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Future of Work, Emerging Sectors and the Potential for Transition to Formality

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Abbreviations and acronyms

AI	Artificial Intelligence
BE	Blue economy
CE	Circular economy
CCA	Climate change adaptation
GE	Green economy
ICT	Information, communication, technology
IoT	Internet of Things
KE	Knowledge economy
LBP	Location-based platform
LMIC	Low- and middle-income country
MSME	Micro-, small- and medium-sized enterprise
OE	Orange economy
OSH	Occupational safety and health
R&D	Research and development
RE	Renewable energy
STEM	Science, technology, engineering and mathematics
T2F	Transition to formality

Foreword

The future of work will be quite different from the current situation in the labour market. The profound changes to daily life, increasing social and political turmoil in many countries, climate change, demographic shifts and geopolitical impacts on global economies will affect the labour market prospects of millions of formal and informal workers. The world is in search of a new paradigm of inclusive and sustainable development emphasized in the final report of the ILO Global Commission of the Future of Work of the ILO in 2019, the ILO Centenary Declaration in 2019, or the Agenda 2030. It is also in line with the Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204), which aims to facilitate the transition of workers and economic units from the informal to the formal economy while respecting workers' fundamental rights and ensuring opportunities for income security, decent work and entrepreneurship.

The informal economy is complex and faces multidimensional economic, political, social and labour market challenges. Transitioning from informal to formal employment is, therefore, not straightforward. Integrated strategies are key to transition to formality and require inclusively shaping the development pattern through structural transformation. Governments' partnerships with the private sector and civil society are essential because sustainable transformation requires a clear vision of priority sectors that are worthy of support and aid. New business models rely on more autonomous workers, hence the traditional power imbalance between the employer and the worker has been changed.

In the future, work will be profoundly changed, and economies structurally transformed by the emergence of new and dynamic sectors, while other sectors decline. Digitalization is changing the way we work in many sectors, but it is also leading to new activities as in the platform economy. The rise of new and flexible work arrangements is challenging most social protection systems worldwide. Climate change will lead to alterations in the way we produce and work but will also give rise to new sectors in the green and blue economies and to the decline of contaminating sectors.

Other examples of sectoral changes that have increasingly been taking place in the last few years include demographic changes that have led to the rise of the care economy, and work-life balance changes and more leisure time that have led to the rise in social and creative services. Will these changes represent an opportunity for the transition to formality of informal workers in developing countries? Will they lead to the substantial creation of new formal jobs for informal workers? Under which circumstances and with what kind of policy support could a trend towards more formal jobs be promoted? What are the opportunities and threats facing the formalization of currently informal workers and economic units in sectors with promising growth potential?

This position paper summarizes the state of the art on these issues. It not only investigates recent research, but also concrete policy responses to these questions by government, social partners and other major stakeholders. It aims to better understand the importance of emerging sectors within the ILO's Future of Work initiative in the transition to the formalization of informal workers and units. The paper pays particular attention to the structural challenges that women and youth face in transitioning from the informal to the formal economy.

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Introduction

Over 2 billion workers around the world or more than 60 per cent of all employed people earn their livelihoods in the informal economy (ILO 2018a). The informal economy is not always their choice, working conditions are notoriously bad, but formal job opportunities are scarce, and it is the only way they have of earning a living wage. Almost 1.6 billion people have been considerably affected by the COVID-19 pandemic; earnings have declined by about 60 per cent and social cohesion has been inexorably undermined (Harsdorff et al. 2020). The recent adoption of the ILO *Resolution concerning a global call to action for a human-centred recovery from the COVID-19 crisis that is inclusive, sustainable and resili*ent calls for the acceleration of the transition to the formal economy and highlights the important role of public investments in sectors hit hardest by the crisis and those with strong potential to expand decent work opportunities.

This study discusses emerging sectors, and the potential for them to absorb informal workers in developing countries as well as the challenges and opportunities to enhance transition to formal employment. The green, orange and care economies are strong candidates, but their success in accomplishing a significant transition to formality (T2F) is not guaranteed without structural transformation policies and pro-formalization sectoral guidelines.

The future of work will be quite different from the current situation in the labour market. The profound changes to daily life, the environment and global economies will affect the labour market prospects of millions of formal and informal workers. For example, climate change, technological change, the pandemic and an economy of low distance social tensions and inequality. The world is in search of a new paradigm of inclusive and sustainable development emphasized in the final report of the ILO Global Commission of the Future of Work (ILO 2019a), the ILO Centenary Declaration (ILO 2019b), the Agenda 2030 (UN DESA 2022), and in a recent Speech by UN Secretary-General António Guterres (UN 2021). It is also in line with the Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204), (ILO 2020b), which aims to facilitate the transition of workers and economic units from the informal to the formal economy while respecting workers' fundamental rights and ensuring opportunities for income security, livelihoods and entrepreneurship.

The informal economy is complex and multidimensional in nature and includes economic, political, social and labour market factors. Informality rates differ between countries and sectors, types of employment, and demographic characteristics such as gender and age. Transitioning from informal to formal employment is, therefore, not straightforward (Chacaltana and Leung 2020; Islam and Lapeyre 2020). Integrated strategies are relevant because transitioning to formality requires inclusively shaping the development pattern through structural transformation. This involves a comprehensive policy agenda that accounts for informal actors' heterogeneity while promoting investment in basic infrastructure, financial inclusion, skills upgrading and a wide range of targeted policies that increase productivity and enforce existing regulations. Governments' partnerships with the private sector and civil society are essential because sustainable transformation requires a clear vision of priority sectors that are worthy of support and aid. New forms of informality seem to be related to the future of work transformation, where business models rely on more autonomous workers, hence the traditional power imbalance between the employer and the worker has been altered (Infante and Martinez 2020). The proliferation of new and flexibles forms of work and ambiguous employment relationships call for innovative social protection systems that cover workers' risk without undermining employers' competitivity.

In the future, work will be profoundly changed and economies structurally transformed by the emergence of new and dynamic sectors while other sectors decline. Digitalization is changing the way we work in many sectors (for example, Industry 4.0) but it is also leading to new activities as the platform economy. The rise of new and flexible work arrangements is challenging most social protection systems worldwide. Climate change will lead to alterations in the way we produce and work but will also give rise to new sectors in the green and blue economies and

to the decline of contaminating sectors (for example, fossil energy).

In developed economies, some examples of sectoral changes that have increasingly been taking place in the last few years include demographic changes that have led to the rise of the care economy, and work-life balance changes that have led to the rise in social and creative services. Will these changes represent an opportunity for T2F for informal workers in developing countries? Will they lead to the substantial creation of new formal jobs for informal workers? Under which circumstances and with what kind of policy support (sectoral, labour market, etc.) could a trend towards more formal jobs be promoted? What are the opportunities and threats facing the formalization of currently informal workers and economic units in sectors with promising growth potential?

This position paper summarizes the state of the art on these issues. It not only investigates recent research, but also concrete policy responses to these questions by government, social partners and other major stakeholders. It analyses the potential of emerging sectors[1] to promote the transition to the formalization of informal workers. This includes self-employed workers and workers in informal employment (in both formal and informal economic units), and informal economic units (especially micro-, small-, and medium-sized enterprises – MSMEs) in developing and emerging countries. Therefore, it aims to pave the way for future research on specific emerging sectors with a high potential for T2F.

The paper aims to better understand the importance of emerging sectors within the ILO's Future of Work initiative in the transition to the formalization of informal workers (including informal units). It analyses the potential and the limitations of emerging sectors with potential for formal jobs creation, the opportunities within them to support transition to the formalization of workers and economic units and recommends types of policies that could support their potential for T2F based on recent countries' experience. The paper pays particular attention to the structural challenges that women and youth face in transitioning from the informal to the formal economy. It also addresses the potential opportunities and synergies of formalization in the context of the transition to a green economy (GE).

1 Emerging sectors are considered as sectors, which already exist, which may be rather small in some countries but bigger in others and have shown a growing dynamism and a strong interconnection with the rest of the economy.

1

Future of work: The need for structural transformation to reach a new sustainable and inclusive development paradigm

"Long term growth depends on continuous structural transformation", stated former World Bank Chief Economist, J.Y. Lin in a working paper (2011:5). Countries achieve sustainable and strong development through successful structural transformation away from their agrarian past towards an industrial future. This implies shifts in the sectoral composition of growth. These shifts are mirrored in the pattern of employment (Kuznets 1966). The "climbing up the ladder" in development stages by various developing countries, in particular in South-East Asia, including India and the People's Republic of China, offers new opportunities for less developed countries to take up simpler industrial activities. Moreover, examples in the rise of new technologies (the digital economy), in demographic shifts (the care economy), in new global concerns (climate change and the GE) and in labour market changes (the rise in productivity and, linked to it, of spare time and leisure activities, promoting the orange economy – OE) offer new opportunities of industrial processing and service activities to countries where informal employment is dominant.

Since the computer revolution of the 1980s, the world of work has undergone an increasing number of changes. The recent penetration of **digital technology** and the wider diffusion of machine learning, robotics, artificial intelligence (AI) and big data are having noteworthy impacts on productivity, job conditions, and the tasks that workers are expected to perform. The skills required to successfully enter and sustain a job in the knowledge economy are changing at a speed that challenges the scope of traditional educational systems. The increasing automation of tasks not only affects manual activities, but also the expansion of the knowledge economy, which is taking over beyond routine work (Frey and Osborne 2017). Although a significant number of blue- and white-collar jobs will disappear, structural changes within industries and labour markets can create opportunities for new and better jobs. Beyond the process of job creation and destruction, occupations are being transformed by technology at rapid rates, and adaptation and lifelong learning policies are essential so that workers do not lose the race against technology. The overall result in terms of net employment is as yet unclear but, as stated in Acemoglu and Restrepo (2019), the displacement effect from automation technologies can be compensated by the reinstatement effect of new tasks, should productivity growth enhance the creation of labour-intensive roles.

Digital-based tools, in addition, could facilitate the T2F of new enterprises and their workers through simple, affordable and flexible schemes (Maurizio 2021). The process of formalizing existing jobs could rapidly expand when new technologies, AI and robotics are utilized in labour inspection systems. The application of new digital tools could, therefore, improve the identification of sectors and activities having difficulties in complying with decent working conditions. E-formalization policies that facilitate registration and tax processes, improve access to financial services, mobile payments and e-procurement could also incentivize citizens to formalize their economic activity (Divald 2021; UN 2021). Recent studies by Kring and Leung (2021) and Williams (2021) evaluate the barriers and opportunities for e-formalization. Among the first, deficits are highlighted in physical and virtual infrastructure, digital ecosystems, big data challenges, interactive digital divides and digital skills gaps. Nonetheless, with adequate policy interventions, e-formalization appears as an innovative initiative to tackle new types of non-compliance and informality.

It is not clear, however, that developing and emerging countries possess the physical or human capital necessary to harness the benefits of the new paradigm. There is a fear that the future of work will be marked by greater inequality within and between countries, and that workers in developing countries will remain in low-productivity employment, with little access to technology (World Bank 2018; Ernst et al. 2019). Even though workers in several low- and middle-income countries (LMICs) may have access to individual-level technology (for example, smartphones), the lack of basic infrastructure, such as affordable access to an Internet connection, could limit the potential benefits of technological change and amplify productivity gaps. Support measures are needed to increase productivity and the quality of jobs, so as to fully take advantage of the new digital paradigm.

While lifelong learning platforms and inclusive education programmes are already being launched in many developed countries, the need to promote soft skills and adapt to a fast-changing world of work is leaving developing countries behind. The delay in the implementation of such policies could exacerbate the existing human capital disparities between and within countries, limiting their prospects to further use and development new technologies. Digital illiteracy, for example, affects women and the older population more severely, making them more likely to be excluded from lucrative employment opportunities. The rapid change in the skills' profiles of existing jobs and in emerging sectors calls for agile action from policy-makers, unions and employers to support workers' adaptation.

The ability to quickly respond to these changes is essential in an age of globalization. The Covid-19 epidemiological crisis is a clear illustration of how flexible the economic system needs to be to react to external shocks and accommodate new environments. More than ever, the gains obtained in digitalization were valued, and the sectors that could adapt to teleworking were better able to adjust to the restrictions imposed by governments in response to the pandemic. The demand for digital activities and consumers' increasing engagement with technology in general led to an incredible expansion of the knowledge economy. In that sense, the pandemic has accelerated the shift towards a modern global business model where services and goods are increasingly being provided on-demand and

mediated through digital platforms. The boost to online marketplaces, such as Alibaba, Amazon and MercadoLibre, revealed that even traditional face-to-face activities such as cloth or grocery shopping could be performed with limited human interaction. This was a big challenge to traditional service sectors, which could continue to face reduction in their market participation, with predictable consequences in the demand of low-skill workers. The advance of e-commerce and digital services, however, faces a major barrier in developing countries. Due to current connectivity and Internet access gaps, a substantial number of businesses, workers, and households are unable to take advantage of business and employment prospects (Maurizio 2021).

The new paradigm, led by the rapid spread of digitalization, faces new complementary challenges that make it different from any technological change the world has ever encountered. A central struggle is the increase in global warming**,** which is of major concern around the world. What used to be a loose scientific warning for decades – with many policy-makers reluctant to believe in it – has become an urgent and irrefutable reality. **Climate change** is generating a rise in temperatures and natural disasters across the world and increasing the number of urban areas facing unbearable levels of air and water pollution. Soil degradation and biodiversity loss are modifying natural and human systems, directly affecting the world of work. Moreover, it is clear that environmental degradation will exacerbate the vulnerability of women, migrants, youth, indigenous and tribal peoples, people in poverty and people with disabilities, all of whom tend to have lower access to climate change adaptation (CCA) resources (ILO 2018b).

The relationship between the world of work and climate change relies on several key features. A significant number of jobs depend on the services that ecosystems provide, which are at risk from the threat of climate change. Jobs in the agricultural or tourism sectors, which account for a significant percentage of the workforce in developing countries, are highly dependent on the management of floods, droughts, and the moderation of environmental degradation. In addition, environmental hazards – more recurrent and intense with an unstable global ecosystem – aggravate working conditions, with safety and health being highly jeopardized.

Sustainable development, therefore, requires harmonization between the new technological paradigm and the transition to a low greenhouse gas economy. The importance of the green and blue sectors relies not only on its direct job creation but also on the adaptation measures that will require investment in climate-resilient infrastructure and consequent demand for construction work. From that perspective, CCA measures present an opportunity for informal workers, as actions will be needed at local level. Activities such as reafforestation, building or improving dykes, and the diverse activities related to biodiversity conservation have the potential to expand employment by requiring a local workforce. The more a society acknowledges the importance of natural environments, the more resources they will spend on their restoration and conservation, and the more employment it could create for communities close to the protected ecosystems.

Another challenge is the **demographic change** that most societies are facing or will face in the coming years. With the increase in life expectancy throughout the world,[2] many older people depend upon care and accompaniment during the remaining years of life after retirement. In addition, changes to family structures, higher care dependency ratios, changes in care needs, and the increase in the level of women's employment in certain countries have led to a demand for paid care work, which is expected to keep increasing with the number of care recipients predicted to reach 2.3 billion by 2030 (ILO 2018c).

The transformation of the traditional nuclear family model has led to more families being headed by single parents, and more women joining the labour force. This has eroded the availability of unpaid work, and augmented care responsibilities, especially in early childhood education. At the same time, population ageing has triggered a shift in health-care needs, including long-term care. Significant investment is needed to keep up with the current coverage and working conditions, and governments need to foresee an increase in fiscal space. For that, an additional investment of nearly 6 percentage points of global GDP is needed (ILO 2018c). More is needed if coverage and quality are to be improved.

2 Many developing countries still have a dominant young population. The care economy often attracts migrant workers from developing countries to developed countries where care activities are steadily rising.

The increase in the care economy creates an employment opportunity for women who face barriers to employment (Florito et al. 2018). According to Fossen and Sorgner (2019), care activities could be considered to be part of the human terrain occupations, since the capacities involved in care work are likely to be the least susceptible to the impact of automation and digital technologies and do not exert much transformative influence on the tasks performed. Consequently, neither the destructive nor transformative elements of digitalization affect care occupations that rely on manual and non-routine tasks. Nevertheless, the expansion of the digital economy and the platformization of services could help many care workers find better-paid jobs in a fast and more secure manner. Many of the new jobs that will be generated, however, will often be underpaid and typified by precarious working conditions. Guaranteeing social protection in these new working environments and not reproducing the sector's characteristic vulnerabilities will still be a challenge.

In LMICs, **women and youth** are highly exposed to the informal economy and are over-represented in non-registered working environments (ILO 2018a). Occupational segregation leads them into the worse paid jobs, and within the same activities, they face lower incomes and more precarious working conditions. Sustainable and inclusive development necessarily has to address vulnerable groups' disadvantaged working conditions. For women and young individuals, this entails the promotion of sectors and activities where they have insertion potential and decent conditions, or by facilitating their representation in emerging sectors where they are not currently involved.

Even though youth enrolment in education in developing countries is increasing, the limited availability of formal opportunities exposes them to skills underutilization and downgrading while narrowing their upward mobility prospects. According to data from the ILO school-to-work transition survey for LMICs, the major point of entry into the labour market for young people is through informal schemes, with more than three-quarters of their first transition into the labour market being in informal employment (Chacaltana et al. 2019). In some low-income countries, 90 per cent of young people are in informal employment. Due to inner complexities in the transition to formality, policies that support initial labour market integration have significant impacts on the quality of future jobs (Chacaltana and Dasgupta 2021). First job initiatives including trainings, subsidies or internships, implemented in Latin America in past decades have proved to be useful programmes in supporting the transition to formality.

Globally, there are fewer women than men in informal employment. However, this does not hold true for most developing and emerging countries, since women are more exposed to informal employment in more than 90 per cent of countries in sub-Saharan Africa, 89 per cent in Southern Asia and almost 75 per cent in Latin America (ILO 2018a). In addition, women are often found in more vulnerable situations. The problems that women contend with within regulated environments – discrimination, segregation, unequal pay – are amplified in the informal economy, where scarcity of assets, technology and productive resources limit their working prospects. Moreover, the lack of access to social protection, low remuneration, poor working conditions, and the lack of organization that characterize informal employment are accentuated for women, since the types of informal employment in which women tend to be engaged, such as home-based work, tend to be socially isolated and statistically invisible (Otobe 2017; Ghosh 2021). Women in the informal economy were disproportionately affected by the COVID-19 pandemic, highlighting yet again the need to rethink the future of work to include women in decent and protected working settings.

2

Emerging sectors and informal employment

According to the latest ILO report on *Women and men in the informal economy. A statistical brief* (2018a), more than 2 billion people or more than 60 per cent of the world's employed population work informally. This affects mostly young and older people, as more than 77 and 78 per cent, respectively, are estimated to be in informal employment worldwide. The picture, however, not only differs among regions but also between sectors. The agriculture sector comprises the highest share of informal workers, with near 94 per cent of employed falling within this category. Industry and service sectors present a lower share of informality, but this differs broadly between developed and emerging countries: while near 16 and 18 per cent of employment is informal in the industry and service sector of developed countries, these account for more than 67 and 56 per cent in emerging and developing countries.

Informality is slow to change. Even with sustained economic growth and the latest changing nature of work, it has remained relatively unchanged in emerging economies. India's information technology industry has grown rapidly in the last 20 years; it has become a nuclear power; it has broken the global record for the number of satellites sent into orbit using a single rocket, and it has reached an annual growth rate of 5.6 per cent. Nonetheless, the size of its informal sector has remained stable at over 90 per cent (World Bank 2018).

The structural transformation advanced in the final report of the ILO Global Commission of the Future of Work (ILO 2019a) requires emerging sectors to be sustainable and inclusive. The potential of each sector to either promote formal jobs or transition informal units to formality differs in many ways, among which key elements are initial conditions and policy decisions. The availability of development drivers such as natural resources, human capital, available infrastructure, technological capability and trade networks also determine the potential for the global emerging sectors to expand in each region and country. The size and combination of these factors can limit the scope to absorb workers into the informal economy and generate formal jobs within each sector.

Due to disparities in relative factor prices, endowments, and labour market characteristics, developed countries may not be reliable references to the employment creation potential of emerging countries. In developing economies, the introduction of digital technology is spreading at a slower rate. The need for labour-saving technologies is low, as they largely benefit from a labour surplus. In addition, although demographic changes are indeed taking place, populations are significantly younger than in developed countries. The high rate of informality and the scarce access to decent work conditions reduces the scope of feasible economic activities, limiting the growth of potential sectors, particularly those highly intensive in capital or that require strong investments of public infrastructure in a limited time.

However, the growth of several activities included in the green, blue, knowledge, care and orange economies are being noticed across the globe. These sectors are considered emerging since they exhibit strategic advantages that go hand in hand with the world's latest trends in terms of digital, climate or demographic changes, as described in the previous section. The expanding paradigm towards sustainable production systems increases the potential of activities related to the circular economy (CE), conservation and ecosystem restoration, and the blue economy (BE). The transition to green energies, for example, can provide decent employment opportunities for countries with a high level of renewable resources. Consumer purchasing decisions are being driven by a growing environmental consciousness, promoting the transformation of traditional activities into eco-friendly businesses, as is happening both with sustainable agriculture and tourism.

The technological conversion amplified by the diffusion of the knowledge economy generates risks and opportunities for workers in many industries, but the sector itself would seem to have limited potential for low-skill workers in developing countries. On the contrary, the expansion of digital labour platforms provides job opportunities for unemployed individuals, although the labour conditions and social protection standards involved are still under debate. The care and OE (embracing cultural and creative activities) include sectors that are facing increasing demand and are potentially more achievable by their complementarity with digital innovations. The scope for developing countries to create formal jobs or formalize existing activities across these emerging sectors is analysed in the following section.

2.1 Green economy

The COP26 gathering in Glasgow in 2021 highlighted, once again, the need to create clean and green jobs to tackle climate change. To keep the temperature of the planet under control, the economic recovery from the COVID-19 crisis needs to secure its shift towards low-carbon production systems (UN 2021). The development of the GE is paramount to avoid environmental disasters, and this paper focuses on how this could be realized.

The concept involves a wide range of economic activities that cut across many sectors. It is associated with the increase of human well-being and social equity, with the greatest emphasis on the reduction of environmental risks and ecological scarcities (UNEP 2011). Every low-carbon sector which aims for resource efficiency and social inclusiveness falls under the green umbrella. There are, nonetheless, a relevant number of focal points. Industries related to renewable energies, biotechnology and bioeconomy, sustainable tourism, eco-conservation and the CE are growing rapidly, but their potential to absorb the informal workforce is reliant on countries' pre-existing characteristics, regulations and long-term interventions. According to ILO (2019c), the transition to renewable energy (RE) and the CE could potentially generate over 100 million jobs by 2030 when just a transition scenario is formulated.

The expansion of the GE is associated with a variety of labour market changes. For instance, it entails job creation in existing and new occupations within environmentally friendly sectors, the substitution of traditional occupations with low-carbon counterparts, and the transformation of traditional jobs, which include environmental considerations. Electricians installing and repairing social solar panels, for example, have to reconvert their skills and adapt to the use of new environmentally friendly materials, techniques and business practices. Many growing green sectors are more labour intensive when compared with their non-eco-friendly equivalents. Renewable energies, such as biomass depend more on labour than fossil energy production, which is highly capital-intensive (Harsdorff et al. 2020). Other green activities such as eco-conservation and organic agriculture demand more workforce involvement than traditional agriculture.

The shift towards a greener working environment will also require changes in processes and skillsets within existing professions. For example, the transformation of urban infrastructure into energy-efficient buildings and sustainable mass transportation will entail growth in construction sectors, green technology and associated industries. This will increasingly involve the use of eco-friendly materials and knowledge-based technologies. Undoubtedly, skills mismatch remains one of the main challenges for new formal jobs in the GE to absorb informal workers. Specific policies will be needed to provide workers with the tools required for the new paradigm. Accordingly, opportunities for job creation in the formal segments of the value chain, such as the development of technologies or manufacturing, are limited for informal workers in emerging economies without proper policies and local stakeholders' involvement. The formalization challenges for green construction and transportation industries may not differ widely from those for their traditional counterparts, but the introduction of new technologies could reduce employment in the informal segments of the value chain.

Jobs in the GE, however, are not necessarily *green* jobs.[3] Several sectors have the potential to improve the quality of work through better working conditions, occupational safety and health (OSH), and higher incomes (ILO 2013). Employment quality varies between countries and sectors, and within value chains. Whereas upstream RE operations are typically linked with high-quality jobs, comparable positions in downstream activities (such as biomass production in the bioenergy value chain) might be subject to poor working conditions, requiring extreme physical efforts or exposure to hazardous environments. In recycling activities, even though upstream operations, such as recycling or upcycling discarded items, are often formal occupations, many informal workers in developing countries work as waste pickers with no social protection, representation, or recognized labour rights (Harsdorff et al. 2020).

2.1.1 Renewable energy

In developing countries, the adoption of RE continues to increase steadily, becoming a cost-effective alternative to traditional energy sources. Solar photovoltaic (SPV), bioenergy, hydropower and wind power are at the centre of the transition to a less carbon-intensive and more sustainable energy system. According to the International Energy Association (IEA), the renewable sector demonstrated to be highly resilient to the Covid-19 crisis. Even though global energy demand declined 5 per cent during 2020, renewables capacity additions in 2020 expanded by more than 45 per cent from 2019 in the energy sector, led by a 90 per cent expansion in global wind capacity, and a 23 per cent growth in PV installations. According to their estimations, the total installed wind and solar PV capacity are on course to surpass natural gas in 2023 and coal in 2024.

In addition, the International Renewable Energy Agency (IRENA 2021) estimated that the global RE sector employed 12 million people globally in 2020, growing 4.3 per cent from 2019. The major contribution to RE employment is made by the solar PV sector, accounting for nearly 4 million jobs. It is followed by bioenergy (3.5 million jobs), hydropower (2.2 million) and the wind sector (1.25 million). Women represented 32 per cent of the RE workforce and are structurally underrepresented across the energy sector (IRENA 2020). Occupation segregation is reinforced in the energy sector, with women mainly employed in management and administrative activities.

Job creation in the RE sector entails both direct and indirect positions, from manufacturing, technical installation and maintenance through to jobs created up and down the value chain. However, while R&D and manufacturing are likely to be foreign jobs, developing countries mostly contribute to employment through project development and installation, which is temporary, and operation and maintenance, which is more stable (ILO and EC 2011). Jobs at different levels of the value chain require a diverse array of abilities and educational backgrounds, delimiting the scope for informal workers (with low-skilled individuals being overrepresented) to access the most valued positions.

3 Green jobs are acknowledged to be opportunities that contribute to preserving or restoring the environment, be they in traditional sectors or in emerging green sectors. For a job to be green, decent working conditions should be realized while contributing to a low-carbon transition economy (ILO 2015).

The sector comprises diverse occupations, including manufacturing engineers, technicians and operators, R&D and software engineers, marketing and sales specialists, logistics professionals and operators, construction and transportation workers, management and retail personnel, among others (Sooriyaarachchi et al. 2015). Despite its dependence on modern technological innovations, a compilation of employment-related and skills analyses made by the International Renewable Energy Agency (IRENA) disclosed that 60 per cent of the human resources currently required by the solar PV and onshore wind industries have low levels of formal training. In fact, a smaller number of people with degrees in Science, Technology, Engineering, and Mathematics (STEM) occupations are required (around 30 per cent) (IRENA and ILO 2021).

Nonetheless, the increasing adoption of Industry 4.0 into the RE sector may change the skills requirements in the sector, including those workers in the lower segments of the value chain. A wider digitalization of processes, such as the introduction of smart grids that connect energy generation to consumption with bidirectional devices, requires a skilled and professional workforce. Even for lower skilled technicians, information communication technology (ICT) knowledge and digital literacy will be needed to substitute traditionally hazardous tasks. (Arcelay et al. 2021). Workers from conventional energy industries like gas, coal and oil sectors should, therefore, undergo a process of reskilling and upskilling to meet the necessities of each RE subsector.

In developing countries, employment opportunities and their potential for informal transition are limited. The long-term impact on economic growth and development is related to the degree of involvement of local supply chains and networks. Nowadays, the integration of local content and local employment remains a challenge in the RE sector. According to IRENA and ILO (2021), the deployment and manufacturing of renewable energies are concentrated in a small number of countries: in the **solar PV industry**, for example, almost nine out of 10 jobs are located in the 10 leading countries, with the People's Republic of China heading the ranking and followed by the United States of America, Japan, India, Viet Nam, Bangladesh, Brazil, Malaysia, Germany and Australia. Employment in the main components of the solar PV manufacturing value chain is also highly concentrated, with the People's Republic of China consolidating its dominant position. If local suppliers are not involved in the evaluation and manufacturing process, employment opportunities are limited to assembling, maintenance and distribution of RE. However, according to Trace (2017), decentralized RE servicing, such as for off-grid energy, has the potential to offer decent work opportunities to economically marginalized individuals. This would involve the integration of women into market value chains and the likelihood for them to transition from the informal to the formal economy. There have been limited but successful targeted projects held in Bangladesh and Ghana, where women accessed training to be clean energy technicians and managers, and projects in Nigeria, Uganda and the United Republic of Tanzania, where women undertook training and obtained subsidies to become distributors of solar devices and clean cook-stoves (Calderon and Stern 2014).

Biofuels include energy derived from organic matter (biomass), such as animal, plant or algae waste. Bioenergy is a job-creating industry, with high levels of employment being needed at every stage of the value chain, from biomass production to transportation, conversion, distribution, and marketing (ILO and EC 2011). The majority of jobs are in the agriculture industry, cultivating and harvesting various forms of feedstock. Although turning feedstock into fuels employs considerably fewer people than supplying it, processing jobs often demand more technical knowledge, offering higher pay (IRENA 2020). The intensity of labour required by feedstock supply means that the sector's potential for developing and emerging countries is considerable. The majority of the global workforce is located in Brazil, Colombia, Indonesia, Malaysia, Thailand and the United States.

As happens with most agricultural employment, workers in the sector are exposed to different employment settings linked to their position in the value chain. In contrast to the industrial segments, downwards in the sector, when biomass is produced, casual and seasonal arrangements are abundant, and there is broader scope to formalize. A study for the biodiesel value chain in Argentina by Epifanio and Ernst (2019) illustrates the dual scenario: the working circumstances of skilled personnel at facilities' maintenance, operation, and management activities largely meet the ILO decent work requirements, while soy producing activities at the bottom of the biodiesel supply chain frequently offer informal labour for unskilled cultivation workers in precarious

working conditions. These employees, as well as the populations living around the soy fields, are frequently exposed to dangerous and poisonous substances. T2F policies are needed to guarantee green jobs along the value chain.

The wind industry is also led by the People's Republic of China, accounting for 44 per cent of global employment, followed by the United States and Germany at the head of the employment ranking. Globally, employment in onshore and offshore wind was estimated to be 1.25 million in 2020, where women represented near one-fifth of the industry workforce (IRENA 2020). Although the sector has the potential to absorb high-, medium- and low-skilled workers from other sectors of the economy, particularly the power sector, the skills required for development and R&D activities within the sector are far from accessible to workers in the informal economy. According to the European Wind Energy Association (EWEA) (2009), manufacturers and component manufacturers account for nearly 59 per cent of the workforce in the European industry, followed by developers (16 per cent) and installation, repair and maintenance (11 per cent).

Potential employment could be created in developing countries through the production of components, which companies could outsource to local sub-contractors, in addition to local jobs related to building work, transportation and logistics. However, a recent overview study by Aldieri et al. (2020) summarizing existing literature on job creation in wind power installation concludes that the potential for employment expansion is limited, highly dependent on project scale and institutional arrangements in each country. Local employment growth relies on countries' ability to establish a strong local supply chain, including through investment in manufacturing, grids, and, for offshore projects, port infrastructure and specialized vessels (IRENA and ILO 2021). Successful outcomes were achieved when a minimum of local content was enforced in RE supply chains as part of the investment arrangement. Several wind farms projects in Brazil and Uruguay have accounted for growth in local green jobs, making the energy transition more inclusive (Saget et al. 2020).

2.1.2 Bioeconomy

The European Commission (2018) defines the bioeconomy as "all sectors and systems that rely on biological resources, their functions and principles. It includes and interlinks land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources; and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy, and services." A key element of the bioeconomy is that it implements new biological techniques (biotechnology) to reshape established economic sectors across diverse segments of their value chains (Diakosavvas and Frezal 2019). The concept, therefore, encloses a wide array of agricultural activities which include: food and feed, such as organic agriculture or sustainable fisheries; manufacturing crafts and products that use bio-based components, such as textiles, paper and pulp or furniture; energy and chemical-related industries, such as biorefineries, biofuels, bio-based chemicals, bio-based plastics, biogas; and health-related areas such as bio-pharmacy and biomedical goods.

Although the agri-food system still plays a major role in bioeconomy development, the subsector includes the production of materials and energy out of renewable biological resources from land and sea. The growth in the demand of the supply of biomass to satisfy the needs of the energy and industrial raw materials sectors is an opportunity for developing countries that are rich in natural resources. The challenge, however, is to generate production of biomass that is both environmentally and socially sustainable.

The development of new technologies, such as molecular biology, or the manipulation of genetic material involves highly skilled workers which are unlikely to be found in informal units. Nevertheless, the use and upgrade of biomass for the production of goods, services or energy provides a source of employment and income for workers in the informal economy, particularly for those in rural areas. Its transformation through the incorporation of biotechnology, therefore, has massive implications for the majority of workers, who are commonly subject to poor working conditions, low incomes and low levels of productivity. Child labour and OSH also challenge the well-being of families in rural areas, disproportionately affecting women. The spread of biotechnologies can boost farmers' productivity and significantly increase their well-being. Policies that enhance workers' incorporation and proper use of these technologies are essential, overcoming both financial restrictions and information constraints. There is considerable potential for transitioning to formality in bioeconomy activities, and access

to new technologies and wider markets are fundamental for small establishments to gain the necessary productivity levels that allow them to formalize their businesses.

Sustainable agriculture

The growing global population ensures the agricultural sector is and will continue to be for several decades the most important economic activity in most African countries, particularly in sub-Saharan Africa. As a result, boosting the sector's productivity and/or modernizing it may strengthen the transition to formality (Chacaltana and Leung 2020). Organic farming, regenerative agriculture, agroecology, and conservation agriculture are examples of sustainable agriculture that could offer considerable environmental, economic, and social benefits (Lukka 2019). Organic agriculture, in particular, is both a sustainable response to increasing food demands and presents opportunities for job creation since it enables farmers to obtain premium prices for their production while accessing new markets. With their many planting and harvesting seasons, the diversification of crops commonly seen on organic farms may also result in greater labour options for women.

Because they have more labour-intensive production activities, a higher share of labour-intensive crops, less mechanization, more on-farm processing and trading, and a higher information management system, their labour requirements per hectare are acknowledged to be higher than their conventional counterparts (OECD 2016). It has been argued, however, that labour needs in organic farming vary according to industry and country characteristics (Orsini et al. 2018). For example, organic horticulture farms need considerably more labour, while organic, cereal-livestock and dairy farms might not require any more labour than their conventional counterparts. The expansion of sustainable agriculture creates opportunities for the manufacture of related farming equipment, so that employment along the agricultural value chain could be boosted if manufacturing policies were aligned.

In a review of the organic sector in Uganda, Trace (2017) found that the activity provides benefits in terms of decent work and enhances women's economic empowerment. In addition, premiums and contracts in organic agriculture for export may offer smallholder farmers higher and more stable prices than local markets. The growth of the sector in Uganda has been enormous, expanding from 15,000 certified organic farmers in 2003 to 400,000 in 2016 (Trace 2017). Certification requirements, however, can entail high costs that informal farmers may struggle to meet, foremost among which is their lack of specific organic technologies' skills (UNEP and UNCTAD 2008).

The process of formalization through organic quality certification requires an upgrade in technical knowledge, the implementation of new organic crops, and modern functional arrangements. In Uganda, the process was frequently achieved collectively across a group of farmers or cooperatives, which encouraged collaboration, and offered opportunities for collective bargaining. Investments in certifications were considered worthwhile since contracts with exporters provided smallholder farmers with predictability, and farmers faced a higher cost-benefit ratio (Trace 2017).

The potential of T2F for sustainable agriculture is extensive. The higher returns that the activity provides in comparison with traditional agriculture can help rural workers overcome the activity-related risks and promote higher standards of living. In order to make organic agriculture beneficial for farmers and promote formal employment, constraints to accessing markets, knowledge and tools should be addressed. Policy packages which include skills upgrading, enterprise and value-chain development, creation of a business-friendly environment, and investments in social protection and infrastructure, can result in significant increases in output and income, particularly among small-scale farmers in developing countries (ILO 2013). Seufert (2012) highlights the promotion of cooperatives and policies that contribute to their capacity building since they can enhance training, access to health, housing, and credit services, as well as provide support with the certification process and access to international markets. Even though the organic product can provide a higher income, deficits in working conditions must be dealt with as in traditional agriculture.

2.1.3 Ecosystem restoration, conservation, and climate change adaptation

A key feature of a GE is that it creates opportunities for economic development and poverty reduction without eroding a country's natural assets (UNEP 2011). The concept includes activities

that are both non-damaging and that contribute to the conservation and regeneration of ecosystems, in addition to activities that reduce the risk of and vulnerability to climate change. Climate proofing infrastructure and natural environment protection programmes provide not only positive environmental impacts but also employment-intensive activities, thus improving livelihoods and providing income security for rural populations (WWF and ILO 2020). This is fundamental for many workers in the informal sector, especially women and youth.

The restoration economy involves assisting the recovery of damaged environments by enhancing local habitat. Such activities could include reforestation, forest thinning, slope protection, soil and water conservation, the lining of rivers and creeks, sluices and footbridges, and construction of dikes, among others. Most mitigation projects are coordinated locally, whilst the role of international organizations is considered crucial for both funding and technical guidance. An example of a successful experience is Guyana's Mangrove Restoration Project, which has attempted to replace informal activities with new livelihoods that support both mangrove conservation and climate adaptation measures while promoting sustainable economic growth for local communities. By 2018, 900 direct and stable jobs had been created, with additional temporary employment in planting seedlings, plant monitoring, agro-processing and distribution (ILO 2019c).

Ecosystem adaptation seeks to protect activities that are highly reliant on environmental stability. Irrigation and drainage, land resource management in rural areas, guaranteeing water quality supply are some that are essential in reducing environmental deprivation and mitigating natural disasters, such as wildfires or floods, but would also bring agricultural benefits to local farmers (ILO 2020a). There is, consequently, a strong relation between restoration, conservation, and CCA, since many activities that help disaster relief for affected communities also enhance environmental recovery. Nature-based solutions, such as Guyana's Mangrove Restoration Project, combine these benefits. According to Bapna et al. (2019), restoring mangroves could secure food supply and livelihoods, improve water quality, reduce storm impacts, and generate incomes for local communities.

Activities in the sector involve a multi-dimensional labour demand for workers with low- and medium-educational levels, transferable from construction and landscaping industries, as well as individuals with higher degrees coming from engineering, management, and scientific backgrounds. The promotion of labour-intensive approaches is a first step towards creating decent work, but multiplicative effects and local resilience are strengthened when combined with local resource-based approaches that utilize locally available skills, technologies, and materials (GCA 2021). Because environmental conservation is considered a public good, the majority of significant initiatives in the restoration economy are funded by public funds. At local level, communities and businesses whose lives and productivity are harmed by environmental degradation also contribute to ecosystem preservation, but they rely mostly on informal employment. There is, therefore, broad scope for both absorbing informal workers from other sectors and improving the situation of those already working in rural and private spheres.

Reforestation and afforestation (sustainable forestry)

Every year the world loses around 5 million hectares of forest. Even though deforestation has declined substantially in the last decades, the net forest loss is slowing down due to a reduction in the rate of forest expansion (FAO 2020). The expansion of soil cultivation and excessive grazing to the detriment of forestall areas is contributing to an acceleration of the process of desertification, affecting water availability in rural communities, as well as many other local economic activities. Goods and services related to the forest environment affect the livelihoods of over 1 billion people, with many developing countries having the highest percentage of forest-based employment, including Brazil, the Democratic Republic of the Congo, Ethiopia, India, Indonesia, and the People's Republic of China (Lippe et al. 2021). According to a factsheet published by the World Bank (2016),[4] forest timber demand is expected to quadruple by 2050. The forestry sector employs more than 54.2 million

4 Compiled from the following sources : FAO, *Contribution of the Forestry Sector to National Economies*, 2014. FAO, *State of the World's Forests 2014. Enhancing the Socioeconomic Benefits from Forests*, 2014. World Bank. *An 'Evergreen' Revolution Cuts Fertilizer for Africa's Farms*, 2013. World Resources Institute. *Forests for Water: Exploring Payments for Watershed Services in the U.S. South*, 2011. Zao-Yin Wang, Joseph H.W. Lee, Charles S. Melching, *River Dynamics and Integrated River Management* (Springer, 2015).

people in the broader forestry, wood, pulp and paper sector, 41 million people of whom informally. Reforestation and tree plantation, therefore, is a necessary condition to restore forest degradation. It makes economic sense on its own, but also supports agriculture and rural livelihoods.

Conservation, sustainable forest management, and the enhancement of forest carbon stocks all have the potential to create employment. It is estimated that with targeted public investment, sustainable forest management could create 10 million new jobs, with significant potential to meet economic, social, and environmental goals, as well as have transformative effects (Lukka 2019). Being a highly labour-intensive activity, forest restoration emerges as a highly cost-effective way of reducing people's vulnerability to climate change (WWF and ILO 2020). For reforestation and afforestation to be a decent work engine, it has to address the working conditions drawbacks that traditional forestry faces. In particular, it is estimated that nearly two-thirds of forestry and logging-based employment is informal or subsistence. Decent work deficits can be found in many stages of the value chain, from logging operators to fuelwood collection, usually performed by women in low-paid or unpaid work (ILO 2019d).

Growing alternatives to industrial logging are sustainable forestry management and community forestry management, both entailing a more labour-intensive process. In the latter, communities have the right to manage forest resources with the idea of sustainably improving the living conditions of their members. In Nepal, for example, community forests had been promoted by the State for preservation and reforestation, achieving significant economic and social results. According to a study made by Merlet (2015), 18,000 user groups are managing 1.7 million hectares and benefiting 2.24 million households. As a result, 86 per cent of communities have improved their forest areas, limited erosion, protected the watershed, and increased their agricultural production. Evidence of the economic benefits of community-based forest experiences has been documented by the Centre for International Forestry Research, including in emerging and developing countries such as Mexico, Nepal, Peru and the United Republic of Tanzania (WWF and ILO 2020). Forest management certification in Argentina and Chile has also been adopted for native and plantation forestry. For example, in Chile, certification helped to improve the relationship between companies and stakeholders through formal consultation processes, the hiring of local workers, and upgrading working conditions and social benefits (Saget et al. 2020).

Reforestation and afforestation have, therefore, the potential to absorb the informal workforce in the forestry industry and related rural environment. For decent jobs to be created, integrated strategies for employment and social protection are required. Institutional coordination with rural cooperatives and communities is of paramount importance, as their informal status restricts their access to support services, such as business development or extension, or financial services. Certification for timber schemes, payments for ecosystem services, and community-based partnerships seem to be interesting strategies for incentivizing better practices that lead to formal agreements (UNEP 2011).

2.1.4 Circular economy: Waste management and recycling

The CE refers to the use and reuse of products in a closed cycle, instead of the traditional linear economy of production, consumption, and waste. It aims to maximize the value of commodities not only while they are in use, but also after they have completed their life cycle by reincorporating components as inputs into new products. Likewise, the concept weights better the use of goods through services (such as rent) rather than ownership. Analogously to the loss in fossil-based energies that would entail a shift towards renewable sources, the increase in the CE is associated with a loss in extractive activities. Policy alignments are needed for just transitions since those gaining new jobs will not certainly be those losing jobs.

The activities within the sector have considerable potential for job creation: as a stepping stone, remanufacturing and repair of goods is more labour-intensive than resource extraction (ILO 2019e; World Bank 2021). It is expected that the CE will create around 6 million new employment opportunities across the world, mostly in recycli activities and in those services associated with repair (ILO 2018d). It has not only the potential to offer relevant employment opportunities to those living in poverty, but also to enhance favourable

environmental outcomes and significant GDP growth (Gower and Schröder 2016).

Access to solid waste management is still a challenge in many developing countries, and health and environmental risks have had huge impacts on the population's standard of living (Lukka 2019). In developing countries, a majority of waste collection and recycling workers are informally employed, usually in hazardous conditions. Significant challenges remain in terms of access to decent work. Social protection deficits and freedom of association constraints are also usual in the sector. Informal waste workers fill a vacuum left by municipalities that lack resources or capacity to implement a formal waste collection and treatment system. An estimated 15–20 million people were employed in the sector in developing countries by 2015, and up to 2 per cent of the urban population in LMICs is working informally as waste pickers engaged in recycling, collecting, recovering, sorting, grading, cleaning, baling, or compacting waste, as well as processing waste into new products (Gunsilius 2011; ILO 2013; ILO 2015).

The development of the CE demands a thorough knowledge of products' components for efficient sorting, suggesting the need to extend training to workers in the informal sector for a suitable transition. Activities include traditional recycled items such as plastic, paper, glass or aluminium, but also an increasing shift to waste management of electrical and electronic equipment. E-waste workers are often highly skilled in making appliances usable again and they contribute considerably to local economies (ILO 2019e). Across all waste items, workers are exposed to poor, unsafe and unhealthy working conditions, with most having informal agreements. Small and micro-businesses comprise most of the sector, having limited access to technology and waste treatment systems. The potential to create impact at scale by formalizing and improving working conditions in the activity is, therefore, highly relevant. In contrast with other informal activities that are outside the regulatory framework, the sector includes a highly marginalized share of the population. Furthermore, transitions to formality must endure barriers of social stigmatization, which requires revaluation of the activity's importance. The recycling value chain is integrated by different processes. Although it varies for each material, it starts with waste collection, sorting, cleaning, shredding and compounding, the production of pellets and the manufacture of new products (WBCSD 2016). Within these activities, formal and informal arrangements are highly interlinked. Middle actors mediate between informal pickers and collectors and recycling plants, sometimes creating a co-dependent relationship between the two. The role of governments to facilitate circular activity while reducing the obstacles in labour rights and occupational safety is, therefore, essential. Coordination with involved stakeholders, including social enterprises, cooperatives, nongovernmental organizations (NGOs), and the companies from which waste originates would increase targeted action leading to an increase in social protection and higher incomes (Barford and Ahmad 2021). In addition, specific training becomes fundamental for workers in the informal waste management sector to enable their incorporation into the more technical stages of the recycling process.

A growing number of initiatives are being implemented in Africa, Asia and Latin America, which aim to integrate and formalize waste pickers, and promote their legal rights and social recognition (Barford and Ahmad 2021). Successful experiences in Brazil, Colombia, India, Nigeria and South Africa have demonstrated that collective action through cooperatives and social enterprises can enhance marginalized actors' working conditions and overall well-being. A real improvement is made when controlled and sanitary waste management services are introduced, enhancing decent work in the informal segments of the sector (Jarvis et al. 2011; ILO 2018d). The case of Colombia is particularly interesting since waste pickers were incorporated into the formal recycling and waste management process as public service providers, receiving an extra payment based on their collection (Lewis 2016).

The CE is growing rapidly. The potential for workers in the waste management sector to transition to a decent paradigm is enormous, and it mostly requires the coordination of institutions at local level. Working conditions in the waste management sector can be improved by introducing safe working procedures and safety equipment, addressing child labour and some of the negative environmental effects of recovery and recycling processes. Other relevant measures include providing self-organization support and introducing light regulation to allow the informal sector to engage with local government (Trace 2017; Ghosh 2021). Social protection policies, such as simplified tax schemes or general protection arrangements would benefit informal

workers in the sector, helping them access at least a minimum of risk protection and coverage. Training on correct waste sorting is also necessary for the development of the CE.

2.1.5 Sustainable tourism

Ecotourism is a form of tourism involving responsible travel to natural areas, conserving the environment, and improving the well-being of the local people. The growing industry has a significant impact on local communities, as it involves the local workforce and the mobilization of resources for conservation purposes. Before the Covid-19 pandemic in 2019, tourism's direct, indirect and induced impact represented 10.3 per cent of the world's GDP and accounted for approximately 330 million, or one in 10, jobs around the world (WTTC 2020).

Increasing consciousness of the environmental impact of travelling is stimulating a change in the sector's type of activities. Ecosystem degradation can jeopardize tourism's economic sustainability, affecting the livelihood of thousands of families. To tackle this, a more sustainable focus is gaining space where the importance is set on ecology conservation. In Caribbean countries, such as Antigua and Barbuda, Dominica, Grenada, the Grenadines, and Saint Vincent, marine and coastal tourism are highly dependent on the quality of the natural ecosystems to attract visitors (OECD 2020). Tourism is based on the recreational value of beaches and clean waters, and its preservation requires an integrated vision of sustainability and cooperation between stakeholders.

One key element of ecotourism experiences is the greater appreciation and understanding of nature, local society and culture. It is delivered on a small scale, which means it is highly labour intensive and strongly dependent on community involvement. Another big component of sustainable tourism is the juncture at which cultural heritage, ethnic groups, living cultures and indigenous populations are incorporated into the scene where actors are usually invisible and marginalized. Women' and youth's engagement in ecotourism activities is also significant in developing countries (Trace 2017; ILO 2019f). Because investment requirements and other hurdles to entry are frequently lower than in other industries, the activities involved are considered to have the potential for inclusive growth in undeveloped areas (Hall et al. 2012). Rural tourism, for example, can enhance the development of rural communities while diversifying their economic dependence on agricultural commodities.

The introduction of sustainable practices for the use of resources and a more nature-driven perspective of the tourist experience requires workers in several occupations to undergo specialized training. New skills should be developed encompassing many areas of focus, from the conservation of protected areas (biologists, veterinarians, park rangers) to tour guides, naturalists, photographers, journalists or researchers. However, there is still a substantive number of traditional tourism jobs (for example, drivers, cleaning, and cooking personnel, etc.) that would not be directly impacted by these changes in required skill levels, and whose labour opportunities will rise hand in hand with ecotourism development.

In terms of challenges for T2F, the sector shares regularization issues with traditional tourism, as well as the OE's cultural activities. In particular, the dependence on short-term and irregular arrangements, income instability associated with seasonal demand and long working hours, particularly in the gastronomic and hotel sector. Analogous to traditional tourism, the value chain is compressed by both formal and informal units. From small independent service providers such as guides, drivers, family-owned restaurants, handicraft producers and artisans, to more structured and regulated travel agencies and hotels. By enhancing the formalization of tourism and the adoption of sustainable practices, the sector has the potential to boost several downstream activities. Introducing sustainable practices and aims accounts for a promising added value behind the value chain of the sector. Costa Rica´s extensive expansion and development of the ecotourism industry had several positive social impacts, including the provision of better paid jobs for young people and women with children (Saget et al. 2020).

The foundation of sustainable tourism is to increase the number of local jobs and ensure that the pay and working conditions are fair, safe and offered to workers without discrimination (UNEP 2005). Tourists that look for sustainable leisure experiences expect and pay for both low ecological impact and fair-working settings. In that sense, consumers consciousness acts as direct enforcement of better labour standards. The expansion of the sector has, therefore, huge potential to absorb informal workers in the

traditional tourism, while enhancing formal work along the value chain.

Since most of the businesses in the tourism sector are small- and medium-sized enterprises (SMEs), sustainable tourism promotion and formalization involves specific policies that enable stakeholders to invest in pertinent infrastructure, knowledge, a business-friendly environment and competencies to start or adequate their business to comply with sustainability measures, but also to offer adequate financing for different types of enterprises. The lack of experience in the tourism sector in rural communities or indigenous populations would require support to deliver profitable and quality sustainable tourism. This includes financing, marketing, business planning, product packaging, and distribution to stimulate demand for rural tourism products. Complementary policies such as local capacity development and social dialogue platforms are fundamental to ensure that ecotourism's positive impact is fairly distributed in local communities.

For workers in the sustainable tourism sector to T2F, targeted support is necessary, involving multifaceted interventions such as an integrated and coherent strategy for employment, social protection and other social policies, as well as institutional coordination (ILO 2019f). The implementation of the *Strategic Plan: Sustainable Tourism and Green Jobs for Indonesia* (ILO 2012) is a sound example of consensus between key stakeholder groups across diverse government levels, communities, industry, education, and training facilities to promote the sustainable tourism industry and decent jobs. The promotion of the sector includes the building of relevant infrastructure, enhancing the business environment and helping firms embrace digitalization, and reforms to vocational education and training to enhance the tourism-related skills of local populations (Ollivaud and Haxton 2019).

2.2 Blue economy

More than 3 billion people rely on the ocean for their livelihoods, the vast majority in developing countries. In many of these countries, ocean-based industries such as tourism and fisheries are key sources of income and jobs. The rise of new activities such as offshore wind energy, growing aquaculture and the development of marine biotechnologies is accelerating the growth of the ocean economy (OECD 2020). The BE comprises the use of local marine and river resources sustainably while adding value, supporting climate adaptation and resilience and preserving biodiversity. The transition to a sustainable BE requires investments in innovative technologies and a business-friendly environment to promote the latter as well as adequate financing.

Wave and tidal energy, algae production, innovative fishing gear, restoration of marine ecosystems has the potential to expand employment. However, blue production is still incipient, and its impact is currently marginal. A large part of the wave and tidal energy research projects, for example, remain at the design or laboratory level, sometimes at a prototype testing stage. This involves formal employment in R&D, but still little opportunities for informal workers.

The high costs involved in the commercial utilization of wave and tidal energy have made its implementation still low compared to that of other renewable sources, such as solar energy and wind energy. While major advances are being made by high-income countries, with Canada, France, South Korea, and the United Kingdom at the top of the technological development, and emerging countries with large coastlines, such as Brazil, Chile and Mexico, steadily getting involved. The potential of this sector to absorb informal employment in the short run is, however, quite limited. A study for Wales in the United Kingdom made by Fanning et al. (2014), demonstrated that employment in the sector is mostly realized through the development and construction process. As happens with solar and wind technologies, despite the installation phase, maintenance tasks and indirect jobs in logistics and transport, the activity is highly dependent on skilled employment, such as mechanical engineers, oceanographers, electrical designers, or marine ecologists, which are usually found in formal environments.

However, many other subsectors of the BE that are currently providers of informal employment have the potential to transition to formal settings. An interesting case is that of seaweed or algae production. Its derived products find applications in multiple industries such as food and beverage, feed, nutraceuticals and dietary supplements, personal care, and pharmaceuticals. The versatility of the algae-derived products is expected to be a major driver of growth in the algae products market. At the moment, seaweed cultivation operations are usually labour intensive and employ many part-time or occasional workers. Downstream activities are

job and income drivers, and include post-harvest handling, distribution, processing, and marketing. In the Philippines, for example, the seaweed sector is expected to employ between 100,000 and 150,000 seaweed farmers, from 30,000 to 50,000 local consolidators, and over 20,000 small traders. In laboratories and government offices, the seaweed-carrageenan business also provides a significant number of supportive and administrative professions (Cai et al. 2021; Hurtado 2013).

In West African countries, including Kenya, Madagascar and the United Republic of Tanzania, seaweed farming has generated small-scale income for local communities, with women fully participating in the collection and transaction of value-added products based on the seaweed biomass cultivated. Experience demonstrated that women were able to meet, at a minimum, basic household needs and take control of their finances (Msuya and Hurtado 2017; Rakotomalala and Tovondrainy 2017). However, working conditions are still far from ideal, involving precarious scenarios with OSH deficits. Policies that promote a T2F would greatly improve working conditions and promote the sector's development, enabling it to access international markets that require strict quality certifications.

Other examples of highly informal sectors that could benefit from T2F perspectives in the blue bioeconomy involve sustainable fisheries, where the waste of the industry can be used in derived products such as bioplastic, beauty products and energy. Sustainable fishing is essential for economic development, employment, food security and the livelihoods of many communities (UNEP 2011). A relevant country case is found in Indonesia, where the ocean economy represents 28 per cent of GDP, mainly explained by the development of marine fishing, aquaculture, fish processing, shipbuilding, maritime passenger and freight transport (OECD 2021). The sector involves activities with a high degree of informality, poor working conditions and exploitation.

Efforts for sustainable transition are being undertaken with regulatory and economic instruments. In terms of T2F, measures include insurance schemes, written work agreements and the establishment of a remediation mechanism. In addition, coordination between diverse government-level institutions, international funds and civic society can enhance the implementation of ecological fiscal transfers, which provide fiscal schemes to discourage the conversion of high conservation-value sites for industrial or commercial use (Kieft 2020).

The BE has huge potential to formalize existing workers while contributing to local communities' development and well-being. Although the current relevance of the sector is low, the increasing search for renewable inputs to diverse industrial productions provide these communities with an opportunity to get involved in wider value chains. The need to set institutional frameworks that promote decent working conditions is a prerequisite for its widespread development.

2.3 Knowledge economy

The knowledge economy (KE) is analysed for its relevance in shaping the world of work by transforming the scope and means of the economic relationships. Sectors in the KE are characterized by their extensive use of intellectual capital and intangible assets as well as their reliance on computerization, the use of big data and the automatization of processes. Their development involves modern but different tools, which makes the sector itself heterogeneous. The KE generates tools and services that are being used in other sectors with more frequency, transforming production, distribution and consumption along with most goods and services.

The digital transformation of the economic system is based on KE advances, and the expansion and interconnection of the knowledge-based innovative sectors with diverse economic and social environments. The KE is a key element of the so-called fourth industrial revolution. Both the development of new technologies such as Artificial Intelligence (AI) or the Internet of Things (IoT) and their application in goods (e.g. drones and sensors) or services (the platform economy) involve the transformation of traditional jobs and the generation of new ones. From the design and production of digital-based hardware and software to the services that operate and manage them, the KE is a crucial component of the future of work. At the moment, however, developed countries are leading its progress, while developing economies face structural challenges to scaling the sector.

Representing the frontier of modern technology, employment in the KE is concentrated among highly skilled workers, where innovation-led non-routine and cognitive tasks are mostly performed. The invention, development and manufacturing of its services and technologies

are biased towards a highly qualified workforce, which is less frequent in informal units. However, even though most activities involve the use of a relevant level of digital literacy, some tasks in the KE that require human intervention are available for workers with a wider range of skills.

2.3.1 Online web-based labour platforms

On the one hand, specialized online web-based platforms, for example, Upwork or Topcoder, offer tasks to workers with high levels of analytical thinking, who are expected to compete between each other while programming, finding bugs and developing new digital tools. Speech and image recognition, as well as cyber security services, are becoming more regular in daily applications, but their development relies mostly on data scientists and engineers.

On the other hand, microtasks and competitive programming platforms such as Amazon Mechanical Turk or HackerRank expect workers to participate and shape the KE from a less advanced technical perspective, such as annotating images, moderating content and transcribing a video (ILO 2021). These platforms, mostly require workers with secondary and higher secondary education levels, which could, to some extent, be compatible with workers in the informal economy. Job opportunities in these platforms are available worldwide, so workers located in both developed and developing countries compete for these jobs.

Jobs in online platforms is appealing for workers looking to complement their earnings and in principal has a net positive employment effect. There are, however, several challenges in terms of income and job insecurity. The sector presents enormous growth potential in developing countries, but the digital transformation has the potential to increase informal and new and flexible employment schemes (OECD 2020; Berg et al. 2018). As terms of service agreements and contracts are unilaterally determined by the platforms, freedom of association and the right to collective bargaining are regularly undermined in digital environments. Hence, even though the sector has a high potential to absorb a number of informal workers with medium level of digital literacy, social dialogue is needed for agreements that leverage opportunities arising from digital labour platforms. The worldwide marketplace for digital piecework allows for rate bidding and competition, which, by design, lowers the value of labour to the cheapest global bidder, further commodifying labour. This business model does not allow workers to organize since they are dispersed and competing for jobs or "gigs",[5] resulting in poor working conditions and unequal labour arrangements (Rani 2020). Regulatory frameworks that consider this new organizational model are needed to protect workers' rights. An interesting example in this regard are the Netherlands with the Dutch Digitalisation Strategy 2021, which also has an influence on and serves as a model for other EU member countries. It provides a comprehensive policy and regulatory framework and considers digitalization as an opportunity for tackling social challenges and for promoting social inclusion, e.g. promote work-life balance, include people with disabilities, digital skills learning, supply of digital devices to low income groups, promote female entrepreneurs in the digital sector (Government of the Netherlands, 2021).

2.3.2 Sensors and drones

Several frontier jobs of the KE are as yet out of reach for workers in developing countries. The development of AI, machine learning or deep learning (DL) require not only a high degree of cognitive skills, mostly found at formal institutions, but also advanced capital infrastructure, such as fast processing computers. Developing counties are, therefore, limited in the production of frontier technology, including smart-machines (self-driving vehicles), virtual reality assistants and intelligent agents (Siri, automated online assistants, chatbots), purpose-build smart machines (neurocomputers), embedded systems (machine monitoring and control systems) and expert systems (medical decision support systems, smart grids). Even though these technologies are being used in a variety of businesses worldwide, their development requires highly skilled workers who are entirely represented in formal institutions. The potential for the KE to absorb informal workers is consequently low at its upstream stages.

The adaptation, implementation and sales of appliances generated by the KE, however, seem

5 Slang word meaning a free market system in which temporary positions are common and organizations hire independent workers for short-term commitments.

to have more potential in the short run for developing countries to expand employment. Smart equipment that uses the Internet of Things (IoT) are replacing traditional technologies in many environments, from household appliances to health-care, industry and agriculture (Mar 2020). Machines are increasingly being embedded with sensors, processing ability, software, and connected with other devices over the Internet.

A clear example of the KE expansion into everyday activities comes from the development and widespread use of drones. Unmanned aerial vehicles have already hit consumer markets, and are being widely used in growing and harvesting crops, and in entertainment, film making, emergency response, energy, personal business, cyber-security and even combat. According to the Grand View Research Report (2021), the global commercial drone market size was valued at $13.44 billion in 2020 and is expected to expand at a compound annual growth rate of 57.5 per cent from 2021 to 2028. The market is so far highly concentrated, with a few market participants accounting for significant market shares, almost entirely based in developed countries. However, the increase in demand for drones will mean a growth in the supply and manufacture of machine parts, with multiplying effects along the value chain.

There is a potential for several developing countries' insertion into the production process. Smart technology manufacturing is carried out in more technical industry environments, but the industrial upgrade is achievable under less restricted scenarios and is feasible for many developing countries' current industrial capabilities. Countries, such as India and Mexico, have been introducing regulations that facilitate the use of a drone for business and recreation, while initiatives in the private sector and government agencies are stimulating start-ups to accelerate local production. The production of drones and sensorial technology enhances formal employment, and value can be generated by services that operate and handle drones, involving software developers, programmers, sensors' experts, telecommunication engineers and remote operators. As happened with the mobile-phone revolution, drone production and distribution activities will require skill-diverse jobs related to customer service, assemblers, mechanics, testing and quality assurance professionals, packaging teams, and production assistants.

2.3.3 Agriculture 4.0 and Industry 4.0

Similar to most of the technologies at the production frontier, relevant employment opportunities for informal workers are not located in R&D, but mainly in services related to the distribution and use of the product. In particular, the retail and operation of drones and other sensor-based technologies do not differ markedly from previous technological advances, and do not require extensive cumulative knowledge. However, drone use can be implemented and boost productivity in other sectors such as construction and cultural activities. Agriculture 4.0, for example, has the potential to augment the productivity of smallholder farmers in poor countries, helping them to access better markets and improve their livelihoods.

Adaptation challenges remain, in particular since the labour profile of rural users of sensor-based technologies is increasingly dependent on digital literacy and requires workers to interpret and take actions on the now automatized data-collection process. Although this process may not be highly complex, it does entail a new productive, logistic and commercial environment (Artopoulos and Lengyel 2019). For productivity and income improvements out of Agriculture 4.0 adoption to be materialized, several technological and cultural barriers must be encountered first. The scope for rural communities to access new markets and increase their working conditions relies on their capacity to appropriate productivity gains out of efficient technological adoption.

Not only is this technology changing the world of work in the agricultural sector, but it is also providing opportunities at the manufacturing level in emerging economies. Pérez et al. (2014) argue that there is a window of opportunity for natural resource-rich countries to participate in the early-stage development of biotechnology, nanotechnology, bioelectronics and new materials, by embedding the associated supporting network into the local economy for a major leap forward when these technologies become pervasive, low-cost and high-growth. However, costs and knowledge factors are often limiting innovation barriers for firms in precision agriculture in developing countries (Lachman and Lopez 2019). As has happened with other digital technologies production, their development requires strong and agile

industrial networks, which most emerging economies do not have.

Most developing country micro- and middle-sized enterprises lack the infrastructure and the finance mechanisms to modernize their production systems. Workers in informal units have little chance of moving to advanced knowledge-based industrial systems, mostly because the supply of smart factories is still low in their economies. Although industrial workers already employed in tech fabrics may be trained to manage new machine-to-machine (M2M) and digital equipment, without adequate training policies, these would only be feasible for those workers with enough experience and a minimum level of digital literacy. The adoption of new technologies, such as drones or precision agriculture, require not only an upgrade in skills for its efficient use, but also an investment and financing facilities that not all informal enterprises are able to do. Although the KE is considered an emerging sector since it keeps growing and expanding globally, only a small proportion of a highly skilled workforce in developing countries is in a position to join it. The possibility that informal workers are absorbed by the KE is low given their limited access to the necessary capital.

The future of work involves dynamic and more sophisticated skills than before. An emerging country like Brazil is focusing on improving the digital skills ("Brasil mais digital") in their education program (OECD, 2022).The role of formal education and lifelong training is, therefore, fundamental for workers to be updated on new production systems. In emerging countries, there has undoubtedly been an improvement, but results are still far from what is needed to catch up with developed economies: although the ratio of students completing lower secondary school increased from 23 per cent in 1990 to 42 per cent in 2014, it remains low compared with a global ratio of 75 per cent (UNESCO 2021). The STEM skills required to operate knowledge-based factories remain at very low levels in LMICs, even for the young population.

2.4 Location-based labour platforms

The expansion and adoption of digital technologies into other sectors enabled new forms of work, challenging the existing regulatory frameworks. A set of labour-intensive activities have been flourishing through location-based digital labour platforms. In contrast with online-based platforms such as Upwork or Topcoder, these jobs are carried out in specified physical locations and include domestic work and care provision, and taxi, delivery, and home services (such as for a plumber or electrician) (ILO 2021). Most of these jobs existed already, and continue to exist in the traditional labour market, but digital platforms are spreading at a rapid rate, introducing new labour opportunities but potentially exacerbating power imbalances among workers and employees (Golman and Rani, forthcoming). Location-based platforms (LBPs) have the potential to benefit both workers and employers: in developing countries, they are regarded as a promising source of work opportunities, while businesses can use these platforms not only to access a local workforce but to enjoy a wider market reach. A comprehensive ILO study determined that workers in these platforms are mainly driven by the lack of alternative employment opportunities, job flexibility and better pay (ILO 2021).

Despite the remarkable income-generating opportunities, in particular for migrants, the low-skilled, underemployed or unemployed recognized several challenges for workers (ILO 2021). In particular, these relate to the regularity of work and income, working conditions, social protection, skills utilization, freedom of association and the right to collective bargaining. The rapid expansion of LBPs and their tendency to incorporate own-account workers has been the object of intense debate, in particular concerning many pre-existing forms of labour precariousness. For example, workers who do not make contributions to social insurance schemes for self-employed persons are excluded from the protection of the social security system, just like all other informal workers (Lopez Mourelo 2020). According to ILO's worldwide survey (2021), only 31 per cent of workers in the app-based taxi and delivery sectors reported that they were covered for employment injury, despite their exposure to high OSH risks.

The rapid growth of these platforms has exceeded labour legislation in many countries, but the potential for the growing workforce to T2F is clear. In that sense, the sector not only has a high prospect of absorbing informal workers from other sectors, but its path to decent working conditions seems conceivable in the medium term. Since workers are operating through well-established and, in most cases, international companies, the scope for formalizing the jobs relies on building coherent legislation and the degree of enforcement. In that sense, the employment carried through digital platforms presents several advantages in comparison with other informal environments that rely on atomized workers such as domestic or agricultural work.

The need for social dialogue among stakeholders is crucial in enhancing working conditions and providing minimum protection. Many countries are advancing in sector-specific regulations that either provide an integrated social protection approach to workers or assign co-responsibilities to companies in the sector. Discussions are being held at national levels and in international institutions. This involves, among other topics, the possibility of establishing a scheme of protection that ensures that LBP workers have a labour status and protection according to the characteristics of the activity they perform, recognizing the rights of unionization, freedom of association and collective bargaining, better clarity and transparency in terms of service and the right for workers to appeal (Lopez Mourelo 2020). In Latin America, Chile has recently approved a law covering for both workers and independent contractors in transport and delivery apps, recognizing the right to access social security protection, training, equipment, insurance, the right to disconnect, and the right to be unionized and to bargain collectively (Idárraga 2022).

2.5 Care economy

The world's population is living longer than any time in history: societies are ageing, and there is a growing demand for more and better care. The increase in the level of women's employment, changes in care needs and family structures are acknowledged as main drivers of the increasing requirement for care. Care jobs include a wide range of workers who differ in terms of education, skills, sector and pay from university professors, doctors and dentists at one end of the spectrum, to childcare workers and personal care workers, at the other. Because of its relational nature, paid care work is less routine than other jobs, and therefore less prone to automation and outsourcing (ILO 2018c). The growth of a comprehensive care sector has substantial repercussions on the rest of the economy. When accessible and affordable childcare is granted, working parents can better seize employment opportunities and gain access to better-paid jobs in the formal economy (UN 2021).

Paid care activities represent a significant source of employment throughout the world, particularly for women, who represent 65 per cent of the global care workforce. Following the latest estimation of ILO (2018c), the global care workforce numbers 381 million workers (249 million women and 132 million men). These figures represent 11.5 per cent of total global employment or 19.3 per cent of global female employment and 6.6 per cent of global male employment. ILO's forecast for 2030 is that care recipients will reach 2.3 billion, with an additional 0.1 billion children aged 6–14 years and an additional 0.1 billion older persons. It is worth noting that almost 1 out of 5 jobs in the care economy are related to non-care workers that support the provision of care services. This includes administrative officers, cooks or cleaners, for example, whose occupations are not in care but whose work is integral to the provision of care services and are therefore part of the care economy. A great number of job provisions in the future will therefore be related to the care economy.

The sector is highly characterized by informal agreements worldwide. In developing countries, the main challenges are related to the quality of paid care work and the deficient extension of social protection coverage to those workers providing childcare, aged care, health care, education and domestic work. Unpaid care work is equally relevant, as it reinforces social and gender inequalities by constraining carers' availability to undertake paid employment and the type and quality of jobs they can access. Among care activities, domestic work is particularly characterized by its high incidence of informal arrangements, which is exacerbated by structural features like a private sphere framed employment relationship and the lack of regulatory frameworks in many countries (ILO 2016). However, health workers, who are more often situated in institutionalized environments, also face poor working conditions, including low

salaries, work overload, long hours and poor career prospects (ILO 2018c).

During the past decade, digitalization of the provision of care and domestic work services has been growing globally, with jobs being mainly occupied by women. However, there are several structural barriers for women to fully access and engage with the gig economy, among which emerges constraints to digital tools, such as a lower rate of digital literacy and access to mobile devices and digital infrastructure, financial exclusion, and a major bulk of in-home unpaid responsibilities. More vulnerable women could therefore be excluded, and the digital context may reproduce and enlarge gender inequalities such as occupational segregation and pay gaps. By classifying workers as independent contractors, care workers' vulnerable conditions are reinforced, threatening their access to decent work (Hunt and Samman 2020; Florito et al. 2018).

Costa Rica and Uruguay are examples of countries with integrated care policies: they are established by law, are universal in ambition, aim to overcome fragmentation, entail the institutionalization of inter-sectoral coordination mechanisms and are firmly rooted in social protection systems (ILO 2020b). Several European countries have made formal domestic worker employment more appealing to households by providing income tax deductions or tax credits (ILO 2016). In France, a combination of these policies, as well as a strong regulatory environment and various collective bargaining agreements, have resulted in some of the highest levels of formal jobs for domestic workers anywhere in the world.

The potential of the sector for T2F in the light of the Future of Work is considerable, both for the increasing demand for workers whose skills can be found in the informal economy and for the scope to formalize individuals already working in the sector. Deficits in working conditions in the sector can be enhanced with state incentives to households to formalize domestic workers, investing in the provision of quality care services in education, and health and social work, and agreeing on transparent and effective regulations that promote formal employment relations. In particular, regulations that guarantee decent work for care workers and promote their representation, social dialogue and collective bargaining. Transition to formality requires the active role of labour and social security laws that account for domestic and care workers intrinsic vulnerabilities, in addition to socioeconomic policies and intermediaries' involvement (Fudge and Hobden 2018). Additional policies include the provision of infrastructure and services to address care needs, promoting a fairer gender division of domestic chores through family-work balance policies, ensuring rights-based social protection mechanisms for workers in flexible employment, reducing the digital divide through skills development, improving women's access to information while providing counselling and guidance on how to navigate new opportunities in the future of work (Florito et al. 2018).

2.6 Orange economy

When automation's effect on the labour market is being discussed, there is a set of skills that is usually left aside from the debate: social and creative abilities are hard to program in a robot. The OE sticks out as an outlier, comprehending creative, cultural and artistic activities whose main inputs are talent and intellectual assets. The concept is broad, and it merges what is usually known as cultural industries (cultural tourism, heritage, music, art, literature, fashion, design, media, radio, tv, and the film industry) with creative industries (professional business services).

The former is not limited to modern technology, in most developing countries, it is accounted for mostly by artisanal and traditional production. The latter group includes many creative industries but also relies on innovation and interconnection with new technologies. Occupations, such as software and videogames developers, virtual animation, and graphic design are attached to technological change, and many more will arise in the future. Overall, industries in the OE are recognized not just for their economic contribution, but also for acting as catalysts for the emergence of new ideas, technologies, and transformational change processes (UNDP and UNESCO 2013).

As a global reference of the OE, the film industry is acknowledged for its consistent growth and for being employment-intensive in many developing countries. Bombay cinema (Bollywood), Kenya, Nigerian cinema (Nollywood), and Latin American countries including Argentina, Brazil, Colombia and Mexico, are some successful examples of recording industries, where informal employment agreements predominate. Nollywood industry, for example, is the second-largest employer in the country after the agricultural sector, creating 300,000 direct jobs (World Bank 2020).

Several factors influence the growth of creative-based sectors in the era of automation. To begin with, the reduction of working hours associated with the latest pursuit of a better work-life balance is giving individuals extra time to spend on leisure activities. A consequence of this is that creative and cultural activities are particularly volatile to the business cycle. As was evidenced during the Covid-19 pandemic, the sector's dependence on consumer spending implies it is very negatively affected by recessions (Comunian and England 2020). This inconstancy has a direct impact on employment relationships, with short-term and project-based agreements, rather than permanent contracts, being typical in the sector. Most of the workers in the OE do not work in a formal company but are own-account workers. A theatre depends on consumers spending, as do their employees indirectly.

The growing use of digitalization has transformed the means of production, distribution and consumption of creative content. Industries, such as art, fashion and music are experiencing higher demand, and workers' potential to scale their activities and link them to the Internet and to the widespread use of social media enables several factors that influence local entrepreneurs to expand their market beyond traditional barriers. Local music bands, for example, are shifting from the production of physical CDs to on-demand platforms for online streaming, sharing their content with a global audience. In addition, digitalization has reduced costs in the production process and introduced innovative funding methods (CNEN 2019). The increasing demand and complementarity with new technologies, therefore, make sectors in the OE robust sources of income generation and drivers of job creation (World Bank 2020).

Even though the sector comprises diverse activities, there are several attributes in common that can be identified. The most evident skill among OE workers is their creative talent. Traditional jobs such as handicraft, film and advertising require high levels of originality and innovation, but also modern occupations related to the future of work, including social media analytics, webpage programming and video game designing. The latter industry excels for its employment opportunities. Although most of the roles are related to IT roles, back office and support functions that require database management, customer relations and marketing are also on-demand. The future of work involves, however, a higher degree of digitalization. Emerging audio-visual entertainment industries provide opportunities along the value chain for individuals – especially youth – with diverse skill sets. From developers to game tasters, the animation industry provides a wide array of creative opportunities, associated with high incomes and flexible working schedules. Less sophisticated tasks in the sector require little digital training, attracting young individuals with more artistic expertise.

Another key element of the OE is its entrepreneurship fingerprint, although it is generally associated with precarious working conditions. From setting up a play and performing at local theatres to participating in contest-based design platforms, individuals in the sector are more dependent on their inner abilities than on highly expensive capital or infrastructure. The access to better equipment circumscribes the quality of individuals' productions and their potential to monetize their services, but their essence relies on the venture spirit. According to the IDB's report (2018) on the OE in Latin America, most of the creative entrepreneurs of the region found their business with their investment or through the help of family and friends and are considered microenterprises. However, 58 per cent of the survey respondents claimed that they could not cover their living expenses with the income generated through their creative work, which reveals the challenges that the sector presents in terms of economic sustainability.

The creative economy, particularly in developing countries, relies heavily on informal cultural systems, processes and institutions (UNDP and UNESCO 2013). Many creative workers including artisans, performers and even professional designers and technicians are not included in formal working regulations. Cultural production in many developing countries is not institutionally supported and is designed for immediate consumption, such as street music or artisanal handicraft. This hinders the development of intellectual property protection for these services and limits the scope of their businesses. In addition, developing countries have significant barriers to the growth of the creative industries, including a lack of investment and entrepreneurial skills and a business-friendly environment in general, inadequate infrastructure, a lack of proper finance channels, and weak institutional and legal frameworks (UNDP and UNCTAD 2010).

In the global south and emerging countries, creative and cultural industries are characterized

by high levels of self-employment and freelance work, with the attendant risk of income instability and precariousness (Snowball and Hadisi 2020). When employment relationships are formed, they tend to be based on temporary contracts, dependent on project-based production and highly reliant on social networks. Employment is often typified by long and erratic working hours, periods of no or low pay, lack of job security, and higher stress levels (Eikhof and Warhurst 2013; McRobbie 2016). An important feature of the OE is that women and youth make up a considerable share of employment, and their weight is higher in low-income countries than in advanced countries (World Bank 2020). This makes the sector ideal when it comes to T2F policies, as its growth-led channelled formalizing policies could absorb individuals highly employed in informal units. Moreover, the sectors involved in the OE are built on local cultural assets, and not on natural resources or on capital-intensive investment. For developing countries, this involves a clear opportunity for sustainable social and economic development.

Formalization policies seek to incorporate these networks into established circuits. Business development policies are therefore crucial for actors in the sector to increase their productivity and adapt to changing market preferences. For example, by expanding access to markets through trade fairs, festivals or events, workers can enhance their project prospectus and reach wider audiences. Building networks and clusters are equally important, as promoting creative hubs spaces, tourism attractions and regional networks are necessary. Providing funding and access to finance through grants, early-stage loans, crowdfunding or tax subsidies are also crucial for capital investments and income stability.

The future of work requires OE workers to promote their services through e-commerce platforms and online distribution channels, hence access to information communication technology (ICT) infrastructure and the Internet. Digital skills development is, consequently, essential to take full advantage of the new digital paradigm. Technical and vocational training, incubator and accelerator programs, internships and apprenticeships, and policies that aim to nurture human capital are needed for workers in the OE to gain work-related experience. The ongoing professionalization of the sector is, therefore, a steppingstone for durable T2F policies.

3

The role of key institutions, actors (including social partners) and social dialogue

The exchange of information, consultation, and all forms of discussion between representatives of governments, employers, and workers is essential in identifying priorities and shared interests. Cooperation is fundamental in securing a transition to formality, as stated in Recommendation No. 204 (ILO 2021). Since emerging sectors present employment opportunities and challenges in terms of quantity and quality, stakeholder debate and agreement ought to be integrally addressed.

The coordination of government with social partners is, therefore, fundamental for this transition to improve livelihoods and promote formal arrangements. It can occur at various levels, ranging from the enterprise level to sector, national, and global levels (ILO 2020b).

The involvement of civil society and the private sector in the development of public policies through tripartite social dialogue stands as a necessary condition for a just transition, where all voices are heard. In that sense, the strategic public-private partnership can be an important strategy to enhance formalization. As the informal economy is often excluded from official social dialogue, new ways have to be found to bring informal workers into social dialogue and decision-making processes. In Argentina, for example, the trade union movement developed an Integrated Human Development Plan together with social movements from civil society (Gremialweb 2020). Civil society organizations (CSOs) and the social economy are often key partners of informal workers and

units. These can provide significant financial, practical, policy and advocacy support.

Inclusive development requires different levels of government to enhance proximity with workers and enterprises to efficiently promote T2F. While national dialogues are needed to set priorities and regulations, build consensus and strengthen the private sector's capacities to scale-up investments in strategic sectors, the role of municipal governments is key to identify vulnerable populations, provide concrete assistance to organizations of informal workers and promote training based on local capacities and needs (UN 2021; Islam and Lapeyre 2020). Accordingly, trade unions, nongovernmental organizations (NGOs) and social movements' roles in raising awareness of minimum wages, paid leave or social security are of paramount importance to ensure progressive formalization (Ghosh 2021). By being able to reach workers across the informal economy, these institutions are crucial in bringing them into established institutional structures.

A crucial element of Recommendation No. 204 is the importance of freedom of association in enabling and supporting the transition to the formal economy. Informal workers' collective representation is key in defining their self-interests as well as gathering and communicating their demands and interests (Fudge 2020). While some emerging sectors with high rates of informal jobs including organic agriculture, the CE and reforestation activities account for some experience where freedom of association has been debated and met, growing sectors such as digital labour platforms have not yet comprehensively achieved it. Strengthening workers' organizations and guaranteeing collective bargaining rights are essential for the transition to formality.

Informal workers are organized in a variety of ways despite the difficulties they face. This includes trade unions, workers' associations outside the formal trade union movement, farmers' groups, market associations, actors from the social and solidarity economy, and many other types of member-based organizations. A particular one that has provided benefits among the described emerging sectors is the cooperative model. In particular, it has been proved to be a useful model to improve workers' bargaining power and market access, particularly in rural environments and in the CE. By gathering atomized workers, cooperatives not only improve their terms of trade for fair value realizations along the value chain but also increase productivity through economies of scale, division of labour and shared services (Schwettmann 2020). In addition, technical and general (for example on OSH, workers' rights, financial and basic education) training and access to finance and even social transfers can be leveraged through small producers' associations, as happens with organic agriculture farmers.

Representation among informal workers in the emerging sectors varies severely across countries and activities. Domestic workers (for example, in the care economy) tend to set wages and other conditions through wage councils or other bodies in which workers and employers are represented at national levels. Other informal own-account workers such as waste recyclers or reforestation communities have local level government authorities as main dialogue partners.

Flexible employment requires modern regulations, and social dialogue which are necessary to ensure labour inclusion. Self-employed or dependent contractors who form a membership-based organization are unable to register as a trade union since they cannot demonstrate an employment tie (ILO 2020b). In that sense, the expansion of freelancing platforms encapsulates a risk for workers that they will be left outside of social protection and minimum wage regulations. New business models rely on intermediary roles between supply and demand of work, where the employment relationship becomes blurred, making it hard to recognize who the employer is. Workers' unfavourable position between self-employed and employees of the platform/customers underscores the need for new categories or a redefinition of old categories to reflect the new reality. Are they partners or subordinate workers? Solutions require a deep discussion on companies' co-responsibilities and/or the provision of social protection regardless of the individual's work status.

Conclusion and policy recommendations

Transition to formality involves the creation of productive jobs in the formal economy. This requires coherent development policies, including sectoral, industrial and technology policies, that promote inclusive and sustainable growth. This implies, for example, avoiding heavy reliance on extractive sectors with low employment content and identifying new emerging sectors with high employment potential. This employment potential should favour in particular informal workers, mostly with low skills, in the case of countries with a labour surplus. In that sense, the inclusive growth pattern goes hand in hand with a structural transformation process towards more industrial processing, a rising service industry, and a more productive and sustainable agriculture sector through digitalization and more environment-friendly production methods.

New dynamic sectors and activities will certainly not be the solution to ending informal employment, but it would still be worth promoting those sectors, sub-sectors or activities which could provide formal jobs to informal workers or improve informal jobs on the way towards formalization.

Not all expanding sectors are labour intensive, offer interesting job opportunities for informal workers or have the potential to improve productivity and income. Several emerging activities may even favour a profile of high-skilled workers who are already inserted in formal environments, with little scope for informal workers to be incorporated into the most rewarding segments of the value chain. This is the case in large parts of the KE and many segments of the RE value chain. However, these sectors still provide increasing opportunities for formal employment and are certainly shaping the technologies that will transform the jobs of the future. Therefore, the indirect and induced effect of jobs in these areas could generate higher productivity in other sectors, higher income in local areas and a higher level of development, affecting informal workers indirectly. In addition, the use of innovative technologies such as e-governance and, parallel to that, e-formalization is transforming how labour market policies are implemented and could facilitate these tasks in traditional and emerging sectors.

The Future of Work is shaped by digital technologies. The fast platformization of services presents challenges and opportunities for T2F in different sectors of the economy, which depend, among other things, on their ex-ante regulatory context and the ability of workers to adapt and make successful use of the new paradigm. The use of platforms as advertisement marketplaces while digitally allowing better accountability could be crucial for T2F policies.

Similar to delivery and logistic platforms, the case of personal services (domestic work, care, household repair, pet care) presents considerable potential for T2F. However, considering current market segregation in care and domestic work, platformization presents several challenges for women. It may amplify labour risks and limit access to labour rights that they already face in the traditional market, such as the exacerbation of power imbalances, constraints to collective bargaining or practices that increase discrimination and harassment. Difficulties in access to digital tools and digital literacy, and women's financial exclusion may also prevent them from taking full advantage of online intermediation services. These issues must be tackled by introducing policy interventions.

However, the recording of transactions, payments, and tasks online can help the professionalization of the sector. The provision of work equipment by platforms can also benefit informal workers who are not able to access the basic capital to start working. Challenges remain in terms of social protection benefits, insurance coverage and income stability, but it seems that sector-specific regulation, flexible institutional frameworks, and strong enforcement strategies could encourage better practices while taking advantage of the new, more efficient and secure intermediation methods.

Along the same lines, the OE could benefit enormously from the use of digital tools providing new channels through which to offer their services to a broader public and, therefore,

develop their "business". Local singers who can now upload their songs to Spotify, or artisans who advertise their products through Facebook or Instagram have access to wider markets while receiving higher and stable profits. Of course, this requires a minimum level of digital literacy, but the paradigm seems to better fit youth knowledge. With appropriate policies that help young creative workers to access the required capital (for example, a computer or access to broadband), the potential for job creation is significant. But as contracts and working conditions are precarious, the focus should be on guaranteeing labour rights and improving working conditions.

Within the GE, activities related to the CE, bioeconomy and biomass (within bioenergy) are the most interesting activities for informal workers. They would mostly be involved at the bottom of the value chain, for example, in the collection of waste/inputs or agriculture. Policies should focus on improving their working conditions (for example, OSH and a minimum of social protection), their organizational structure (for example, creating cooperatives) and their productivity in general (through skills development, but also including them in some processing activities further up the value chain).

Several emerging sectors have the potential to incorporate vulnerable groups of workers who face structural labour market deficits. The OE and digital labour platforms offer interesting opportunities for young, in particular female people, who are currently overrepresented in the value chain of tourism and related services. Similarly, women and migrants mostly characterize the care sector, and rural workers have tangible chances to progress through the GE development. Digital platforms may also help women to better balance work with family responsibilities. The growth of these sectors does not guarantee that working conditions will improve without accompanying policies, but it is a first promising step against the risk of work automation, which often exists in other growing sectors. Moreover, specific labour demand interventions such as employment subsidies or incentives to entrepreneurs could help reduce labour segregation particularly if they encourage the hiring of vulnerable groups of workers.

In order to grasp these new opportunities for formal jobs, there is an urgent need to improve the capabilities and skills of informal workers to adapt to the requirements of the future. In particular, there is an pressing need for the formal education system to be more flexible and attuned to labour market needs. Recently, the reconceptualization of life-long learning has been receiving more attention (ILO 2019g), but this should not be to the detriment of informal learning and apprenticeships which should be increasingly recognized and utilized (Hofman et al. 2022). Occupations related to the CE or along the sustainable agriculture value chain undoubtedly involve different tasks to traditional waste picking or agriculture. Therefore, workers must acquire specific knowledge to transition to greener activities. The transition to renewable energy-based economies will demand packages of support for countries and regions that are dependent on fossil-fuel revenues. These sectors will lose jobs, and specific policies to help workers' retraining and insertion into emerging sectors will be needed in combination with social protection measures. In sectors such as nature conservation, nature-based solutions and restoration, where public goods are involved, public employment programmes (for example, green works) could provide local workers with secure and stable incomes whilst improving their environmental experience.

Enterprise development involves measures to help businesses grow and realize their potential through conducive business and investment environments. Most of the jobs in the informal economy are created through MSMEs, which could benefit greatly from policies such as targeted subsidies, sectoral support (including on technology and innovation), financing to overcome liquidity constraints, and business-related e-formalization. Own-account workers could be regrouped into broader, formal units, such as cooperatives giving them better access to public services (on production, but also on social protection, training, workers' representation, etc.). These sorts of policies are extremely relevant for actors in the OE, whose creativity and entrepreneur profile could be enhanced through relevant business development. Helping workers in the cultural sector to access capital, expand networks and realize more stable agreements, could improve issues of income instability and precarious working conditions.

Institutional policies and regulations that incorporate innovative and dynamic business models are essential for workers in many emerging sectors who are transitioning to formality. The clearest example is one of the digital labour platforms. The sector is growing rapidly, not only in transport and delivery but also

in home-based services such as domestic and care work, handymen and many other services, such as on-demand platforms and marketplaces. The need for legislation to catch up with new business models is indispensable in guaranteeing not only workers' labour rights, but also decent working conditions. State provision of welfare benefits, regardless of the work status, could be an alternative to enabling the benefits of flexibility while assuring a minimum level of social protection.

Workers in the care economy are another example, in particular in the domestic sector. Regulations that account for the inherently private relationship between domestic workers and families while guaranteeing the latter a decent level of protection are needed. It is critical to not merely embrace the asymmetrical law of the household workplace, which reinforces substantive inequality and structural invisibility among domestic workers. If regulatory frameworks do not pay attention to the underlying norms that order the relationship in highly inequitable ways, they will be unenforceable and fail to formalize domestic employment.

In addition, macroeconomic and sectoral policies with specific employment targets could facilitate the emergence of new technologies and productive activities with high employment potential including for the less-skilled, often informal workers, and reduce transitional frictional unemployment induced by structural change. This refers partly to tax, fiscal and monetary policies that promote entrepreneurship, MSMEs, and other forms of business models and economic units, such as cooperatives and other social and solidarity economies.

Finally, a key development strategy involves incorporating informal workers' added value into regional and global supply chains by promoting the network between small and local producers, subcontractors and leading enterprises. Successful industrial policies that stimulate country-specific emerging sectors are essential to facilitate structural transformation processes. These policies should be supported by well-functioning tripartite social dialogue that includes informal workers and units so crucial in enhancing the employment potential of emerging sectors to promote T2F in the light of the Future of Work.

Formalization is not automatic, and it mostly requires an integrated strategy that accounts for its multiple manifestations. It is mainly a development process and the result of structural transformation taking place in the economy. It cannot be achieved by isolated transition to formalization policies. The process should be accompanied by a coherent policy framework, an appropriate combination of measures and articulation of the actions of the main public, social and private actors. Acknowledging the multidimensionality of informality leads to a non-dual approach, where workers and economic units are exposed to different degrees of informality and formality.

Annex 1. Characteristics of emerging sectors

Emerging sector	Subsector	Type of activities / occupations	Skill level of work-force	Capital required	Work intensity	Potential to absorb informal workers	Potential to be formal-ized
Knowledge economy	AI[1], cloud computing, machine learning, IoT[2], big data	R&D[3], production, services associated (retail, operators, repair)	High	High	Low	Low	Already formal
	Drones and sensors		High	High	Low	Low	Already formal
	Agriculture 4.0		Medium–high	High	Medium–low	Medium– low	Already formal
	Industry 4.0		Medium–high	High	Low	Low	Already formal
	Online labour platforms	Speech and image recognition, cyber security, finding bugs	Medium	Medium	Low	Medium	High
Location-based platforms	Delivery, ride-hailing, personal services (domestic work and care provision) and home services (plumbing, electrician, gardening)		Low	Medium–low	High	High	High
Green economy	Solar PV[4]	Manufacturing engineers, technicians and operators, R&D and software engineers, marketing and sales specialists, logistics professionals and operators, construction and transportation workers, management and retail personnel	Medium–high	Medium	Medium	Medium–low	Already formal
	Biofuels		Medium–low	Medium–low	High	Medium	Medium
	Wind		High	High	Medium–low	Low	Already formal
	Bioeconomy	Organic farming, regenerative agriculture, agroecology, conservation agriculture, sustainable fisheries, manufacture of products that use bio-based components	Medium	Low	High	Medium	Medium
	Circular economy	Waste pickers, recycling managers	Low	Low	High	High	High
	Sustainable tourism	Guides, rivers, family-owned restaurants, handicraft producers and artisans, landscape operators, cleaning services, cooking services, environmental educa-tors, naturalists, photographers, journalists and researchers	Medium–low	Low	High	Medium-low	Medium
	Ecosystem restoration, Eco- conservation and climate adaptation	Reforestation and afforestation, forest thinning, slope protection, soil and water conservation, the lining of rivers and creeks, sluices and footbridges, and construction of dikes	Medium–low	Low	High	High	Medium
	Blue economy	Wave and tidal energy, algae production, restoration of marine ecosystems, sustainable fisheries	Medium Low	Medium–high	High	High	Medium
Care economy	Domestic worker, elderly care, patient care, babysitting, cooking, pet care		Low	Low	High	High	High
Orange economy	Creative	Professional business services, videogame developer, videogame taster, graphic design, virtual animation	High	Medium–high	Medium–high	Medium	High
	Cultural	Cultural tourism, heritage, music, art, literature, fashion, design, media, radio, tv, film industry	Medium–high	Medium–low	High	High	Medium

[1] Artificial intelligence. [2] Internet of Things. [3] Research and development. [4] Solar photovoltaics.
Source: Authors.

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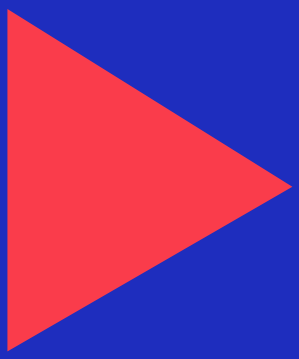

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