

► Employment and just transition to sustainability in the BRICS countries

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▶ 1) Introduction

In recent decades, humanity has increased its pressure on the environment beyond what is sustainable. The resource- and greenhouse gas (GHG)-intensive model on which economic progress has relied on led to environmental degradation, including climate change, depletion of natural resources, air and water pollution, soil degradation, biodiversity loss and changes in biochemical flows. There is scientific consensus on the alteration of the global climate as a result of human interference. Such changes in the climate have caused, and will continue to

cause, impacts on natural and human systems, including peoples and societies around the world, on livelihoods, and on labour markets¹.

GHG emissions are the primary causes of global warming and climate change². The Paris Agreement on climate change, adopted in 2015, aims to half global emissions over the next decade, with net-zero emissions achieved by the middle of the century, and to keep global warming well below 2°C³. All the BRICS countries, except South Africa, feature in the top-10 list on GHG emissions⁴, ultimately, pointing to the important role of BRICS countries to the achievement of net-zero emissions by mid-century.

To ensure that climate change is efficiently addressed, maximizing the social and economic opportunities of climate action, while minimizing and carefully managing any challenges, governments across the world are working to promote a just transition. Such action is in line with the Paris Agreement, which refers to the imperatives of creating decent work and a just transition of the workforce, as important dimensions of climate action. A Just Transition is based on social dialogue and labour rights, and it means greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities, and leaving no one behind. This paper will explore employment effects of climate change in the BRICS countries, and how the governments may explore pathways towards a just transition to sustainable economies and societies for all.

How does climate change impact the labour market?

In seeking to understand the relationship between the world of work and climate change, there are at least four key aspects to bear in mind⁵:

- **Directly and indirectly**, jobs rely on ecosystems and on the services they directly and indirectly provide (e.g., jobs in agriculture, fisheries, forestry, and tourism). Climate change threatens the provision of many of these vital services (e.g., freshwater provision, biodiversity, storm protection, stock renewal), negatively affecting the economic activities and jobs that rely on them. Among these negative effects is also a reduction in labour productivity.
- **Jobs and decent working conditions rely on the absence of environmental hazards** (such as storms and air pollution) and the maintenance of environmental stability (e.g., temperatures staying within a particular range and predictable precipitation patterns). Climate change, in so far as it affects temperature and rain patterns, may render entire regions unproductive and make workplaces too hot for work, thereby leading to climate-induced migration, food insecurities, the proliferation of precarious and informal work, and an increase in unemployment.
- **The risks and hazards associated with environmental degradation tend to affect vulnerable workers the most**, including women, migrant workers, older people, people in poverty, indigenous and tribal peoples, persons with disabilities and other vulnerable groups depending on the country or region, thereby generating and perpetuating inequality.
- In addition to the physical effects of climate change, it **is important to consider the impact of the implementation of response measures**. Policy responses to climate change can have

¹ IPCC (2014). Climate change 2014: Impacts, adaptation, and vulnerability (New York, Cambridge University Press)

² See for example; NASA (n.d.) [What is the greenhouse effect?](#); and IPCC (2021) [Climate change widespread, rapid and intensifying](#)

³ IPCC (2018) [Summary for Policymakers, in Global Warming of 1.5°C](#);

⁴ WRI (2020) [The Interactive chart shows changes in the World's top 10 emitters](#)

⁵ ILO (2018) [The employment impact of climate change adaptation – Input Document for the G20 Climate Sustainability Working Group](#)

both intended and unintended consequences. Overall, the impacts on employment can be considered from four perspectives: a) new employment will be created, b) some jobs might be substituted by others, c) certain jobs will be lost, and finally, d) most jobs will be transformed.

Climate change, labour markets, and economic growth are closely interlinked

From the labour market perspective, environmental sustainability is critical. In fact, the increasing frequency and intensity of natural disasters associated with human activity have already lowered productivity. Annually, between 2000 and 2015, natural disasters caused or exacerbated by humanity resulted in a global loss of working-life years equivalent to 0.8 percent of a year's work⁶. Looking ahead, projected temperature increases will make heat stress more common, reducing the total number of working hours by 2.0 percent globally by 2030, and affecting primarily workers in agriculture and in developing countries. Furthermore, local air, water and soil pollution and other forms of environmental degradation negatively affect workers' health, income, food, and energy security, as well as their productivity. For example, air pollution does not only lower quality of life, life expectancy rates, and increase the burden on welfare costs, it also further reduces productivity and working hours through the deterioration of the health of workers themselves, and exacerbates gender inequalities, as particularly women have to care for increasing sick children⁷. In sum, the damage associated with unmitigated climate change will therefore undermine GDP growth, productivity, and working conditions.

Currently, 1.2 billion jobs globally depend on the effective management and sustainability of a healthy environment⁸. Jobs in farming, fishing, and forestry, for example, rely on natural processes such as air and water purification, soil renewal and fertilization, pollination, pest control, the moderation of extreme temperatures, and protection against storms and floods. Environmental degradation threatens these ecosystem services and the jobs that depend on them.

The effects of environmental degradation on the world of work are particularly acute for the most vulnerable workers. Workers from lower-income countries and Small Island Developing States, rural workers, people in poverty, indigenous and tribal peoples and other vulnerable groups are affected the most by the impact of climate change. The transition to a green economy is not only urgent for the sake of the planet but is also compatible with critically needed improvements in decent work conditions. Lastly, to recover fully from COVID-19, governments can promote economic growth, job creation and environmental sustainability and bring back GDP to what it would have been in the absence of COVID-19.

Climate change will impact practically all sectors and economy-wide, yet there is a net positive job gain from decarbonization policies

An implementation of the Paris Agreement, based on renewable energy development, energy efficiency and sustainable transportation, is projected by the ILO to create 24 million new jobs by 2030. At the same time, ILO's projections also suggest that actions taken to decarbonise the energy, transport and construction sectors and limit global warming to below 2°C could result in 6 million jobs losses worldwide due to the contraction of certain industries. The net global increase of approximately 18 million jobs will be the result of the adoption of sustainable practices, including changes in the energy mix, the projected growth in the use of electric

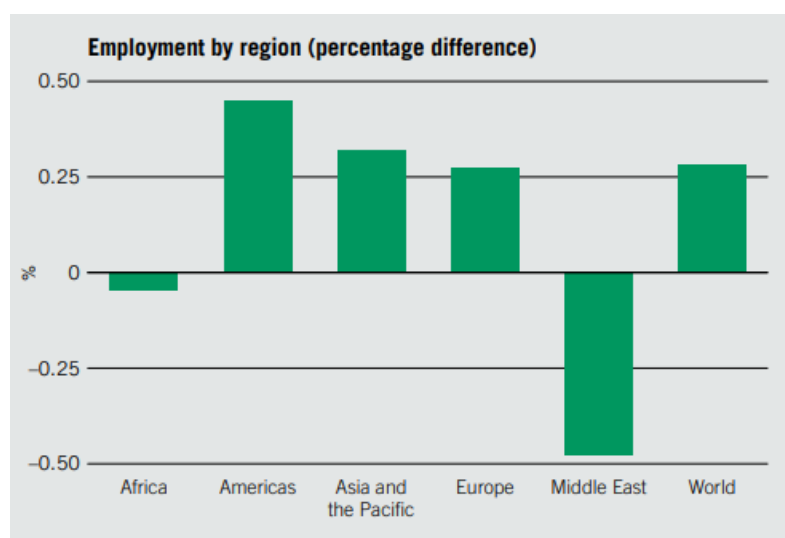
⁶ [ILO \(2018\) The future of work in a changing natural environment: Climate change, degradation and sustainability](#)

⁷ [ibid.](#)

⁸ [ILO \(2020\) Nature hires: How Nature-based Solutions can power a green jobs recovery](#)

vehicles, and increases in energy efficiency in existing and future buildings. Still, there will be large net job-gain disparities between continents, regions, and even within countries. Therefore, Just Transition policies will be instrumental in buffering the impact of the large sectoral, occupational, national and regional shifts that will occur. The graph below shows some of the regional disparities expected from the green transition, thus further underlining the need for planning and responding well ahead to labour market changes from the transition.

Graph 1: Net green employment gain disparities is expected between regions



Source: *World Employment and Social Outlook (2018) Greening with jobs*

Similar to geographical disparities, the transition will have an important gender equality dimension. Job reallocation across sectors can also have gender. Some of the most negatively affected industries (e.g., extractives and heavy industries) have a male-dominated workforce, calling for gender-responsive transition policies in certain regions. At the same time, the still low female participation in science, technology, engineering, and maths (STEM) fields of education and specific barriers to female entrepreneurship may constrain women's participation in the renewable energy sector and other emerging industries. Furthermore, regional economies heavily reliant on carbon-intensive sectors or fossil fuel extraction may face severe challenges in their structural adjustment and diversification process.

A significant proportion of the jobs destroyed may be reallocated in some countries but not in others. For example, some of the workers in the fossil fuel sector possess skills that are relevant and transferable to the renewable energy sector. Countries which currently have a limited low-carbon energy industry, such as Russia and South Africa for example, may need to invest in existing and new technical and vocational training systems (TVET), retrain workers, anticipate needs and provide upskilling measures, offer on-the-job training and apprenticeships, or chose a different economic development model in emerging sectors such as low-carbon digital or care-economy sectors.

Simply focusing too narrowly on jobs and sectors that account for the highest share of GHG emissions, such as coal and oil, misses the complexity of the labour market impact of decarbonisation and its social implications, thereby putting at risk the implementation and success of climate mitigation policies⁹. Not fully anticipating, understanding, and addressing the

⁹ Decarbonisation of the economies involves changing methods of production and consumption across the economy. Such a change concerns particularly, but not exclusively, economic sectors that account for a high share of greenhouse gas (GHG)

secondary and induced feedback effects playing out at the social, geographic, institutional and economic level may lead to social backlash making the transition to net zero ever harder. This may lead to withdrawing decarbonisation policies altogether.

For example, the choice of different low-carbon energy sources will imply very different labour market outcomes both in direct and indirect employment. First, the total number of direct and indirect jobs that are either created or lost will differ. Second, multiple labour market dimensions will be affected, such as labour market composition, skill needs, wage and labour income, gender, age, and geographic location. Thereby, feed-back impacts will occur through induced job creation, change in inequality, social cohesion, tax revenues, social spending, unionisation and labour market institutions to name a few. Success in meeting global climate goals depends on what is happening in BRICS countries as well as other larger emitters, such as G7 economies.

The impact depends on the decarbonisation path countries take

Decarbonization may have different effects at the country level depending on Government’s fiscal, economic, industrial, social and labour market policies. For example, as the BRICS countries largely depend on fossil fuels as the primary energy supply and, to varying degrees, as an important source of government revenues¹⁰, they may experience future labour market vulnerabilities and shifts due to decarbonization. The dependence on fossil fuels (either for revenue or energy supply, or both) can make decarbonization and ultimately just transition strategies differ greatly between countries as government budgets (and subsequent expenditures on education systems and social protection floors, for example) may depend on maintaining or even growing fossil fuel industries. See the table below for country-level data.

► **Table 1: BRICS’ countries oil dependency as sources in energy mix and government revenues**

Country	Share of fossil fuel in total primary energy supply (2019)	Share of government revenue from fossil fuel production and consumption
Brazil	55 percent	6.8 per cent
Russia	90 per cent	23.6 per cent
India	75 per cent	17.8 per cent
China	89 per cent	4.2 per cent
South Africa	92 per cent	6.8 per cent

Table Source: [IISD \(2019\) Beyond Fossil Fuels: Fiscal transition in BRICS](#)

Ultimately, strong and early action may change each country’s economic structure and hence the impact on job creation and social outcomes. A review of climate change policies in 26 countries¹¹ (including adaptation and mitigation action) found that 19 of the policies include labour dimensions.¹² Of these, ten refer to skills, training and capacity development for adaptation, eight refer to job creation as an objective or outcome of climate policies, and seven consider job creation as a component of sectoral action. Other labour-related aspects range from the integration of climate change into training for various professions and the

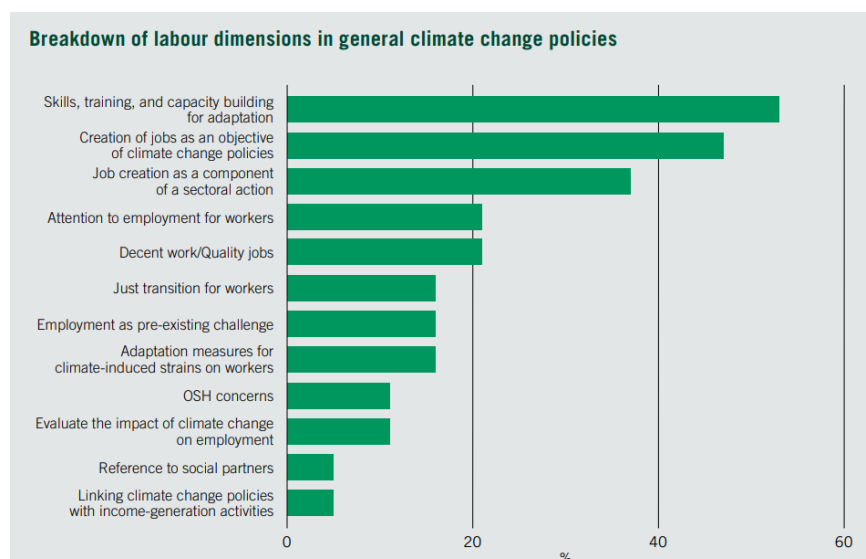
¹⁰ [IISD \(2019\) Beyond Fossil Fuels: Fiscal transition in BRICS](#)

¹¹ [ILO \(2018\) WESO](#)

¹² The policies examined do not include NDCs. A separate review of NDCs for G20 countries has shown that integration of employment and decent work has been rather limited

development of capacity-building for adaptation strategies (awareness of the phenomenon and its technical and organizational implications) to the re-skilling of specific groups of professions. The graph below shows an overview of the most frequent labour-related issues in national climate change policies. The BRICS countries are all included in those calculations.

► **Graph 2: Employment and labour dimensions must be further accounted for in climate change policies**



Source: World Employment and Social Outlook (2018) Greening with jobs

Although climate change mitigation measures may result in short-term employment losses, their negative impact on GDP growth, employment, and inequality can be reduced through appropriate policies (see appendix 1, box 1 for examples). Coordination between the social partners can reduce inequality and promote efficiency gains, while coordination at the international level is necessary to achieve meaningful cuts in emissions. Certain mitigation policies (for example promoting renewable energy) may act as an incentive for enterprises to develop and adopt more efficient and clean technology, thereby boosting employment in key occupations, as well as productivity. Adaptation policies (e.g., converting to climate-resilient agriculture practice) can also create jobs at the local level.

When well designed and implemented, green stimulus measures can generate income and create jobs¹³. Research from South Africa confirms that green policies can promote economic growth, job creation and environmental sustainability and bring back GDP to what it would have been in the absence of COVID-19¹⁴. In other words, a recovery without strong green policies would see GHG emissions return quickly to the levels seen before the COVID-19 pandemic and would continue to rise. Still, the OECD Green Recovery Database shows that only around 20 percent of recovery spending has so far been allocated to environmentally positive measures¹⁵.

Introducing a just transition

To enable and assist governments, workers and employers around the globe to leverage the process of structural change towards a greener, carbon-neutral economy, create green jobs at a large-scale and promote social inclusion, the ILO adopted the *Guidelines for a just transition*

¹³ Cambridge Econometrics (2021) Modelling an Inclusive Green Economy COVID-19 Recovery Programme for South Africa

¹⁴ *ibid.*

¹⁵ OECD (n.d.) Green Recovery

towards environmentally sustainable economies and societies for all in 2015.¹⁶ The Guidelines are both a policy framework and a practical tool to help countries at all levels of development manage the transition to carbon-neutral economies and can also help them achieve their Nationally Determined Contributions (NDC), National Adaptation Plans (NAP) and the 2030 Sustainable Development Goals (SDGs). It's worth noting that the Paris Agreement on Climate Change, also adopted in 2015, noted "a just transition of the workforce and creation of decent work and quality jobs in accordance with nationally defined development priorities"¹⁷ as an important consideration for climate action.

The Just Transition Guidelines cover nine policy areas to address environmental, economic and social sustainability simultaneously and holistically. These policy areas were established based on tripartite consensus during the 2013 International Labour Conference which considered evidence and lessons learned from country-level policies and sectoral strategies geared towards environmental sustainability, greening enterprises, social inclusion and the promotion of green jobs as follows:

- I. Macroeconomic and growth policies
- II. Industrial and sectoral policies
- III. Enterprise policies
- IV. Skills development
- V. Occupational safety and health
- VI. Social protection
- VII. Active labour market policies
- VIII. Rights
- IX. Social dialogue and tripartism

For example, international labour standards can strengthen adaptation frameworks by providing the legal foundation for addressing rising inequality and the increasing vulnerability of workers and enterprises in the face of climate change, as well as for enhancing the adaptive capacity of communities. They are international legal instruments drawn up by representatives of governments, employers and workers – the ILO's constituents – which set out basic principles and rights at work. International labour standards, such as the Employment and Decent Work for Peace and Resilience Recommendation, 2017 (No. 205), can help attract and consolidate international cooperation in areas such as capacity development, financing and technology transfer.

The challenge cuts across several domains, so there is a need for mainstreaming sustainable development across all areas and for cooperation and coordination between employment authorities and their counterparts in various fields, including finance, planning, environment, energy, transport, health, and economic and social development. Institutional arrangements must be adapted to ensure the participation of all stakeholders at the international, national, regional, sectoral and local levels in the building of an appropriate policy framework. Internal coherence should be sought among institutions at the national level as well as within international institutions at the regional and global levels for the effective integration of the three dimensions of sustainable development.

¹⁶The Guidelines were drafted by a tripartite meeting of experts convened from 5 to 9 October 2015. Eight of the experts were nominated by the Governments of Brazil, Indonesia, Germany, Kenya, Mauritius, Turkey, South Africa and the United States, while the Employers' and the Workers' Group in the ILO appointed another eight for each of the two groups..

¹⁷ UNFCCC (2015) Paris Agreement p. 2

See appendix one, box one, for a few examples of policy frameworks and approaches by ILO constituents on how to incorporate the just transition agenda in their own decarbonization plans and policy frameworks. The examples are not exhaustive or prioritized.

▶ 2) Climate impacts on decent work in the BRICS countries

Economic and social impacts of climate change in BRICS countries

As already established, climate change impacts the environment, economy, and employment in intrinsic and complex ways. The impacts vary between and within countries, sectors, demographics, etc. Below, the report highlights a few ways in which climate and environmental changes impact the BRICS countries' economies and labour markets. For a deeper understanding of the effects, a much larger and more extensive study is needed. The ILO works together with the [Green Jobs Assessment Institution Network](#), to assess and model employment effects of environmental policies. This section only serves to give a quick overview and may not touch upon all elements of economic growth, labour productivity, incomes and jobs, occupational safety and health for each country, and cannot estimate employment impacts of current and future environmental policies. Keeping the above impacts in mind, there are some general trends to consider in the BRICS countries:

- ▶ The share of employment that relies on ecosystem services varies widely across the BRICS countries with Brazil (23 per cent), Russian Federation (14 per cent), India (52 per cent), China (50 per cent) South Africa (11 per cent), respectively¹⁸. These sectors are particularly vulnerable to climate change and include agriculture, forestry, fishing, food, drink and tobacco, wood and paper, biofuels and renewable energy sources, the pharmaceutical and chemical industries, and environment-related tourism.
- ▶ The increasing frequency and intensity of various environment-related hazards caused or exacerbated by human activity have already reduced labour productivity. Between 2000 and 2015, 23 million working-life years were lost annually at the global level because of such hazards. Among the members of the BRICS, China, Brazil, and India were the most affected countries, with respectively 8.7, 3.2 and 1.5 working-life years lost per person per year during the period 2008–15¹⁹.
- ▶ Investment in adaptation infrastructure is likely to have positive effects on employment, in particular because of the increased demand for construction work in projects to reduce climate-related risks. The combined direct, indirect and induced employment effects of investment in adaptation infrastructure vary between countries. For every US\$ 1 million invested in the construction sector, close to 650 jobs are expected to be created in India, 200 in China, 160 in Brazil, and 120 in the Russian Federation²⁰. Another important indirect effect of investment in climate-resilient infrastructure is that it protects millions of livelihoods by reducing the negative impact of climate change-related events.

¹⁸ ILO (2018) The employment impact of climate change adaptation – Input Document for the G20 Climate Sustainability Working Group

¹⁹ *ibid.*

²⁰ *ibid.* Comparable estimates for South Africa were not available.

- BRICS countries are said to represent more than 40 percent of the world's GHG emissions. With more than 40 percent of the global population and nearly 30 percent of the land mass in the world, the BRICS countries are facing several environmental and resource consumption issues. These issues have – to an extent – arisen from rapid development of globalization and urbanization²¹. While energy transition is central, just transition and decarbonization is not purely an energy issue. In addition to energy, agriculture, forestry, ecotourism, transport, formalization, and economic diversification could be just a few additional examples of relevance to the BRICS group²².

Brazil

Supporting the transition to a greener and more resilient growth model will be key to Brazilian economic and employment growth in the coming decades. Brazil is home to more than 60 percent of the Amazon rainforest, the largest tropical forest in the world, as well as 15-20 percent of the World's biological diversity²³. While Brazil has a high share of renewables in its energy matrix, the country is still highly exposed to climate risks and deforestation²⁴. In fact, land-use change, primarily deforestation, accounts for 46 percent of GHG emissions in Brazil, followed by agriculture (24 percent) and the energy sector (21 percent)²⁵.

One study predicts that the average annual economic losses due to climate change range from 0.4 percent to 1.8 percent of Brazilian GDP until the end of the century²⁶. This is particularly due to the importance of climate vulnerable sectors, such as agriculture. In 2017, the agriculture sector directly contributed to 23.5 percent of the national GDP. The sector also accounts for 38.5 percent of the total national exports, placing the country as the world's third largest exporter of agricultural commodities, such as soybeans, sugar, and beef²⁷. According to ILO estimates, 7.1 million jobs can be created in the decarbonization scenario relative to a high-emissions scenario in Brazil²⁸. Deeper analysis reveals that large net job creations in the plant-based agriculture sector can more than compensate for job losses in the livestock and fossil fuel sectors combined.

In addition to the above challenges, climate change and, particularly, global warming will impact labour productivity directly across regions in Brazil. Climate change projections for the 21st century suggest an increase in average temperature, more intense over the central part of the country, including a rise in the number of days with temperature above 35 °C²⁹. ILO data has already shown that workers operating at moderate work intensity lose 50 per cent of their work capacity already at 33–34°C³⁰. Such high temperatures have severe implications for occupational health and safety, as new ways of working must be introduced to accommodate the extreme heat stress. In addition to warmer days, the number of consecutive dry days would also increase, as well as the intensity and frequency of droughts, impacting agricultural productivity and yield even further.

²¹ Tian et. Al. (2020) [Examining the role of BRICS countries at the global economic and environmental resources nexus](#)

²² ILO & IDB (2020) [Jobs in a net-zero emissions future in Latin American and the Caribbean](#)

²³ UNEP (2019) [Megadiverse Brazil: giving biodiversity an online boost](#)

²⁴ World Bank (2021) [Brazil overview](#)

²⁵ A. Mendonça et. Al (2020) [An Overview of Environmental Policies for Mitigation and Adaptation to Climate Change and Application of Multilevel Regression Analysis to Investigate the CO2 Emissions over the Years of 1970 to 2018 in All Brazilian States](#)

²⁶ Souza & Haddad (2021) [Climate change in Brazil: dealing with uncertainty in agricultural productivity models and the implications for economy-wide impacts: Spatial Economic Analysis](#)

²⁷ OECD (2018) [Brazil. Agricultural Policy Monitoring and Evaluation 2018](#)

²⁸ ILO & IDB (2020) [Jobs in a net-zero emissions future in Latin American and the Caribbean](#)

²⁹ World Bank Group (2021) [Climate Risk Country Profile Brazil](#)

³⁰ ILO (2019) [Working on a warmer planet](#)

Some researchers³¹ suggest that a solution for making Brazilian agriculture more resilient is through the large-scale adoption of environmentally sustainable practices. Rigorously abiding to the existing legislation, such as the 2012 Forestry Code, which regulates land-use change in private properties, would help to stop illegal native vegetation conversion and recovering and preserving valuable ecosystem services (water availability, local temperature control, pollination, etc.), resulting in improved resilience to climate change and contributing to its mitigation. Similarly, mining – in particular illegal practices – is an important driver of deforestation associated with GHG emissions and loss of biodiversity. For example, Indigenous Peoples leaders have said that “our territories, which belong to us by our Constitutional right, are being invaded by illegal miners and loggers; villages are surrounded by large-scale cattle and soybean farms; rivers are being contaminated with pesticides and mercury; and the Amazon rainforest is burning to ashes”³². Ultimately, increasing environmental law enforcement mechanisms will further aid the process.

Russian Federation

According to the Russian Federation’s own NDC submitted to the UNFCCC, climate change is already impacting Russia in several ways “as ongoing warming at a rate more than two and a half times the average rate of global warming”³³. Russia presents a unique case of the effects of climate change on a country’s energy, agriculture, and social stresses, as it experiences “milder winters; melting permafrost; changing precipitation patterns; the spread of diseases; and increased incidence of drought, flooding, and other extreme weather events,”³⁴ all as a result of climate change. For example, flash floods in Siberia destroyed entire villages and displaced thousands of residents³⁵. Similarly, droughts have been experienced in Russia’s rich southern agricultural “bread basket” regions encompassing Stavropol and Rostov. This could pose food security risks and threaten a primary Russian export: wheat³⁶. Still, from a climate perspective, the country ranks fourth globally in terms of carbon dioxide emissions³⁷.

While the environmental damage from climate change is clear, ripple effects hamper Russia’s economy, as well. Climate change will have direct or indirect impacts in almost all economic areas. Sectors depending directly upon natural and climatic conditions – including agriculture and forestry, water supply systems, buildings and engineering constructions, transportation infrastructure in the permafrost zones – are obviously most vulnerable to climate change, with water becoming the most destructive consequence of global climate change for the south of Russia and neighbouring regions³⁸.

Historically, Russia’s economy has been cyclical due to its reliance on, especially, oil prices. As oil demand will fall and price-competition amongst oil producers rise, the Russian economy will be increasingly more exposed and vulnerable³⁹. The high dependence of the Russian economy on fossil fuels leaves Russia and its many energy sector workers vulnerable to the impacts of any significant reduction in global demand for fossil fuels over the next two decades that would result from the level of climate action necessary to limit warming to 1.5°C⁴⁰. Diversification of

³¹ [Zilli, et. al \(2020\) The impact of climate change on Brazil's agriculture](#)

³² [Tarumã Declaration: Statement on the climate crisis by the Indigenous Peoples of the Brazilian Amazon \(2021\)](#)

³³ [Nationally Determined Contribution of the Russian Federation \(2020\)](#)

³⁴ [The Effects of Climate Change on Russia's Economy and Governance | by Advocacy @ UNA-NCA | UNA-NCA Snapshots | Medium](#)

³⁵ [Climate Change Will Reshape Russia | Center for Strategic and International Studies \(csis.org\)](#)

³⁶ Ibid.

³⁷ [Hendersen & Mitrova \(2020\) Implications of the global energy transition on Russia](#)

³⁸ [Russia and Neighbouring Countries: Environmental, Economic and Social Impacts of Climate Change \(preventionweb.net\)](#)

³⁹ [Gustafson \(2017\) "The future of Russia as an Energy Superpower", Harvard University Press](#)

⁴⁰ [Climate Transparency \(2020\) Russia](#)

both economy and energy mix may be one solution to soften the economic blow from an ecological transition. According to IRENA, The Russian Federation has set out to increase and diversify its use of renewables, particularly for power generation. Under current plans and policies, renewables (such as wind, hydro, and bioenergy) would reach nearly 5 percent of total final energy consumption by 2030⁴¹. Similarly, energy efficiency continues to be a key opportunity for decarbonization, as Russia's energy use per capita is significantly larger than all BRICS countries (and twice as large as the second most energy intensive country, China)⁴². The challenge for Russia in the coming years is to develop a new strategy for energy sector development (at least for energy exports), even in the absence of a significant domestic climate change agenda, in the face of increasing global competition, growing technological isolation and financial constraints.

Finally, the strongest climate change consequences will be in the Arctic region due to the danger of thawing permafrost and permafrost degradation. Here, social impacts of climate change will be felt most by indigenous minorities, whose social systems have traditionally been oriented towards both social networking and maintaining people's balance with the highly vulnerable environment, having successfully adapted to living in the extreme environmental conditions that the Arctic presents. Due to climate change, food preservation in this region could become problematic, resulting in an increase in intestinal diseases – a trend that has been seen in North Canada.

India

India is the world's third-largest energy consuming country, thanks to rising incomes and improving standards of living. Energy use has doubled since 2000, with 80 percent of demand still being met by coal, oil and solid biomass⁴³. India is the third-largest global emitter of CO₂, despite low per capita CO₂ emissions, and emissions are expected to rise due to India's continued industrialisation and urbanisation. The affordability and reliability of energy supply are key concerns for India's consumers.

A majority of Indians live in rural areas on small farms with little or no access to electricity⁴⁴. The impacts of climate change – such as drought and pollution – have the potential to devastate lands that these rural farmers rely on for their livelihoods. Projected temperature rises are strongest in the northern regions of India, and annual minimum and maximum temperatures are expected to increase at a greater magnitude than national average temperatures. Meanwhile, intensification of climate extremes is projected in India, with increased drought risk, and increases in the quantity of precipitation during heavy rainfall events destroying livelihoods across India. Without adaptation measures, extreme river floods are expected to affect an additional 13 to 34 million people by the 2040s and coastal flooding is expected to affect an additional 5 to 18 million people by the 2070s to end of the century⁴⁵. Ultimately, major restructuring of agricultural systems and adaptation investments, including considering crop range shifts may be required to respond to the negative outlook for yields, particularly to maintain supply of staple crops.

A substantial portion of India's total GHG emissions is generated by the energy sector (about 75 percent), followed by agriculture (14 percent), industrial processes and product use (8 percent),

⁴¹ [Irena \(2017\) Renewable Energy Prospects for the Russian Federation \(Remap working paper\)](#)

⁴² [Russia: Energy Country Profile - Our World in Data](#)

⁴³ [IEA \(2021\) India Energy Outlook 2021](#)

⁴⁴ [World Bank Data Bank](#)

⁴⁵ [World Bank Group \(2021\) Climate Risk Country Profile India](#)

and waste (3 percent)⁴⁶. Thus, improving resource use and energy efficiency, expanding the use of renewable energy, improving energy security, universal and affordable access to modern energy, and diversifying energy resources are the key focus areas of the Indian power sector in terms of climate change mitigation⁴⁷. According to IEA⁴⁸, solar power is set for explosive growth in India, matching coal's share in the Indian power generation mix within two decades, promising a sustainable and reliable energy source for the future generations and consumers to come in India.

China

The effects of extreme weather events, present-day climate variability, and future climate change cut across many different sectors of China's economy. China's government estimates that direct economic losses from extreme weather events cost the country 1 to 3 percent of gross domestic product each year⁴⁹.

China, the world's biggest consumer of raw materials, and a major producer of some of them, is attempting to curb carbon emissions and conserve electricity, while at the same time preserving economic growth. Similarly, China is trying to clean up its oil refining sector, improve mine safety and has officially ended coal financing abroad. However, some of these policies are cutting the supply of commodities and pushing up prices and thus inflation. The trade-offs are having differing impacts on markets: iron ore prices have plunged as steel production is curbed, coal has surged, while energy-intensive aluminium has jumped to a 10-year high amid the power saving drive⁵⁰.

China has experienced more extreme events (floods, droughts, storms) in recent years than ever before. The extreme weather events have caused direct economic losses of \$25 to 37.5 billion in China per year⁵¹. While climate change impacts will vary across the vast geography of China, all regions will be exposed to future climate change related risks across energy-, transport-, and manufacturing industries, agriculture, tourism, livelihoods and public health⁵². Furthermore, scarcity of natural water resources, fast-growing urbanization and industrialization, severe water pollution, cheap water prices, and the adverse impacts of climate change on water sources may lead to a water crisis in China.

Lastly, Due to their flat and low landscape, China's coastal regions, the engine of China's economic achievement, are highly vulnerable to storm, flood, and sea-level rise. The increasing frequency and intensity of extreme weather events such as typhoons has threatened economic development at local, regional, and national levels. China has been actively developing early warning systems and related monitoring systems and improving the design standards of sea dikes and port docks. These efforts may help buffer some risk of natural weather extreme events. In addition, a comprehensive study of the socio-economic effects of climate change in China suggest that⁵³ greater cross-disciplinary collaboration between climate adaption, poverty

⁴⁶ [Ministry of Environment, Forest and Climate Change, India \(2021\) Third Biennial Update Report to The United Nations Framework Convention on Climate Change](#)

⁴⁷ [Ministry of Environment, Forest and Climate Change, India Third Biennial Update Report to The United Nations Framework Convention on Climate Change](#)

⁴⁸ [IEA \(2021\) India Energy Outlook 2021](#)

⁴⁹ Sall, Chris (2013) *Climate Trends and Impacts in China*. World Bank, Washington, DC

⁵⁰ [Bloomberg \(2021\) China's Conflicting Climate and Economic Goals Roil Commodities](#)

⁵¹ DNI (2009) *China: Impact of Climate Change to 2030 a commissioned research report*

⁵² [Ding et. Al, \(2021\) An overview of climate change impacts on the society in China](#)

⁵³ [ibid.](#)

alleviation and Nature-based Solutions to address some of the above mentioned climate change related challenges.

South Africa

Higher temperatures and a reduction in rainfall expected as a result of climate change will reduce already depleted water resources, contributing to an increasing number of droughts in the country. Extreme weather events are the most noticeable effects to date, especially the drought in the Western Cape and wildfires, but rises in vector- and waterborne diseases are also gaining prominence⁵⁴.

South Africa's development is highly dependent on climate-sensitive sectors such as agriculture and forestry. Food security is under threat, with, for example, crop yields likely to decline in several provinces, with related loss of livestock⁵⁵. Moreover, any negative impacts of climate change on the country's economy will have major implications for people's access to food, which is largely contingent on affordability. Food access is already tenuous given the existing levels of poverty and as ownership of arable land is highly inequitable, reflecting the particular history of the country.⁵⁶

It is increasingly apparent that delays in responding to climate change over the past decades have jeopardized human life and livelihoods. While slow progress with mitigation, especially in the energy sector, has garnered much attention, focus is now shifting to developing plans and systems to adapt to the impacts of climate change together with international donors and the climate change community.

While South Africa does not feature in the top-10 of highest-emitting countries, it does have the second highest CO₂ emission per capita in the BRICS group (after Russia, before China)⁵⁷. By 2030, it is estimated that the impact of climate change will result in 3.000 job losses in the chemicals and chemical products sub-sector in South Africa, and a further 11.400, due to changes in international trade⁵⁸. Despite this, there are encouraging opportunities. The advancement of certain chemical products used to cope with climate change, for example, and the increasing demand for these, could lead to increased employment and even the establishment of new chemical plants. Mitigation interventions in this sub-sector are expected to create 650 job opportunities and adaptation interventions, an additional 3.825 jobs, according to the WWF. It is also noted that South Africa is the only country of the BRICS group to directly refer to just transition in their NDCs. The just transition plans will be elaborated later in the report.

According to a study by Cambridge Econometrics⁵⁹, to achieve South Africa's greenhouse gas emissions target it will be necessary to avoid the lock-in to higher carbon emissions associated with building new coal-fired power stations. The transition to a low-carbon economy inevitably involves more activity in the low-carbon supply chain and less activity in coal mining. Like other countries with a significant fossil fuel extraction industry, South Africa will need 'just transition' policies to support those individuals and communities dependent on jobs that do not have a

⁵⁴ Chersich & Wright (2019) *Climate change adaptation in South Africa: a case study on the role of the health sector*

⁵⁵ Mugambiwa SS, Tirivangasi HM. Climate change: A threat towards achieving 'Sustainable Development Goal number two' (end hunger, achieve food security and improved nutrition and promote sustainable agriculture) in South Africa.

⁵⁶ Masipa (2017) *The impact of climate change on food security in South Africa: Current realities and challenges ahead*.

⁵⁷ *According to world bank data, most recent data from 2018*

⁵⁸ WWF (2019) *Planning for employment effects of climate change in the chemicals and chemical products sub-sector*

⁵⁹ Cambridge Econometrics (2021) *Modelling an Inclusive Green Economy COVID-19 Recovery Programme for South Africa*

sustainable long-term future. Mitigation measures will also be needed to protect other natural capital assets.

Decarbonization and risk of stranded assets in BRICS

As outlined above, fossil fuels remain the dominant energy source in all five BRICS' countries. Incumbent energy technologies, fossil fuel production and consumption impact what is known as *path dependence*, i.e. "the tendency for past decisions and events to self-reinforce, thereby diminishing the prospects for alternatives to emerge"⁶⁰. Path dependency matters in particular when considering the transitions in the BRICS countries, as some of the countries are both net exporters or importers of different fossil fuels⁶¹. Therefore, decarbonization and energy transitions will impact both the economy, labour market, and infrastructure in such fossil fuel dependent countries.

Examples range from the largest GDP gains from clean energy transition for China and India as large energy importers, as well as the modest gains for Brazil, Russia and South Africa due to energy-efficiency improvements and reduced costs of energy⁶². However, the clean energy transition also leads to losses for fossil-fuel-producing segments of the economy, especially those oriented toward exports. Similarly, a more diversified economy also has a more diversified fiscal base, where different sectors and entities can become significant taxpayers⁶³. Lastly, as the risk of fossil fuel asset stranding increases, governments may find themselves pressed for more subsidies to bail out the affected companies, translating to fiscal stress and often broader financial system stress.

In a case study of stranded fossil fuel assets in India, the independent think tank ODI⁶⁴ found the key drivers for stranding fossil fuel assets include the improved cost competitiveness of renewables, pollution, climate and environmental regulations as well as the need to phase out government support to fossil fuels, without which they often cannot compete. The risk of stranding can vary depending on assumptions made about global climate ambition and future fossil fuels prices and have ripple effects on the financial and other sectors of the economy. The study argued that the "Indian government was counteracting a number of the drivers of asset stranding by delaying the pass-through of market signals and the costs of environmental and wider climate impacts to coal power project developers and investors". The same study highlighted similar patterns of government interventions to the coal power value chain in China and South Africa. Ultimately, the researchers argued that it will be critical for governments in these countries to carefully manage their interventions in the power sector to avoid fossil fuel subsidies and support a wider commitment to energy access and a transition to low carbon energy sources.

⁶⁰ IPCC (2014) p. 312: *Climate change 2014: Mitigation of climate change. Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*

⁶¹ IISD (2019) *Beyond Fossil Fuels: Fiscal transition in BRICS*

⁶² Ugle Pimpalkhute (2020). *How are BRICS Nations Nudging with G20 Nations for framing Climate and Energy Synergies?*.

⁶³ Gerasimchuk, et. Al. (2019) *Report Part Title: Aligning BRICS Policies With the Clean Energy Transition*

⁶⁴ Worrall, L., Whitley, S., Garg, V., Krishnaswamy, S., & Beaton, C. (2018). *India's stranded assets: How government interventions are propping up coal power*. Overseas Development Agency.

► 3) Labour and just transition policies in the response to climate and environmental change in BRICS countries

Nationally determined contributions (NDCs)

Nationally determined contributions (NDCs) are at the centre of the Paris Agreement and the achievement of these long-term goals. NDCs are the efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requires each Party to formulate, communicate and sustain successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, aiming to achieve objectives of their NDCs.

Together, these contributions determine whether the world achieves the long-term goals of the Paris Agreement and to reach global peaking of GHG emissions as soon as possible and to undertake rapid reductions thereafter in accordance with best available science, to achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs in the second half of this century. It is understood that the peaking of emissions will take longer for developing country Parties, and that emission reductions are undertaken based on equity, and in the context of sustainable development and efforts to eradicate poverty, which are critical development priorities for many developing countries.

NDCs are submitted every five years to the UNFCCC secretariat. In order to enhance the ambition over time the Paris Agreement provides that successive NDCs will represent a progression compared to the previous NDC and reflect its highest possible ambition. The most recent NDCs were submitted at COP26 in 2021 in Glasgow, United Kingdom. However, as the Contributions presented at COP26 were deemed to not be ambitious enough, the Parties agreed to submit and present new NDCs already the year after at COP27 in Cairo, Egypt.

Reviewing the BRICS countries' NDCs

This section will review nationally determined contributions on climate change and targets for net-zero in BRICS countries, with a view to identify policies and measures considered to promote green employment, including policies on skills and enterprise development, education and training, social protection, occupational safety and health, and the role of social dialogue, taking into consideration the ILO Guidelines for a Just Transition. Table 2 (in the appendix) serves as a summarizing table, reviewing the countries' NDCs for references to just transition, decent work/employment, skills and reskilling, OSH/health issues, social protection and social dialogue.

The NDCs from Brazil and Russia were submitted in 2020, China and South Africa's NDCs are from 2021, and the NDC from the Russian Federation date back from 2016. All countries have committed to net-zero targets, Brazil by 2060, Russia by 2060, India by 2070, China by 2060, and South Africa by 2050. Thus, only one of the BRICS countries, South Africa, are in line with the Paris Agreements mid-century net-zero targets.

In general, the references to social dimensions of climate change are only referred to vaguely throughout the countries' NDCs. Similarly, none of the NDCs address the role of social partners or social dialogue in address climate change. Only South Africa, specifically address Just

Transition and include heat-stress consideration. The Russian Federation refer to ‘fairness’ and considering social aspects of climate change. India refers to employment and power eradication, while considering different groups particular vulnerabilities to climate change. The Chinese NDCs do highlight some of the employment effects of climate action, and the need to promote ‘fair, reasonable, cooperative, and win-win global climate governance systems’. In general, all countries NDCs do consider some degree of education, training, or skilling, yet there is an overall lack of focus on reskilling and upskilling of national workers in all other country NDCs but South Africa.

A thorough study of the BRICS countries’ economic and environmental nexus⁶⁵ found that economic development was coupled with environmental emissions and resource consumption, especially in Brazil and Russia. This highlights the importance of decoupling economic growth and development from carbon emissions and resource use.

Brazil’s NDC

Brazil updated their NDCs in December 2020. Brazil’s NDC reaffirms the country’s commitment to reducing total net GHG emissions by 37 percent in 2025 (reference year of 2005) and officially takes on the commitment to reducing Brazilian emissions by 43 percent in 2030, aiming towards climate neutrality (net-zero emissions) in 2060⁶⁶. This long-term objective was later updated in 2021, with the updated submission letter for reaching climate neutrality by 2050⁶⁷.

According to one ILO study⁶⁸, the main reason behind this optimistic commitment to reducing Brazilian GHG emissions was the considerable reduction in deforestation, particularly in the Brazilian Amazon, between 2005 and 2015⁶⁹. Emissions from slash-and-burn associated with the land-clearance process in the expansion of the agricultural frontier were historically the main source of GHG emissions. Yet, there was an expansion of Brazilian GHG emissions in almost all other sectors. With the recent comeback of deforestation, especially since 2019, the total level of GHG emissions rose despite the economic slowdown (which usually reduces energy consumption and other sources of emissions). Still, the sector particularly driving deforestation, agriculture, was the only sector that had GDP growth in 2020⁷⁰. Securing rights for groups that depend heavily on the natural environment, such as indigenous peoples, can help them better adapt to the effects of environmental degradation⁷¹. Securing rights can also empower them to become actors to advance the transition, as they often care for vast amounts of natural resources⁷². Securing land rights can give people who care for natural resources access to payments for ecosystem service schemes, allowing them to contribute to conservation efforts and benefit from cash transfers in exchange⁷³. To this regard, the NDC actually reference the Brazilian Constitution and the ILO Convention 169, “paying due attention the special needs of women and indigenous peoples”⁷⁴.

⁶⁵ Tian et. Al. (2020) [Examining the role of BRICS countries at the global economic and environmental resources nexus](#)

⁶⁶ [Government of Brazil \(2020\) Brazil submits its Nationally Determined Contribution under the Paris Agreement](#)

⁶⁷ [UNFCCC \(2021\) Brazil first NDC \(updated submission-letter\)](#)

⁶⁸ [ILO \(2018\) Skills for Green Jobs in Brazil](#)

⁶⁹ [According to PRODES \(Deforestation Monitoring Project\) data released by the Brazilian National Institute for Spatial Research \(INPE\)](#)

⁷⁰ [Agro \(2021\) Agropecuária foi o único setor que cresceu no PIB de 2020; entenda](#)

⁷¹ [ILO \(2018\) The future of work in a changing natural environment: Climate change, degradation and sustainability](#)

⁷² ILO (2016) [Indigenous peoples and climate change: From victims to change agents through decent work](#)

⁷³ ILO (2018) [World Employment and Social Outlook 2018: Greening with jobs](#)

⁷⁴ [Paris Agreement Brazil’s Nationally Determined Contribution \(NDC\) \(2020\) p. 3](#)

Due to the increase in deforestation emissions, Brazil is not on track to meet its NDC targets and has yet to develop an integrated long-term national strategy to achieve its climate goals, according to the World Bank⁷⁵. Still, recent reforms in the infrastructure sector, together with the administration's renewed interest in the climate agenda, provide sound opportunities for Brazil's green recovery and for lifting millions of Brazilians out of poverty.

One such strategy could focus on skilling and reskilling of workers. According to an ILO study from 2018⁷⁶, reductions in public budgets for education, environment and science and technology are additional obstacles to the diffusion of green skills. Redirecting development towards a green economy will require increasing involvement from the public sector, and transition to more sustainable and inclusive practices will not happen spontaneously through market forces alone.

The Russian Federation's NDC

The Russian Federation submitted its 2020 NDCs to the UNFCCC, declaring the goal to limit GHG emissions to 70 percent relative to 1990 levels by 2030, or an emission reduction target of 30 percent relative to 1990. The NDCs are "taking into account the maximum possible absorptive capacity of forests and other ecosystems and subject to sustainable and balanced socio-economic development of the Russian Federation"⁷⁷. However, because Russia used the 1990 as its benchmark, a year when the country was still part of the Soviet Union and emitted nearly 2.4 billion tons of carbon, Russia can effectively increase its emissions over the next decade and still meet its 30 percent reduction target⁷⁸. For example, the latest technical review records the country's total GHG emissions, excluding emissions and removals from land use, land-use change and forestry, decreased by 30.3 percent between 1990 and 2018, and increased in 2018 by 3 percent relative to 2017⁷⁹.

According to the NDC, the Russian Federation's implementation efforts focus on fiscal measures to stimulate GHG reductions, increasing energy efficiency in all sectors, and "developing the use of non-fuel and renewable energy sources." Other measures aim at improving the quality of natural sinks and storage of GHGs. The NDC announces that the Russian Federation will also update its GHG emission standards in line with international standards for quantifying the carbon footprint of products. Also, from the NDCs; "adaptation to direct (real and expected) and indirect consequences of climate change for the population, infrastructure and economy;"

NDC wording does not specifically mention just transition, there are several references that encapsulate the essence of just transition, for example "precaution in planning and implementing measures to ensure the protection of people, the economy and the state from the adverse effects of climate change" and the need to "ensure the safe and sustainable development [...] including institutional, economic, environmental and social, including demographic, aspects development in a changing climate and the emergence of related threats". Still, there is no specific mentioning of quality of jobs and employment creation, no specific reference to occupational health and safety, social protection, or social dialogue. While there is some reference to training and green skills in the Russian Federations assistance to developing countries, the current NDCs fail to consider skilling, reskilling and upskilling of their own workforce for the transition.

⁷⁵ [World Bank \(2021\) Brazil overview](#)

⁷⁶ [ILO \(2018\) Skills for Green Jobs in Brazil](#)

⁷⁷ [Nationally Determined Contribution of the Russian Federation \(2020\)](#)

⁷⁸ [CSIS \(2021\) Climate Change Will Reshape Russia](#)

⁷⁹ [IISD \(2020\) Russian Federation's NDC Reiterates 30 Percent by 2030 Emission Reduction Goal](#)

India's NDC

India's most recent NDCs submitted to UNFCCC are from 2016, and India have yet not submitted updated 2030 target. According to Climate Action Tracker, the current NDC target would be well overachieved with current policies. India did, however, present a net-zero target by 2070 at COP26 in Glasgow, in 2021.

The NDCs do not specifically reference to just transition, decent work, quality of jobs, occupational health and safety, social protection, or social dialogue. Nevertheless, the NDCs do highlight climate justice and social justice, in particular in regard to improving rural communities' livelihoods and accounting for particularly vulnerable groups. Similarly, the NDCs present some enterprise programmes that focus on resource efficiency, waste management and pollution control. Similarly, the public employment programme, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) highlighted in the NDCs.

The MGNREGA may serve as a good example of how public employment programmes can incorporate environmental goals. The act is aimed at providing social protection and economic security for rural people in poverty, strengthening drought-proofing and flood management, and empowering marginalized communities. Through the MGNREGA, each rural household is entitled to 100 days of employment a year. People are employed in unskilled manual work, such as the construction or improvement of community infrastructure, or the generation of ecosystem services that protect environmental resources. According to the Ministry of Rural Development, 60 per cent of the work-hours provided through the programme in 2012 involved water conservation and 12 per cent were related to the provision of irrigation facilities⁸⁰. The programme also increased female labour participation and, in some cases, also women's autonomy in household decision-making by providing them with higher wages than those offered by other rural jobs⁸¹.

Lastly, India does acknowledge the need to invest in training and upgrading of skills across sectors as well as "establishing more intensive state centric knowledge" on different aspects of renewable energy. The NDC also address investment in research and development institutions for "pre-competitive research". This is key, as research and new technology will be essential to meeting the net-zero ambitions in the Paris Agreement.

China's NDC

In 2020, China submitted their most recent NDC to the UNFCCC process. The NDCs are 62 pages long and covers China's philosophy and goals on addressing climate change; positive results achieved in the NDC implementation; new measures to implement the updated NDC goals; and China's work to promote international cooperation on climate change. China also "aims to have CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060"⁸². These NDCs should be considered against the backdrop, of China accounting for the largest share of GHG emissions in total terms, ever since 2005⁸³, calling for a very ambitious and rapid decarbonization of the economy.

The Chinese NDC frequently reference to socio-economic transitions, but not followed up with decent work, quality of jobs, occupational health and safety or social dialogue. The closest

⁸⁰ Das, S.K (2013) "A Brief Scanning on Performance of Mahatma Gandhi National Rural Employment Guarantee Act in Assam, India", in American Journal of Rural Development, American Journal of Rural Development, Vol. 1, No. 3, pp. 49-61

⁸¹ ILO (2017) World Social Protection Report 2017-19: Universal social protection to achieve the Sustainable Development Goals (Geneva, International Labour Office)

⁸² China's Achievements, New Goals and new measures for nationally determined contributions (2021)

⁸³ WRI (2020) World's Top Emitters Interactive Chart

language to just transition was in relation to international cooperation on climate change where it states “China is committed to promoting the establishment of a fair, reasonable, cooperative, and win-win global climate governance system and the global transition to green, low-carbon, climate-resilient and sustainable development [...] Developing countries should [...] make a gradual transition to economy-wide emission limit or emission reduction in consideration of different national conditions”.

Meanwhile, the Chinese NDC refers to various elements of training and education. While it does not directly address the need for skill workers for a decarbonized economy, or how to reskill existing employees that may find their jobs becoming redundant from the transition, they do address the need for upgrading the skills of professionals in China as well as abroad through their South-South partnerships. Skills upgrading, including green skills, is considered across education levels, for example in national education systems as well as at university level (see table 2 for quotes).

South Africa’s NDC

South Africa has set a net zero target for 2050 and, according to Climate Action Tracker, the new target represents a significant change compared to the previous target, providing a good example on how governments can increase their mitigation ambition over time⁸⁴. Furthermore, the updated NDC is economy wide, covering agriculture, forestry and other land uses, energy, industrial processes and product use, waste, and 5 gases (CO₂, CH₄, N₂O, HFCs and PFCs)⁸⁵.

South Africa is the only BRICS country to explicitly mention and refer to just transition in their NDCs. The NDC references to just transition in the following ways;

- “In South Africa, a just transition is core to shifting our development pathway to increased sustainability, fostering climate resilient and low GHG emissions development, while providing a better life for all.” (p. 2)
- “A just transition means leaving no-one behind. It requires procedural equity to lead to equitable outcomes. A just transition is at the core of implementing climate action in South Africa, as detailed in both the mitigation and adaptation goals presented below. As South Africa indicated at the UN Secretary General’s Climate Action Summit in 2019, as part of ensuring a just transition we will need to put measures in place that plan for workforce reskilling and job absorption, social protection and livelihood creation, incentivising new green sectors of our economy, diversifying coal dependent regional economies, and developing labour and social plans as and when ageing coal-fired power plants and associated coal production infrastructure are decommissioned. Similar measures will be necessary to adapt to the impacts of climate change.” (p. 5)
- “The just transition will also need international cooperation, and requires solidary and concrete support. Ensuring that no one is left behind as we move from a high GHG emission, low employment energy development pathway to a low emission, climate-resilient and job-rich pathway, is central to our national work on development and climate change.” (p. 5)

South Africa also established a Presidential Climate Change Coordination Commission to oversee South Africa’s just transition. According to the NDCs, the Presidential Climate Commission “undertook extensive consultations over two years to develop a draft ‘2050 vision and pathways for a just transition to a low carbon, climate resilient economy and society’. Based on this process, we will be finalising our Just Transition Plan, including defining pathways

⁸⁴ Climate Action Tracker (2021) South Africa

⁸⁵ NDC Partnership (2021)

compatible with pursuing efforts to limit temperature increase to 1.5 °C.” Thus far stakeholder engagements on a Just Transition have occurred predominately at national level through the Presidential Climate Commission and a National Planning Commission.

The National Planning Commission has played a critical role in terms of Just Transition policy development. It concluded a multi-stakeholder social dialogue process in 2019, “Social Partner Dialogue for a Just Transition”. The outcome of the process was intended to be a coherent country-wide plan, which can be adequately financed and operationalised. What has been produced so far are outlines of potential transition pathways, constructed within the ILO’s framework on the transition⁸⁶. These pathways pertain to water, land use, and energy. As noted above, this works prioritised Mpumalanga and the Free State as geographical sites for initial Just Transition implementation, given the already existing risks in those Provinces. While the energy transition most immediately impacts Mpumalanga, energy, water and land are interconnected, requiring that all three issues are considered in parallel in the province. The coal transition is less relevant to the Free State, but water, land and to a lesser extent gold, are critical, and sustainable energy has a supporting role in strategies to manage these resources and enable service delivery.

There remains, however, significant work to be done to institutionalise a Just Transition and to navigate emergent trade-offs, tensions and disagreements between stakeholder groups and various interests through systematic participation processes. Significant gaps also exist in the integration of planning across spheres of government (national, provincial, local), and in disaggregating national targets to unpack appropriate local strategies, actions and investments across the country. It is of particular concern in Mpumalanga Province, in which up to 80 percent of the coal value chain is concentrated, largely in two districts, rendering it highly exposed to social-ecological risks associated with mining and power generation, as well as transition risk. The Free State has already had to deal with gold mining decline but also faces transition risks associated with coal mining and power, refining, and steel, as well as in the agricultural sector associated with physical climate risks.

► 4) Promoting and measuring green employment creation in BRICS countries

Promoting green employment

In addition to their NDCs, countries have several response measures to address climate change. The ILO Guidelines for a just transition towards environmentally sustainable economies and societies for all outline quite a few. As previously established, climate change must be addressed in a holistic manner, which is why the guidelines range across nine thematic areas and several policy areas (see section 1 on just transition). Similarly, the Guidelines outline specifically what governments, as well as workers’ and employers’ organisation, should do. While it would be too extensive for this short report, to outline all the Guidelines’ recommendations for government action, the following may serve as a quick summary. Still, the recommendation would be for governments and social partners to thoroughly familiarize

⁸⁶ National Planning Commission., 2019. Social Partner Dialogue for a Just Transition: 2050 Vision and Pathways for a Just Transition to a Low Carbon, Climate Resilient Economy and Society.

themselves with the Guidelines, as they really should be considered in their whole and in accordance with national circumstances and priorities.

Regulatory frameworks, incentives and procurement

According to the Guidelines, governments should *promote policy coherence and institutional arrangements for a just transition for all*. This includes providing a stable and enabling environment based on social dialogue and a regulatory framework. Similarly, governments should consider and promote the most relevant international labour standards for their just transition framework (a list of such relevant labour standards can be found in the [appendix of the ILC 2013 conclusions](#)). Furthermore, the active engagement with social partners, and the collaboration across line ministries, and strengthening of institutional and technical capacities are highlighted, including the availability and access to labour market data which this paper further addresses in section four.

Amongst concrete policy tools are social dialogue, active labour market policies, green public procurement, incentive schemes for enterprise innovation and sustainable economic growth. For example, governments could adopt appropriate regulations and instruments, including to explore and identify an appropriate combination of taxes (e.g. environmental tax reforms), subsidies, incentives, guaranteed prices, and loans to encourage a just transition. Similarly, the Guidelines promote public investments as a mechanism for greening the economy. For example, to use public investments to develop infrastructure with the lowest possible adverse environmental impact, to rehabilitate and conserve natural resources and to prioritize resilience in order to reduce the risk of displacement of people and enterprises. Similarly, promoting environmentally sustainable goods and services and the inclusion of MSMEs and disadvantaged groups in the transition through public procurement is another approach highlighted in the guidelines. Indeed, the guidelines do encourage government together with social partners to pay special attention to assisting MSMEs, including cooperatives and entrepreneurs in making the provision.

Enterprise development and entrepreneurship

In addition to public procurement and investments, the Guidelines promote enterprise level support for greening businesses. For example, governments should provide financial incentives (grants, low-interest loans and tax incentives) for businesses adopting environmentally sound practices, including, but not limited to, energy-saving and efficiency measures and measures targeted at clean sources of energy, in line with economic and social sustainability.

The Guidelines give much attention to MSME development and resilience. The Guidelines indicate that Governments can do this through national planning and policymaking, coordinating agendas with line ministries, improving access to labour market data, creating, supporting or implementing programmes, and fostering social dialogue. The Guidelines specify that governments and social partners should; for existing enterprises, provide technical support, advice, and services to establish environmental management and compliance systems. Likewise, market-based instruments, public procurement, subsidies, tax reforms in line with environmental taxes, and risk guarantees help MSMEs to transition to new activities, sectors, or markets.

Similarly, the Guidelines encourage governments to pay special attention to assisting entrepreneurs in making the transition. For example, they suggest that governments and social partners should conduct awareness and education campaigns to foster a culture of eco-entrepreneurship and provide technical support, advice, and services; and foster peer learning

among enterprises and workers, as well as education and training in green entrepreneurship to spread sustainable practices and the use of green technologies. This is closely linked to the need for considering skills development as a part of green employment promotion.

Skills for green jobs and public employment programmes

As previously specified, just transition strategies must consider the social implications of decarbonization in addition to the environmental and economic effects. Therefore, the Guidelines also address the need for investing in skills development, occupational safety and health, social protection, and rights. It is in particular the social dimension that is lacking in most countries' NDCs and promoting decent job creation, social dialogue, and a social justice in the climate change response measures is key for a just transition.

The most widespread effect of the green transition on employment is the need to reskill or upskill within existing occupations⁸⁷. New and emerging green occupations are more rare and tend to emerge at higher skill levels. Low-skilled occupations tend to require limited adaptation to greener work processes such as simply greater environmental awareness. Similarly, there will be shifts in the demand for both technical (specific to each occupation) and core/soft skills (e.g. skills such as entrepreneurship, networking, marketing, innovation, analytical thinking etc.). Thus, investing in skills for a green transition is key to promote employment opportunities through the transition. Still, an ILO study⁸⁸ found that systematic policy coordination across ministries is rare, and the integration across environmental and educational ministries must be improved.

Similarly, the Guidelines promote public employment programmes. This could for example be through 'green works' employment programmes. Green Works refer to the employment intensive development, restoration and maintenance of public infrastructure, community assets, natural areas and landscapes to contribute to environmental goals such as adaptation to climate change and natural disasters, environmental rehabilitation, ecosystem restoration and nature conservation. Common examples of green works are soil and water conservation, afforestation and reforestation, irrigation, and flood protection. Certain BRICS countries already have such programmes in place and their further development could be reinforced.

At the same time, social protection is also powerful tool to protect populations at greater risk of climate-related hardship. Well-designed social protection systems can quickly deliver relief in the wake of extreme weather events, including storms, droughts and floods, which are on the rise globally. Ensuring that these are covered by social protection is important to offset losses in income or assets that could threaten their livelihoods and wider economic activity. Targeted social protection measures can increase the resilience of workers, safeguard against loss of jobs and income, and enable income support and unemployment benefits during periods of transition from one jobs to another.

Data collection and measurement

The ILO Guidelines for statistical measurement of employment in the environmental sector support measurement of green jobs in official statistics. [The Guidelines concerning a statistical definition of employment in the environmental sector](#) represent the first internationally agreed conceptual framework for understanding the concepts and definitions associated with

⁸⁷ ILO (2019) Skills for a greener future

⁸⁸ Ibid.

employment in the environmental sector and green jobs as well as the data collection programme and methods recommended at the national level.⁸⁹

The objective of the 19th International Conference of Labour Statisticians (ICLS) Guidelines is to facilitate the development of a comprehensive system of statistics on employment in the environmental sector to provide an adequate statistical base for different data users. Such statistics are needed for monitoring the transition towards a green economy and monitoring green jobs levels and trends. They can help support the planning, design, and evaluation of aligned environmental and labour market policies, including impacts on the number of people employed in the environmental sector and their skill levels. They facilitate assessing the extent to which the economy is responding to various public policies and initiatives. They support the analysis of the economic and social situation of particular groups of workers in the environmental sector such as women, rural and urban populations, youth, and the elderly. They can help support the development and implementation of decent work and green jobs policy strategies and plans, aligning with SDG and Just Transition Frameworks.

It's worth noting that the 19th ICLS Guidelines cover separate concept definitions related to employment in the environmental sector and decent work. This enables the production of datasets that can provide separate statistics on both employment in the environmental sector and decent work. The key concepts covered by the 19th ICLS Guidelines include those associated with the *production of environmental goods and services* and include: (1) environmental activities, (2) the environmental sector, and (3) environmental goods and services. Concepts associated with *employment and decent work in the environmental sector* include: (1) employment in the environmental sector, (2) green jobs, (3) green work and (4) other related concepts. These concepts are discussed in the following sections.

► Environmental activities

According to the [Central Framework of the System of Environmental Economic Accounting \(SEEA\)](#), environmental activities are economic activities whose primary purpose is to reduce or eliminate pressures on the environment or to make more efficient use of natural resources. Environmental activities are grouped into two broad types: (1) environmental protection activities and (2) resource management activities. *Environmental protection activities* are those activities whose primary purpose is the prevention, reduction and elimination of pollution and other forms of degradation of the environment. *Resource management activities* are those activities whose primary purpose is the preservation and maintenance of the stock of natural resources and hence safeguarding against depletion. Activities in agriculture, fisheries and forestry can be considered as environmental if environmentally sustainable technologies and practices are used. The UN SEEA has established a classification of environmental activities according to the two broad categories of environmental activities as presented in Table 3 below.

► Environmental sector

The *environmental sector* consists of all economic units that carry out environmental activities. It's worth noting that the environmental sector concept used in the 19th ICLS Guidelines corresponds to the concept of Environmental Goods and Services Sector (EGSS) in the SEEA.

► Environmental goods and service

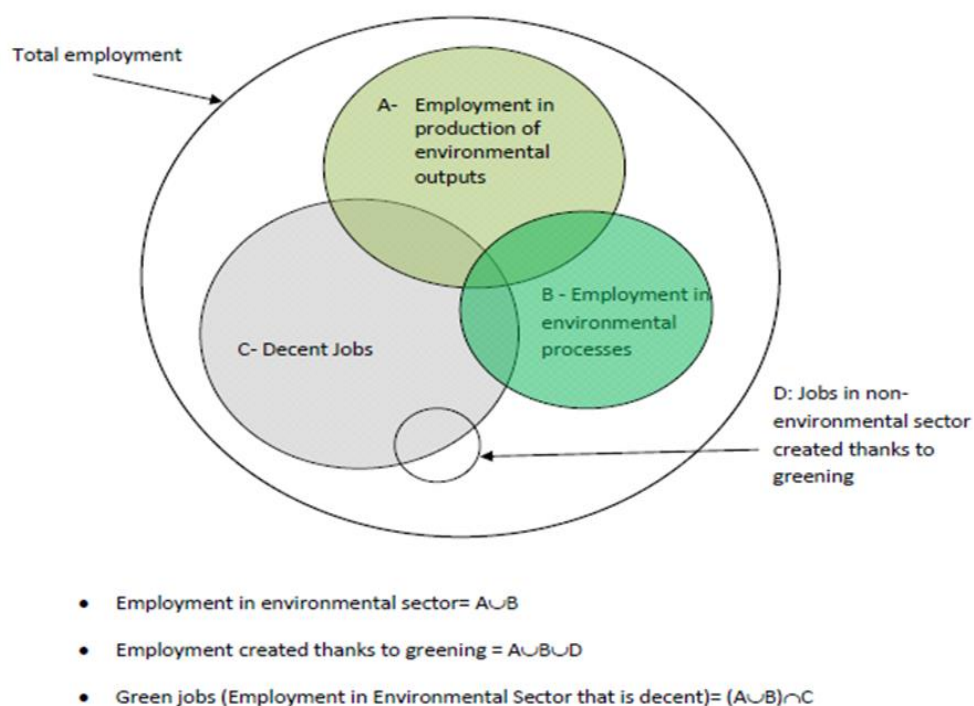
Economic units in the environmental sector produce, design, and manufacture at least some goods and services. *Environmental goods and services* are produced for the purpose of environmental protection or resource management. According to the SEEA, there are four types

⁸⁹ For background information that was discussed during the 19th ICLS session on this topic, see the [19th ICLS Room Document 5, Proposals for the statistical definition and measurement of green jobs](#).

of environmental goods and services: (1) environmental specific services, (2) environmental sole-purpose products, (3) adapted goods, and (4) environmental technologies (end-of-pipe and integrated technologies). Environmental goods and services can be produced by economic units for consumption by others or for own use.

A useful visual depiction of the main employment-related concepts presented in the 19th ICLS Guidelines is shown in Figure 2 below. The concept of ‘employment in the environmental sector’ is depicted by the union of circles A and B. Circle A represents the concept of ‘employment in the production of environmental outputs’ while Circle B represents ‘employment in environmental processes’. The intersection between ‘decent jobs’ (shown as circle C) and ‘employment in the environmental sector’ (union of circles A and B), defines the scope of ‘green jobs’. Note that both concepts fall within the scope of ‘employment’ (outermost circle), that is, work carried out for others in exchange for pay or profit.

► **Figure 2. 19th ICLS Guidelines: Schematic relationships between total employment, employment in the environmental sector and decent work**



Source: ILO

5) Conclusion

Key take-aways

- Climate change is affecting the environment, economy, and employment outlooks in all of the BRICS countries. The share of employment that relies on ecosystem services varies widely across the BRICS countries with Brazil (23 per cent), Russian Federation (14 per cent), India (52 per cent), China (50 per cent) South Africa (11 per cent) respectively. These types of employment are particularly vulnerable to climate change.

- ▶ Policy responses to climate change can have both intended and unintended consequences. Overall, the impacts on employment can be considered from four perspectives: a) new employment will be created, b) some jobs might be substituted by others, c) certain jobs will be lost, and finally, d) most jobs will be transformed.
- ▶ All BRICS countries have signed the Paris Agreement, and committed to avoid dangerous climate change by limiting global warming to well below 2°C. Similarly, all BRICS countries have submitted NDCs, and announced net-zero targets.
- ▶ Still, though all countries have submitted NDCs, not all are equally up to date or in line with UN net-zero targets for 2050. While all NDCs address GHG emissions, not all BRICS countries are including employment and just transition dimensions in their NDCs. In fact, South Africa is the only country to explicitly refer to just transition.
- ▶ None of the BRICS countries' submitted NDCs refer to social dialogue, decent job creation or the role of social partners. As well established in this report, all countries' labour markets will be impacted by climate change to some degree, and not sufficiently addressing labour market issues in the NDCs and integrating just transition plans, their climate action may unintentionally worsen the labour market and social consequences (or impacts) effect of decarbonization.
- ▶ As the risk of fossil fuel asset stranding becomes more material, governments may find themselves pressed for more subsidies to bail out the affected companies, translating to fiscal stress and often broader financial system stress. Yet, the lack of government action or slow adoption of clean energy technologies may further marginalize and expose the BRICS economies to future climate change impacts, as well as jeopardize employment and livelihoods.
- ▶ Countries can explore cooperation opportunities in energy efficiency, renewable energy, circular economy and ecosystem, and biodiversity protection. The BRICS group can consider collaboration in innovation, technology transfer and information and knowledge sharing, and develop best practices in energy efficiency, renewable energy, circular economy and ecosystem, and biodiversity protection.
- ▶ To better understand and measure the green jobs potential across the BRICS countries, they may consider adopting and deploying [*The Guidelines concerning a statistical definition of employment in the environmental sector*](#) in their countries.
- ▶ As indicated in several of the BRICS' NDCs, south-south cooperation is a priority to many of the governments. The BRICS grouping can further strengthen such cooperation through technical assistance and knowledge exchanges, and jointly raise the ambition for climate action and decent job creation. However, as indicated in most of the countries' NDCs, international technical and monetary support is needed. Climate cooperation should also leverage avenues to boost the flow of climate finance to the countries' most in need of it within these blocs.

▶ Appendices

▶ Appendix 1: Box 1, examples of policy frameworks and approaches by ILO constituents

Examples of policy frameworks and approaches by ILO constituents

Canada¹

Canada has committed to achieving net-zero greenhouse gas emissions by 2050. “Decarbonizing” the Canadian economy will require the winding down of coal, oil and natural gas projects across the country with potentially harmful effects for the hundreds of thousands of workers and dozens of regional economies currently dependent on fossil fuel production. In recognition and anticipation of the socio-economic impacts of its climate policies, Canada’s federal government committed in 2019 to introducing a Just Transition Act to “support the future and livelihood of workers and their communities in the transition to a low-carbon global economy.”

Ireland²

Ireland’s draft *Just Transition (Worker and Community Environmental Rights) Bill 2021* is meant to amend the *Climate Action and Low Carbon Development Act 2015* with a view to better aligning environmental and labour market policies by: defining climate justice and just transition; establishing the principle of just transition in law; consulting with the National Just Transition Commission in the making of carbon budgets, mitigation, national and local climate action plans, transition plans and the adaptation framework; and including delivery on just transition among the general functions of the Advisory Council on Climate Change.

In the draft Act 2021, “just transition” means a transition that ensures the economic, environmental and social consequences of the ecological transformation of economies and societies are managed in ways that maximize opportunities of decent work for all, reduce inequalities, promote social justice, and support industries, workers and communities negatively affected, in accordance with nationally defined priorities, and based on effective social dialogue; “just transition principles” are the importance of taking action to reduce net Irish emissions of greenhouse gases in a way which:

- (a) supports environmentally and socially sustainable jobs;
- (b) supports low-carbon investment and infrastructure;
- (c) develops and maintains social consensus through engagement with workers, trade unions, communities, non-governmental organisations, representatives of the interests of business and industry and such other persons as Ministers consider appropriate;
- (d) creates decent, fair and high-value work in a way which does not negatively affect the current workforce and overall economy; and contributes to resource efficient and sustainable economic approaches which help to address inequality and poverty.

Spain³

In 2019, Spain adopted a Just Transition Strategy within the Strategic Energy and Climate Framework. The Strategic Energy and Climate Framework seeks to facilitate the modernization of the Spanish economy and move towards a sustainable and competitive model which helps slow down climate change. This Strategic Framework is shaped by: a National Integrated Energy and Climate Plan (NECP); a Bill on Climate Change, and a Just Transition Strategy. These three elements are designed to give Spain a sound and stable strategic framework for the decarbonization of its economy. The Just Transition Strategy aims at supporting a just transition to ensure that people and regions make the most of the opportunities offered by this transition, so that nobody is left behind. It sets the context of a just transition in Spain; provides measures to make better use of opportunities arising from the ecological transition to generate activity and employment; mandates a just transition strategy every five years. It contains provisions for active green employment and social protection policies; green vocational training policies; just transition agreements; the establishment of a just transition institute; participatory governance; and defines an Urgent Action Plan for Coal-mining Regions and Power Plant Closures.

United Kingdom (Scotland)⁴

In 2019, the Scottish Parliament amended the Climate Change (Scotland) Act 2009 to make provision setting targets for the reduction of greenhouse gases emissions and to make provision about advice, plans and reports in relation to those targets. In that context, it enacted a set of “just transition principles”, defined as “the importance of taking action to reduce net Scottish emissions of greenhouse gases in a way which:

- (a) supports environmentally and socially sustainable jobs;
- (b) supports low-carbon investment and infrastructure;
- (c) develops and maintains social consensus through engagement with workers, trade unions, communities, non-governmental organisations, representatives of the interests of business and industry and such other persons as the Scottish Ministers consider appropriate;
- (d) creates decent, fair and high-value work in a way which does not negatively affect the current workforce and overall economy; and
- (e) contributes to resource efficient and sustainable economic approaches which help to address inequality and poverty.”

¹ [Canada Launches Just Transition Engagement – Canada.ca.](#)

² [Just Transition \(Worker and Community Environmental Rights\) Bill 2021 – No. 110 of 2021 – Houses of the Oireachtas](#)

³ Ministerio para la Transición Ecológica y el Reto Demográfico (Ministry of Ecological Transition and the Demographic Challenge), [Estrategia de Transición Justa dentro del Marco Estratégico de Energía y Clima.](#)

⁴ [Climate Change \(Emissions Reduction Targets\) \(Scotland\) Act 2019v](#), inserting section 35C into the 2009 Act.

Country	Just transition	Decent work/ employment	Skills and reskilling	OSH/health	Social protection	Social dialogue
Brazil (2020) ⁹⁰ (net zero target updated in 2021, but the other NDCs from 2020 remain valid) ⁹¹	No references to just transition	Mentioning of minimum income, no mentioning of jobs, work, or quality	On skills, health and social security the Brazilian NDC states; “The country also has a wide range of social and poverty eradication policies in place in the areas of healthcare, education, social security, and minimum income.”			No mention of social partners of social dialogue. However, there is a reference to civil society without specifying further; “Interaction between government and civil society via. Brazilian Forum on Climate change...”
The Russian Federation (2020) ⁹²	<p>“... it is a fair and real contribution [...] and does not pose a threat to the economic development of the Russian Federation on a sustainable basis”</p> <p>“[...] ensure the safe and sustainable development [...] including institutional, economic, environmental and social, including demographic, aspects development in a changing climate and the emergence of related threats.”</p> <p>“precaution in planning and implementing measures to ensure the protection of people, the</p>	<p>“determination of priority measures to adapt economic sectors and spheres of government to climate change”</p> <p>No mentioning of jobs, work, or quality</p>	<p>The NDCs mentions reference of in the Russian Federations assistance to developing for example; “training of qualified specialists in climatology, meteorology, hydrology and oceanography.”</p> <p>No mention of the need to skill and reskill own workforce</p>	<p>“The negative consequences of the expected climate change for the Russian Federation include: an increase in health risk (an increase in the level of morbidity and mortality) of certain social groups of the population”</p> <p>No mentioning of occupational health and safety specifically</p>	No explicit mentioning of social protection	No mention of social partners of social dialogue

⁹⁰ [Brazil First NDC \(Updated submission\).pdf \(unfccc.int\)](#)

⁹¹ [2021 - Carta MRE.pdf \(unfccc.int\)](#)

⁹² [NDC_RF_eng.pdf \(unfccc.int\)](#)

economy and the state from the adverse effects of climate change.”

India (2016) ⁹³	<p>References to climate justice and social justice, but not in relation to just transition or employment</p> <p>Efforts in improving rural communities livelihoods and improve natural resource bases</p> <p>Vulnerability between groups, states and regions is considered in regards to adaptation strategies</p>	<p>No mentioning of decent work, but mentioning of quality of life as seen here; “a decent quality of life to its citizens by building a clean and sustainable environment”</p>	<p>“India’s efforts will require proper training and upgrading of skills across sectors [...] establishing more intensive state centric knowledge and awareness creating activities and training of professionals in different aspects of renewable energy and supporting research and development institutions for pre-competitive research.”</p>	<p>The ‘Zero Effect, Zero Defect’ and the ‘SME Cluster Programs for Energy’ programs refers to quality control of SMEs on resource efficiency, waste management and pollution control, but not OSH</p>	<p>No explicit mentioning of social protection</p>	<p>Social dialogue or social partners are not mentioned</p>
China (2021) ⁹⁴	<p>Frequent reference to socio-economic transitions, but not</p>	<p>?The only mention of employment creation was in relation to a</p>	<p>In regard to capacity building it is specified;</p>	<p>References to human and public health in</p>	<p>No reference to social protection</p>	<p>No reference to social partners or social dialogue</p>

⁹³ [INDIA INDC TO UNFCCC.pdf](#)

⁹⁴ [China's Achievements, New Goals and new measures for nationally determined contributions \(2021\)](#)

<p>followed up with decent work or other social issues.</p> <p>The closest language to just transition was in relation to international cooperation on climate change where it states “China is committed to promoting the establishment of a fair, reasonable, cooperative, and win-win global climate governance system and the global transition to green, low-carbon, climate-resilient and sustainable development [...] Developing countries should [...] make a gradual transition to economy-wide emission limit or emission reduction in consideration of different national conditions ”</p>	<p>green poverty alleviation project in Sichuan, where it says “the photovoltaic poverty alleviation program has enabled poor households to increase income and become rich through employment transformation, thus achieving the win-win of poverty alleviation and ecological protection. ”</p> <p>Similarly, while it does not refer to quality jobs or decent working conditions, the follow segment on shared transportation is considering the employment effects of such efforts; “single shared transportation platform can generate more than 100 million tons of CO2 emission reductions. At the same time, shared transportation has produced important social benefits by bringing flexible work and income opportunities to car owners and drivers.”</p>	<p>“More official training, professional skill training, public publicity and education will be provided.”</p> <p>“Green and low-carbon development will be included in the national education system.”</p> <p>China also promotes their South-South cooperations and “over 100 training courses on climate change, energy conservation and emission reduction that benefit more than 4,000 people.”</p> <p>Similarly, a Chinese university joined the Global Alliance of Universities on Climate Change and work on; “joint research, talent training, student activities, green campus, and public participation, [...] aims to promote global youth cooperation and exchanges, raise public awareness and mobilize more climate actions”</p>	<p>regard to pollution and natural disasters.</p> <p>No references to occupational health and safety.</p>
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<p>South Africa (2021)⁹⁵</p>	<p>“In South Africa, a just transition is core to shifting our development pathway to increased sustainability, fostering climate resilient and low greenhouse gas emissions development, while providing a better life for all”</p>	<p>“South Africa will seek to develop small, medium and micro-enterprises, including energy service companies, to implement innovative technologies and create sustainable employment.”</p> <p>Quality of jobs not explicitly mentioned</p>	<p>See cross-cutting example below</p>	<p>Occupational health and safety not explicitly mentioned, but health and heat stress implications of climate change were;</p> <p>“This will also result in a number of co-benefits, such as reduced air pollution in the key pollution hot spots of the country, with health co-benefits”</p> <p>“A plausible increase in “extremely hot days” (a hazard indicating an increase in days where health will be at risk from exposure to high temperature) [..].”</p> <p>“Health: monitoring, surveillance and early warning systems for climate-induced diseases.”</p>	<p>See cross-cutting example below</p>	<p>“but a well-resourced just transition strategy will be needed to shift to low-carbon technologies, to maximize benefits and minimize adverse impacts on communities, workers and the economy”</p>
<p>“[...] as part of ensuring a just transition we will need to put measures in place that plan for workforce reskilling and job absorption, social protection and livelihood creation, incentivising new green sectors of our economy, diversifying coal dependent regional economies, and developing labour and social plans as and when ageing coal-fired power plants and associated coal production infrastructure are decommissioned.”</p>						

Source: Own compilation based on the most recent submitted NDCs and published on UNFCCC website

⁹⁵ [South Africa updated first NDC September 2021.pdf \(unfccc.int\)](https://unfccc.int/sites/default/files/ghg/2021/09/20210901_south_africa_updated_ndc.pdf)