



# Social Foundations of a Just Coal Transition

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# Executive Summary

**With climate change causing loss and damage, disrupting nature, and affecting the lives of billions of people, the world has accepted that it cannot achieve carbon dioxide reduction goals without phasing out coal.** The global energy sector is the primary contributor to carbon dioxide emissions, with coal as the foremost contributor between 2015 and 2019, responsible for approximately 44 percent in 2019 (IEA 2020). But while transitioning from coal to affordable, reliable, and clean energy sources is essential for fulfilling the Paris Agreement targets, it also poses economic and social challenges in meeting growing energy demands.

**This paper argues that addressing the broader social dimensions of coal transitions is crucial for success and offers benefits and opportunities for the millions of people affected.** It outlines existing literature about anticipated impacts of the transition not just on workers, but on people and communities more broadly, such as loss of employment, increased household costs, reduced public investment, mobility and outmigration, mental health, social and cultural identity, and conflict. It also considers the social co-benefits of coal transitions, such as reduced risks to livelihoods, new job opportunities, improvements in health and well-being, and social empowerment. Finally, it cautions that the uneven distribution of transition benefits and burdens can exacerbate pre-existing inequalities and systemic marginalization, reproducing the energy sector's legacy of social exclusion and injustice (Johnson et al. 2020), underlining that social sustainability, alongside economic and environmental sustainability, are vital for advancing a just transition away from coal.

**The paper offers a framework of upstream interventions to help governments and other actors facilitate inclusive planning, decision-making, and transition management.** To help ensure their transition away from coal is both socially sustainable and just, interventions must start at the earliest stages of planning and continue through to the post-transition community development phase. To guide planners and decision-makers through this process, the paper explores the importance of:

- **Collecting and analyzing socioeconomic and social inclusion data** early on, which helps develop a good understanding of the context within which

the transition will take place. Using participatory approaches and mapping helps ensure everyone is heard and nobody is overlooked in transition planning and management.

- **Supporting consensus and vision-building**, which will enhance trust in and community ownership of the transition process. Having a shared vision for the community's post-coal future provides clear direction for transition planners, guiding decision-making and resource allocation toward specific outcomes. Sustained and inclusive social dialogue contributes to the co-creation of such a vision—and a roadmap for its achievement—with affected communities and stakeholders.
- **Ensuring institutions at all levels are ready and able to manage the transition, and work together with all stakeholders**, which will ensure more effective and inclusive policy planning and decision-making. Governance structures must be transparent and participative, and outcomes desirable and acceptable for affected communities. Decentralizing decision-making authority to the lowest appropriate level of governance while ensuring coordination and collaboration between different government levels, sectors and stakeholders will help align the needs and priorities of affected communities with national transition and development goals. It will also promote effective local action.
- **Community investments that respond to local priorities and needs while being aligned with regional and national development planning**, which will enhance trust and ownership over the transition process. Environmental rehabilitation, land repurposing, and stranded asset upgrading can attract new opportunities and bring broader social benefits to the local community, especially when guided by locally led, participatory, inclusive, and empowering processes.
- **Multicountry and national-level coal phaseout knowledge exchange platforms**, which can help bridge the gap between the way we understand and address challenges around socially sustainable just transitions away from coal. As well as building confidence that there is a better way to manage

the transition, these platforms can facilitate the dissemination of bespoke, contextualized knowledge and play a pivotal role in disseminating policies, reforms, and initiatives.

- **Building meaningful and continuous dialogue and engagement**, which lies at the heart of developing a socially sustainable transition, and cuts across the five areas of intervention outlined above. Building trust among stakeholders and in institutions takes significant time and resources, and must be patiently cultivated

through ongoing dialogue and transparent and participatory policy practices.

**It is important to recognize that this framework represents a set of ideal interventions or entry-points, and to acknowledge the challenges of implementing this transition.** Doing so will require political will, significant time inputs, financing, and an interdisciplinary skillset. These challenges underscore the complexity and depth of the transition process, and the need for sustained effort and collaboration across various stakeholders to ensure a fair and equitable outcome.

# Acronyms

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<b>CIF</b>	Climate Investment Funds
<b>COP</b>	Conference of the Parties to the United Nations Framework Convention on Climate Change
<b>IEA</b>	International Energy Agency
<b>ILO</b>	International Labour Organization
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>LURA</b>	Land Use Repurposing Application
<b>PPCA</b>	Powering Past Coal Alliance
<b>SME</b>	Small and Medium-sized Enterprises
<b>STEM</b>	Science, Technology, Engineering and Mathematics

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# 1 | Introduction

**Climate change is widespread, rapid, and intensifying. It has already caused dangerous losses and damages, led to disruptions in nature, and affected the lives of billions of people worldwide (IPCC 2022).** Risks to livelihoods, food security, water supply, health and well-being, ecosystem structure and function, biodiversity, economic growth, and human security are projected to increase with global warming of 1.5°C and will increase further with 2°C (IPCC 2018a).

**The global energy sector stands as the primary contributor to carbon dioxide emissions.** Limiting warming to well below 2°C necessitates swift and substantial reductions in energy system carbon dioxide and greenhouse gas emissions (Clarke et al. 2022). This entails increasing production from low- and zero-carbon energy sources, decreasing reliance on fossil fuels, and promoting greater use of electricity and alternative energy carriers. But despite these requirements, energy demands and emissions from the energy sector continue to climb. Fossil fuel carbon dioxide emissions from the global energy system surged by 4.6 percent between 2015 and 2019, constituting around two-thirds of annual global anthropogenic greenhouse gas emissions (Minx et al. 2021; Monforti et al. 2021).

**As stipulated in the Paris Agreement of the United Nations Framework Convention on Climate Change, phasing out coal in the electricity sector is key to limiting global warming to 1.5°C (IPCC 2018b; Spencer et al. 2018).** Coal emerged as the foremost contributor to carbon dioxide emissions from the energy sector between 2015 and 2019, and was responsible for approximately 44 per cent of such emissions in 2019 (IEA 2020). Should investments in coal and other fossil fuel infrastructure persist, energy systems will become locked into higher emissions, increasing the challenge of limiting warming to well below 2°C (Clarke et al. 2022).

**The urgency of the climate crisis contrasts with the lengthy coal phaseout process, which often spans decades.** Countries transitioning away from coal need to adhere to significantly accelerated timelines compared to those followed in the past, as globally, unabated coal-fired power generation must decrease to 80 percent below 2010 levels (Climate Analytics 2019). To meet such targets, Organization for Economic Co-operation and Development nations will need to eliminate coal usage by 2030, and lower and middle-income countries shut down all coal-fired power plants by 2040 (appendix A), requiring them to cancel new coal power projects and hasten the retirement of existing coal plants (Edenhofer et al. 2018; Smith et al. 2019). To limit warming to 2°C or lower, existing coal plants must retire 10–25 years earlier than the historical average operational lifespan (Clarke et al. 2022), while executing all planned projects would curtail the viable lifespan of all plants by another 5–10 years (Cui et al. 2019).

**But while transitioning away from coal is essential for fulfilling the Paris Agreement targets and attaining the Sustainable Development Goals, it also poses economic and social challenges.** These obstacles vary regionally, contingent on extant coal infrastructure, economic development, alternative energy availability, institutional capacity and governance, legal and administrative capacity, historical background, political economy considerations, cultural norms, and other factors (Jakob et al. 2020; World Bank 2024a). Importantly, the transition is expected to have widespread socioeconomic effects on communities and regions. And, although knowledge and resources for mitigating the direct impacts of a coal phaseout on employment and coal mine workers is well developed, understanding of the indirect, long-term consequences on the wider community remains more limited.



## 1.1 Study objective

Given these challenges, the objective of this study is two-fold. First, it aims to demonstrate why social sustainability (box 1) is central to the process of advancing a “just” phaseout or transition away from coal. It does this by reviewing what the existing literature says about anticipated impacts of the transition not just on workers, but on people

and communities more broadly, and about the opportunity for leveraging social co-benefits. Second, it aims to address the “how” of facilitating a socially sustainable transition, informed by consultations with key informants working in this area. It does this by proposing a framework of interventions that decision-makers and other actors supporting the transition can undertake from the earliest stages of planning through to post-transition community development.

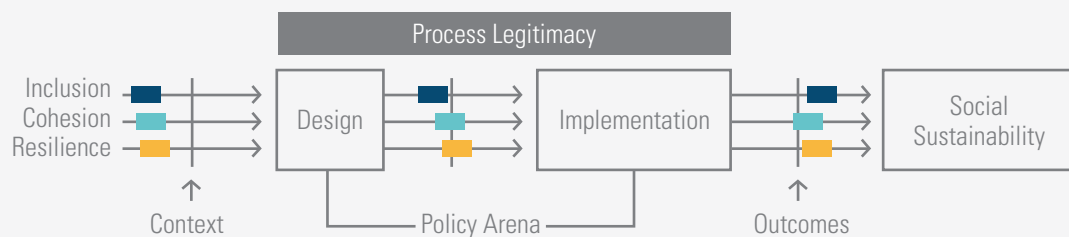
### Box 1. Understanding “social sustainability”

Barron et al. (2023) identify four key components of social sustainability (figure 1):

- **Building *inclusive societies***, by expanding access to markets, services, and political, social, and cultural spaces for all those affected—especially vulnerable and marginalized groups—in ways that promote their dignity.
- **Strengthening *social cohesion***, by promoting a sense of shared purpose, trust, and willingness to cooperate within and across communities, and between communities and the state.
- **Strengthening *communities’ resilience***, by ensuring that everyone—including poor and marginalized groups—can withstand shocks, be safe, and protect the integrity of their culture and thrive over time.
- **Ensuring *process legitimacy***, which is the extent to which a community or society accepts who has authority, what goals they pursue, and how policies and programs get implemented, from the earliest stages of transition planning through to post-transition community development.

Inclusion, cohesion, and resilience are the core elements of social sustainability, while process legitimacy determines the extent to which they produce social sustainability.

Figure 1. Conceptual framework for social sustainability



Source: Barron et al. 2023, p21.

**A social sustainability understanding of a just transition highlights the importance of a society-wide approach to preparing and managing the transition away from coal.** The literature on just transition (in and beyond the coal sector) converges around three overarching dimensions of justice: *distributional justice*, highlighting that the benefits and burdens of transitions must be shared fairly among all stakeholders; *procedural justice*, referring to the need for inclusive, transparent, fair and equitable decision-making around the transition; and *restorative justice*, referring to the need to redress inequalities through economic and social empowerment (Carley and Konisky 2020; McCauley and Heffron 2018). While the *social sustainability* perspective aligns with these three dimensions of justice, it brings to the forefront the importance of transitions being just for the whole of society, not only those facing loss of employment. This is particularly important to consider for coal transitions, which occur under unique circumstances, as coal regions are often geographically isolated and characterized by monoculture societies, with a strong cultural identity rooted in coal jobs, passed down between generations (Stanley et al. 2019). So, to be socially sustainable, a just transition away from coal must account for both direct and indirect social impacts of the transition, and be responsive to wider communities' needs, priorities, and vision for the future.

**This study builds on two World Bank publications that have considered the social dimensions of sustainability transitions.** The first, *How to Implement a Just Transition: Emerging Practices in Policy and Governance* (World Bank 2023a), shares emerging practice to help manage just transitions across industries, sectors, and places, and has case studies from New Zealand, Italy, Spain, and South Korea. The second, *Managing a Coal Mine Closure: Achieving a Just Transition for All* (Stanley et al. 2019), focuses on coal transitions and introduces the World Bank's 3x3 framework for addressing the socioeconomic and environmental impacts of mine closures (appendix D). The 3x3 framework outlines

three pillars for successful transition: governance systems, support for people and communities, and environmental reclamation.

**While there are strong interlinkages between all three pillars of the World Bank's 3x3 framework on just coal transitions, this study offers a deep dive into Pillar 2: People and communities.** Its value added is twofold. First, it outlines the breadth of social impacts and benefits that coal transitions may have for people and communities that are directly and indirectly affected. Existing literature has tended to focus predominantly on the impacts on coal mine workers, paying only cursory attention to the broader affected populations. Second, while the existing literature emphasizes the importance of consultations and engagement with affected stakeholders, this paper widens the scope of interventions for ensuring a just transition for people and communities. As well as dialogue, it highlights the crucial need for upstream analytics, consensus and vision building, supporting institutional readiness for the transition, community investments, and knowledge exchange.

## 1.2 Audience, methods, and scope

**This study is produced for the Just Coal Transition Platform – Southeast Asia.** A partnership between the World Bank and the Energy Transition Partnership for Southeast Asia, the platform provides a convening mechanism for sharing knowledge and lessons learned to help stakeholders in coal regions across Asia shape an informed vision for a just transition. The bulk of the world's coal-powered electricity is generated in Asia, in plants with an average age of 12 years and a typical economic lifespan of 40 years (box 2). The major rise in coal production to respond to growing energy demand in China, India, and Indonesia—which accounts for 44, 10, and 6 percent of global coal production, respectively—means that the region will be impacted most acutely by future mine closures (Stanley et al. 2019). So, while this study draws on global literature, it is tailored for and to the experience of Asia.

## Box 2. Status of coal phaseout in Asia

With 75 percent of the world's coal capacity and more than 90 percent of all coal-fired plants and pipelines, the Asia-Pacific region is at the heart of the energy-climate debate. The region's increase in coal use, mainly driven by China, contrasts with the decrease observed elsewhere, particularly the European Union and the United States (IEA 2024a). The situation varies across the Asia-Pacific region. Pakistan and Bangladesh are expanding their capacity, while in India, despite a heavy reliance on coal, capacity is declining and its pipeline shrinking. In Southeast Asia, Indonesia, the Philippines, Thailand, and Viet Nam all plan to expand, mostly from an already high capacity. Indeed, the expansion plans in Viet Nam and the Philippines are larger than their existing capacity (UN-ESCAP 2021).

But there are also signs that these countries are moving away from plans to increase coal capacity and generation. Viet Nam, a signatory to the Conference of the Parties (COP) 26 phaseout agreement, has pledged to stop building new coal-fired power plants, but will allow those that have already secured financing to complete. Phasing out coal will help the country reach net zero emissions by 2050. The Philippines, which has announced plans to increase clean power generation and energy efficiency measures, has banned new coal power but will allow approved projects to be built. Indonesia will consider accelerating the coal phaseout by the 2040s, subject to receiving more financing and technical assistance, as part of its commitment to reach net zero by 2060.

COP26 also witnessed the launch of a new partnership between Indonesia, the Philippines, and the Asian Development Bank to establish an energy transition mechanism to help accelerate the clean energy transition in Southeast Asia (ILO 2022).

**This paper is based on a literature review, focus group discussions, interviews, consultations, and feedback (appendix B).** As well as covering literature in the public domain and World Bank operations supporting just transitions away from coal, the desk-based review incorporates applicable insights from other sectoral transitions and models—such as community and local development approaches—aimed at fostering low-carbon economies. The study complements the review with data from a series of online focus group discussions and one-to-one semi-structured interviews, conducted between December 2023 and March 2024 with 16 key stakeholders working in the just energy transition space (appendix C). The study is also informed by consultations at the Just Coal Transition Platform – Southeast Asia stakeholder meetings on November 9–10, 2023 (in Singapore) and April 25, 2024 (virtual) and a feedback round with key stakeholder interviewees on May 8, 2024 (virtual).

**Relying on nascent literature and discussions on the social dimensions of coal and broader sustainability transitions, the paper aims to outline the breadth of possible social impacts of coal transitions, despite not being able to delve more deeply into each issue.** Historical evidence from

past coal transitions offers valuable, though limited, insights about impacts on people and communities. Existing literature shows common trends in the social impacts of the coal phaseout and makes suggestions on how to minimize some of these. But it lacks comprehensive coverage of the issues, due to the relatively recent emergence of the just transition as an essential part of climate action and field of study. Its focus is also quite narrow, mainly covering transitions in higher-income countries such as the United Kingdom, United States, and Germany, and offering little evidence from lower- and middle-income country contexts (Diluiso et al. 2021). This paper aims to lay the foundation for deeper consideration of social impacts and co-benefits in current and future coal transitions.

**This paper also recognizes that each coal mine closure presents unique challenges in diverse contexts.** Some coal communities are close to urban centers, while others are geographically isolated or less connected to transport infrastructure (Siyongwana and Shabalala 2019). And in some settings, the coal industry offers well-paid, formal, and secure jobs, while in others, it employs a large number of informal workers (Banerjee 2022). The context of the transition will also affect the anticipated social impacts (Lahiri-Dutt et al. 2022)—

for example, the impact of a single coal plant closure will differ from the impacts of multiple, sequential closures in an area. Finally, the influence of local, regional and global political economy factors will produce winners and losers at the local level, which

will vary from one coal mine or plant closure to the next. These challenges underscore the importance of grounding the analysis of distributional impacts and opportunities, as well as transition planning and implementation, to local circumstances and needs.

## 2 | Social dimensions of the transition away from coal

The concept of a “just transition” has garnered significant attention as a crucial objective for achieving a fair and equitable transition toward a low-carbon economy. A *just transition* emphasizes the “key principles of respect and dignity for vulnerable groups, the creation of decent jobs, social protection, employment rights, fairness in energy access and use, and social dialogue and democratic consultation with relevant stakeholders, whilst coping with the effects of asset-stranding or the transition to green and clean economies” (Denton et al. 2022, p 1730).

Given its roots in the labor union movement of the 1970s, a jobs-focused application of the concept has tended to dominate policy narratives, with a focus on addressing the economic and employment ramifications of transitioning away from coal (World Bank 2023a). Miners and other workers along the coal value chain have been, and will continue to be, on the frontline of the transition away from coal. As such, governments have tended to direct just transition efforts toward temporary income support, re-skilling or re-education initiatives, and other forms of social protection for affected workers (Stanley et al. 2019; World Bank 2023a).

Comparatively less emphasis has been placed on the social consequences of sustainability transitions, but there is a growing recognition of the significance of justice extending beyond economic considerations (Browne, Stehlik and Buckley 2011; Strambo, Aung and Atteridge 2019; Vivoda, Kemp and Owen 2019; Williams and Doyon 2020). Advocates of society-focused interpretations of just transition emphasize the need for system transformation to address long-standing inequities, both across and within countries and across temporal scales (World Bank 2023a), and increasingly acknowledge that the move toward a low-carbon economy must neither perpetuate current injustices nor introduce new ones (Setyowati 2021) (appendix C). But this interpretation of a socially sustainable just transition

is more challenging to operationalize. A key first step is improving understanding of both the breadth of possible adverse impacts on people and communities of a shift away from coal, and the associated social co-benefits of a socially sustainable just transition. This chapter reviews evidence and current thinking on both these aspects.

### 2.1 Transition impacts on people and communities

#### *Loss of employment among lower-skilled and informal workers, and non-mine workers*

**Lower-skilled and informal coal workers, and illegal miners will be directly and disproportionately affected by mine closures.** Unlike formal coal sector workers, who tend to have higher levels of education and technical skills, lower-skilled workers have limited or no education, which severely restricts their livelihood opportunities (Lahiri-Dutt et al. 2022). In Indonesia, for example, a temporary halt in coal mining activity in 2015-16 primarily affected workers such as cleaners, support staff, and maintenance staff (World Bank 2023b). In many countries, activities requiring unskilled labor (such as loading trucks with coal) are carried out by informal workers, who are mostly women (Lahiri-Dutt et al. 2022). The Indian state of Jharkhand, for example, provides more than 300,000 direct jobs and nearly 1 million indirect jobs in coal supply chains and service sectors (CSIS and CIF 2021). Because they lack written contracts, they risk being excluded not only from transition dialogue, but also from safety nets, compensation packages, and other short-term support. Similarly, the coal sector includes a significant population of illegal miners, such as the Zama Zamas in South Africa’s Mpumalanga province, who use basic tools to extract coal from abandoned and often unsafe mines for self-use or to sell in local markets (CSIS and CIF 2021). Illegal miners, whose livelihoods depend on coal, are most likely to be excluded from transition dialogue.

**Coal mine closures also have far-reaching implications for labor markets, extending beyond the workers who are directly involved in mining operations.** Impacts will also be felt by individuals working in other sectors of the coal supply chain, as well as those with indirect ties to coal-related activities, such as local retail, entertainment, restaurants, and other activities that cater to coal miners and their families (Ruppert Bulmer et al. 2021). In Indonesia, for example, when coal trucks were rerouted from public roads in West Merapi in 2020, roadside restaurants and shops disappeared instantly

(World Bank 2023b). In certain communities, mine closures can have a persistent and destabilizing shock on demand for goods and services, as displaced workers encounter difficulties transitioning to new employment opportunities. This may be due to limited alternative work options, a reluctance to accept lower-paying jobs, an unwillingness to relocate to areas with higher labor demand, a lack of available opportunities, or restrictions imposed by skills required to find employment outside the mining industry (Lawrie, Tonts and Plummer 2011; Ruppert Bulmer et al. 2021).

### Box 3. Social impacts of phasing out coal in India

To avoid catastrophic impacts on climate, India must halve its coal demand by 2040 (IEA 2021). But the transition to cleaner energy would affect around 2.6 million coal miners across the country, 70 percent of whom are informal workers (Banerjee 2022).

A survey of Ramgarh coal district in Jharkhand state found that local communities, particularly those living close to mining areas, are highly dependent on coal mining for income and cannot imagine a future without coal. In their view, coal mine closures cause an immediate loss of livelihoods, pushing many people into poverty, particularly unskilled and poorly educated workers, but also, in some cases, skilled workers. Other effects include reducing employment in local retail businesses, particularly those near the mines, causing distress migration for the poor, and increasing the incidence of crime and substance abuse. Even where mines have closed, the persistence of other mining activities encourages local people to hope they can still secure work in the industry, "if not here, then somewhere else" (Bhushan, Banerjee and Agarwal 2020).

Of particular concern is the impact of mine closures on informal workers. For example, the closure of the Saunda D coal mine in Ramgarh district in 2016 affected many informal workers. Those who could not find alternative work became poorer, while others continued to illegally collect coal from the abandoned mine. Formal workers were less affected, with many transferring to other coal mines (Bhushan, Banerjee and Agarwal 2020).

### *Increased household costs and reduced public investment in social services and local infrastructure*

**Phasing out coal may have adverse short-term impacts on consumers who rely on it as an affordable and reliable source of energy.** In many lower-income countries, where demand for electricity is growing faster than supply, coal constitutes cheap and abundant energy for cooking, heating, and transport, among other uses (Kalkuhl et al. 2019). As such, phasing out coal may lead to higher energy costs in the near term, particularly for poorer households, as the transition to cleaner energy infrastructure and grid expansion often requires substantial upfront investments (IEA 2024b). This will also affect consumers indirectly, driving up the cost of food,

transport, and other goods and services (Steadman et al. 2024).

**The transition could also lead to reduced public spending on social services and public infrastructure for coal mining communities.** In fossil fuel-dependent economies, revenue from these fuels is a main source of financing for social programs and public infrastructure (Laan and Maino 2022). The impacts of a financing gap for delivering basic services are often felt locally, particularly in contexts where fossil fuel extraction represents the main economic activity, as is the case in many coal communities. Local governments in Indonesia's East Kalimantan region, for example, collect between 25 and 75 percent of their revenue from coal (World Bank 2023b). Similarly, in the United States, one-third of public revenue in Boone

County, West Virginia comes from coal activities, funding the county commission, rubbish collection, health department, jail and public transportation, and contributing to the state's education sector (Carley and Konisky 2018). A decline in public spending for basic services, including health, education, and child-care services will disproportionately impact women, and disadvantaged and excluded groups, deepening poverty and widening inequalities for generations to come (Lahiri-Dutt et al. 2022).

### *Mobility and outmigration*

**Although human mobility has multiple underlying drivers, outmigration is an anticipated impact of the coal transition.** New or alternative employment opportunities for former coal mine workers or workers along the coal value chain may not align temporally or geographically, requiring long commutes or relocation (Stanley et al. 2019). And not everyone responds in the same way to this challenge. Younger, skilled male workers can often migrate, while older, unskilled, manual workers (both male and female) and those with fewer transferable skills tend to be less mobile (Aung and Strambo 2020; Lahiri-Dutt et al. 2022).

**This impacts not only on the migrants, but also their families and communities.** In communities with outmigration of skilled and young labor, the result is significant demographic decline (Spencer et al. 2018). Research also indicates that women in mining communities have smaller social networks than men (Sharma 2010), and if they stay in a mining town after closure, they will bear the brunt of the impacts. Their ability to rely on support from local social networks to cope with the impact of job loss and fractured families will likely be limited (Sesele, Marais and van Rooyen 2021), while women who become de facto single parents due to mine closures—because their husbands or partners migrate or commute long distances for work—have reported feeling exhausted and disheartened by the additional responsibility and increased labor burdens (Dublin and Licht 2000; Lahiri-Dutt 2023). This is particularly challenging as they generally have fewer resources. Men have likewise expressed discontent with the changes in family life as a result of mine closures, particularly the limited time they spend with their children and the consequent impact on their well-being and overall family cohesiveness (Dublin and Licht 2000).

**Despite these potentially negative social impacts, migration can effectively enhance resilience, not least by helping households diversify their sources of income or provide remittances to family members who stay behind—although this receives**

**little attention in the just transition literature** (Maharjan et al. 2020; Porst and Sakdapolrak 2020). Necessary enablers for successful migration include social networks that provide essential forms of support, such as access to information, resources and opportunities; educational qualifications and occupational skills that improve the ability to secure employment with the potential for increased income stability or higher income; and access to adequate levels of economic capital.

**Another often-overlooked challenge that needs addressing is when individuals and households affected by the coal phaseout lack the means to migrate from difficult and worsening conditions.** The just transition literature pays little attention to this issue of “trapped populations”, both within and beyond the coal sector, but valuable insights can be drawn from the climate-migration literature. Identifying the groups that are more at risk of being trapped in place is vital (Nawrotzki and DeWaard 2018). The poorest, most vulnerable households may be involuntarily forced to stay (Adams 2016), while gendered sociocultural norms and practices, economic factors, and other barriers mean that women, children, the elderly, people with disabilities, and those with pre-existing health issues are less likely to move away (Ayeb-Karlsson et al. 2022; Bhatta et al. 2015). Given the potential exacerbation of risks for those left behind, particularly women, if men migrate in response to the closure of coal mines, the “trapped populations” need greater social protection and livelihood security (Bhatta et al. 2015).

### *Stress, anxiety, and depression*

**In most cases, communities are ill-prepared for the loss of employment, which leads to poverty, declining living standards, lifestyle changes, deterioration of networks and social groups, and erosion of individual and community identity.** This results in shock and stressful financial and emotional uncertainty about the future. Studies have indicated a strong relationship between unemployment, emotional distress, and health issues such as insomnia, hypertension, and depression, as well as feelings of helplessness, isolation, hopelessness, a lack of purpose, loss of pride, and anger following mine closure (Ackerman, Van der Waldt and Botha 2018; Bennett 2015; Siyongwana and Shabalala 2019) (box 4).

**Mine closures affect the mental health of former miners and their families.** With men often feeling the burden of providing for their families, their sense of self-worth is undermined, and their identity as former key actors in the energy system eroded; this

is compounded by the stigma against men seeking support (Lahiri-Dutt et al. 2022). On the other hand, when the men in a household are laid off and household incomes decline, women are often compelled to look for income-generating activities, and female employment rates rise. But these jobs are often low paid, insecure, and exploitative (Miewald and McCann 2004). This leads to an increase in women's "triple burden" of paid work, unpaid domestic and caring responsibilities, often resulting in high levels of anxiety and mental stress, particularly in the context of heightened levels of

domestic violence and abuse (Aung and Strambo 2020; Lahiri-Dutt et al. 2022). Research by Sesele (2020) in South Africa's Free State Goldfields found that some female household heads had resorted to forcing their daughters and sons into sex work and crime to alleviate poverty caused by a decline in mining. Studies show that many people in the sex trade struggle with mental health problems—including post-traumatic stress disorder, anxiety and depression, and somatization—as well as stigmatization (Martín-Romo, Sanmartín and Velasco 2023; Puri et al. 2017).

#### Box 4. Social impacts of the closure of the Pilgrim's Rest gold mine in South Africa's Mpumalanga Province

A survey of local community members and stakeholders in Pilgrim's Rest found the following social impacts of the closure of the gold mine there.

**Education issues for young people:** Many young people dropped out of school because their parents could no longer afford education expenses, while others relocated with their families following the mine closure. Some of the parents of the children who remained in school locally were unemployed and unable to fully assist their children's education, demotivating some young people and turning others to substance abuse, which negatively affected the school environment.

**Emotional trauma and psychological stress:** 48 percent of respondents reported experiencing emotional trauma and psychological stress after they or their family members were retrenched by the mine, with some expressing feelings of hopelessness, despair, and suicidal thoughts. The loss of social networks due to population evacuation worsened the stress of unemployment. Inadequate communication of the mine closure to workers, coupled with their exclusion from discussing the issue in a bargaining forum, contributed to feelings of unfair treatment and heightened stress levels.

**Substance abuse and excessive alcohol consumption:** 54 percent of respondents identified these as significant issues. Local government officials attributed these behaviors to a lack of engaging activities for residents, particularly youth, and reported that they contributed to incidents of rape and assault.

**Increased crime:** 83 percent of respondents reported an increase in crime, particularly car theft and shop breaking, due to a lack of employment opportunities. Despite being hazardous, illegal mining also increased, with some miners being robbed.

**Emigration:** 54 percent of respondents indicated that many local miners had left the area, contributing to reduced employment opportunities, loss of foreign exchange, limited money circulating in the area, and a decline in living standards. Some community members said they would not leave, despite the challenges, due to their strong sentimental attachment to the area, prioritizing a sense of "home" over seeking better opportunities elsewhere. The scarcity of skills outside the mining sector posed challenges for former miners seeking alternative employment opportunities.

Source: Based on Siyongwana and Shabalala 2019.



### *Place attachment, and social and cultural identity*

**Individuals in coal communities experience a profound sense of loss around identity and attachment, including their sense of belonging, lifestyle, and familial and kin connections associated with living and/or working in a coal community.**

The hasty removal of physical remnants of the coal industry, such as pithead gear, fails to consider the deep-rooted sense of place and heritage that is often connected to these artefacts. Disregard for the historical identity of coal mining communities and the symbolic significance of such objects exacerbates the emotional impact of their abrupt removal; as one

woman said, “They just took them down; we did not have a chance to mourn” (Strangleman 2016, p 479). Some have expressed feelings of detachment from their community. Despite taking pride in their children’s and grandchildren’s educational achievements and recognizing the importance of education and outmigration for long-term economic success, a pervasive sense of loss for future generations remains (Dublin and Licht 2000). But historical evidence also shows that separating the discontinuation of coal from the lived experience of the abrupt shutdown of other heavy industries is challenging due to its embeddedness in the social fabric of everyday life (box 5).

#### **Box 5. Grounding the coal phaseout in historical awareness of legacies of the past**

The phaseout of coal in Yorkshire, United Kingdom, is entwined with the intricate legacies of deindustrialization that persist long after the closure of mines or plants. These legacies are apparent in persistent economic struggles, the gradual decline of working-class communities, and the uncertainties individuals grapple with while attempting to adapt to economic and social transformations.

Coal technologies were deeply ingrained in the fabric of everyday Yorkshire life, playing a transformative role in shaping the region and ingraining cultural traditions and social identities. This underscores the importance of not only exploring social, cultural, and political factors but also understanding how they impact the lives of individuals, families, communities, and locations long after the initial closure event. It calls for the coal phaseout to be grounded in historical awareness and the cultural and social context, acknowledging potential intergenerational and lasting consequences.

Sources: Based on Johnstone and Hielscher 2017; Kirk, Contrepois and Jeffreys 2012; Linkon 2014; Strangleman 2016.

**Mine closures negatively affect social capital, as evidenced by the erosion of individual and community identities, shifts in social status, and the loss of communal spaces due to closures or dislocation of towns and municipalities** (Diluiso et al. 2021).

Even decades post-mine closure, the legacy of poorly executed phaseouts impedes the establishment of new industries and activities, hampering efforts to promote a new identity for former coal regions (Diluiso et al. 2021; Merrill and Kitson 2017). Understanding how community cohesion and social networks in areas will be reconfigured and sustained as new energy futures emerge is crucial to foster more just transitions (Johnstone and Hielscher 2017).

**Although social identity and solidarity can be strengthened when communities unite to resist or protest against coal mine closures, there is limited evidence that this creates durable forms of social capital and builds community resilience.** The act of mobilization can forge temporary bonds and

networks, but sustaining these connections over time presents challenges. During the miners’ strike in Northumberland and County Durham in England, for example, there were periods of solidarity within families, communities, and the union movement—and across working-class communities across the United Kingdom, but this was often threatened by conflicting loyalties (Shaw and Mundy 2005).

### *Tension, conflict, and violence*

**When reskilling opportunities are limited and compensation is inadequate for dealing with the impacts of the coal phaseout, the risk of conflict, violence, and social tension increases** (Ackerman, Van der Waldt and Botha 2018; Diluiso et al. 2021; Sustainable Minerals Institute 2022). Financial and emotional stress can contribute to an escalation in household conflict, domestic violence and abuse, sexual assault and abuse of women and children, substance abuse among men, and marital breakdown

(Aung and Strambo 2020; Barry 2001; Bennett 2004; Lobao et al. 2021; Maggard 1994). For example, after the layoffs in the coal sector and workforce reduction policies in Poland's Silesia region, substance abuse and alcoholism rose among men, and domestic violence intensified (Stanley et al. 2019).

**Heightened violence against women due to the impacts of coal mine closure is particularly concerning because violence against women is already widespread both at the domestic and work levels in the mining sector (Mishra, Sravan and Mishra 2024).** Many studies suggest that women in coal mining communities already face significant challenges dealing with their male partners' work stress, often caused by working in dangerous situations. As such, they face higher levels of gender-based violence—including increased rates of domestic violence and alcohol-fueled violence—leading to personal trauma, social isolation, family break-ups, and more broadly, a lack of community cohesion (Cane, Terbish and Bymbasuren 2014; Hinton, Hinton and Veiga 2016; Petkova et al. 2009; Scheyvens and Lagisa 1998). Research indicates a mutual reinforcement of gender-based violence at the household and workplace levels in the mining sector (Mishra, Sravan and Mishra 2024).

**The underlying causes of such conflicts, violence, and abuse vary, but the psychological impact of**

**unemployment and the uncertainty it brings, along with the connection between work and male identity and masculinity, are significant factors** (Bhalotra et al. 2020; Mshweshwe 2020; Sikweyiya et al. 2020). Shifts in gender roles due to women's employment or political engagement can also play a role (Dublin and Licht 2000; Kideckel 2004). For example, following mine closures in the United Kingdom, some women refused to return to traditional caregiving roles (Shaw and Mundy 2005). But despite the gender-differentiated impacts of the coal phaseout, the mining industry and governments primarily focus on addressing the environmental and technical aspects of mine closure and its impacts on male mine workers (Lahiri-Dutt 2023). Failure to address existing gender issues in coal mining, including violence, is likely to lead to their replication in new energy systems (Johnson et al. 2020).

### *Intersectionality*

**Coal phaseout policies rarely take into adequate consideration how local contextual factors and other intersecting axes of difference and identity shape the way impacts are distributed among, and experienced by, different groups.** Although disadvantaged and excluded groups will be disproportionately affected by the direct and indirect impacts of the coal transition, no single social category or factor can explain people's unique situations or lived experience (Lahiri-Dutt et

#### **Box 6. Gendered participation barriers: the importance of intersectionality**

A comparative analysis of agreements between mining companies and communities shows that, in environments with a "highly patriarchal gender dynamic", women are less involved in both the informal and formal agreement negotiations, and that gender-segregated consultations do not guarantee women's inclusion. Certain intersectional factors—such as age, migrant status, marital status, and economic independence—can also intensify the exclusion of women. In particular, those who are young or middle-aged (and have not yet acquired elder status), migrants and women who have married into the community (and are therefore considered outsiders), widows, and single mothers, all face significant barriers to participation. However, women who possess "personal economic independence" are more active in such negotiations.

Corporate culture and employee diversity within mining companies and their negotiation teams also play a significant role in shaping the gender dynamics of negotiations. Inclusive, transparent, and collaborative approaches promote the participation of women, and a company's stance on agreement-making is crucial, with those viewing agreements as opportunities for long-term relationship development generally seeing more favorable outcomes. Being excluded from the negotiation process does not always mean women's perspectives and needs are unacknowledged or not influential, but men are more likely to focus on women's immediate, practical needs rather than their long-term, strategic interests.

Source: Based on Keenan, Kemp and Ramsay 2016.

al. 2022). For example, gender intersects with various other identity markers—such as indigeneity, ethnicity, race, caste, socioeconomic status, age, religion, education, sexuality, household headship, ability, and relationship status—as well as with social practices, institutional arrangements, and cultural ideologies, and the outcomes of these interactions in terms of power, causing some people to experience more negative outcomes from the coal phaseout than others (Crenshaw 1991; Davis 2008; Mohanty 1988) (box 6).

## 2.2 Social co-benefits of a coal transition

**Despite the breadth of possible adverse impacts on people and communities, phasing out coal also comes with social co-benefits that can be leveraged through a socially sustainable just transition.** The environmental benefits of transitioning away from coal are widely acknowledged. But, as shown in section 2.1, there is a risk of oversimplifying this complex issue by focusing on reducing carbon dioxide and neglecting the multifaceted social and economic impacts of the coal phaseout (appendix E). Social co-benefits, often underemphasized in the literature, also arise because of the legacy of poverty and exclusion in the coal sector. A socially sustainable coal transition seeks to leverage these co-benefits, or positive outcomes for people and communities—particularly vulnerable and marginalized groups—that arise from transitioning away from coal, such as social inclusion, enhanced resilience, and social empowerment.

**Coal must be phased out to limit global warming to 1.5°C, which itself will generate many social co-benefits.** Among other things, it will reduce risks to livelihoods, food security, health, well-being, cultural identity, human security, and challenges related to migration and displacement, all of which are expected to worsen with a 2°C rise (IPCC 2018a; Jordan 2019; Schuster et al. 2020). Given that structural inequalities and systemic marginalization—based on gender, race, indigeneity, caste, socioeconomic status, ethnicity, age, and ability—render certain social groups more susceptible to these increased risks (Jordan 2019; Thomas et al. 2019), a just transition could avert and minimize the scale of loss and damage experienced by the most marginalized and vulnerable communities, in coal regions and beyond.

**The shift to clean and renewable energy sources can lead to net gains in employment, offsetting the decline in coal job losses.** The International Energy Agency estimates that 13.8 million new jobs could be generated in energy supply between 2019 and 2030 under its net zero by 2050 scenario (IEA 2021). It also expects almost 5 million formal jobs in fossil fuel

production to be lost in the same period, including 2.5 million in coal fuel supply and power plant employment. This will result in a net gain of nearly 9 million jobs, with changes varying by region, as job gains will not always occur in the same locations or align with the skill sets of jobs lost in the coal sector (IEA 2021). To achieve and sustain such employment gains, developing comprehensive plans for job transitions, policy development, and other support measures to safeguard global workers is crucial (Hanto et al. 2021).

**Women and other disadvantaged groups will not necessarily benefit from the net gains in employment (Lahiri-Dutt 2023).** New and decent employment in the green sector is largely being created within areas that are traditionally male-dominated and many of the potential new jobs will require highly skilled workers. Women are underrepresented in the renewable energy sector in the Asia-Pacific region and globally, especially in technical and leadership positions (World Bank 2024b). They constitute 48 percent of administrative jobs globally, 28 percent of science, technology, engineering and mathematics (STEM) jobs, and 35 percent of non-STEM technical jobs (IRENA 2019). These sectors present high entry barriers, particularly for women, including gender-based occupation segregation, legal restrictions, unequal access to education and training, and the disproportionate amount of time women spend on unpaid care and domestic work (CIF 2024a; Livingstone and Jenkins 2021; World Bank 2024b). The intersection of other categories of social difference—such as ability, indigeneity, ethnicity, and caste—can exacerbate these barriers. As a result, women with disabilities, for example, are likely to experience further challenges due to stigma, discrimination, and accessibility issues in the workplace (Livingstone and Jenkins 2021).



Despite the breadth of possible adverse impacts on people and communities, phasing out coal also comes with social co-benefits that can be leveraged through a socially sustainable just transition

**Despite these challenges, a socially sustainable just transition from coal to clean and renewable energy could foster new opportunities for building an inclusive and sustainable labor market (CIF 2024b).**

Supporting those who are negatively impacted by job displacement and economic shifts due to the coal phaseout, and who face barriers to accessing green and higher-skilled jobs and leadership positions, requires a multifaceted approach to dismantle entrenched inequities and avoid deepening the gender crisis in the world of work (CARE 2022; CIF 2024a). This includes developing specialized curricula for green entrepreneurship training, promoting STEM education early on to build foundational skills, especially among girls and young women, and providing upskilling and reskilling programs for women affected by job displacement (CIF 2024a; Biegel and Lambin 2021; Livingstone and Jenkins 2021). Efforts should also focus on advancing women’s careers through inclusive leadership initiatives involving both women and men, reducing gender segregation at work, especially those likely to benefit from new job opportunities, and implementing measures to safeguard women—particularly those with Indigenous, tribal, or ethnic identities, and migrant or disability status—from violence, exploitation, discrimination, and sexual harassment as they transition into roles in traditionally male-dominated fields (CARE 2022; CIF 2024a; ILO 2017). Other crucial steps include addressing inequities in unpaid care work by recognizing care as a fundamental right and ensuring social protection and safety nets are in place for marginalized groups, such as women working in the informal sector and workers with disabilities (CARE 2022; CIF 2024b; Jordan, Abhilashi and Shaheen 2021).

**There are significant opportunities to improve conditions not only for women but also for people with disabilities, who often experience a multitude of socioeconomic vulnerabilities in the workforce (CIF 2024b).** The mining sector has the highest rate of people with health limitations caused by working conditions in the energy industry (CIF 2024b). Although many workers affected by mine closures in countries with well-developed disability protection policies may qualify for disability status, implementing measures to integrate them into the workplace is essential (CIF 2024b). Prioritizing people with disabilities from mining work—especially those who are ineligible for official severance packages—for health rehabilitation programs, reskilling and upskilling training programs, and other supportive interventions can help facilitate their transition to new employment (CIF 2024b). It is crucial to engage people with disabilities to ensure that workplaces are accessible and inclusive, to facilitate their integration into the renewable energy sector. Additionally, disability insurance payments should be

provided to both former informal and formal coal mining workers who are unable to return to work, ensuring their financial stability.

**For local communities, the more immediate and direct social benefits of transitioning away from coal include improved health, particularly arising from reduced ambient and household air pollution, which causes almost 7 million premature deaths globally every year (WHO 2023).** Coal mining carries significant negative externalities for human health and the surrounding environment, affecting both workers and nearby communities and disproportionately impacting people from lower socioeconomic backgrounds (Diluiso et al. 2021; Grainger and Ruangmas 2018). Numerous studies have reported a notable reduction in mortality and morbidity associated with transitioning away from coal, including decreases in deaths from cardiovascular and respiratory disease (Danek 1995; Goodman et al. 2009; ILO 2015). The environmental and health benefits alone would outweigh the direct policy costs of a coal phaseout (Rauner et al. 2020), and the resulting improvements in public health would also reduce healthcare costs for households and governments.

**Transitioning away from coal will bring substantial health benefits for marginalized groups—particularly people from lower socioeconomic backgrounds, women and children—through reduced household air pollution.** It is crucial to consider the asymmetric health effects and impacts of coal consumption more broadly (Diluiso et al. 2021). This is particularly relevant because coal consumption in domestic households is prevalent in lower-income countries, disproportionately impacting people from lower socioeconomic backgrounds and exacerbating health inequities (Grainger and Ruangmas 2018). Globally, around 2.3 billion people cook on open fires or inefficient stoves fueled by coal, kerosene, and biomass, resulting in harmful household air pollution (WHO 2023). This disproportionately impacts women and children and has been identified by the World Health Organization as the second most significant health risk for women and girls (WHO 2016). In 2020 alone, household air pollution contributed to more than 237,000 deaths of children under five (WHO 2023).

**Better health outcomes, such as those resulting from reductions in air pollution, can positively affect the educational attainment of children and young people, as well as improve their future career prospects.** As air quality improves, the decline in health issues commonly associated with coal-related pollution, such as respiratory illnesses and cognitive impairments can lead to better school attendance,

enhanced concentration, and overall improved academic performance (Duque and Gilraine 2022; Komisarow and Pakhtigian, 2022). In the Midwest in the United States, Duque and Gilraine (2022) estimate that the decline in coal use from 2006-07 to 2017-18 not only led to improvements in math scores by 0.016 standard deviations but also had considerable impacts on educational inequality given that minority and disadvantaged children disproportionately attend schools near coal plants. This decline in coal use resulted in a reduction of the black-white test score gap by 0.023 standard deviations and the socioeconomic test score gap by 0.05 (Duque and Gilraine (2022). These educational improvements have the potential to open up greater career prospects in the future.

**Post-transition environmental rehabilitation further mitigates pollution and restores balance where threats to life and ecosystems are manageable over time** (Stacey et al. 2010). Looking at the environmental effects of managing ex-mining sites, Diluiso et al. (2021) found positive effects related to landscape interventions, including the use of natural capital, restructuring residential areas, and a higher degree of landscape diversity. Exposure to nature has also been found to improve cognitive function, mental health, and sleep quality (Bratman et al. 2015; Kondo, Jacoby and South 2018; McCormick 2017), while green spaces and natural environments offer opportunities for enhanced social interaction and foster a stronger sense of community (Kelly et al. 2017; Nieuwenhuijsen et al. 2017). The World Bank's Land Use Repurposing Application (box 7) helps ensure that land rehabilitation brings about social and climate co-benefits by enabling an objective assessment of post-mining land use options.

**In areas where coal mines were developed on or near Indigenous territories, environmental rehabilitation and landscape interventions have the potential to contribute to restoring Indigenous Peoples' social, spiritual, and cultural relationships to land and other natural resources that may have been destroyed or degraded.** If these interventions respond to and align with Indigenous Peoples' self-determined values and priorities, they can enhance the health of their communities, given the significant role that natural systems play in their well-being (Johnson, Parsons and Fischer 2021; Sangha et al. 2015). While they will not undo the impacts of land expropriation, this alignment ensures that the measures taken are respectful of and rooted in Indigenous and traditional knowledge systems and practices, thereby fostering a sense of ownership and agency among community members (CIF 2021; Monosky and Keeling 2020).

**The transition could have a positive impact for disadvantaged groups who have long opposed the coal industry.** Health concerns, driven by the environmental impacts of coal mining, are consistently cited across 44 countries and a range of periods as a major motivator for transitioning away from coal (Diluiso et al. 2021). But opposition to the coal industry is also driven by competition over resources—particularly land and water—as well as environmental and social grievances. For example, Indigenous Dayak communities in Kalimantan, Indonesia, have experienced contamination of water, soil and air, as well as loss of access to land and forests due to mining and displacement, without adequate compensation (Atteridge, Aung and Nugroho 2018; Brown and Spiegel 2017). And in the Philippines, Semirara Island communities have reported severe environmental

#### Box 7. The World Bank's Land Use Repurposing Application (LURA)

LURA is a free, web-based, open-source tool that informs repurposing project design through geospatial mapping and by prioritizing recommended economic diversification alternatives, based on an assessment of the attributed characteristics and suitability of postmining land. The consultative and collaborative nature of LURA implementation helps build and nurture trust and consensus among stakeholders. Data about the land are collected and validated with local and national governments, local communities, civil society, and other stakeholders. After incorporating their feedback, LURA generates a map that illustrates various zones and the most feasible repurposing strategies for each, considering local conditions and community requirements. The application suggests a range of postmining land uses, such as reforestation, agricultural development, natural habitat conservation, and energy crop cultivation. It also proposes the creation of facilities for renewable energy production and storage, hydrogen infrastructure, and business parks designed for low-carbon industries.

Source: Based on Pohl 2022.

degradation due to coal mining, and health problems and loss of livelihood due to water pollution and land subsidence have led to strong local resistance against the expansion of coal mining operations (Santos et al. 2022). Similarly, in Viet Nam, residents of the Ha Long Bay area have protested coal-powered plants due to air and water pollution that threatens both health and tourism, a major source of income in the community (Ha-Duong et al. 2016).

**The transition must acknowledge and redress historical injustices.** Given histories of violence and land expropriation, Indigenous and frontline communities often face difficulties in expressing disagreement, let alone participating meaningfully in stakeholder engagement processes to support the coal phaseout (Kumar 2023). Including affected communities and engaging stakeholders in a legitimate, open, and fair manner can empower stakeholders and/or democratize relations between diverse stakeholders. But where consent is violated, trust breaks down, or coal mining and closure practices are not accountable, communities can be prevented from expressing dissent, and stakeholders are impeded from collaborating to ensure for a just transition (box 8; Sartor 2018; Whyte

2020). To ensure the transition process is legitimate, it must be transformative, acknowledging and repairing histories of violence and dispossession (Kumar 2023).

**A socially sustainable just transition does not begin from a situation of justice.** The distribution of the impacts of, and social co-benefits arising from, coal transitions will depend on local circumstances and local, regional and global political economy factors. But this chapter has shown that pre-existing inequalities render coal communities—and certain groups within them—vulnerable to the shock of a coal phaseout. Given the limited social development benefits that mining operations give to impacted communities and impoverished individuals, prioritizing the reduction of social inequality during postmining transitions is crucial (Meyersfeld 2016). Transitions that do not seek to address the uneven distribution of benefits and burdens will not only fuel resistance to change, but also exacerbate pre-existing inequalities and reproduce the sector's legacy of social exclusion and injustice (Johnson et al. 2020). On the other hand, socially sustainable just transitions seek to leverage opportunities to redress inequalities while maximizing social co-benefits, by prioritizing fairness in both transition outcomes and process.

#### Box 8. Violence, expropriation, and abuse of legal safeguards to Indigenous lands in India's coal expansion

It is crucial not to overlook the historical lived experiences of violence, expropriation of Indigenous and frontline communities' land, and abuse of legal safeguards to Indigenous lands that have enabled the expansion of coal mines and coal-fired power plants.

An analysis of state violence in 64 coal projects in India finds that 87.4 percent of coal projects were associated with either medium or high-intensity conflicts, while 12.4 percent involved latent or low-intensity conflicts. In more than half of these (51.5 percent), there was mass mobilization, arrests, and violence. High-intensity conflicts involved violent conflicts over land acquisition. Understanding these historical and ongoing injustices of state violence and land expropriation is essential for ensuring a just transition away from coal.

Source: Based on Kumar 2023.

# 3 | A framework for ensuring a socially sustainable just transition

**Although nations shifting away from coal need to speed up timelines compared to the past, they must also prioritize the fairness of the transition and ensure both meaningful engagement with communities and the legitimacy of their actions (Forsyth 2014).** Without this, efforts to phase out coal will likely be counterproductive and may even slow down the speed of the transition.

**This chapter proposes a process-based framework of upstream interventions to mitigate adverse transition impacts, leverage social co-benefits, and facilitate inclusive planning, decision-making, and coal transition management (figure 2).** The framework outlines five areas of intervention to be undertaken from the earliest stages of transition planning through to the post-coal community development phase: analytics, consensus and vision-building, institutional readiness, community investment, and knowledge exchange. Dialogue and participatory approaches cut across these five areas. Indicative or “ideal” activities are provided for each.

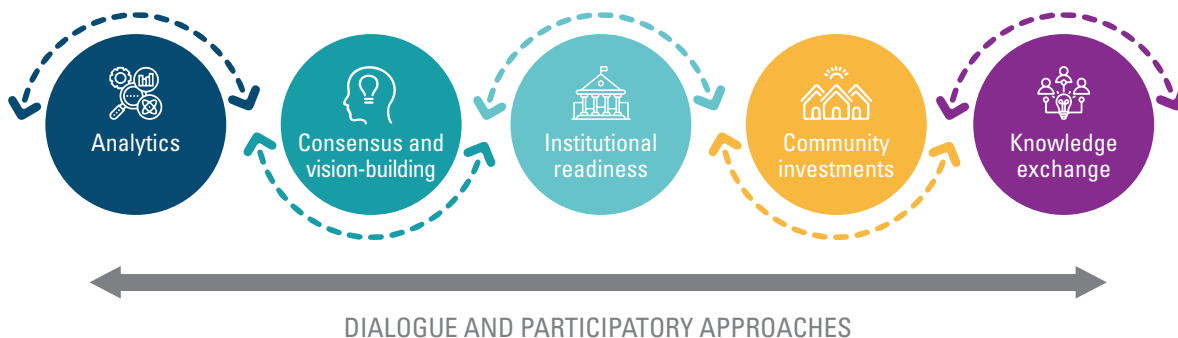
**These activities are neither mutually exclusive nor exhaustive, and should be tailored to the specific context and political economy within which the coal transition is taking place.** It is important to acknowledge the local power dynamics underpinning the transition process, which determine who stands to gain or lose from the transition, and where resistance may be present. A deep understanding of the political economy will aid in assessing the feasibility of proposed policies or actions, designing interventions that will help mitigate negative impacts on vulnerable groups, building coalitions, and addressing governance bottlenecks, among other benefits. The global political economy also significantly influences the transition context

by shaping policy frameworks, market dynamics, international relations, and social and environmental justice considerations. Successfully navigating these complexities requires global policy coordination and cooperation, and careful attention to economic interests, political priorities, and societal values at local, national and international levels.

**The framework represents a nonlinear process for facilitating a socially sustainable just transition that is iterative, flexible, and involves a wide range of actors.** The activities inform one another, with some triggering others, and as such, may be prioritized or sequenced in different ways to best fit local needs and circumstances. While some activities—such as developing strategies that integrate transition planning into wider regional and national socioeconomic development plans—should be government-led, others may be led by other actors involved in supporting the transition, such as civil society organizations, academic institutions, and/or the private sector.

**While the proposed areas of intervention align with principles common to good development, this framework unpacks how they play out in the context of coal transitions.** As well as insights gathered from consultations with key informants, lessons from other sector transitions and community and local development initiatives have informed the development of the framework. As such, the areas of intervention are not unique to supporting a socially sustainable transition away from coal; they also have the potential to advance development objectives more broadly by enhancing economic prosperity, building community resilience, promoting social inclusion and empowerment, and fostering inclusive governance practices.

Figure 2. Framework of upstream interventions for ensuring a socially sustainable just coal transition



This framework outlines five, non-mutually exclusive areas of intervention to be undertaken from the earliest stages of transition planning through to the post-coal community development phase: analytics, consensus and vision-building, institutional readiness, community investments, and knowledge exchange. Dialogue and participatory approaches cut across these five areas.

Importantly, this framework represents a nonlinear process for facilitating a socially sustainable just transition that is iterative and flexible, that involves a wide range of actors, and that should be tailored to the specific context and political economy within which the coal transition is taking place.

### 3.1 Analytics



#### Indicative Activities

Household services	Participatory risk and socioeconomic assessment
(Direct) impact distribution analysis	Mine closure social risk assessment (indirect impacts)
Gender and social inclusion impact analysis	Stocktake of civic space
Public perception survey	Political economy analysis

**Early collection and analysis of socioeconomic and social inclusion data are crucial for understanding the context within which the transition will take place.** Existing national household socioeconomic survey data can offer comparisons between coal communities and national averages. But more granular data from surveys undertaken within coal regions and neighboring areas provide valuable baseline information on aspects of people’s lives, including income, employment, education, skills, health, living conditions, and resilience to shocks. Integrating social inclusion variables in these surveys indicates

the extent to which individuals and groups within coal communities can fully participate in society. They include data on access to services, social protection, resources, and opportunities, as well as measures of discrimination, inequality, social cohesion and trust, particularly those focused on marginalized or disadvantaged groups, such as women, ethnic minorities, youth, persons with disabilities, and the elderly. Tools such as the Coal Vulnerability Index (box 9) provide a structured way to process data and understand the social and economic risks associated with the transition away from coal.

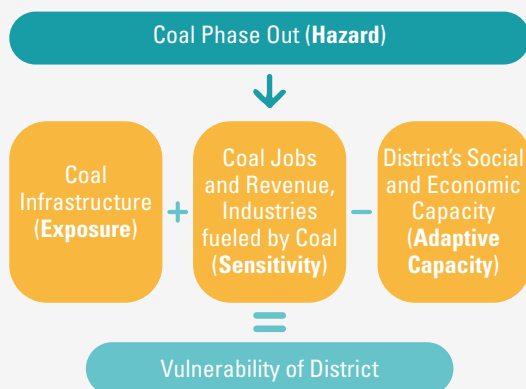


### Box 9. Coal Vulnerability Index: A tool for analytics

The Coal Vulnerability Index (CVI) provides a structured way to understand the social and economic risks associated with the transition away from coal. Developed to support a just transition, the CVI draws on the Intergovernmental Panel on Climate Change's (IPCC) definition of vulnerability and integrates three critical dimensions: **exposure**, **sensitivity**, and **adaptive capacity**. This index was originally conceptualized by Agrawal et al. (2024), who sought to provide a comprehensive tool to evaluate the vulnerabilities of coal-dependent geographical units, such as districts, regencies, or other administrative divisions during the energy transition.

- **Exposure** captures the physical presence of coal infrastructure, such as the number of coal mines and thermal power plants within a geographical unit. This dimension helps in understanding which areas are directly at risk due to the existing coal infrastructure.
- **Sensitivity** considers factors like coal-related employment and revenue, reflecting the socio-economic dependency on coal. High sensitivity indicates a greater socio-economic impact when coal activities decline, making it crucial to support communities heavily reliant on coal-related jobs.
- **Adaptive Capacity** represents a geographical unit's ability to respond to change, measured through indicators such as Gross Value Added, literacy rates, and the multidimensional poverty index. Higher adaptive capacity suggests that a region is better equipped to manage the transition away from coal without severe negative consequences.

**Conceptual framework by Agrawal et al. (2024) illustrating the vulnerability of districts to coal phase-out in India.**



By calculating CVI, Agrawal et al. provide a nuanced understanding of vulnerability, allowing for the identification of the most vulnerable geographical units and the key factors driving their vulnerability.

In South Africa, the CVI has been instrumental in highlighting districts that are most at risk from coal phase-out. In Indonesia, the index is now being applied to identify areas that require support during the energy transition, helping prioritize communities for assistance and investments to bolster resilience.

**Using participatory approaches in the early stages of transition to identify vulnerability and assess the potential risks of coal phaseout enrich findings from household surveys, build trust, and empower stakeholders.** Participatory methods leverage community perspectives, knowledge, and experiences, to ensure data collected through surveys are relevant to their conditions and concerns, leading to more accurate assessments

of vulnerability, risk, and resilience to livelihood shocks. They are also useful for filling in data gaps and highlighting nuances that surveys cannot always capture, enhancing our understanding of local context, vulnerable groups (who they are, where they are located, and so on), underlying drivers of vulnerability, social dynamics, and cultural factors. Importantly, they help empower stakeholders, strengthening social cohesion and building trust

among affected communities in the transition process, preventing outside actors from predefining their problems and measures to address them.

**Systematic social impact assessments that integrate intersectional principles anticipate the direct and indirect impacts of the coal phaseout and their distribution across and within social groups.** Despite the severe social impacts of coal phaseouts, there is little contextual research and there are few early assessments encompassing the full breadth and complexity of these social impacts (Monosky and Keeling 2020). A social impact assessment is not a one-off exercise. Rather, it is a process informed by analyzing data from surveys, key informant interviews, and focus groups, which offers a better understanding of stakeholder concerns about—and expectations for—the transition. It may begin, for example, by identifying the direct social impacts of coal mine closure, based on defined geographical and temporal boundaries, complementing or overlapping with other analyzes that focus on economic or labor impacts. It can then assess indirect or secondary impacts on different population groups and over broader spatial and temporal scales, considering intended and unintended, positive and negative social impacts, and how these are influenced by the interaction of various social categories or identities, such as gender, age, ethnicity, race, caste, indigeneity, socioeconomic status, ability, and other forms of identity. Gender and social inclusion impact assessments can delve deeper into risks for disadvantaged groups, to develop mitigation measures that address gender disparities and systemic marginalizations in the transition process (Hill, Madden and Collins 2017; Hillenbrand et al. 2015). Systematically undertaking such impact assessments can provide essential information for monitoring and evaluating the transition as it unfolds, contributing to resource efficiency, accountability, learning, and evidence-based decision-making.

**Mapping stakeholders and key actors helps ensure that transition planning and management overlooks nobody and pays particular attention to already disadvantaged groups (World Bank 2024c).** While chapter 2 focuses on impacts on and social co-benefits for people and communities, coal transitions involve a wider range of stakeholders with differentiated interests and concerns. As well as formal and informal workers and community representatives, stakeholders may include coal enterprises and associated small and medium-sized enterprises

(SMEs); state, regional and energy municipalities; private sector and financial institutions with interest in transition strategy; nongovernmental organizations; and public participation groups that are active in coal mining and clean energy initiatives. By strengthening understanding of diverse perspectives, interests, levels of influence, relations, and interdependencies between different interest groups, stakeholder mapping can lead to more equitable and sustainable outcomes when analyzing the local political economy, designing stakeholder engagement plans, and developing tailored strategies that address the needs and concerns of different groups.

**A comprehensive stocktake of civic space lays further groundwork for meaningful stakeholder engagement in transitioning countries.** The level of such space is pivotal in determining the success of transition, given the essential role of working closely with civil society and grassroots organizations to understand the needs, priorities, and interests of workers and local communities, especially vulnerable and marginalized groups (World Bank 2024d). Civil society organizations are also instrumental in stakeholder engagement, facilitating the inclusion of diverse voices, promoting transparency, and fostering collaboration across sectors of society. Understanding the impact of civic space on transition efforts is therefore essential, and involves considering legal and social constraints and the broader sociopolitical context in which civil society operates. This is especially significant in social and geographical contexts where civil society groups operate in narrow civic spaces.

**Public perception surveys provide essential baseline information about levels of public awareness, attitudes, and expectations of the transition process.** These surveys seek to answer important questions, including: Do people understand the reasons for shifting away from coal? Whose interests are prioritized in this shift? To what extent do they support it, and what do they anticipate from the transition? Do they expect benefits or burdens for themselves or their household due to the transition? This type of survey is one of the most effective tools when developing an informed stakeholder engagement strategy. By fostering greater understanding and awareness among those living and working in coal regions about the objectives, challenges, and potential benefits of the transition away from coal, they provide a foundation for meaningful dialogue and collaboration (box 9).

### Box 10. Assessing public perceptions on the transition away from coal in the Western Balkans

Conducted in 2021, the Western Balkans Coal Regions in Transition Public Perceptions Survey is one of the largest of its kind to date, covering 21 coal regions and five non-coal regions across five coal-producing countries: Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia, and Kosovo.

The survey found that, although 73 percent of respondents believe that citizens should be involved in the energy transition process, awareness of the just transition concept and its implementation remains limited, with 80 percent of respondents indicating unfamiliarity with it. Almost half of respondents in coal regions—and a quarter of respondents in non-coal regions—anticipate that the energy transition will have negative consequences for themselves or their households.

The survey findings highlight the importance of a key upstream step in preparing for a just transition away from coal: before engaging stakeholders, awareness-raising, public education, outreach, and capacity-building efforts are vital to empower citizens and ensure their meaningful participation in the just transition process.

Source: Based on World Bank 2024c.

**Having an early and deep understanding of the political economy surrounding the coal phaseout allows decision-makers to evaluate the breadth of potential social impacts, design and sequence mitigation measures, and enhance the legitimacy of the transition for everyone involved** (Hallegatte et al. 2024). Mapping the political economy at central, state, and local levels involves building on the analytical groundwork described above, to understand who stands to gain or lose in the transition, and how power dynamics factor in transition decisions (for example, how “problems” and “solutions” are framed, and whose narrative dominates). Successfully navigating the diverse and complex political economy barriers

to implementing a socially sustainable just transition requires a systematic approach to analysis. To address this complexity, the 4i framework can help dissect these barriers into four key components: institutions, interests, ideas, and influence (box 10). By providing valuable insights into potential obstacles—such as vested interests in maintaining the status quo, or resistance to change from key stakeholders—as well as local individual and institutional capacities, and enabling factors for managing a socially sustainable coal transition, political economy analyzes can help planners, decision-makers, and stakeholders design a transition that is tailored to local contexts, priorities, and needs.

### Box 11. The 4i framework for understanding political economy barriers

- **Institutions:** The established formal and informal rules, norms, and organizations that shape political, economic, and social behavior within society.
- **Interests:** The diverse distribution of impacts and differing priorities and preferences that influence the behavior of all involved stakeholders.
- **Ideas:** The values, beliefs, narratives or worldviews that influence the preferences and decisions of stakeholders.
- **Influence:** The authority, power, and leverage that stakeholders can access to promote their interests and ideas, as well as their interactions with one another and with institutions.

Source: Godinho, Hallegatte and Rentschler (forthcoming).

## 3.2 Consensus and vision-building



### Indicative Activities

National/subnational dialogues	Awareness-raising campaigns
Tailored communication strategies	Gender and social inclusion plan
Dedicated consultations with previously identified marginalized groups	Co-development of a roadmap for the transition

**Building a shared vision of a post-coal future through social dialogue is a key first step to successful transition planning and management.** Having a vision provides clear direction for transition planners, guiding decision-making and resource allocation toward specific outcomes, thereby minimizing inefficiencies and missed opportunities. Without such a vision, coal communities can remain vulnerable to challenges, even if they support the phaseout (Yang and Shanker 2023). Co-creating a vision and shared principles for achieving it builds community ownership for the transition, and integrating bottom-up project identification and implementation alongside top-down financing and coordination has emerged as a highly effective strategy for coordinating and implementing a shared vision of post-coal futures in Europe (Wong, Röser and Maxwell 2022).

**Early awareness-raising campaigns and public forums about the need to phase out coal enhance understanding about the transition, as well as the local context.** Helping coal communities envision a post-coal future begins with raising awareness about why a phaseout is needed and being transparent about its potential impacts on their lives and how they can be involved in transition planning and decision-making. But awareness-raising campaigns alone only offer one-way interaction with stakeholders. Expanding debate and dialogue through public forums can enhance citizen understanding of well-planned and well-managed coal phaseouts—including their potential benefits such as improved air quality and natural environment—and approaches for minimizing their adverse effects (World Bank 2024b). Importantly, they also help planners better understand the local context and community dynamics, as well as the community's fears and anxieties about the transition and their needs, priorities, and vision for the future (World Bank 2024b).

**Tailoring communication and engagement approaches and strategies to diverse groups and**

**needs helps ensure all voices are heard and feed into transition visioning, planning, and decision-making.**

Stakeholders may have varying levels of literacy, language proficiency, or accessibility requirements, as well as different cultural backgrounds. To address these needs, it is essential to employ accessible communication strategies that use a wide range of methods and channels, including Indigenous theatre, visual arts, multimedia resources, artificial intelligence-based technologies, digital platforms, and written materials that are clear and available in multiple languages, while also ensuring that digital content is accessible to people with disabilities. Additionally, providing childcare support tailored to local contexts, addressing mobility and access needs for the elderly and people with disabilities, covering costs for transport and internet access for young people, and creating inclusive spaces that value cultural diversity, traditions, values, and the wealth of knowledge that exists within communities can help remove barriers to effective participation (Lahiri-Dutt et al. 2022). Capacity-strengthening initiatives can build confidence and empower marginalized groups with the skills and knowledge they need to engage effectively in transition dialogue and decision-making processes, especially in contexts where women, Indigenous Peoples, young people, persons with disabilities, and other disadvantaged groups are not usually heard. For example, providing young people with opportunities to build soft and foundational skills can enable them to meaningfully participate in transition dialogue (Lijfering et al. 2024).

**Placing women and other excluded groups at the forefront of dialogue and consultative processes, along with implementing strategies to support their participation in just coal transition decision-making and leadership roles, ensures their interests and needs are fully addressed.** Women and other marginalized groups are underrepresented in many decision-making spaces. As a result, their voices, needs, and priorities are often unheard, misunderstood, or overlooked

in policies and interventions that impact them (box 11; Lahiri-Dutt et al. 2022). To avoid perpetuating existing inequalities and injustices, it is important to recognize gender differences in the impacts of the coal phaseout and the multidimensional and interdependent intersectional differences that shape the impacts on marginalized and vulnerable groups (Clancy and Mohlakoana 2020; Gambhir, Green and Pearson 2018; Hill, Madden and Collins 2017). This means avoiding tokenistic participation of women and other marginalized groups, and incentivizing and actively working with them to integrate their invaluable knowledge, skills, local understanding, and lived experience into building the community's vision for a post-coal future, and all subsequent phases of a mine closure. This involves identifying and dismantling barriers to their participation and leadership. For

example, implementing policies that offer health and social services to women in caregiving roles, along with establishing support and peer groups to enhance their confidence and skills, can facilitate them in pursuing leadership opportunities (CIF 2024a).

**As well as ensuring their perspectives are represented in their communities' post-coal vision, supporting the participation of women, youth, and other marginalized groups will ensure the design and delivery of financial aids, compensation schemes, and other supportive mechanisms are gender-responsive and inclusive.**

For example, their participation could help ensure counseling services to address the psychological aspects of mine closure are available not only to the predominantly male mineworkers, but also to their families, too (Sesele, Marais and van Rooyen 2021).

#### Box 12. Exclusion of Indigenous voices from consultative processes in mine closure planning

A critical review of ten mine closure plans across five territories in Canada's northwest revealed a consistent omission of Indigenous knowledge in their development. The extent of local community involvement in these plans varied significantly, and in the absence of stringent regulatory guidelines, the incorporation of community interests and responses to their concerns into these plans hinged solely on the discretion of the mining companies to exceed the minimum standards set by the government. The review also revealed a lack of consensus or established method for managing the socioeconomic impacts within these plans, leading to a lack of definitive approaches to lessen adverse effects.

Source: Based on Monosky and Keeling 2020.

**Bottom-up co-development of a roadmap for achieving a community's post-coal vision promotes ownership and sustainability of transition efforts and investments.** Co-designing a roadmap with communities can involve a series of workshops and consultations, using several channels and media to maximize inclusion and participation, on defined transition topics, including the breadth of social impacts and co-benefits and how to respond and leverage them. These should take place over a bounded, but long-enough timeframe—for example, two years—be guided by local circumstances

and the broader political economy context, and have clearly defined objectives and medium-term targets. The roadmap may include, for example, identifying short-term actions and medium- and long-term strategies that contribute to the collective re-imagining of the community's future. New Zealand's Taranaki 2050 program, which aims to help the region navigate the shift from off-shore oil and gas toward a low-emissions future, offers a best practice example of how to co-design a roadmap with and for communities (Venture Taranaki 2019; World Bank 2023a).

### 3.3 Institutional readiness



#### Indicative Activities

Establishment of high-level body to oversee and coordinate the transition process

Assessment of national and local institutional capacity for preparing and managing the transition

Capacity strengthening of local and national institutions

**Establishing a cross-sectoral, multi-disciplinary, high-level institutional body or mechanism to oversee the transition process and work closely with all stakeholders, including affected communities, will ensure more effective and inclusive policy planning and decision-making.**

Forming a multistakeholder consultative and advisory body, and, if relevant, committees from each coal-dependent region, can help build consensus around—and mutual understanding of the challenges and necessary steps toward—a socially sustainable just transition (World Bank 2024d). This helps ground the roadmap for a transition process in historical awareness, political economy considerations, the cultural and social context of affected areas, and the needs, priorities, interests, and perspectives of affected communities, especially historically marginalized groups. Importantly, the body can strengthen coordination and cooperation across sectors, including for stakeholder engagement, help build partnerships between diverse stakeholders and different levels of government and ministries, and create synergies between transition strategy and plans and policies and strategies in other areas such as employment and social protection, education and learning, and women and equality, while sustaining policy momentum and focus (World Bank 2024a). A key first step for the body or mechanism is to define clear roles and responsibilities for local, regional, and national government, community leaders, civil society organizations, the private sector, and other local and regional stakeholders.

**Aligning the needs and priorities of affected communities with national coal phaseout and development goals, and promoting effective local action, are both vital for the social sustainability of the transition.** To deliver on national commitments, strong subnational implementation systems are needed to connect top-down policies with bottom-up processes. For example, Indonesia’s decentralized governance system means that strengthening and delineating subnational government roles is integral

to ensure effective transition policy. Prioritizing locally led approaches helps ensure coal transition-related activities are more sustainable, contextually relevant, suitable, and cost-effective (Coger et al. 2022; Smith and Greene 2020). Promoting more inclusive local governance and amplifying citizens’ voices in just transition policy dialogues can help ensure interventions address the differentiated social impacts of the transition (Gambhir, Green and Pearson 2018; World Bank 2023b).

**Nationally coordinated fiscal support is a key factor in facilitating a successful coal phaseout, and substantial national-level support and coordination is required to implement bottom-up, locally led strategies.** Historical evidence from past coal transitions, primarily from the European Union, shows that national governments have had to cover these significant costs after the economic impact of the coal transition eroded local resources and fiscal capacity. National coordination can ensure the efficient and transparent allocation and use of funds, coupled with interventions to ensure local institutions and communities—including women, Indigenous Peoples, and persons with disabilities—have more direct access to finance, thereby enhancing their capacity to manage and report on funds (Hallegatte et al. 2024; Soanes et al. 2021). In countries with limited state capabilities, this can allow for accountable service delivery and lessen the load on the state (Andrews, Pritchett, and Woolcock 2017; World Bank 2004). Support at the local level can include, for example, increasing women’s access to financial resources to meet their energy transition needs and priorities and supporting income-generating activities and businesses managed or owned by women (CIF 2024a).

**In this context, small grants are particularly important, as they can be designed to bypass complex application processes and rigid criteria, allowing for a more direct and rapid response to those in need.** Small grants aimed at the most

vulnerable groups can constitute a vital safety net, offering immediate financial assistance that serves as a bridge in situations of economic distress (CIF 2024a), while also recognizing and fostering their leadership and knowledge. Unlike larger, more structured programs, small grants provide a level of flexibility and accessibility that is often necessary for social inclusion. They can also help address the wider social challenges that often accompany mine closures, as described in chapter 2. For example, they can support initiatives that provide vocational training for youth to enter employment in the low carbon sector, offer counseling for those suffering from anxiety or loss of identity, raise awareness about the dangers of substance abuse, or establish community programs to combat gender-based violence.

**It is also possible to leverage existing local government funding transfer mechanisms to implement community investment projects or community-driven programs.** In many cases, the use of available support transfer mechanisms helps facilitate the efficient and effective implementation of transition plans. In Indonesia, for example, there is potential to leverage the existing Village Funds program to channel funding from national to targeted district or municipality government levels. Such mechanisms can foster greater ownership in subnational governments and local communities, increasing the sustainability of the transition.

**Assessing and building the capacity of national and subnational institutions facilitates the devolution of transition decision-making authority to the lowest possible level of governance.** With strong institutions, decision-making authority can be decentralized to the lowest appropriate level of governance. As well as empowering local communities to take the lead in identifying their own just coal transition needs and priorities, this approach recognizes the importance of higher levels of governance in providing financial and regulatory support, capacity-strengthening, and guidance when necessary (Sartor 2018; Steinbach et al. 2022). But local governments must have the resources, capacity, technical skills, and support they need to implement transition policies and programs (Lahiri-Dutt et al. 2022). Several studies indicate that local governments bear the brunt of the revenue impacts of mine closures and are responsible for executing transition programs (Mohr et al. 2020; Sesele 2020). Analyzing resources and capacities at lower tiers of government and in local institutions, as well as the barriers to implementation at all levels, can

provide a comprehensive evaluation of enabling and constraining factors (Lahiri-Dutt et al. 2022). This enables understanding of the financial and regulatory support, capacity-strengthening efforts, and guidance needed to implement transition and enhance local government capacity in participatory planning and investment mechanisms.

**Strategically targeted and increased investments implemented within strong governance and accountability mechanisms are vital for achieving a socially sustainable and just transition (World Bank 2024a).** The World Bank's (2024d) Just Transition Taxonomy, a first step toward developing a comprehensive, globally applicable just coal transition taxonomy, summarizes the financing needs for a just coal transition and outlines the financial responsibilities of different public and private actors. Various instruments—including grants, bonds, debt, concessions, and equity—are used to fund transition activities, and can be applied individually or in combination, with the optimal mix determined by specific contexts and needs. But these often have rigid funding criteria with complicated application processes, hindering innovation and progress. So a more adaptable and flexible strategy, which accommodates the multifaceted nature of transition activities, is necessary. To truly support a socially sustainable and just transition, these instruments must operate within strong governance, accountability, and transparency mechanisms that respond to local priorities and needs. This is particularly important as just transition activities are more susceptible to failure or disruption compared to conventional, tried-and-tested development activities, where key stakeholders typically have a solid understanding of the processes involved (World Bank 2024a).

**Governance structures must be transparent and participative, and outcomes desirable and acceptable for the affected communities (Hallegatte et al. 2024).** This will prevent inadequately designed or executed policies that do not consider local needs and contexts or exceed the capacity of regional or local government agencies (Lahiri-Dutt et al. 2022). Institutional trust plays a pivotal role, as without it, even well-designed policies and compensation measures can face resistance and pushback (Hallegatte et al. 2024). A legitimate institutional framework for a just transition necessitates transparent, accountable, and inclusive policy processes, along with interventions that rebuild trust—for example, by developing locally-responsive mechanisms to address concerns and grievances (World Bank 2016; 2024b).

### 3.4 Community investments



#### Indicative Activities

Strategies that integrate transition planning into wider regional and national socioeconomic development plans	Local plans for economic diversification
Locally led, climate-resilient community and regional investments	Post-mining environmental rehabilitation and land repurposing and redevelopment
Stranded assets upgrading	

Government-led social, human, and economic development interventions that combine structural reforms with targeted support measures can effectively create synergies between transition plans and strategies in other areas, leveraging social co-benefits and broader development outcomes (Hallegatte et al. 2024). Examples include implementing structural policies designed to enhance resilience to shocks by increasing access to financial instruments and services; bolstering health care systems, social protection, social safety nets, and essential infrastructure; encouraging economic diversification to create new employment opportunities; and promoting labor market mobility and agility (Hallegatte et al. 2024; IEA 2021). Policies specifically designed to support impacted workers—such as offering early retirement packages or providing financial and reemployment assistance—can be effectively combined with broader initiatives at the community or regional level (Hallegatte et al. 2024). These include, for example, local economic development programs, education and skills training programs for the low carbon sector and other new industries, social welfare services, and environmental restoration efforts (Stanley et al. 2019; World Bank 2024a). Such multifaceted strategies help integrate transition planning into wider regional and national socioeconomic development plans, helping advance development objectives more broadly by enhancing economic prosperity, building community resilience, promoting social inclusion and empowerment, and fostering inclusive governance practices. Government leadership in this area also signals a commitment to supporting people and communities through the transition, and ensures adequate financing to meet transition needs.

**Attracting investments in new sectors and activities, diversifying the local economy, offering decent**

**employment alternatives that are sustainable and accessible, and providing adequate social safeguards to those unable to re-enter the labor market can support the development of a new identity for coal regions (Diluiso et al. 2021; World Bank 2024a).** This involves anticipating changes in job profiles, providing adequate social protection for affected workers and their families—including informal workers, people with disabilities, and “trapped populations”—and promoting skills development, re-education initiatives, and associated enabling measures tailored to the needs of disadvantaged and marginalized groups, such as people with disabilities from mining work, especially those that are ineligible for official severance packages (CIF 2024b; Stanley et al. 2019). Offering labor intermediary services to connect jobseekers with employment opportunities is also vital (World Bank 2024a), particularly where there is deeply entrenched skepticism about how the transition will support and benefit communities. Such investments can build trust and confidence in the transition process, foster community buy-in, and ensure that the transition is both sustainable and inclusive.

**Alongside these multifaceted strategies, developing an enabling care economy—the sector of economic activities related to providing both paid and unpaid care—is crucial for addressing the barriers that women face entering the labor market.** This involves recognizing, reducing, and redistributing unpaid care work, as well as rewarding and representing paid care work (CARE 2022). For example, this includes improving the availability and access to childcare services, enhancing coordination between responsible agencies and stakeholders, addressing social norms to promote gender-equitable caregiving roles, and implementing workplace policies and employer-supported childcare (World Bank, 2024e). Implementing these measures can not only support



women's participation and retention in the workforce but also contribute to long-term social well-being (World Bank 2024e), fostering a more inclusive and sustainable transition process.

**Prioritizing environmental rehabilitation and repurposing and redeveloping land, power plants, and other coal mining assets can facilitate the restoration of natural habitats, and the enhancement of ecosystem services that local communities rely on, while also ensuring the long-term safety and stability of sites, attracting new opportunities, and bringing broader social benefits to the local community (Singh, Agarwal, and Prabhat 2024; World Bank 2024a).** Land and other mining assets can be repurposed as wildlife habitats, forests, eco-resorts, recreational parks, museums and cultural sites, skills training centers, solid waste management centers, solar parks, youth centers, and research and innovation hubs (Ballesteros and Ramírez 2007; Deng et al. 2020; Gandah and Atiyat 2016; Lituma et al. 2021). By integrating sustainable practices and leveraging natural, physical, and cultural assets to serve new, beneficial roles, a more forward-looking vision for the region can be created, where communities can adapt to changing conditions and future generations can thrive. Ensuring that the repurposing process is locally led and socially inclusive can help ensure the transition toward sustainable and responsible land reclamation and resource management meets the local community's needs and priorities, addresses the multifaceted challenges faced by disadvantaged and marginalized groups in the coal phaseout, and avoids perpetuating past injustices of land dispossession and violence caused by the expansion of coal mines and coal-fired power plants.

**Ensuring that the transition does not exacerbate existing social injustices faced by vulnerable groups and enabling marginalized groups to take advantage of the opportunities that emerge will help rectify existing social injustices (Hill, Madden and Collins 2017; World Bank 2024a).** Achieving this involves implementing measures to ensure traditionally excluded groups are included in social protection and safety net schemes, and developing other economic and social empowerment programs to target groups that are disproportionately affected by the transition and often excluded from decision-making and leadership roles (CIF 2024a; World Bank 2024a). Effective measures include establishing comprehensive social welfare and equality policies and strategies—such as gender-based violence prevention and response programs—as well as initiatives to meaningfully engage and support disadvantaged groups and livelihood programs tailored to the specific needs of these groups, while

also implementing measures to address barriers to their full participation. Restoring or enhancing community assets, infrastructure, and social services is also crucial, given that their destruction or demise following mine closures has disproportionate impacts on women, Indigenous Peoples, and low-income groups (Lahiri-Dutt et al. 2022). Implementing measures that recognize and address historical injustices such as abuse, violence, and dispossession, which have facilitated the expansion of coal mines and coal-fired power plants is also vital. This includes compensating and supporting those who have lost family members, livelihoods, and lands due to coal mining activities (Kumar 2023). These efforts are essential for fostering a more equitable and inclusive transition process that uplifts vulnerable groups and ensures their active participation and empowerment in shaping their own futures.

**Effective community investments are guided by locally led, participatory, inclusive, and empowering processes; without them, even well-designed and well-intentioned initiatives can lack credibility and prove maladaptive.** This approach involves empowering local communities to take the lead in identifying investment priorities, while also recognizing the importance of higher levels of governance in providing support, resources, and guidance when necessary (Steinbach et al. 2022). When local stakeholders drive the investment process, they are more likely to support and engage with transition plans, increasing the likelihood of successful implementation and long-term sustainability (Edwards and Maritz 2019; Hoadley and Limpitlaw 2008; Wong 2012). Locally led investments can also support innovation and new skills development, promoting new, demand-driven avenues for job creation. By investing in human capital and training, communities can prepare their workforce for new industries, ensuring that the transition is a step toward a more diverse and skilled labor market (IEA 2021). A locally led approach is key to developing transition plans that not only comprehensively address local needs and priorities but also have the potential to be transformative by redressing, rather than entrenching, existing drivers of vulnerability and exclusion.

**This requires stringent participatory monitoring, evaluation, accountability, and learning mechanisms that integrate gender and social inclusion to be put in place to ensure that the identification, design, planning, and delivery of community investments are transparent and accountable to local stakeholders (Soanes et al. 2021).** Involving local communities in monitoring and evaluation can provide continuous feedback, allowing stakeholders to assess progress and make necessary

adjustments to meet evolving needs (Coger et al 2021). Fostering a culture of accountability ensures that resources are used effectively, and outcomes align with community priorities, while integrating

learning mechanisms allows for the dissemination of best practices and lessons learned, enhancing the overall effectiveness and sustainability of community investment initiatives.

### 3.5 Knowledge exchange



#### Indicative Activities

Multicountry knowledge exchange platform

National knowledge exchange platform

**There is a significant gap in the way we understand and address challenges around socially sustainable just transitions away from coal, which cross-sectoral and multi-disciplinary multicountry and national knowledge platforms can help bridge.**

Understanding the full breadth and complexity of the social impacts of coal phaseout is challenging, given that these vary by context and may take time to materialize. By convening diverse stakeholders across sectors—including health and social care, women and equality, education and learning, sustainable finance, Indigenous Peoples and minorities, land management and natural resources, planning and community development, employment and social protection, and energy security—and sharing experiences and lessons learned, coal phasedown platforms can facilitate the exchange of local and global knowledge. This knowledge can be adapted to inform policies, reforms, and initiatives in different contexts and scales, enhancing institutional capacity to prepare for and manage transitions (World Bank 2023c). This approach can help foster innovation and identify synergies between policies and strategies to avoid conflicts and ensure that measures in one sector support and reinforce those in others. By supporting early engagement to foster trust between different stakeholder groups at risk of being adversely affected, they can also build momentum for the transition and a shared vision of a post-coal future.

**Multicountry coal phaseout platforms are increasingly effective in building confidence that there is a better way to manage the transition.** These platforms bring together impacted stakeholders to disseminate global knowledge and learning, share experiences and lessons learned, deliver online and classroom learning, and facilitate study tours in twinned regions. As well as building trust, this improves understanding of the many facets of

just transition support, what to expect and when. Multicountry platforms help stakeholders see that the coal phasedown process is smoother when there is a sound understanding of the timing and distribution of impacts, mapped against nationally determined contributions and net zero emissions commitments, and when decommissioning or closures are approached as opportunities to repurpose assets to create new sustainable, inclusive livelihood opportunities (World Bank 2023c). The more effective platforms are facilitated by a neutral convening power.

**Country-level platforms, on the other hand, facilitate the dissemination of bespoke knowledge contextualized to state, province, and district-level needs and play a pivotal role in disseminating policies, reforms, and initiatives.** These platforms engage a diverse range of stakeholders in ongoing conversations, ensuring that their perspectives and insights are integrated into the planning process. As well as delivering bespoke knowledge, they provide technical assistance, support extensive analytical work on the social impacts of the coal phaseout, offer learning opportunities, and comprehensively track outcomes—including financial flows related to decision-making—to keep all stakeholders well informed. They are an effective mechanism for addressing the complex challenge of coordinating measures to operationalize the transition across multiple ministries and addressing a breadth of issues (World Bank 2023c).

**Effective delivery of knowledge and learning within these platforms requires bespoke approaches that are tailored to the unique characteristics and challenges of each coal region, as well as the diverse backgrounds and perspectives of the stakeholders involved.** These platforms bring together participants with a wide range of formal education levels, work experience, and degrees of familiarity with the

intricacies of managing coal phaseouts (World Bank 2023c). By employing bespoke approaches that develop a nuanced understanding of unique regional and stakeholder needs, they can enhance the accessibility, relevance, and effectiveness of their knowledge-sharing initiatives. And this, in turn, will foster greater engagement, collaboration, and progress toward achieving a just transition away from coal.

### 3.6 Dialogue and participatory approaches as cross-cutting

**Open, transparent, and continuous engagement with the coal community lies at the heart of developing a socially sustainable just transition.** To be effective, stakeholder engagement must start at the earliest stages of transition visioning and planning and continue throughout the post-coal community development phase. It involves active information sharing, consultation, and dialogue with pre-identified stakeholders who will be directly or indirectly affected by the transition. Given that a significant proportion—54 percent—of the energy transition minerals and metals resource base is located on or near the lands of Indigenous and peasant peoples, it is crucial to embed rights to consultation and free, prior, and informed consent in the energy transition process (Owen et al. 2023). Prioritizing these rights ensures that these communities are not only consulted but also have a meaningful role in decision-making, thereby enhancing the transition’s social sustainability. Importantly, this approach seeks to empower local actors to participate and have a stronger voice in decision-making at various levels and advocate for awareness of local needs and priorities. By prioritizing inclusivity and transparency, it ensures that the perspectives of those most affected by the transition are represented, valued and fed into transition planning and design, while also keeping them informed about the process and how to engage (World Bank 2024b). This approach helps promote consensus, accountability, and legitimacy when operationalizing the coal transition. It also fosters co-learning, innovation, and local community ownership of transition initiatives (Edwards and Maritz 2019; Hoadley and Limpitlaw 2008).

**Developing and executing a stakeholder engagement plan, and revising and updating it as the transition planning and implementation progress, will help ensure effective engagement.** Stakeholder mapping

can ensure the plan outlines the individuals or groups that could be directly or indirectly affected by the transition and assess their level of interest and influence. The plan should also develop approaches for how to engage with different types of stakeholders, which can range from informing and consulting to involving, collaborating, and empowering them, detailing the methods and frequency of communication, the information shared and channels used, and how views and feedback will be captured. It is also important to outline specific engagement activities, such as meetings, workshops, public forums, surveys, and feedback mechanisms, and establish monitoring and evaluation processes to measure their effectiveness.<sup>1</sup> Developing and implementing a system to report back to stakeholders about how their input is feeding into transition planning and decision-making will close the feedback loop, while establishing a robust on-site grievance redressal mechanism will facilitate easy access for communities to provide feedback (World Bank 2023c; 2016).

**Efforts to facilitate dialogue on just transition may need to overcome the hurdle of eroded trust and skepticism stemming from negative past experiences, both in the extractive industries and within a wider societal context** (Diluiso et al. 2021; Whyte 2020). When stakeholders lack trust in institutions to manage the transition fairly and equitably, they are less likely to support it, which could lead to resistance against phaseout efforts (Sartor 2018). Trust in institutions cannot be assumed; rather, it needs to be patiently cultivated through transparent and participatory policy practices that result in outcomes that are both desirable and acceptable for the public (Hallegatte et al. 2024; World Bank 2024b). Effective communication, meaningful engagement with affected communities, and a commitment to addressing historical grievances are essential components in rebuilding trust and fostering support for just transition initiatives. Including affected communities and engaging stakeholders in a legitimate, open, and fair manner can empower stakeholders and/or democratize relations between diverse stakeholders. Assessing the effectiveness of trust-building interventions and setting realistic expectations are important, as consultation and dialogue can inadvertently lead to a breakdown in trust if communities cannot see a direct positive impact from this. And as some benefits of the transition may not materialize until far into the future, this is particularly important.

<sup>1</sup> Arnstein’s (1969) ladder of participation (appendix F) provides a valuable framework for evaluating citizen empowerment and involvement in decision-making, highlighting the importance of moving beyond tokenistic participation toward more substantive forms of citizen engagement and empowerment.

## 4 | Conclusion and further work

**This paper has argued that addressing the broader social dimensions of coal transitions is crucial for success, and offers benefits and opportunities for the millions of people affected.** It has outlined existing literature about anticipated impacts of the transition not just on workers, but on people and communities more broadly, including loss of employment, increased household costs, reduced public investment, mobility and outmigration, changes in mental health, effects on social and cultural identity, and conflict. It has also considered the social co-benefits of coal transitions, such as reduced risks to livelihoods, improvements to health and well-being, and social empowerment. It has cautioned that the uneven distribution of transition benefits and burdens risks exacerbating pre-existing inequalities and systemic marginalization—including those based on gender, indigeneity, socioeconomic status, disability, ethnicity, and age—and reproduce the sector’s legacy of social exclusion and injustice (Johnson et al. 2020). In doing so, it has demonstrated that ensuring social sustainability along with economic and environmental sustainability is critical to the process of advancing a just transition away from coal.

**Based on this review, the paper proposes a framework outlining a set of upstream interventions for government and other actors to facilitate inclusive planning, decision-making, and transition management.** This process-based framework underscores the need for flexibility and iteration, with activities continuously feeding into one another, and being undertaken at the earliest stages of planning through to the post-transition community development phase. In particular, it outlines the importance of the following.

- **Collecting and analyzing socioeconomic and social inclusion data** early on, which helps develop a good understanding of the context within which the transition will take place. Using participatory approaches and mapping helps ensure everyone is heard and nobody is overlooked in transition planning and management.
- **Supporting consensus and vision-building**, which will enhance trust in and community ownership of the transition process. Having a shared vision for the community’s post-coal future provides clear direction for transition planners, guiding decision-making and resource allocation toward specific outcomes. Sustained and inclusive social dialogue contributes to the co-creation of such a vision—and a roadmap for achieving it—with affected communities and stakeholders.
- **Ensuring institutions at all levels are ready and able to manage the transition and work together with all stakeholders**, which will ensure more effective and inclusive policy planning and decision-making. Governance structures must be transparent and participative, and outcomes desirable and acceptable for affected communities. Decentralizing decision-making authority to the lowest appropriate level of governance while ensuring coordination and collaboration between different government levels, sectors, and stakeholders will help align the needs and priorities of affected communities with national transition and development goals. It will also promote effective local action.
- **Community investments that respond to local priorities and needs and are also aligned with regional and national development planning** will enhance trust and ownership over the transition process. Environmental rehabilitation, land repurposing, and stranded asset upgrading can attract new opportunities and bring broader social benefits to the local community, especially when guided by locally led, participatory, inclusive, and empowering processes.
- **Multicountry and national-level coal phaseout knowledge exchange platforms**, which can help bridge the gap between the way we understand and address challenges around socially sustainable just transitions away from coal. As well as building confidence that there is a better way to manage the transition, these platforms can facilitate the dissemination of bespoke, contextualized knowledge and play a pivotal role in disseminating policies, reforms, and initiatives.

- **Building meaningful and continuous dialogue and engagement**, which lies at the heart of developing a socially sustainable transition, and cuts across the five areas of intervention outlined above. Building trust between stakeholders and in institutions takes significant time and resources, and needs to be patiently cultivated through ongoing dialogue and transparent and participatory policy practices.

**The ambition of a socially sustainable just transition away from coal must be matched with adequate financing.** As research and experience on how to finance the just transition increases, costing the activities required to address the social dimensions of coal transitions, from the earliest stages of planning through to the post-coal community development phase, has yet to happen. But upstream financing needs must be fully integrated into the just transition plans that countries, regions and communities are developing, not only to ensure adequate public sector finance flows for supporting these activities, but also to attract private sector investments.

**The breadth and complexity of the social impacts of the coal phaseout necessitate integrated and multidisciplinary approaches (Solomon, Katz and Lovel 2008).** Setting up multidisciplinary groups or communities of practice among policymakers and practitioners can bring together different skillsets for implementing the outlined activities. This would

reduce the risk of the framework being used as a box-ticking exercise, rather than an iterative, flexible process to be tailored to the specific context within which the transition is occurring. This can also help foster innovation and identify synergies between policies and strategies to avoid conflicts and ensure that measures in one sector support and reinforce those in others. A multidisciplinary approach is also valuable for compiling best practice examples across sectors and developing or strengthening existing toolkits or guidance on how to implement a just transition.

**Finally, it is important to recognize that this framework represents a set of ideal interventions or entry-points, and to acknowledge the challenges implementing this transition.** Although crucial, rebuilding trust with those affected by the transition away from coal, addressing historical grievances, and establishing transparent and participative governance structures require political will, significant time inputs, and significant resourcing. The global political economy is also often a major force in defining the context of the transition, influencing its prioritization in national policy frameworks and the extent to which social and environmental justice is placed at the forefront. As such, local, national and international economic interests, political priorities, and societal values must all be considered, underscoring the complexity and depth of the transition process. Only a sustained effort and collaboration across multiple stakeholders can ensure a fair and equitable outcome.

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# Appendixes

## Appendix A. Status of coal phaseout

**Europe:** Several European countries are part of the Powering Past Coal Alliance (PPCA) and have committed to phase out unabated coal on or before 2030 (Jewell et al. 2019). Because these countries represent a small share of global coal generation capacity and have mostly ageing coal plants, they tend to face fewer changes in phasing out coal. The effectiveness of PPCA in countries with younger coal fleets has thus been questioned (Jewell et al. 2019; Blondeel et al. 2020). Germany recently joined the PPCA and has committed to phase out unabated coal by 2038. As part of its commitment to phase out coal, Germany is implementing a set of measures that include compensation for power plant closures, labor market measures for coal workers, and substantial support of structural change in coal-mining regions. Poland, another coal-heavy country in Europe, has not indicated a coal phaseout target and faces substantial challenges (Whitley et al. 2017; Antosiewicz et al. 2020). European efforts to phase out coal indicate that appropriate financial instruments are needed (Rentier et al. 2019), and a just transition for workers are important to gain broad public support and help those most affected by the phaseout (Johnstone and Hielscher 2017; Osička et al. 2020).

**North America:** Coal use has been declining in North America. In the United States, the primary driver has been the availability of cheap shale gas and ageing coal fleets. Coal use in the United States has dropped by over 50 percent since 2008 (EIA 2019). The recently announced Nationally Determined Contribution by the Biden Administration sets a 100 percent carbon-free electricity goal by 2035 (The White House 2021), indicating a phaseout not only of unabated coal electricity generation, but also of natural gas generation. As one of the two founding countries of the PPCA, Canada has committed to phasing out unabated coal power by 2030 (Government of Canada 2018). Declining coal use in both the United States and Canada has decreased greenhouse gas emissions, local air pollutants, and cooling water use (Harris et al. 2015; Kondash et al. 2019). However, there have been concerns about social and economic consequences, particularly at the local level. For instance, the United States has lost about 50,000 coal mining jobs between 2011 and 2021 (US Bureau of Labor Statistics 2021), with significant regional and economic inequities (Bodenhamer 2016; Abraham 2017; Greenberg 2018). Comprehensive social programs, such as retirement compensation, training for reemployment, and business support for economic diversification, have been suggested as means to support a just transition (Homagain et al. 2015; Patrizio et al. 2018; Grubert 2020).

**Asia:** After a period of rapid growth, coal expansion has slowed in Asia, but it is still the primary driver of the global increase in coal demand (IEA 2020e). China's coal consumption reached a plateau under policy efforts during the 13th Five-Year Plan (2016-2020), and new coal plants are being built at a slower rate than previously. Both China and India have suspended and cancelled many new coal power projects and retired a small set of old, dirty, inefficient coal plants (CEA 2019; Global Energy Monitor et al. 2021). These efforts are largely due to non-climate reasons, such as air pollution and health (Singh and Rao 2015; Gass et al. 2016; Peng et al. 2018; Malik et al. 2020), overcapacity (Blondeel and Van de Graaf 2018), and rural electrification and renewable investments (Aklin et al. 2017; Thapar et al. 2018). However, as new builds offset retirements, coal generation capacity has continued to grow in both countries since 2015 (Global Energy Monitor et al. 2021). Other fast-growing Southeast Asian countries, such as Indonesia, Viet Nam, and the Philippines have experienced strong growth in coal use (IEA 2020b), but an increasing number of new coal power projects are being cancelled (Littlecott et al. 2021). Coal projects in these countries are decreasingly likely to proceed because they rely on



international financing, and China, Japan, the United States, and other G7 countries have pledged to end overseas coal financing (Schiermeier 2021).

**Africa:** New coal power projects in Africa have been declining since 2016, with only South Africa and Zimbabwe currently building new coal plants and several others with planned projects (Littlecott et al. 2021). However, these projects also largely depend on international financing and are thus less likely to be implemented (see above). In South Africa, employment in the coal mining sector has dropped by almost half since the 1980s and has been estimated to fall from 77,000 today to 22,000 to 42,000 by 2050 (Cock 2019; Strambo, Aung and Atteridge 2019). Policy and financial support are essential to ensure a sustainable transition for these workers (Swilling et al. 2016).

Source: Denton et al. (2022), p 626.

## Appendix B. Research design and methods

**The team used several databases and approaches to search for appropriate and relevant publications.**

Databases included Web of Science, Scopus, ScienceDirect, and Google Scholar. An example of a search string used in the review is: (just transition OR sustainability transitions OR energy transition OR coal transition OR coal mining) AND (all of society OR justice OR equitable OR fair OR political economy) AND (impacts OR social impacts OR marginalized groups OR vulnerable groups OR gender OR intersectionality) AND (resilience OR inclusion OR cohesion OR empowerment) AND (stakeholder engagement OR community engagement OR participation) AND (legitimacy OR institutional arrangements OR governance) AND (barriers OR limits OR enablers OR inequality OR vulnerability). To avoid excluding key literature, the team also sought insights, suggestions, and recommendations from key stakeholder interviewees. This was supported by a review of the World Bank's programming and policy documents.

**Each focus group and interview adhered to a similar overarching structure, centering on key categories of questions, including:**

- 1 Critical factors** that facilitate effective stakeholder engagement in supporting a just transition away from coal.

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- 2 Key institutional arrangements** needed from the initial stages of transition preparation to the post-transition community development phase to ensure a just transition away from coal.

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- 3 Gaps in evidence** requiring attention to better support a just transition away from coal.

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## Appendix C. Seven principles to realize a just transition to a low-carbon economy

Just transition principle	Implementing and reinforcing this principle
<p><b>Actively encourage decarbonization</b></p>	<p>Work actively toward decarbonizing economies as fast as possible. Invest in a clean energy transition, and in greenhouse gas reductions, particularly in hard-to-abate sectors (e.g., cement production, chemical production, steel manufacture, heavy transport, waste) that have few realistic, low-carbon substitutions available.</p> <p>Create space and support for just transition planning. Engage governments to reshape the norms around decarbonization and transition, particularly where transition debates are absent. Highlight practical steps that different stakeholders in regions facing future transition can take in anticipating change. This can help to lower resistance to decarbonization, and ensure time is used for preparation rather than avoidance.</p>
<p><b>Avoid the creation of carbon lock-in and more “losers” in these sectors</b></p>	<p>Avoid new investments linked to high-carbon assets or activities. That is, do not create further carbon entanglement, or set the stage for stranded assets.</p> <p>Support programs should not enhance the dependency of workers – or of local, regional, and national economies and political regimes – on fossil fuel-based economic activities. For example, programs targeting SMEs that depend on carbon-intensive industries should support diversification.</p> <p>Avoid reviving or prolonging the decline of carbon-intensive industries.</p> <p>Promote fiscal reforms, particularly fossil fuel subsidy reform. Policies that promote or maintain carbon lock-in should end. This frees up more government revenue to support transition planning, and to roll out policies, investments and financial support measures for affected communities.</p>
<p><b>Support affected regions</b></p>	<p>Actively support regions that today depend on high-carbon industry with finance (including investment), technical assistance and policy engagement that promotes diversification of the economy and re-skilling of workers.</p> <p>Support the private sector, ensuring tailored support to promote new and expanded SMEs. Tailor SME-targeted assistance toward opportunities that generate significant, sustainable new employment opportunities.</p> <p>Support diversification of SMEs dependent on carbon-intensive industries.</p> <p>Help carbon-intensive companies to diversify core activities where plausible. The private sector should bear those costs that can and should reasonably be anticipated as part of its business. Such costs include those mandated by new environmental regulations, and the effects of carbon pricing pressures (whether imposed domestically or through international supply chains). However, costs associated with voluntary changes to reduce carbon intensity might be appropriate for concessional financial support.</p> <p>Locally contextualized solutions: Ensure that decisions about major, new industrial investment consider local assets and capacities, along the lines of the European Commission’s “smart specialization” agenda.</p> <p>Use a bottom-up process that involves diverse stakeholders sharing knowledge with one another (i.e., the “entrepreneurial discovery process”) (European Commission 2018; Hausmann and Rodrik 2002).</p>

**Just transition  
principle**
**Implementing and reinforcing this principle**

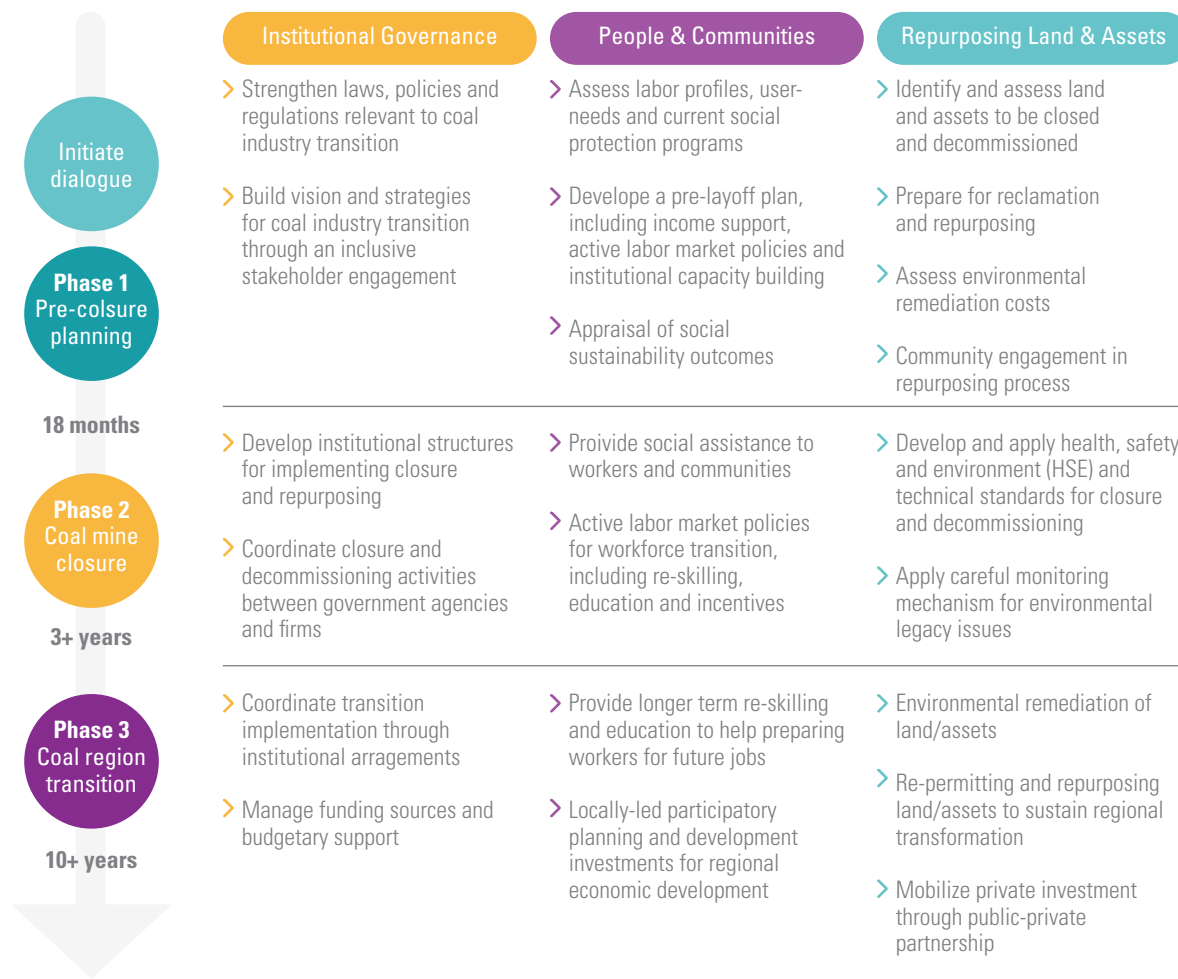
	<p>Education and research: Work with education institutions and the private sector to identify and address skills gaps that constrain private-sector growth and investment.</p> <p>Infrastructure: Finance universal infrastructure (such as transport, communication and education) that aids a wide range of beneficiaries. Focus on increasing connectivity between carbon-intensive regions and surrounding regions – particularly linking urban and rural areas. Seek opportunities to repurpose existing industrial infrastructure, where this might be an asset or magnet for new and small businesses with similar technical needs.</p> <p>Urban regeneration: Support activities that promote urban regeneration of town centers, rather than the creation of new business parks around the fringes of towns. Supporting urban renewal and preventing decay can play an important role in maintaining or encouraging positive sentiment among the private sector, which can create a positive investment feedback loop.</p> <p>Technical and policy support: Develop guidance and policy frameworks that facilitate economic regeneration and diversification, spur job creation, and improve access to public services, particularly for vulnerable groups.</p> <p>Use fiscal and economic development policies to provide such support. Explore options for raising capital for regional investment in green industries and green infrastructure (e.g., issuing green bonds).</p> <p>Reform fiscal policy to ensure the maintenance of public income and resources and guarantee the provision of key services in affected areas.</p> <p>Other efforts to strengthen institutional capacity in the public sector can also help, including addressing environmental legacies, and strengthening the rule of law and democracy.</p>
<b>Support workers, their families and the wider community affected by closures and downscaling</b>	<p>Provide re-skilling to workers affected by low carbon transitions and ensure that these programs are also available for workers’ families and the wider community. Also, create opportunities for other forms of personal support, such as job-seeking, mental health counseling, and financial planning.</p> <p>Scale up social safety nets, particularly in regions where rapid or large-scale decarbonization is on the horizon, and where existing social protections are weak.</p>
<b>Ensure that environmental damage is remediated, and that environmental costs are not transferred to the public sector</b>	<p>Strengthen regulatory requirements and financial guarantees for mines and major industries in relation to site closure and environmental remediation responsibilities.</p> <p>Ensure individual mines have closure plans in place, and that financial resources for cleanup are secured by government. Further, introduce requirements that mines upgrade these plans to reflect new closure scenarios, such as externally driven closure scenarios that occur before planned end-of-mine-life.</p>
<b>Address existing economic and social inequalities</b>	<p>Target support measures (such as SME initiatives, infrastructure investments, and policy reforms) to avoid higher cost burdens on the poor or other marginalized groups. Measures should actively aim to reverse trends of inequality. This means identifying and understanding pre-existing social inequalities (such as those based on gender, age, ethnicity or ability), and understanding the distributional impacts of transition and of</p>

Just transition principle	Implementing and reinforcing this principle
	<p>different support measures. Transition support measures should target not only direct workers from carbon intensive industries but also their families, contractors, and other vulnerable groups.</p> <p>Gender equality – and measures targeted at addressing gendered inequality – should be integrated into any package of transition support, including when designing support measures; evaluating employment and other economic opportunities; assessing livelihood impacts or environmental costs; and prioritizing outcomes from transition support.</p> <p>Indicators used to assess the progress of just transitions should go beyond net job creation, diversity of manufacturing, and regional economic growth. Other indicators could relate to, for instance the kinds of jobs created, who has access to them, and levels of broader community resilience and innovation.</p> <p>Fossil fuel subsidy reform, strengthening of social safety nets, and programs such as energy efficiency measures that result in cost savings for low-income households can contribute to tackling inequality and vulnerability.</p> <p>Prioritize investment support for types of public infrastructure, and the design of public infrastructure.</p>
<p><b>Ensure an inclusive and transparent planning process</b></p>	<p>Create opportunities for wide local engagement with transition planning, so that many different stakeholders and social groups are active participants in defining regional visions and opportunities, and in identifying challenges and risks that need to be managed. Locally driven and coordinated transitions have tended to fare better than those coordinated by national governments.</p>

Source: Atteridge and Strambo (2020), pp. 10-11.

## Appendix D. World Bank 3x3 framework for a just transition

Figure D1. The World Bank 3x3 framework



Source: Stanley et al. (2019).

## Appendix E. Overview of the social aspects of mine closure

Social aspect	Indicative elements
<b>Economy</b>	<ul style="list-style-type: none"> <li>Local economic activity (diversity and dependencies)</li> <li>Household income</li> <li>Local living standards</li> </ul>
<b>Business</b>	<ul style="list-style-type: none"> <li>Local businesses development opportunities in mining</li> <li>Business opportunities in other sectors</li> </ul>
<b>Employment</b>	<ul style="list-style-type: none"> <li>Local employment opportunities in mining</li> <li>Local employment other sectors</li> <li>Local employment stability/volatility</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>Social order and safety (e.g., tensions, crime, violence)</li> </ul>
<b>Education and training</b>	<ul style="list-style-type: none"> <li>Local skills development in mining and other sectors</li> <li>Access to quality education and training</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>Local transport (e.g., public buses, roads, airports)</li> <li>Critical infrastructure (food supply, power supply, water supply, telecommunications)</li> </ul>
<b>Amenity</b>	<ul style="list-style-type: none"> <li>Local aesthetic and recreational resources (e.g., heritage sites, parks and recreation areas, communal areas)</li> <li>Local culture, arts and sports (including facilities)</li> </ul>
<b>Livelihoods</b>	<ul style="list-style-type: none"> <li>Local livelihoods (e.g., access to land, food, water and shelter that affects livelihoods)</li> </ul>
<b>Land</b>	<ul style="list-style-type: none"> <li>Local land ownership, access and use</li> <li>Recognition of traditional/customary ownership</li> </ul>
<b>Housing</b>	<ul style="list-style-type: none"> <li>Local housing quality, availability and affordability</li> </ul>
<b>Health</b>	<ul style="list-style-type: none"> <li>Community health and wellbeing</li> <li>Access to quality health and social services</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>Environmental aspects that affect social conditions (e.g., quality of air, water, land, ecosystem)</li> </ul>
<b>Demography</b>	<ul style="list-style-type: none"> <li>Local population dynamics (e.g. growth/decline, migration, ageing, gender balance)</li> </ul>
<b>Participation</b>	<ul style="list-style-type: none"> <li>Stakeholder participation in closure planning, and closure and post-closure processes (including decision-making)</li> </ul>
<b>Inclusion</b>	<ul style="list-style-type: none"> <li>Inclusive stakeholder engagement, including with vulnerable and otherwise marginalized groups (e.g., Indigenous Peoples, women, ethnic minorities, persons with disabilities, elderly, youth) in closure planning, and closure and post-closure processes (including decision-making)</li> </ul>
<b>Social (general)</b>	<ul style="list-style-type: none"> <li>General socio-economic considerations</li> <li>Social considerations in financial assurance mechanisms</li> </ul>

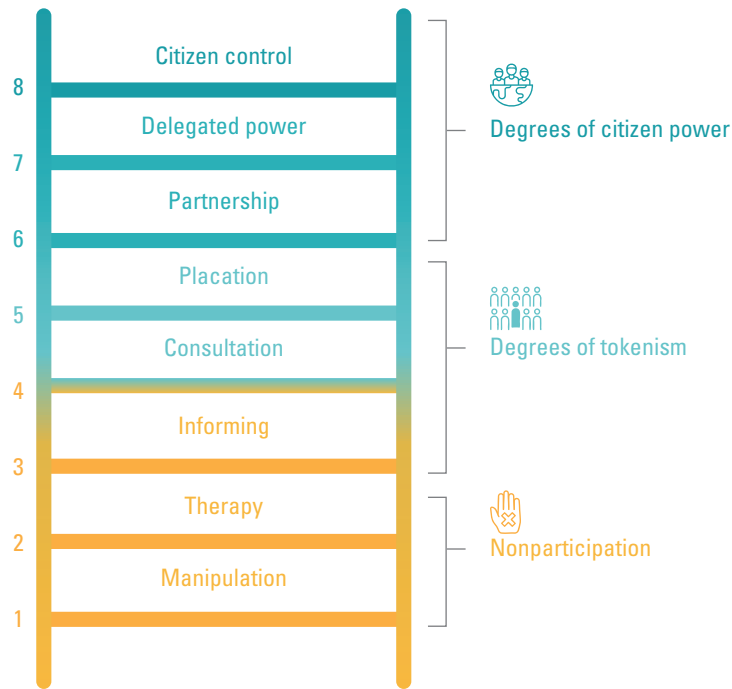
Source: Vivoda et al. (2019), pp. 9-10.

Note: Sesele et al. (2021) observed that there is a lack of integration of gender issues across the above themes.

## Appendix F. Degree of citizen participation and power in decision-making

Arnstein's (1969) ladder of participation (figure F.1) is a conceptual framework used to analyze the degree of citizen participation in decision-making. Each of its eight rungs represents a different level of participation, ranging from nonparticipation to full citizen control.

Figure F.1. Arnstein's ladder of participation



Source: Arnstein 1969, p217.

**Citizen control:** The highest rung of the ladder represents full citizen control, where decision-making authority resides entirely with citizens or their elected representatives. Citizens have the power to define issues, make decisions, and implement policies without interference from external authorities.

**Delegated power:** Decision-making authority is formally delegated to citizens or their representatives. Citizens have the power to make decisions within a defined scope, but ultimate authority rests with higher-level decision-makers or institutions. This can include participatory budgeting processes or community-run programs where citizens have direct control over resources and decision-making.

**Partnership:** A more collaborative approach to decision-making, where citizens and authorities work together to identify issues, develop solutions, and make joint decisions. This level of participation involves genuine dialogue and negotiation, with decisions reached through consensus or mutual agreement.

**Placation:** Decision-makers create the illusion of citizen participation by allowing citizens to articulate their concerns or preferences, but only within predefined boundaries that do not challenge the existing power structure. Decision-makers may make minor concessions to appease citizens without fundamentally altering the decision.

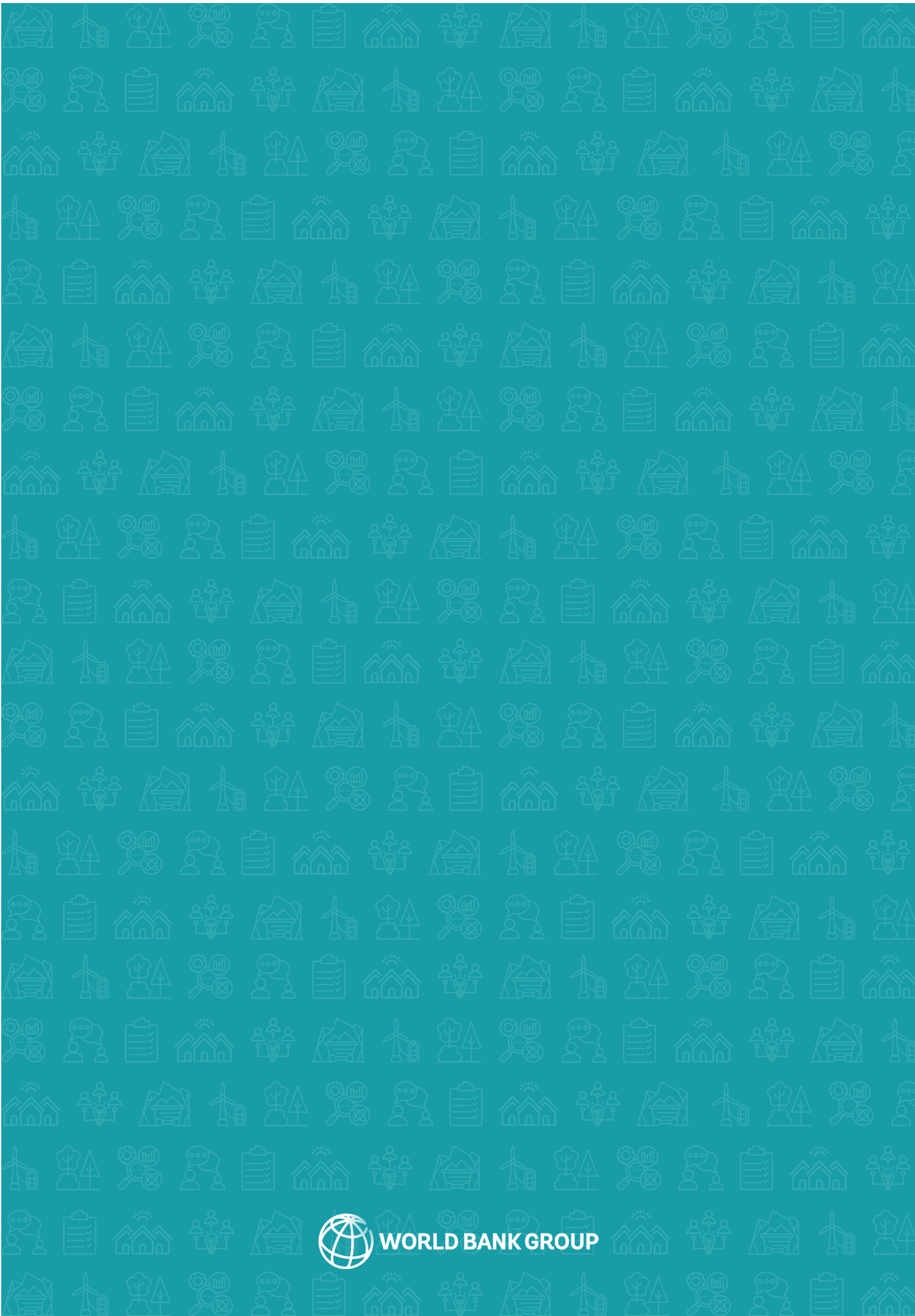
**Consultation:** Decision-makers seek citizens' opinions or feedback on specific issues or decisions—often through surveys, focus groups, or public meetings—but the degree to which citizens' input influences the final decision varies. Although they may consider citizen feedback, the decision-makers retain control over decision-making.



**Informing:** Authorities or decision-makers provide information to citizens about decisions that have already been made or are in the process of being made, through newsletters, websites, public announcements or other communication channels. Citizens are not given the opportunity to provide input or influence decision-making.

**Therapy:** Citizens are given the illusion of participation, but this is tokenistic, with their role limited to venting frustrations or airing grievances. It includes forums such as public hearings, where citizens are allowed to express their concerns, but their input may not be seriously considered.

**Manipulation:** This is the lowest rung, where citizens have no real power or control over decision-making. Authorities or powerholders may use propaganda, misinformation, and other tactics to shape opinions without genuine citizen participation.



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