circular job is waste picking. It is estimated that there are 11.4 million waste pickers⁹⁸ worldwide—a figure which previously ranged between 12.5 and 56 million.⁹⁹

In India, 0.1% of workers are informal waste pickers who collect and process roughly 80% of waste.¹⁰⁰ Each year, 30,000 informal workers dismantle abandoned oil tankers for scrap metal in Bangladesh. Meanwhile, ride-sharing companies like Uber compete with informal minibus services in cities such as Addis Ababa, Nairobi and Jakarta.¹⁰¹ In Nigeria, while the total number of people working informally in the global e-waste sector is unknown, the ILO estimates that up to 100,000 people are thought to be working in the informal e-waste sector, while in China, that number is thought to be 690,000.¹⁰²

CIRCULAR ECONOMY ACTIVITIES WITHIN THE INFORMAL ECONOMY

Waste picking provides important economic opportunities to people with low formal skills and education, and no alternative sources of income.¹⁰³ For example, circular economy activities related to the bio-compost of coffee waste can financially support communities surrounding coffee industries. Alongside economic benefits for individual farmers and other workers, in value chains like agro-food, circular economy activities can support innovation and economic growth in local regions.¹⁰⁴

However, informality in the Global South can be problematic. Poor working conditions, and the associated health and environmental hazards, can be prevalent. Further problems come from the transboundary movement of waste and second-hand goods from the Global North to countries that do not have adequate waste management infrastructure. This is also affected by trade regulation. As companies must be registered to export materials under the Basel Convention, the informal economy itself has no access to the export market and its potential economic benefits. A dynamic that is further heightened by insufficient human rights due diligence monitoring at the firm-level, all of which are based on voluntary reporting by companies.¹⁰⁵ Also, informality and social exclusion are often mutually reinforcing realities.

It is also worth noting that informal employment involved in circular activities is also present in the Global North and not only a Global South issue. Migrants with irregular employment status or socially disadvantaged workers often work in high-income countries' waste management and recycling sectors, for example.^{106 107} In recent years, informal work has been driven by economic recessions and crises combined with the changing nature of work arrangements, such as flexibilisation and overall precarious employment—usually held by vulnerable groups with insecure jobs and few entitlements to income support.^{108 109}

Research also indicates better working conditions are possible in the informal sector. In Dar es Salaam, Tanzania, waste pickers earn about 108 U.S. dollars on average per month, 40% higher than the national minimum wage for formal employment.¹¹⁰ Waste pickers in Brazil and India are well organised into cooperatives and associations recognised by the authorities and the public,^{111 112} leading to better working conditions and, in some cases, increased income.¹¹³

As there is a growing acknowledgement of how vital the informal economy is for circular interventions, literature on the informal economy is often guided by the implicit assumption that the informal sector hampers the pursuit of decent work improvements and therefore advocates for formalisation policies. While the informal sector could benefit from improved working conditions, decent work should be pursued in all parts of the economy—including the informal economy.

KEY THEMES UNDERPINNING DECENT WORK IN THE CIRCULAR ECONOMY

3·B·3

WORK REALLOCATION AND SKILLS DEVELOPMENT

WORK REALLOCATION

The successful reallocation of workers from linear to circular sectors is often presented in the literature as dependent on the workforce's access to training and related policy measures. According to ILO estimates, the circular economy transition, along with the energy transition, would lead to only 2% of the existing jobs globally being at risk of disruption. The transitions would also potentially create over 100 million new jobs depending on training and skills interventions. The same report also highlights that current linear sectors, such as construction, transport and certain areas of energy, are male-dominated mid-skill occupations, which will have the greatest need for reskilling and upskilling to enable them to tap into new job opportunities.¹¹⁴



KEY THEMES UNDERPINNING DECENT WORK IN THE CIRCULAR ECONOMY

3·B·4 --- **WORKING CONDITIONS AND SOCIAL DIALOGUE**

A 2021 study on the skilling implications of the European labour market foresees an increase in mid-level qualifications and expects that only a few skills will become redundant.¹¹⁵ Instead of workers needing to adopt an entirely new set of skills to work within the circular economy, ongoing training to keep skills up-to-date and to up-skill across occupations will be more important.¹¹⁶ ¹¹⁷ One study found that circular jobs require significantly more work experience and training than other occupations, mainly due to the skills needed for certain circular activities (for example, sorting, repair, redesign). Thus, educational pathways in the circular economy will require both practical and vocational modes of learning, higher education and lifelong learning across all fields.¹¹⁸

The omission of key dimensions of decent work is particularly acute when considering job redeployment strategies to ensure a just transition. Current circular policy prescriptions and analyses do not seem to consider key stakeholders and actors or incorporate decent work pillars and mechanisms for a just transition.

TYPES OF SKILLS IN THE CIRCULAR ECONOMY

Gaining the deep skills required for circular economy interventions can be challenging, as it relies on employers' and educational institutions' knowledge of circular business models and their ability to reflect the demand for knowledge and skills in their training and curricula. This can result in a 'deep skills' gap in the workforce which can be a barrier towards greater implementation of circular economy business models and reallocating workers.¹¹⁹ This skill gap can be more significant in many lower-income countries, where there is less public investment in tertiary education and additional barriers to vocational training offerings.

A recently published World Bank analysis reported that labour market effects induced by the circular economy transition would have a skills bias. Circular business models, like reverse logistics, resource sorting, and product refurbishing, require an initial endowment of soft and technical skills.¹²⁰ This can be challenging for countries with higher concentrations of unskilled workers, for example, in the four Eastern European member states of Bulgaria, Croatia, Poland, and Romania.¹²¹

The discussion on skills required for the circular economy in the literature differs by geography. First, 'capacity development' is the dominant terminology in the context of the Global South, compared to 'upskilling' in the Global North. Studies also tended to focus on promoting knowledge of the circular economy through development aid, and efforts are mainly aimed at skilling the unskilled labourers in the informal waste management sectors in the Global South. These efforts largely aim to provide legal training and technical skills to improve operations.¹²² Finally, while the importance of digital skills is often acknowledged as a critical capacity to develop for all workers,¹²³ ¹²⁴ the specific digital skills and technological capabilities required for circular economy interventions in the Global South is an understudied area. A recent study on Latin America emphasised the critical role of higher education institutions (HEIs) in the Global South in conveying circular knowledge and in embedding imported frameworks to existing local circular practices.¹²⁵

While the circular economy policy agenda depends on skilling and capacity building, the wide-ranging scope of circular sectors and activities makes it particularly challenging to develop comprehensive skill mapping and re-skilling programmes. Specifically, concerning technical skills development in low-income countries, there needs to be more understanding of the skills required for remanufacturing and related sectors.

POVERTY ALLEVIATION

The circular economy has been proposed as a solution to eradicate poverty (SDG 1), by a few academics and practitioners, mainly due to its job creation potential and its ability to support a sustainable economic growth trajectory decoupled from material extraction.¹²⁶ Still, the discussion on poverty alleviation resulting from the circular economy has been marginal to date.¹²⁷ Only a few studies examine whether and/or how a circular economy can alleviate poverty through better wages, working conditions and worker protection, and create economic benefits for vulnerable communities, especially in the Global South, within the wider framework of SDGs.

OCCUPATIONAL SAFETY AND HEALTH

Most occupational health and safety concerns relating to circular economy activities are associated with the global waste trade and second-hand goods flowing from Global North to Global South countries. These flows are driven by high costs of waste management domestically, loopholes in global waste and second-hand goods legislation,¹²⁸ ¹²⁹ ¹³⁰ and related monitoring challenges, which lead to instances where circular activities are conducted illegally.¹³¹ As stringent regulations are often non-existent and have weak regulatory frameworks, the most negative health and safety risks are felt by the most disadvantaged groups in the Global South—often in the informal sector.

Overall knowledge of the effects of the circular economy on working conditions and the health and safety of workers is limited.¹³² Current studies predominantly focus on toxicological risks linked to exposure to specific pollutants and hazardous by-products, especially in the e-waste and de-construction sectors.¹³³ ¹³⁴ While mechanical risks and musculoskeletal disorders have also been featured in academic studies (yet to a lesser extent), the psychosocial risks of the circular economy transition have been rarely discussed. As circular jobs in the aggregate are more labour intensive, they are



projected to be more demanding than conventional jobs in terms of cognitive (they rely on less-routine work) and interpersonal skills (they have more emphasis on interactive relationships), and will require more work experience and on-the-job training.¹³⁵ Several studies have revealed that the quality of work accompanying the recycling loops within circular processes in many low- and middle-income countries remains a blind spot in much of the circular economy literature, policy, and practices.¹³⁶ It has been conclusively shown that poor working conditions are endemic in the waste-treatment sector—where most new jobs in a circular economy will likely be.¹³⁷ While waste pickers' role in the circular economy's recycling loop is critical, new research is unveiling the extent to which countries rely on them to handle large proportions of their recycled materials under deploring working conditions.¹³⁸

Moreover, the World Health Organization (WHO) has drawn attention to several risks, particularly related to managing waste and exposure to hazardous substances. These risks are heightened in the informal economy, often comprising vulnerable groups, including children and low-income families.¹³⁹ There is an extensive body of literature examining the considerable challenges waste pickers face, including marginalisation, exploitation, abuse, child labour, and reduced community health due to picking from dumpsites and working without any personal protective equipment.¹⁴⁰ ¹⁴¹ While interventions at the local and national scales have sought to improve the circumstances through mechanisms such as fixed pricing, government contracts, and sanitation programmes aimed at critical waste-sorting actors, the consensus is that the work of most waste pickers is precarious and dangerous.¹⁴²

The vulnerable conditions of workers in the informal and formal e-recycling sectors worldwide are well documented.¹⁴³ ¹⁴⁴ Many studies have evidenced informal waste pickers—often including child labour—being exposed to hazardous chemicals and subsisting on very low incomes.¹⁴⁵ Decent work challenges and deploring working conditions in the electrical and electronic waste management industry have been the subject of several ILO reports, with case studies focusing on India¹⁴⁶ and Nigeria.¹⁴⁷ In contrast, two studies state that health inequalities and vulnerabilities are also experienced, yet often overlooked, by workers

employed in the formal e-recycling industry in high-income countries.¹⁴⁸ ¹⁴⁹

There have been growing discussions on the role of finance,¹⁵⁰ the use of Aid for Trade schemes¹⁵¹ ¹⁵² and international development cooperation¹⁵³ to address these issues. A less studied yet growing topic is the role and contribution of EPR schemes and circular standards to improve health and safety standards.¹⁵⁴ ¹⁵⁵ ¹⁵⁶

NEW FORMS OF WORK AND RIGHTS AT WORK

A particular concern related to the ability of workers to improve their conditions comes from the growth of new enterprises and sectors within the circular economy. More 'established' sectors have collective bargaining systems and structures in place. These systems and structures might change in the future as activities embrace more circular standards, where existing collective agreements might no longer be applicable or may be non-existent.¹⁵⁷ For example, the collaborative economy (or collaborative consumption) is a shared economy where efficiency, usefulness, sustainability and access to experience take precedence over ownership.¹⁵⁸ A study on the side effects of the collaborative economy model in Europe states that self-employed individuals are sometimes unable to conduct collective bargaining or get support from traditional trade unions or employer associations.¹⁵⁹

As many circular business models place shared ownership as a key pillar of their purpose, this often entails a heavier reliance on the service sector—operating via product-as-a-service (PaaS) or sharing economy¹⁶⁰ business models, for example. These types of business models have a significant impact on how work is organised and under what conditions it is performed. The scaling of circular business models, often described as technologically intensive, has raised concerns about workers' employment status and conditions. Despite the proven advantages of these collaborative models,¹⁶¹ it has been argued that their exclusion from most legal systems can lead to inequality among its most vulnerable actors: self-employed workers.¹⁶² The consensus has been that current legal systems do not protect these atypical workers, including temporary, self-employed and flexible platform

workers.¹⁶³ Atypical work encompasses all forms of work that are not accounted for by national statistics, including informal, unpaid, care work and newly emerging forms of work in the platform economy which is often performed by disadvantaged groups of society. Most of the research exclusively focuses on informal work, as this sector is directly and overtly performing circular activities in many countries of the Global South.

The abovementioned collective bargaining challenges around circular economy interventions are also present in the manufacturing re-valorisation activities—like the recycling of metals and the manufacture of prefabricated modules.¹⁶⁴ In some instances, recycling work is subcontracted, thereby excluding workers from collective agreements. Labour laws regulating new forms of circular jobs are yet to be made. This challenge affects the Global North and South alike. A study on the labour routine of app-based drivers in Brazil identified that their working conditions are close—when looking in an aggregate way—to the context defined in the literature on flexibilisation and precarisation of labour relations for workers in the sharing economy.¹⁶⁵ Another study on the social impact of circular economy interventions in the apparel value chain in the Netherlands, Spain and India confirmed that rental, repair and resale share the same precarious characteristics of the linear retail industry, like short contracts, minimum wage payments and sometimes part-time jobs.¹⁶⁶

Studies have shown that work in waste management offers a meagre livelihood for some of the most marginalised groups. This labour force mainly comprises workers in excluded segments of the labour market, such as the elderly, homeless, refugees, migrants or marginalised groups, and under informal working conditions, which are sub-standard, often unregulated, with no social protection.¹⁶⁷ Poor-quality jobs, even if circular, in unsafe conditions paid at poverty wages, without social safety, reinforce and recreate existing injustices, regardless of where they are performed, whether in the Global North or South.¹⁶⁸

GENDER AND SOCIAL EQUITY



GENDER EQUITY

The use of circular economy interventions for sustainable development presents an opportunity to address existing social equity challenges in labour markets, including ones related to gender. Employment projections show that if gender distribution across sectors remains the same, the transition to a circular economy will increase the female employment share globally.¹⁶⁹ Additionally, the ILO estimates suggest that greater adoption of circular economy interventions can influence the reallocation of mid-skilled occupations that are dominated by men, resulting in a net increase of 12 million jobs for women by 2030. However, this increase in employment opportunities is not expected to offset prevailing gender inequalities in the labour market¹⁷⁰—unless countries adopt strong policies and programmes to address the gendered aspects of labour market participation and access in a greening economy.¹⁷¹

In a UN Women and African Development Bank report, barriers hindering women's participation in green jobs within Africa's transition to the circular economy were identified. These could arguably also apply to the circular economy:¹⁷²

- Mismatch between new jobs and women's skills and qualifications
- The gender gap in access to financial resources for women-led businesses
- The gender gap in access to information and communication technologies (ICT)
- Discriminatory social norms including gender biases in the law and unpaid care work as well as women's underrepresentation in leadership roles

Results of a study focusing on the textiles sector in the Netherlands, Spain and India corroborate that the current circular economy movement's social ambition in terms of gender is low and that current circular economy interventions follow the same feminisation of poverty and precariousness of working conditions

found in the linear apparel value chain.¹⁷³ Other studies have focused on the potential empowerment opportunities offered by circular economy interventions. For example, the detailed examination of the collaborative economy in Poland demonstrates that it has the potential to stimulate female social and economic empowerment and increase the female labour participation rate amongst Polish women.¹⁷⁴ Similarly, the United Nations Development Programme (UNDP) underlines the importance of a circular economy to create benefits for gender equality in Indonesia—where women account for 58% of the jobs in the textiles sector—and the necessity of a proactive women-centric approach to policy development.¹⁷⁵

SOCIAL EQUITY CONCERNS

There is a knowledge vacuum on how circular economy interventions relate to migrants, minorities and youth. This is particularly relevant for social equity since most researched core circular sectors, such as waste management and recycling, are usually associated with a negative social stigma. This can lead marginalised and excluded groups to be more likely to perform these types of jobs. The potential for the circular economy to empower and create opportunities for young people, particularly in regions with high levels of youth unemployment is also vital to address.

Social equity concerns¹⁷⁶ relating to the potential social blindspots of circular economy interventions among critical, yet underrepresented, circular economy actors—irregular (migrant) workers^{177 178} and child labourers¹⁷⁹—were only studied in-depth three times. An example is cobalt mining in the Democratic Republic of Congo (DRC). Cobalt is a key metal used in electric batteries. While the electric car industry may be classified as a green and clean industry, the act of cobalt mining is essentially a 'brown job'—the opposite of a green job—in a green economy, where cases of forced child labour practices have been found.^{180 181}

The lack of integration of wider social and climate justice concerns in circular economy policies and interventions, such as the distribution of benefits and burdens, meaningful participation or social inclusion in policy formulation, has received criticism,¹⁸² especially by labour unions.¹⁸³ Current policy instruments and proposals by the European Commission ([European Green Deal](#), [Just Transition Mechanism](#), [European Social Fund Plus](#), [Social Climate Fund](#) for example) are considered too narrow and fall short of providing the holistic and legal framework that society needs for a just transition towards the circular economy. This includes the potential rebound effects of market-driven EU circular solutions within Europe and abroad.¹⁸⁴ In addition, while many studies develop a national or regional perspective, very few consider the employment effects of a transition to the circular economy on a global scale—and beyond employment.¹⁸⁵

On the other hand, five publications considered circular economy interventions as a social equity solution for at-risk youth, as well as an innovative strategy to foster entrepreneurship in low-income contexts.

SUMMARY OF THE KEY RESEARCH GAPS AND LIMITATIONS

This analysis identified the following research gaps and limitations which are key to ensuring a just transition to the circular economy. If overcome, these barriers could lead to a circular economy that is holistically integrated, reaching beyond ecological and economic dimensions to have a positive social impact.

GAPS AND LIMITATIONS OF RESEARCH ON DECENT WORK AND THE CIRCULAR ECONOMY:

- Focused on the net employment potential of circular economy interventions rather than the potential to improve the quality of jobs and employment conditions.
- Exploration of decent work is limited to occupational safety and health conditions in waste management and recycling sectors and does not properly explore decent work aspects like fair remuneration, inclusion and collective bargaining.
- Limited country or regional-level analysis of the socioeconomic impacts of implementing circular economy interventions in the Global South in comparison to the Global North.
- Limited research into the informal sector despite its pivotal role in driving the circular economy. Research that does address the informal economy focuses only on formalisation rather than other potential resources for decent work improvements.
- The potential and conditions for circular economy interventions to improve outcomes and increase employment opportunities for atypical workers, women, migrants, youth and minorities are underexplored.
- Shortcomings in data collection, quality and methodology: no modelling studies considered decent work indicators in the future circular scenarios, central actors were omitted in current estimates, granular data was insufficient and modelling methods include Global North bias and assumptions.



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WAYS FORWARD: TOWARDS A GLOBAL CIRCULAR ECONOMY AND JUST TRANSITION FOR ALL



For the full potential of circular economy interventions to be realised—including helping to tackle issues from climate change mitigation and adaptation, social inequality, and biodiversity loss to pollution—people’s needs and livelihoods must be central to actions across countries and industries. This will require the combined efforts of governments, employers and workers through social dialogue and the formulation of targeted and transformative policy. Processes should actively embrace the circular economy as a tool for sustainable economic development and a just transition towards sustainable low-carbon societies. For circular economy interventions to support a just transition to a sustainable low-carbon society in which the planet and all people can thrive, two main dimensions should be prioritised:

1. Promote social and climate justice to rectify existing inequalities in value chains, including within labour markets and communities already experiencing the impacts of climate change.
2. Anticipate and mitigate potential negative future impacts on workers and industries that come with the transition to low-carbon economies and industries.

The arguments put forward in this paper illustrate that the provision of decent work is a vital component of these central actions to be taken across countries and industries. Employment and wider socioeconomic and environmental policies promoting circular economy interventions must embed decent work evidence

and indicators to support human development and improvements to people’s well-being around the world.¹⁸⁶

This report outlines a growing body of evidence into how and under what conditions the circular economy could support decent work and address social inequities more broadly. It also identified gaps in the evidence base, which must be filled to inform truly transformational circular economy policy supporting a just transition for all. Alongside investment in more inclusive and participatory mechanisms to design and implement circular economy interventions and enabling policies across countries and global regions, the evidence base and tools for supporting these policies and interventions must be strengthened.

Circle Economy, the ILO and S4YE programme of the World Bank present this report as a comprehensive overview of the current evidence base and a call for action. Based on the findings of this report, we put forward a call for action to generate better evidence under three main areas:

1. More in-depth and inclusive research on decent work and the circular economy
2. Global and social justice-led research and policy
3. Joint advocacy and data partnerships

MORE IN-DEPTH AND INCLUSIVE RESEARCH ON DECENT WORK AND THE CIRCULAR ECONOMY

ACTIONS NEEDED

Most research into work in the circular economy has been conducted at the macro-economic level, from the perspective of or with an explicit focus on the Global North. As a result, there are significant gaps when it comes to:

- Circular economy impacts at the city-level,
- A-typical workers on the fringes or outside of the formal labour market,
- Marginalised groups including women, youth and immigrant workers.

Current studies combining decent work and the circular economy focus on waste management. They often overlook circular economy interventions such as repair and reuse—which are high-value, labour intensive and offer potential for job creation—as well as skills development and the development of new markets. Studies also often focus on ‘core’ jobs directly involved in closing material cycles, thereby underestimating the demand for new skills and knowledge in ‘enabling’ sectors from policy to IT and research.

Despite the impacts of circular economy interventions being highly localised, there are very few localised, city-level studies addressing its employment and social blindspots and opportunities.

A more critical and nuanced view will be supported by more comprehensive and realistic modelling of the impacts of the circular economy, which can, in turn, inform transformative policy and regulation.

WAYS FORWARD

- More research on the impact of the circular economy on key actors and marginalised groups and ensure their inclusion in the development and implementation of circular interventions.
- More localised, city-level, quantitative studies on the potential shortcomings and opportunities of circular economy interventions.
- Review and adjust the current circular economy modelling methods, including assumptions and policy scenarios.
- Compensate insufficient quality data for scenario modelling by employing mixed method approaches to analysing sectoral or country-level policy impacts and gathering data from alternative sources.
- Identify and adapt globally relevant indicators of employment and decent work in the circular economy.

GLOBAL AND SOCIAL JUSTICE-LED RESEARCH AND POLICY

ACTIONS NEEDED

There is a need to develop a global and internationally relevant picture of and ambition for the circular economy.

Since circular economy activities are extensive and commonplace in the Global South, more examples and studies of current and best practices are needed. This can guide enabling policies to develop the conditions for decent work in key opportunity areas and areas of existing know-how. The African Circular Economy Alliance’s (ACEA) *Five Big Bets for the Circular Economy* in Africa and visioning documents by other regional alliances should be used to develop targeted evidence and interventions. These can focus on promoting decent work opportunities and conditions in key industries and sectors that develop local industry—and resilience and prosperity—to complement existing EU-led policies, programmes and impact assessments.

The development of the circular economy will be different for each country. Therefore, further exploration of different socioeconomic and political contexts is needed. For example, using the Common But Differentiated Responsibilities (CBDR) principle, which explores the degree of industrialisation or the producer/consumer status of a country, could determine the potential circular commitments and favourable access to relevant technological transfer and intellectual property rights.

Circular economy interventions support broader, related agendas, such as sustainable development, the green deal, net-zero and the energy transition. Yet the connection between these global agendas, what role workers play and how they will be displaced or deployed needs to be better understood and, as a result, risk hampering one another.

Greater involvement of trade unions, employers’ organisations, and other stakeholders representing workers in key sectors, such as [WIEGO](#) and Trade Union Confederations, will be instrumental in formulating and evaluating circular economy interventions and policies being proposed in different regions.¹⁸⁷

WAYS FORWARD

- Collection and dissemination of circular economy best practices across value chains in countries and regions in the Global South.
- Deep dives reporting into circular economy challenges and opportunities in different countries and value chains around the world, including areas of overlap.
- Study existing and upcoming policy measures, making sure they include social requirements, and the participation of affected workers in key policy dialogues such as trade and economic cooperation agreements, EPR schemes, European [Corporate Sustainability Reporting Directive](#).

JOINT ADVOCACY AND DATA PARTNERSHIPS

ACTIONS NEEDED

As interest in the circular economy grows, so does its potential. But this potential must be benchmarked by decent work and just transition, especially in the redeployment of linear value chains and their workers. This can be achieved in a number of ways, including through 1) partnerships to co-develop the evidence base, 2) combined efforts of governments, employers and workers through social dialogue and on the co-formulation and evaluation of targeted and transformative policy, and 3) advocacy efforts at the international level.

Partnerships will also be key for building a comprehensive, relevant and reliable evidence base, for example, revising the international and national industrial classifications to reflect the circular economy or collaborating with the private sector to fill data gaps. Such a coordinated effort would expand the concept's applicability across a variety of sectors and regions and contribute to better insights on circular interventions and, thereby, inform circular policies and research.

Strengthening statistical analytical capacity in Global South regions will also be crucial. This can be achieved by building global partnerships and international networks that consider local contexts and, thus, improving data collection for circular indicators to inform research and circular policy. For example, [C40 Cities](#) and [ICLEI](#) have been instrumental in co-developing programmes that strengthen the statistical

capacity of cities around the world and the Circular Economy Indicator Coalition (CEIC), co-hosted by Circle Economy and the Platform for Accelerating the Circular Economy (PACE), is working on the harmonisation and increased application of circular indicators—including those related to socioeconomic impacts.

WAYS FORWARD

- Develop partnerships with social and localised circular economy stakeholders to co-formulate and evaluate circular economy policies.
- Create partnerships for data collection and analysis, revise international and national industrial classifications and find solutions to the omission of key circular actors/activities in current databases.
- Ensure circular economy advocacy is adding value to, and not competing with, existing well-established 'green'/climate' partnerships.

This report is the first output under the 'Jobs in the Circular Economy' initiative of Circle Economy, the ILO and the World Bank's S4YE Programme. This initiative aims to address many of the gaps in the evidence base identified in this paper through collaboration with an international community of research institutions, industry representatives, social partners, governments, and public bodies.

The next step from this first report will include deep-dive studies of what the circular economy means for people and work in key value chains and countries. Alongside this, we intend to conduct a systematic review of methodologies used in modelling studies and to develop, in partnership, indicators and models that build a comprehensive picture of work in the circular economy and the first authoritative review of jobs in the circular economy. We invite and encourage collaboration from stakeholders around the world on this initiative.

REFERENCES

1. Club of Rome (1972). The limits to growth. Retrieved from: [The limits to Growth book](#)
2. Circle Economy (2023). Circularity Gap Report 2022. Retrieved from: [Circle Economy website](#)
3. OECD (2018). Good jobs for all in a changing world of work. Retrieved from: [OECD report](#)
4. ILO (2022). World Employment and Social Outlook: trends 2023. Retrieved from: [ILO website](#)
5. World Inequality Lab (2022). World Inequality Report 2022. Retrieved from: [World Inequality Lab website](#)
6. ILO (2022). Global Wage Report 2022–2023. The impact of inflation and COVID-19 on wages and purchasing power. Retrieved from: [ILO report](#)
7. IPCC (2021). Intergovernmental panel on climate change. Summary for policy-makers. Retrieved from: [IPCC report](#)
8. IPCC (2021). Intergovernmental panel on climate change. Summary for policy-makers. Retrieved from: [IPCC report](#)
9. De Angeles, R. (2021). Circular economy business models: a repertoire of theoretical relationships and a research agenda. Retrieved from: [Springer website](#)
10. Pearce, D.W., Turner, R.K. (1989). Economics of Natural Resources and the Environment. Retrieved from: [Google books](#)
11. Geissdoerfer, M. et al. (2017). The circular economy – a new sustainability paradigm. Retrieved from: [Elsevier website](#)
12. Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. Retrieved from: [Elsevier website](#)
13. Circle Economy (2023). Circularity Gap Report 2022. Retrieved from: [Circle Economy website](#)
14. Circle Economy (2022). Why we need to rethink the ‘technical’ circular economy. Retrieved from: [Circle Economy website](#)
15. Circle Economy (2020). Resilience and the circular economy. Opportunities and risks. Retrieved from: [Circle Economy report](#)
16. Circle Economy (2022). Why we need to rethink the ‘technical’ circular economy. Retrieved from: [Circle Economy website](#)
17. Circle Economy (2023). Circularity Gap Report 2022. Retrieved from: [Circle Economy website](#)
18. Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: an analysis of 114 definitions. Retrieved from: [Elsevier website](#)
19. Merli, R., Preziosi, M., & Acampora, A. (2018). How do scholars approach the circular economy? A systematic literature review. Retrieved from: [Elsevier website](#)
20. Leipold, S. et al. (2021). Lessons, narratives and research directions for a sustainable circular economy. Retrieved from: [Research Square website](#)
21. Friant, M., Vermeulen, W., & Salomone, R. (2021). Analysing European Union circular economy policies: words versus actions. Retrieved from: [Elsevier website](#)
22. Leipold, S. et al. (2021). Lessons, narratives and research directions for a sustainable circular economy. Retrieved from: [Research Square website](#)
23. Geissdoerfer, M. et al. (2017). The Circular Economy–A new sustainability paradigm? Retrieved from: [Elsevier website](#)
24. ILO (2016). Guidelines for a just transition towards environmentally sustainable economies and societies for all. Retrieved from: [ILO website](#)
25. ILO (2008). ILO Declaration on Social Justice for a Fair Globalization. Retrieved from: [ILO website](#)
26. ILO (2015). 2030 development agenda: Major breakthrough for world of work. Retrieved from: [ILO website](#)
27. ILO (2015). Guidelines for a just transition towards environmentally sustainable economies and societies for all. Retrieved from: [ILO report](#)
28. European Commission (2022). Policies, sustainable growth and jobs, Employment and decent work. Retrieved from: [European Commission website](#)
29. ILO (2018). Decent Work and the 2030 Agenda for Sustainable Development: How to achieve the Sustainable Development Goals through Decent Work. Retrieved from: [ILO website](#)
30. Schröder, P. (2020). Promoting a just transition to an inclusive circular economy. Retrieved from: [Chatham House research paper](#)
31. Circle Economy (2022). Why we need to rethink the ‘technical’ circular economy. Retrieved from: [Circle Economy website](#)
32. Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. Retrieved from: [Elsevier website](#)
33. Schröder, P. et al. (2019). Degrowth within–Aligning circular economy and strong sustainability narratives. Retrieved from: [Elsevier website](#)
34. OECD (2020). The Circular Economy in Cities and Regions: Synthesis Report. Retrieved from: [OECD website](#)
35. Friant, M., Vermeulen, W., & Salomone, R. (2021). Analysing European Union circular economy policies: words versus actions. Retrieved from: [Elsevier website](#)
36. Circle Economy (2020). The social economy: a means for inclusive & decent work in the circular economy? Retrieved from: [Circle Economy website](#)
37. Schröder, P. et al. (2019). The circular economy and the Global South: sustainable lifestyles and green industrial development. Retrieved from: [Routledge website](#)
38. Circle Economy (2021). Closing the skills gap: vocational education & training for the circular economy. Retrieved from: [Circle Economy website](#)
39. Circle Economy (2020). The social economy: a means for inclusive & decent work in the circular economy? Retrieved from: [Circle Economy website](#)
40. O’Connor, S. (2021). Not all green jobs are safe and clean. Retrieved from: [The Financial Times website](#)
41. ILO (2012). Are “green” jobs decent? Retrieved from: [ILO article](#)
42. Gregson, N. et al. (2014). Doing the ‘dirty work’ of the green economy: Resource recovery and migrant labour in the EU. Retrieved from: [Sage Journals website](#)
43. Circle Economy (2022). Thinking beyond borders to achieve social justice in a global circular economy. Actions for governments and multilateral bodies. Retrieved from: [Circle Economy website](#)
44. Circle Economy (2020). Avoiding blindspots: promoting circular and fair business models. Retrieved from: [Circle Economy website](#)
45. Renstrom, T. & Roszbach, K. (1995). Trade Unions, Employee Share Ownership and Wage Setting: A Supply-Side Approach to the Share Economy. Retrieved from: [SSRN website](#)
46. “Micro” studies have individual or household, firm-level or product-level as their main unit of analysis.
47. “Meso” studies focus on industrial symbiosis, city-level, and specific manufacturing processes analysis.
48. “Macro” studies adopt a regional (e.g. European Union and its member states), multi-regional or global (worldwide) perspective in their analysis.
49. Roos Lindgreen, E., Salomone, R., & Reyes, T. (2020). A critical review of academic approaches, methods and tools to assess circular economy at the micro level. Retrieved from: [MDPI website](#)
50. ILO (2022). Industrial symbiosis networks as part of a circular economy: Employment effects in some industrialising countries. Retrieved from: [ILO website](#)
51. Salomone, R. et al. (2020). Industrial Symbiosis for the Circular Economy. Retrieved from: [Springer website](#)
52. Cecchin, A. et al (2020). Relating industrial symbiosis and circular economy to the sustainable development debate. Retrieved from: [Springer website](#)
53. McCarthy, A., Dellink, R., & Bibas, R. (2018). The macroeconomics of the circular economy transition: A critical review of modelling approaches. Retrieved from: [OECD website](#)
54. BSR (2021). Keeping Workers in the Loop: Preparing for a Just, Fair, and Inclusive Transition to Circular Fashion. Retrieved from: [BSR website](#)

55. McCarthy, A., Dellink, R., & Bibas, R. (2018). The macroeconomics of the circular economy transition: A critical review of modelling approaches. Retrieved from: [OECD website](#)
56. ILO (2018). World Employment Social Outlook 2018: Greening with Jobs. Retrieved from: [ILO website](#)
57. Stavropoulos, S. & Burger, M.J. (2020). Modelling strategy and net employment effects of renewable energy and energy efficiency: A meta-regression. Retrieved from: [Elsevier website](#)
58. Laubinger, F., Lanzi, E., & Chateau, J. (2020). Labour market consequences of a transition to a circular economy: A review paper. Retrieved from: [OECD website](#)
59. ILO (2018). World Employment Social Outlook 2018: Greening with Jobs. Retrieved from: [ILO website](#)
60. ILO (2019). Skills for a Greener Future.: a global view Retrieved from: [ILO website](#)
61. Chateau, J. & Mavroeidi, E. (2020). The jobs potential of a transition towards a resource efficient and circular economy. Retrieved from: [OECD website](#)
62. Donati, F. et al. (2020). Modelling the circular economy in environmentally extended input-output tables: Methods, software and case study. Retrieved from: [Elsevier website](#)
63. Laubinger, F., Lanzi, E., & Chateau, J. (2020). Labour market consequences of a transition to a circular economy: A review paper. Retrieved from: [OECD website](#)
64. Laubinger, F., Lanzi, E., & Chateau, J. (2020). Labour market consequences of a transition to a circular economy: A review paper. Retrieved from: [OECD website](#)
65. Stavropoulos, S. & Burger, M.J. (2020). Modelling strategy and net employment effects of renewable energy and energy efficiency: A meta-regression. Retrieved from: [Elsevier website](#)
66. WBCSD. (2021). Policy brief: driving the transition to a circular economy. Retrieved from: [WBCSD website](#)
67. European Commission. (2020). New Circular Economy Action Plan: For a cleaner and more competitive Europe. Retrieved from: [European Commission website](#)
68. Chatham House (2022). Trade for an inclusive circular economy: A framework for collective action. Retrieved from: [Chatham House website](#)
69. Guillibert, P., Barca, S., & Leonardi, E. (2022). Labour in the Transition to the Circular Economy: a Critical Literature Review on Just Transition and Circular Economy. Retrieved from: [Just2CE website](#)
70. European Commission (2020). Investing in the circular economy: a blueprint for a green recovery. Retrieved from: [European Union website](#)
71. FEPS (2022). The Circular Economy and Green jobs in the EU and beyond. Retrieved from: [FEPS website](#)
72. Chateau, J. & Mavroeidi, E. (2020). The jobs potential of a transition towards a resource efficient and circular economy. Retrieved from: [OECD website](#)
73. ILO (2018). World Employment Social Outlook 2018: Greening with Jobs. Retrieved from: [ILO website](#)
74. Guillibert, P., Barca, S., & Leonardi, E. (2022). Labour in the Transition to the Circular Economy: a Critical Literature Review on Just Transition and Circular Economy. Retrieved from: [Just2CE website](#)
75. Mitchel, P. & James, K. (2021). Levelling Up Through a More Circular Economy. Retrieved from: [WRAP website](#)
76. Circle Economy (2020). Jobs & Skills in the Circular Economy. State of Play and Future Pathways. Retrieved from: [Circle Economy website](#)
77. UNDESA (2018). 2018 Revision of World Urbanization Prospects. Retrieved from: [United Nations website](#)
78. IPCC (2022). Climate Change 2022: Mitigation of Climate Change. Retrieved from: [IPCC report](#)
79. ILO (2018). World Employment Social Outlook 2018: Greening with Jobs. Retrieved from: [ILO website](#)
80. ILO (2019). Skills for a Greener Future: a global view. Retrieved from: [ILO website](#)
81. European Commission. (2018). Impacts of circular economy policies on the labour market: Final Report. Retrieved from: [European Commission website](#)
82. World Bank (2022). Squaring the Circle: Policies from Europe's Circular Economy Transition. Retrieved from: [World Bank website](#)
83. Repp, L., Hekkert, M., & Kirchherr, J. (2021). Circular economy-induced global employment shifts in apparel value chains: Job reduction in apparel production activities, job growth in reuse and recycling activities. Retrieved from: [Elsevier website](#)
84. Laubinger, F., Lanzi, E., & Chateau, J. (2020). Labour market consequences of a transition to a circular economy: A review paper. Retrieved from: [OECD website](#)
85. Circle Economy (2020). Jobs & Skills in the Circular Economy. State of Play and Future Pathways. Retrieved from: [Circle Economy website](#)
86. Wiebe, K. et al. (2019). Global circular economy scenario in a multiregional input-output framework. Retrieved from: [ACS website](#)
87. Repp, L., Hekkert, M., & Kirchherr, J. (2021). Circular economy-induced global employment shifts in apparel value chains: Job reduction in apparel production activities, job growth in reuse and recycling activities. Retrieved from: [Elsevier website](#)
88. Circle Economy (2020). Jobs & Skills in the Circular Economy. State of Play and Future Pathways. Retrieved from: [Circle Economy website](#)
89. IPCC (2022). Climate Change 2022: Mitigation of Climate Change. Working Group III. Retrieved from: [IPCC website](#)
90. Korsunova, A. et al. (2022). Necessity-driven circular economy in low-income contexts: How informal sector practices retain value for circularity. Retrieved from: [Elsevier website](#)
91. As defined by WIEGO. Retrieved from: [WIEGO website](#)
92. Repp, L., Hekkert, M., & Kirchherr, J. (2021). Circular economy-induced global employment shifts in apparel value chains: job reduction in apparel production activities, job growth in reuse and recycling activities. Retrieved from: [Elsevier website](#)
93. World Bank (2022). Squaring the Circle: Policies from Europe's Circular Economy Transition. Retrieved from: [World Bank website](#)
94. Lucas, P. Brink, H., & van Oorschot, M. (2022). Addressing International Impacts of the Dutch Circular Economy Transition. Retrieved from: [PBL website](#)
95. Dewick, P. et al, (2022). The puzzle of the informal economy and the circular economy. Retrieved from: [Elsevier website](#)
96. Halog, A. & Anieke, S. (2021). A review of circular economy studies in developed countries and its potential adoption in developing countries. Retrieved from: [Springer website](#)
97. Bonnet, F., Vanek, J., & Chen, M. (2019). Women and men in the informal economy: A statistical brief. Retrieved from: [WIEGO website](#)
98. Lau, W. et al. (2020). Evaluating scenarios toward zero plastic pollution. *Science*, 369(6510), 1455-1461. Retrieved from: [Science website](#)
99. MacArthur, D., Waughray, D., & Stuchtey, M. (2016). The new plastics economy, rethinking the future of plastics. Retrieved from: [Science website](#)
100. Bonnet, F., Vanek, J., & Chen, M. (2019). Women and men in the informal economy: A statistical brief. Retrieved from: [WIEGO website](#)
101. Preston, F. & Lehne, J. (2017). A wider circle? The circular economy in developing countries. Retrieved from: [Chatham House website](#)
102. ILO (2019). Decent work in the management of electrical and electronic waste (e-waste). Retrieved from: [ILO website](#)
103. Morais, J. et al. (2022). Global review of human waste-picking and its contribution to poverty alleviation and a circular economy. Retrieved from: [IOPScience website](#)
104. Bimantara, K. et al. (2021). Circular economy of bio compost from coffee waste to support sustainable development goals in alleviating poverty in communities around the Sidoarjo coffee industry. Retrieved from: [IOPScience website](#)
105. Sitra. (2021). How does the circular economy change jobs in Europe? Upskilling and reskilling for a just transition. Retrieved from: [Sitra website](#)
106. Bendixsen, S. (2018). Transnational Practices of Irregular Migrants And Nation-State Management in Norway. Retrieved from: [NJMR website](#)
107. Rendon, M., Espluga-Trenc, J., & Verd, J. M. (2021). Assessing the functional relationship between the formal and informal waste systems: A case-study in Catalonia (Spain). Retrieved from: [Elsevier website](#)
108. Horn, Z. (2010). No Cushion to Fall Back On: Global Recession and Informally Employed Women in the Global South. Retrieved from: [WIEGO website](#)
109. European Parliament (2016). Precarious employment in Europe: patterns, trends and policy strategies. Retrieved from: [European Parliament report](#)

110. Palfreman, J. (2015). Waste pickers in Dar es Salaam, Tanzania. Retrieved from: [Globalrec website](#)
111. Dias, S. (2012). Waste and development—perspectives from the ground. Retrieved from: [Open Edition Journals website](#)
112. Campos, H. (2014). Recycling in Brazil: challenges and prospects. Retrieved from: [Elsevier website](#)
113. Morais, J. et al. (2022). Global review of human waste-picking and its contribution to poverty alleviation and a circular economy. Retrieved from: [IOPScience website](#)
114. ILO (2019). Skills for a Greener Future: a global view. Retrieved from: [ILO website](#)
115. Trinomics (2021). European Social Partners' Project on Circular Economy and the World of Work - Final Report. Retrieved from: [ETUC website](#)
116. Laubinger, F., Lanzi, E., & Chateau, J. (2020). Labour market consequences of a transition to a circular economy: A review paper. Retrieved from: [OECD website](#)
117. Alvis, S. & Avison, Z. (2021). Levelling up through circular economy jobs. Retrieved from: [Green Alliance website](#)
118. Burger, M. et al. (2019). The heterogeneous skill-base of circular economy employment. Retrieved from: [Elsevier website](#)
119. Burger, M. et al. (2019). The heterogeneous skill-base of circular economy employment. Retrieved from: [Elsevier website](#)
120. World Bank (2022). Squaring the Circle: Policies from Europe's Circular Economy Transition. Retrieved from: [World Bank website](#)
121. World Bank (2022). Squaring the Circle: Policies from Europe's Circular Economy Transition. Retrieved from: [World Bank website](#)
122. UNDP (2021). The economic Social and Environmental Benefits of a circular economy in Indonesia. Retrieved from: [UNDP website](#)
123. Dwivedi, A., & Paul, S. K. (2022). A framework for digital supply chains in the era of circular economy: Implications on environmental sustainability. Retrieved from: [Wiley website](#)
124. Circle Economy (2021). Closing the skills gap: vocational education & training for the circular economy. Retrieved from: [Circle Economy website](#)
125. Salas, D. et al. (2021). The role of higher education institutions in the implementation of circular economy in Latin America. Retrieved from: [MDPI website](#)
126. Padilla-Rivera, A. et al. (2021). Social circular economy indicators: Selection through fuzzy delphi method. Retrieved from: [Elsevier website](#)
127. Elena Segneanu, A. (2018). Food Security into a Circular Economy. Retrieved from: [Herald Open Access website](#)
128. Barrie, J. & Schröder, P. (2022). Circular economy and international trade: a systematic literature review. *Circular Economy and Sustainability*, 2(2), 447-471. Retrieved from: [Springer website](#)
129. van der Ven, C. M. A. (2020). The Circular Economy, Trade, and Development: Addressing spillovers and leveraging opportunities. Retrieved from: [SSRN website](#)
130. UNECE (2021). Conference of European Statisticians Framework on Waste Statistics. Retrieved from: [UNECE website](#)
131. Chatham House (2022). Trade for an inclusive circular economy: A framework for collective action. Chatham House. Retrieved from: [Chatham House website](#)
132. Wegmann, V. (2020). Safe Jobs in the Circular Economy: Health and Safety in Waste and Wastewater Management. Retrieved from: [EPSU website](#)
133. ILO (2019). Decent work in the management of electrical and electronic waste (e-waste). Retrieved from: [ILO website](#)
134. Aublet-Cuvelier, A. et al. (2022). From Globalization to Circular Economy, Which Issues for Health and Safety at Work?. Retrieved from: [Springer website](#)
135. Aublet-Cuvelier, A. et al. (2022). From Globalization to Circular Economy, Which Issues for Health and Safety at Work?. Retrieved from: [Springer website](#)
136. Barford, A. & Ahmad, S.R. (2021). A Call for a Socially Restorative Circular Economy: Waste Pickers in the Recycled Plastics Supply Chain. Retrieved from: [Springer website](#)
137. FEPS (2022). The Circular Economy and Green jobs in the EU and beyond. Retrieved from: [FEPS website](#)
138. Barford, A. & Ahmad, S.R. (2021). A Call for a Socially Restorative Circular Economy: Waste Pickers in the Recycled Plastics Supply Chain. Retrieved from: [Springer website](#)
139. WHO (2018). Circular economy and health: opportunities and risks. Retrieved from: [WHO website](#)
140. Costas, A. et al. (2022). Enabling the informal recycling sector to prevent plastic pollution and deliver an inclusive circular economy. Retrieved from: [Elsevier website](#)
141. Wright, C. et al. (2019). Circular economy and environmental health in low- and middle-income countries. Retrieved from: [BMC website](#)
142. Barford, A. & Ahmad, S.R. (2021). A Call for a Socially Restorative Circular Economy: Waste Pickers in the Recycled Plastics Supply Chain. Retrieved from: [Springer website](#)
143. ILO (2019). Decent work in the management of electrical and electronic waste (e-waste). Retrieved from: [ILO website](#)
144. Ceballos, D. et al. (2020). Overlapping vulnerabilities in workers of the electronics recycling industry formal sector: A commentary. Retrieved from: [NCBI website](#)
145. Circle Economy (2022). Thinking beyond borders to achieve social justice in a global circular economy. Actions for governments and multilateral bodies. Retrieved from: [Circle Economy website](#)
146. Perina, B. & Ratynski, M. (2019). From waste to jobs decent work challenges and opportunities in the management of e-waste in India. Retrieved from: [ILO website](#)
147. Goel, S. (2019). From waste to jobs decent work challenges and opportunities in the management of e-waste in Nigeria. Retrieved from: [ILO website](#)
148. Ceballos, D. et al. (2020). Overlapping vulnerabilities in workers of the electronics recycling industry formal sector: A commentary. Retrieved from: [NCBI website](#)
149. Scheinberg, A. et al. (2016). From collision to collaboration—Integrating informal recyclers and re-use operators in Europe: A review. Retrieved from: [SAGE Journals website](#)
150. Circle Economy & Ministry of Infrastructure and Water Management (2022). Unlocking the Potential of International Financial Institutions: A High-level Roadmap. Retrieved from: [Circle Economy website](#)
151. Blot, E., Oger, A., & Watkins, E. (2022). Trade in support of circular economy: a Synthesis Report. Policy Report. Retrieved from: [IEEP website](#)
152. Chatham House. (2022). Trade for an inclusive circular economy: A framework for collective action. Chatham House. Retrieved from: [Chatham House website](#)
153. Schröder, P., Lemille, A., & Desmond, P. (2020). Making the circular economy work for human development. Retrieved from: [Elsevier website](#)
154. Schröder, P., Anggraeni, K., & Weber, U. (2019). The relevance of circular economy practices to the sustainable development goals. Retrieved from: [Wiley Online Library](#)
155. Ferronato, N. et al. (2019). Introduction of the circular economy within developing regions: A comparative analysis of advantages and opportunities for waste valorization. Retrieved from: [Elsevier website](#)
156. Rezaie, S. et al. (2022). Accelerating the transition to a circular economy through impactful and actionable research. Retrieved from: [SEI website](#)
157. Trinomics (2021). European Social Partners' Project on Circular Economy and the World of Work - Final Report. Retrieved from: [ETUC website](#)
158. R. Botsman & R. Rogers (2010). What's mine Is yours the Rise of collaborative consumption. Retrieved from [book](#)
159. San Martin, A. (2019). The side effects of the collaborative economy model in Europe: the self-employed workers. Retrieved from: [Cadernos de Dereito Actual website](#)
160. The sharing economy focuses on the sharing of underutilised assets, monetised or not, in ways that improve efficiency, sustainability and community. Retrieved from: [WEF Website](#)
161. Collaborative business models focus on enabling collaborative forms of consumption, production, finance and learning. Retrieved from: [WEF Website](#)
162. San Martin, A. (2019). The side effects of the collaborative economy model in Europe: the self-employed workers. Retrieved from: [Cadernos de Dereito Actual website](#)
163. Circle Economy (2020). Jobs & Skills in the Circular Economy. State of Play and Future Pathways. Retrieved from: [Circle Economy website](#)
164. Trinomics (2021). European Social Partners' Project on Circular Economy and the World of Work - Final Report. Retrieved from: [ETUC website](#)

165. Júnior, J. et al. (2022). Flexibilization and precarization of working conditions and labor relations in the perspective of app-based drivers. Retrieved from: [Emerald Insight website](#)
166. Suarez-Visbal, L. et al. (2022). The Social Impacts of Circular Strategies in the Apparel Value Chain; a Comparative Study Between Three Countries. Retrieved from: [Springer website](#)
167. Wegmann, V. (2020). Safe Jobs in the Circular Economy: Health and Safety in Waste and Wastewater Management. Retrieved from: [EPSU website](#)
168. Barford, A. & Ahmad, S.R. (2021). A Call for a Socially Restorative Circular Economy: Waste Pickers in the Recycled Plastics Supply Chain. Retrieved from: [Springer website](#)
169. ILO (2018). World Employment Social Outlook 2018: Greening with Jobs. Retrieved from: [ILO website](#)
170. ILO (2019). Skills for a Greener Future: a global view. Retrieved from: [ILO website](#)
171. AfDB (2021). Green jobs for women in Africa. Retrieved from: [AFDB website](#)
172. AfDB (2021). Green jobs for women in Africa. Retrieved from: [AFDB website](#)
173. Suarez-Visbal, L. et al. (2022). The Social Impacts of Circular Strategies in the Apparel Value Chain; a Comparative Study Between Three Countries. Retrieved from: [Springer website](#)
174. Beaumont, K. (2016). The Collaborative Economy in Poland and Europe: A Tool for Boosting Female Employment?. Retrieved from: [SSRN website](#)
175. UNDP (2021). The economic Social and Environmental Benefits of a circular economy in Indonesia. Retrieved from: [UNDP website](#)
176. Circle Economy (2022). Thinking beyond borders to achieve social justice in a global circular economy. Actions for governments and multilateral bodies. Retrieved from: [Circle Economy website](#)
177. Rendon, M., Espluga-Trenc, J., & Verd, J. M. (2021). Assessing the functional relationship between the formal and informal waste systems: A case-study in Catalonia (Spain). Retrieved from: [Elsevier website](#)
178. Bendixsen, S. (2018). Transnational Practices of Irregular Migrants And Nation-State Management in Norway. Retrieved from: [NJMR website](#)
179. Holland, M. (2020). Reducing the health risks of the copper, rare earth and cobalt industries: Transition to a circular low-carbon economy. Retrieved from: [OECD Website](#)
180. S4YE (2021). The Circular Economy: could it provide opportunities for greener and better jobs? Retrieved from: [S4YE Website](#)
181. EU Parliament. (2022). Parliamentary questions: Child slave labour in Congo 'horror mines'. Retrieved from: [EU Parliament](#)
182. Culot, M. & Wiese, K. (2022). Reimagining work for a just transition. Retrieved from: [EEB website](#)
183. ETUI (2022). Why the EU's patchy 'just transition' framework is not up to meeting its climate ambitions. Retrieved from: [ETUI website](#)
184. Culot, M. & Wiese, K. (2022). Reimagining work for a just transition. Retrieved from: [EEB website](#)
185. Guillibert, P., Barca, S., & Leonardi, E. (2022). Labour in the Transition to the Circular Economy: a Critical Literature Review on Just Transition and Circular Economy. Retrieved from: [Just2CE website](#)
186. Schröder, P. & Barrie, S. (2022). Is going circular just? Environmental justice and just transition – key elements for an inclusive circular economy. Retrieved from: [Open Edition Journals website](#)
187. As can be further explored on Chatham House digital map of circular economy policies across the globe. Retrieved from: [Chatham House Website](#)
188. "Circular economy" equivalent key terms were: sharing economy, bio-economy, eco-innovation, green economy, low carbon, material efficiency, doughnut economy. "Decent work" equivalent key terms were related to the main pillars of this ILO framework: social dialogue, well-being, labour, employment, working conditions, social protection, (living) wage, better work.
189. Friant, M. C., Vermeulen, W. J., & Salomone, R. (2020). A typology of circular economy discourses: navigating the diverse visions of a contested paradigm. Resources, Conservation and Recycling, 161, 104917. Retrieved from: [Elsevier website](#)

APPENDIX

METHODS AND MATERIALS

To provide an overview of the existing evidence base on decent work in the circular economy, this study used a mixed research methodology. First, a desk-based analysis was performed of scientific peer-reviewed and grey literature. Second, a systematic literature review of 505 publications was conducted.

SYSTEMATIC LITERATURE REVIEW METHOD

As part of the desk-based analysis, an extensive worldwide list of publications was compiled to better understand the potential research gaps and limitations. The analysis assessed: 1) the literature landscape and 2) the key themes underpinning decent work in the circular economy.

From a total of 30,543 academic publications on the circular economy, a total of 425 publications were found that included decent work on the open-access and non-open-access academic databases Scopus, Web of Science, and [CORE](#). Based on the systematic literature review method, the protocol consisted of combined inclusion and exclusion parameters.

Inclusion parameters were:

- Scientific peer-reviewed and grey literature, including books, articles and reports.
- Publications written between 1995 and 2022 (data extraction conducted in November 2022).
- Publications written in the English language.
- Publications that include words and combinations of words that refer to "circular economy" and "decent work" and equivalent terminology¹⁸⁸— as defined and agreed upon by Circle Economy, the ILO and S4YE—present in titles, abstracts and keywords.

Exclusion parameters were:

- Research on the green economy that did not make an explicit connection to the circular economy and decent work was excluded from this analysis.

A significant body of circular economy research and thought leadership has been developed and promoted by NGOs, think tanks, business consultancies, governments, and multilateral organisations.¹⁸⁹ Since this 'selected' grey literature does not usually appear in academic databases, a total of 80 articles and reports were chosen using a snowball method and following a similar selection parameters rationale. The 80 publications were added to the 425 academic publications previously found, reaching a final number of 505 publications analysed.

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Please note that the responsibility for opinions expressed in this work rests solely with its author and the publication does not constitute an endorsement by the ILO of the opinions expressed in it.

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FRONT COVER IMAGE

The Intha are members of an ethnic group who live around Inle lake in Myanmar. They are largely self-sufficient farmers whose livelihoods are highly intertwined with the ecosystem of the lake. Among such long-standing practices are their unique weaving techniques out of lotus stems. Their textile products are highly sought out as lotus fabric is believed to have calming and meditative properties.

