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Climate policy impact assessment: Centring intergenerational equity, gender, youth, local communities and Indigenous Peoples

Draft policy brief

Abbreviations and acronyms

FAO	Food and Agriculture Organization of the United Nations
GHG	greenhouse gas
GI-ESCR	Global Initiative for Economic, Social and Cultural Rights
GIS	Geographic information system
GIZ	German Agency for International Cooperation
ICIMOD	International Centre for Integrated Mountain Development
IFPRI	International Food Policy Research Institute
ILO	International Labour Organization
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
KCI	Katowice Committee of Experts on the Impacts of the Implementation of Response Measures
LPG	Liquefied petroleum gas
NDC	Nationally determined contribution
RECOFTC	The Centre for People and Forests (Formerly, Regional Community Forestry Training Centre for Asia and the Pacific)
REDD	Reducing emissions from deforestation and forest degradation in developing countries
REDD+	Reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks
TEC	Technology Executive Committee
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization

I. Background

1. Climate change is a global challenge that requires urgent action, and countries are implementing a range of climate policies to mitigate and adapt to it. Mitigation policies, also known as response measures, include among others, carbon pricing mechanisms; promotion of low-emission, zero-emission, and carbon removal technologies; energy efficiency programmes; and industrial decarbonization strategies. These policies are aimed at limiting global warming to well below 2 °C above pre-industrial levels and pursuing efforts to limit it to 1.5 °C, in accordance with the Paris Agreement. It has been recognized that limiting global warming to 1.5 °C with no or limited overshoot requires deep, rapid and sustained reductions in global GHG emissions of 43 per cent by 2030 and 60 per cent by 2035 relative to the 2019 level, and reaching net zero carbon dioxide emissions by 2050 (IPCC, 2023).

2. While climate change mitigation policies are essential for reducing emissions and building a low-emission future, their implementation comes with far-reaching socioeconomic and environmental implications. These policies do not affect all communities and sectors equally: some benefit from emerging opportunities in green industries, while others face economic disruption, workforce displacement and shifts in social dynamics. If response measures are not carefully designed, they risk creating unintended consequences that disproportionately affect groups in vulnerable situations such as low-income communities, Indigenous Peoples, women, youth, children, migrants, the elderly and persons with disabilities. The challenge for policymakers, therefore, is to ensure that these policies drive climate action without deepening existing inequalities or creating new ones.

3. A comprehensive approach to impact assessment is necessary to understand how mitigation policies reshape economies, societies and ecosystems. From an economic perspective, policies must be evaluated based on their effects on labour dynamics, trade and sectoral transitions in order to prevent job losses, economic dislocation and widening income gaps. The social dimension of mitigation measures is equally important to consider, particularly understanding how they affect marginalized communities, workers in carbon-intensive industries and individuals already experiencing systemic vulnerabilities. Without safeguards, these groups may bear the heaviest burden of policy shifts, whether through job losses, increased living costs or reduced access to essential services. In addition, assessing these potential impacts may assist policymakers in identifying policies with the most co-benefits or with the least adverse impacts for which safeguards are needed. At the same time, the environmental implications of mitigation efforts must be carefully assessed. Large-scale afforestation projects, renewable energy expansion initiatives and conservation programmes can lead to land-use changes, biodiversity loss and restrictions on traditional livelihoods, particularly for Indigenous Peoples and rural communities that rely on natural resources. Policies must therefore be designed to balance climate objectives with ecological integrity and sustainable resource management.

4. Just transition is becoming increasingly relevant to ensuring that climate policies support workers and communities rather than leaving them behind. Proactive measures relating to, for example, social protection, retraining, reskilling and upskilling programmes and identification of alternative livelihood opportunities are required to facilitate a smooth transition in employment from high carbon to more sustainable industries. Without such measures, climate policies risk triggering economic instability and deepening inequalities.

5. Beyond the economic, social and environmental dimensions of their impacts, mitigation policies should also be assessed from governance and technological perspectives to ensure they are inclusive, equitable and aligned with international commitments such as the Paris Agreement and the Sustainable Development Goals. One key consideration in this regard is the fair distribution of low-emission technologies and financial resources, which are crucial for a just transition and ensuring that developing countries and marginalized communities are not excluded from the benefits of the clean energy transition.

6. This policy brief builds on a technical paper produced by the KCI on the impacts of the implementation of response measures on intergenerational equity, gender, local communities, Indigenous Peoples, youth and people in other vulnerable situations (UNFCCC-KCI, 2024) to provide policymakers with a structured approach to incorporating

people-centred considerations into climate change policymaking. The brief presents the key dimensions of impact assessments and provides examples of some of initiatives used by governments to minimize the negative impacts of response measures. It also discusses methodologies and data sources that support evidence-based decision-making, including household surveys, macroeconomic modelling, geospatial analysis and participatory research.

7. By identifying best practices, policy gaps, and making targeted recommendations, this brief will also provide guidance on designing climate policies that are just, inclusive and responsive to the needs of communities. It emphasizes the importance of participatory decision-making, social protection mechanisms, and equitable access to climate finance and low-emission technologies to ensure that no group is left behind in the transition to a sustainable future.

II. Intergenerational equity

A. Why intergenerational equity matters

8. Intergenerational equity emphasizes the responsibility of making decisions today that protect the well-being of future generations. Rooted in Indigenous values such as the seventh generation principle,[1] it is about balancing the needs and rights of present and future populations. This means ensuring that today's decisions about land, water, air and energy do not compromise the ability of future generations to thrive, and that the benefits and costs of climate action are shared fairly over time.

9. Climate change mitigation policies implemented today, such as transitioning to renewable energy, implementing carbon pricing and preserving ecosystems, can shape long-term economic, environmental and social outcomes. Similarly, climate finance policies also have long-term impacts, especially for developing countries with less resilience to climate impacts (UNFCCC-SCF, 2022, 2024). These policies influence not only the present but also the opportunities and conditions inherited by future generations.

10. Building on this, recent research shows the growing role of youth in advocating for climate justice (Theodorou, Spyrou and Christou, 2023; Trott, 2024). Such research calls for forward-thinking policies that ensure equitable outcomes through the provision of future-forward climate finance. Policymakers are encouraged to use tools such as long-term modelling and scenario analysis to assess the intergenerational impacts of mitigation actions and to ensure that today's investments contribute to sustainable industries and green job opportunities for future generations.

B. Enhancing the consideration of intergenerational equity in climate policies

11. Ensuring intergenerational equity requires analysing how response measures could affect social, economic and natural resource systems over generations. A focus area in this regard is the sustainable management of natural resources. Climate policies made today must preserve ecosystems, biodiversity and essential resources, including air, water and land. The depletion of resources today will make it more challenging for future generations to meet their needs, and is, therefore, essential to assess whether current mitigation strategies lead to the degradation or preservation of ecosystems that future societies will depend on.

12. The long-term economic consequences of response measures also need to be considered. While mitigation efforts may bring short-term benefits such as green job creation and renewable energy infrastructure, it is crucial to assess how those efforts will influence future economic systems. Policymakers must ensure that current actions do not result in

[1] The seventh generation principle is based on the philosophy that the decisions made today should result in a sustainable world seven generations into the future (see, e.g., https://futureplanet.com/resources/seventh-generation-principle).

economic instability for future generations. Doing so involves evaluating the sustainability of green technologies, the resilience of economies to future climate impacts, and the capacity of today's younger generations to access quality employment and services in a low-emission economy. Furthermore, the long-term requirements of the green transition must be recognized. These include sufficient investments and reforms in the education sector to ensure long-term compatibility between labour demand and supply.

13. From a social perspective, ensuring intergenerational equity calls for an analysis of how the costs and benefits of climate policies are distributed across generations. Vulnerable groups, including youth, the elderly and individuals in poverty or at risk of poverty, may experience the consequences of climate change more acutely than the broader population. Addressing these disparities is critical to designing fair and forward-looking climate policies that protect those most at risk. Mitigation policies should, thus, avoid placing disproportionate burden on future generations and ensure that both current and future generations benefit from a sustainable, climate-resilient world. This involves policymakers considering how policies such as those relating to carbon taxation and shifts in energy production might affect future access to healthcare, education, housing and other essential services.

C. Assessing intergenerational equity in climate policies: indicators and data sources

14. To effectively assess the impacts of climate policies on future generations, policymakers need reliable data and indicators that capture the multidimensional nature of intergenerational equity.

15. One key indicator is the carbon footprint of current mitigation policies, which can be used to monitor reductions in GHG emissions over time (see table 1). By examining trajectories, policymakers can assess whether emissions are on track to meet long-term climate goals while considering the implications of those trajectories on future generations. National GHG emissions inventories comprise a key data source for this indicator. Various organizations have also developed databases used for tracking, and in some cases projecting emissions. For example, the Climate Action Dashboard of the Organisation for Economic Co-operation and Development (OECD, n.d) features key indicators and provides an overview of climate action disaggregated by country, including the current status of and predictions for GHG emissions. Similarly, the International Energy Agency compiles historical and current data while also forecasting emissions (IEA, 2025). Other useful databases include the Life Cycle Databases of the Greenhouse Gas Protocol (Ingwersen, n.d), the Emissions Database for Global Atmospheric Research of the European Commission (European Commission, n.d), the databases of Climate Watch (Climate Watch, n.d) and the data of the Global Footprint Network (Global Footprint Network, n.d).

16. Another key indicator is the concentration of particulate matter in the atmosphere to track air quality over time. Numerous response measures, such as electrification, the shift towards cleaner energy and the closure of coal mines, can have positive effects on air quality. It is, therefore, important to track air quality and the associated health effects across generations. Key sources of data for this indicator include the WHO Global Health Observatory air pollution data portal (WHO, 2025) and the European Environment Agency datahub (European Environment Agency, n.d).

17. The sustainability of natural resources is another critical indicator (see table 1). Sustainability can be analysed using data relevant to resource depletion, such as deforestation rate, vegetation cover, urban heat island indices, freshwater availability and biodiversity status. Gathering information on the consumption of natural resources today and exploring the implications of mitigation policies on natural resources in the future will help gauge their sustainability. The Global Material Flows Database of the United Nations Environment Programme International Resource Panel is a key resource in this regard as it compiles data on material flows and resource productivity indicators from more than 200 countries (UNEP, n.d).

18. Long-term economic projections are vital for assessing intergenerational equity. These projections should take into account the future availability of green jobs, the scalability of renewable energy technologies and the economic resilience of communities to the impacts of climate change. Economic models that factor in investments in low-emission technologies, such as those relating to wind and solar power and energy efficiency, can help determine whether current investments will create a strong economic foundation for future generations.

19. Lastly, climate resilience and adaptation capacity should be measured as part of assessing the intergenerational equity of climate polices, which includes monitoring the durability of infrastructure, the robustness of public health systems and the ability of communities to recover from climate shocks. The Notre Dame Global Adaptation Initiative has developed a methodology and indicators for measuring both a country's vulnerability to climate change and its readiness to manage this vulnerability (University of Notre Dame, 2025). Evaluating these indicators will provide insights into whether future generations will inherit resilient systems or face heightened vulnerability to climate change impacts. Table 1 below provides a summary of the assessment dimensions, their purpose, and example indicators that can be used in the impact assessment of response measures from an intergenerational lens perspective. The table is not exhaustive and serves to highlight a few examples.

Table 1
Assessing the intergenerational equity of response measures

Assessment dimension	*Assessment purpose*	*Potential indicators*
Climate change mitigation	To assess whether mitigation actions implemented today will lead to the necessary emission reductions for future generations, ensuring sustainable development pathways	Projected GHG emission reductions over time Carbon footprint of policy scenarios Long-term emission trajectories
Air quality and health	To ensure that mitigation actions implemented today improve air quality for future generations	Trends in concentration of particulate matter (PM2.5 and/or PM10) Health impacts of air pollution (morbidity and/or mortality) over time
Natural resource depletion & ecological trade offs	To ensure that mitigation actions implemented today do not deplete natural resources that future generations will depend on and that they consider the sustainable use of land and water and the preservation of biodiversity	Deforestation rate Soil quality degradation Fresh water availability Resource depletion rate Natural systems replacement rates Access to resources by local communities
Economic stability and resilience	To assess whether mitigation policies create economic structures that provide long-term, resilient livelihoods for future generations	Green job creation projections Investments in low-emission technologies Economic vulnerability index
Climate resilience and adaptation	To ensure that implementation of climate policies increases the ability of future generations to cope with climate change impacts and climate-related disasters	Measures of adaptive capacity (infrastructure resilience, health system robustness) Number of disaster risk reduction policies

Assessment dimension	*Assessment purpose*	*Potential indicators*
Social equity, inclusivity and justice	To ensure that mitigation actions implemented today address current and future inequities to prevent burdens being passed on to vulnerable populations in the future	Vulnerability assessments (by gender, income, region) Access to services (energy, water, education) Involvement in policymaking processes
Institutional sustainability, transparency and accountability	To ensure that climate policies are backed by institutional mechanisms – beyond short-term political cycles – that prioritize long-term sustainability	Resource availability for capital and recurrent expenditures Number of policies integrating intergenerational equity in national planning Provision of channels for public feedback on long-term policies Transparency in long-term monitoring of policies
Youth engagement	To gauge the involvement of future generations in decision-making, ensuring that their needs are considered, and their voices represented	Youth representation in policymaking

III. Gender considerations

20. Climate change impacts on women and men often differ owing to historical and current gender inequalities and multidimensional factors. Similarly, gender roles, sociocultural norms and systemic barriers significantly shape how women and marginalized gender groups experience the effects of climate policies, including in areas such as employment, mobility and economic opportunity, as well as how they are involved in climate-related decision-making. Women already face significant barriers in accessing decent work and opportunities in both formal and informal employment as the challenges of discrimination and inequality between men and women persist. Any assessment of climate policy impacts on women should thus consider both formal and informal economies to ensure specific needs are not overlooked in decision-making (ILO, 2017).

21. Under the UNFCCC process, substantial progress has been made in integrating gender considerations into climate policymaking through initiatives such as the gender action plan and the enhanced Lima work programme on gender, which foster gender balance and the meaningful participation of women in climate change negotiations and decision-making processes. Parties have acknowledged the role that the enhanced Lima work programme on gender has played in enhancing the effectiveness, fairness and sustainability of activities under the Convention through gender mainstreaming in all goals.[2] The enhanced Lima work programme on gender also recognized that mainstreaming gender-responsiveness when implementing climate policies can not only enhances gender equality but also contribute to more ambitious climate action.

22. UNFCCC constituted bodies and operating entities of the Financial Mechanism have mainstreamed gender considerations in their work. For example, the TEC, in its policy brief, highlights the socioeconomic benefits of both involving women in the policymaking for mitigation policies and considering their needs, which include improved welfare outcomes, increased enrolment of girls in school and an increased number of women in leadership positions (UNFCCC-TEC, 2024). The Global Environment Facility integrates gender considerations into its financing by ensuring equal opportunities for women and men to participate in, contribute to and benefit from the activities it funds. Similarly, the Green Climate Fund incorporates in its programming gender-responsive impact assessments,

[2] Decision 7/CP.29.

stakeholder consultations and initiatives that promote gender equality and women's empowerment in climate action. The KCI has also undertaken gender-disaggregated impact assessment case studies.

23. The gendered impacts of mitigation policies can include co-benefits in the areas of social services and health and well-being, such as improved health outcomes due to reduced air pollution as a result of the phase-out of fossil fuels. Women often experience higher exposure to indoor air pollution from traditional cooking methods, and therefore, transitions to cleaner energy sources can significantly improve their respiratory health and reduce their disease burden (WHO, 2014). At the same time, such transitions must ensure that alternative sources are affordable and accessible in order to avoid worsening gendered health disparities. Gender-responsive energy policies can create multiple co-benefits, including reducing the time poverty of women,[3] improving educational outcomes for girls and enhancing livelihood opportunities for women entrepreneurs in the renewable energy sector (Chandrasekaran et al., 2023). Impact assessments of mitigation policies should also consider mental health and stress factors, as economic disruption related to climate action can disproportionately affect women. Further, impact assessments should track gender-disaggregated health data on climate-related illness and monitor access to healthcare services, particularly in rural and vulnerable communities. Jain, Tewathia and Barik (2023) also highlight that climate change uniquely affects women's health and economic stability, emphasizing the need for gender-responsive climate change strategies.

24. The underrepresentation of women in climate governance and the lack of appropriate gender expertise leads to mitigation policies that do not fully take into account gender-specific risks and opportunities. Research shows that when women are meaningfully included, climate governance improves in both process and outcomes. For instance, countries with a higher level of political representation by women tend to adopt more ambitious climate policies and ratify international environmental treaties quicker than those with a lower level of representation (Mavisakalyan and Tarverdi, 2019). Impact assessments should therefore examine whether women and gender-diverse groups have been meaningfully engaged in policy design, planning, implementation, and monitoring, evaluation and learning processes. Similarly, the Sixth Assessment Report of the IPCC highlights the importance of inclusive governance in climate action, including women and other groups, as a key lever in facilitating climate-resilient development and socially acceptable solutions (IPCC, 2023).

25. Mitigation policies can create both challenges and opportunities regarding time use and the care economy. Women typically bear disproportionate responsibility for unpaid care work, including childcare, elder care, household maintenance and food preparation. Well-designed clean energy transitions can significantly reduce the time women spend collecting firewood and other household tasks. Studies show that improved cookstoves and electrification can save women in developing countries one to four hours daily, creating opportunities for education, income generation or leisure (Krishnapriya et al., 2021; Pillarisetti et al., 2014). Energy access initiatives that explicitly consider gender dimensions have demonstrated positive impacts on women's empowerment and household welfare. However, some mitigation policies may inadvertently increase care burdens if they affect household services or economic stability. Assessments should utilize time-use surveys to understand how climate policies impact the distribution of unpaid care work and women's time poverty (Elson, 2017).

26. Climate change mitigation policies in agriculture, forestry and land use can significantly impact women's economic opportunities and food security. When gender is considered in their design, these policies can enhance women's land rights, decision-making power and access to resources. Gender-transformative approaches to climate-smart agriculture have been demonstrated to improve both productivity and women's empowerment (FAO and CARE, 2019; Puskur and Aayushi, 2024).

27. Payments for ecosystem services programmes that actively include women as beneficiaries have been shown to have positive impacts on household income and women's

[3] Time poverty is a phenomenon in which women are often left with little or no discretionary time owing to the inequitable gender-based allocation of unpaid domestic work, representing "double-duty" for women who enter the workforce (Hyde, Greene and Darmstadt, 2020).

status in community governance (Larson et al., 2018). However, without gender-responsive policy design, women with insecure land rights and limited access to productive resources may be restricted in their ability to adopt climate-smart agricultural practices or participate in conservation initiatives. Gender-responsive impact assessments of REDD+ activities and agricultural emission reduction initiatives should, therefore, examine women's access to, control over and ownership of land and natural resources.

A. Assessing gendered dimensions of climate policy: indicators and data sources

1. Gendered social effects

28. Various data sources can be used to examine how climate change mitigation policies influence, in a gendered manner, health outcomes, including maternal health. A key resource for such analysis is the WHO Global Health Observatory, which provides gender-disaggregated data on health outcomes linked to climate-related risks such as air quality, heatwaves and water stress. The Global Health Observatory data enable an in-depth examination of how environmental hazards affect women differently than men, especially those in vulnerable regions or experiencing difficult socioeconomic conditions, and they can also be used to track the positive health outcomes of mitigation actions.

29. Similarly, national health surveys that include gender-disaggregated data are invaluable for exploring how climate change mitigation policies impact women's health. These surveys collect information on diseases and conditions that may be exacerbated by climate change, including respiratory diseases, heat stress and mental health issues. They can also be used to monitor improvements in health indicators following implementation of gender-responsive climate policies. Gender-responsive surveys provide critical insights into the health impacts, both positive and negative, that women, particularly those in rural or marginalized communities, experience from policies that alter energy access or increase energy costs.

30. Health impact assessments also offer a comprehensive approach to understanding how mitigation policies might influence public health, particularly for women. Many health impact assessments now integrate gender-responsive analyses that focus on how specific mitigation strategies, such as transitioning to clean energy or implementing carbon taxes, affect women's health differently than men's health. Health impact assessments make it possible to capture the unique health challenges faced by women and identify the mitigation strategies that are most beneficial to their well-being, while also highlighting co-benefits such as reduced disease burden and improved quality of life.

31. Gender-responsive budgeting methodologies can assess how financial resources allocated to climate change mitigation are distributed between genders. Gender-responsive budgeting tools are used for analysing budget allocations and policies affecting expenditures and revenue from a gender perspective, ensuring that climate finance benefits women and men equitably. Experience from many countries demonstrates that gender-responsive budgeting can lead to more equitable resource allocation in climate initiatives, resulting in improved outcomes for women (see for example, Sikhosana et al., 2024). The UNDP and UN Women also provide frameworks for conducting gender budget analyses of climate investments which can reveal both disparities and improvements in funding allocation (UNDP, 2022; UN Women, 2023).

32. Participatory assessment methods can provide crucial insights into gendered impacts of climate policies that may not be captured by quantitative data alone. When effectively implemented, these methods not only identify potential negative impacts but also highlight positive outcomes and opportunities for women's empowerment. Focus group discussions, community mapping exercises and participatory rural appraisals enable women to articulate their experience with climate policies and identify concerns or benefits that may be overlooked in traditional assessments. For example, participatory assessments of renewable energy projects in Nepal revealed that beyond reducing emissions, solar microgrids created business opportunities for women entrepreneurs and addressed safety concerns of women

through improved lighting (ICIMOD, 2021). These methods are particularly valuable for understanding local contexts and intersectional impacts. The Gender Action Learning System (CGIAR, 2023) and Women's Empowerment in Agriculture Index also offer structured frameworks for participatory gender assessments in climate initiatives (Alkire et al., 2013).

33. In the transport sector for example, when designing response measures or assessing their impacts in a gender-disaggregated manner, two critical factors to consider are mobility and access to public services. Women rely more on public and non-motorized transport and often make complex, multi-stop trips owing to caregiving and domestic responsibilities. If response measures such as fuel subsidy removal, investment in electric vehicles and urban redesign fail to account for gendered mobility patterns, they risk reducing women's access to affordable and safe transport options. Impact assessments should analyse how changes in transport infrastructure, pricing and accessibility affect women's ability to participate in economic and social activities. Policymakers may use transportation usage patterns, such as reliance on public transit versus private vehicles, alongside affordability assessments to ensure that cost increases do not disproportionately burden women, particularly in rural areas. The importance of including mobility, safety, and access to public services in climate policy assessments to promote equitable access has been highlighted by the TEC (UNFCCC-TEC, 2024).

34. Furthermore, when assessing the impact of climate change mitigation policies on women's mobility and safety, it is crucial to account for the unique barriers they face in accessing low-emission transportation options. Mitigation policies such as those relating to the development of public transit systems, cycling infrastructure and energy-efficient mobility solutions can have significant implications for women's ability to participate in sustainable transport systems. Safety benefits can be undermined if policies are not gender-responsive, as women are disproportionately vulnerable to harassment and violence in public spaces (Niboye, 2023). For example, the introduction of cycling infrastructure or expanded public transit systems, while beneficial in reducing carbon emissions, can inadvertently limit women's access to transportation if the routes and facilities are unsafe, poorly lit or poorly designed.

35. Thus, to effectively assess the gendered impacts of mitigation policies in the transport sector, safety and security indicators such as the prevalence of gender-based violence, public perceptions of safety and the availability of gender-responsive infrastructure – such as well-lit pathways, secure waiting areas and emergency response systems – should be integrated into impact assessments. In so doing, policymakers can identify areas or locations where women are more likely to avoid public transport or low-emission transport options owing to fears of violence or harassment. Furthermore, climate change mitigation policies must ensure that the infrastructure developed as part of energy-efficient transport systems is designed with women's specific needs in mind.

36. The UNDP Gender and Climate Change Adaptation Toolkit (UNDP, 2024) offers valuable insights into integrating gender-sensitive safety considerations into urban mobility planning. The toolkit provides guiding questions and a framework for ensuring that mitigation policies do not unintentionally exacerbate barriers to women's mobility but rather support their ability to engage in climate-friendly transportation without facing disproportionate risks. By aligning climate change mitigation efforts with a focus on safety and security, policymakers can help create a more inclusive and equitable transportation system that supports both environmental sustainability and women's empowerment (Parikh, 2007; UNFCCC-TEC, 2024)

2. Gendered effects on labour dynamics and economic opportunities

37. A key gendered dimension to consider when assessing the impact of climate policies is employment and economic equity. While women may not be severely affected by job losses in male-dominated high-emitting industries, they are often excluded from the benefits of the transition. This may be due to structural barriers, skills gaps and gendered labour market segmentation. Without targeted policies to address these challenges, these disparities, such as those seen in the male dominated renewable energy sector (International Labour Office, 2018; ILO, 2022b), can hinder women's economic empowerment and exacerbate

existing inequalities. Mitigation policies should consider the distribution of newly created jobs between men and women and include measures to enhance gender equality.

38. Comprehensive impact assessments should not only evaluate job losses in carbon-intensive industries but also identify pathways for women to participate in emerging green sectors. This includes analysing participation rates in reskilling programmes, identifying gender-specific obstacles to job access and measuring the inclusivity of job creation. Beyond access, assessments should consider job quality, wages and working conditions to promote fair wages and decent work for women (UNFCCC-TEC, 2024). The consideration of informal sector and the care economy is also critical, given that women globally carry out about 75 per cent of unpaid work, dedicating an estimated 3 times more hours than men to unpaid work (Charmes, 2019). As such, encouraging social dialogue and investment in the care economy has been recognized as key in promoting gender equality and more inclusive economies (ILO, 2024).

39. Gender-disaggregated employment data are valuable for tracking the impacts of climate policies across industries. Policymakers should gather data on the number of men and women employed in various sectors, especially in low-emission industries, and monitor how those numbers change as climate policies are implemented. Participation rates in reskilling and capacity-building programmes should also be assessed to ensure that women have equal access to training opportunities, which are crucial for their transition into green jobs. In addition, comparing income levels between men and women in green industries can provide valuable insights into economic equity and whether the transition to a low-emission economy is creating equal financial opportunities for women.

3. Assessing gendered economic effects of climate policies

40. The UNDP *Gender Responsive Indicators* guide is an important resource for ensuring that impact assessments of gender dimensions are comprehensive and effective (UNDP, 2020a). By incorporating gender-disaggregated data into their evaluations, policymakers can monitor and analyse how effectively women are being included in the green workforce and whether climate policies are perpetuating or reducing gender disparities. This guide emphasizes the need for such data to identify and rectify imbalances in economic participation.

41. In addition, the consideration of women's engagement in unpaid care work and informal labour is crucial, as both are often overlooked in economic impact assessments. Policies such as those relating to carbon pricing or energy transitions may increase household costs or workload for women who depend on traditional energy sources for cooking and daily activities. Therefore, impact assessments should consider how mitigation policies affect the redistribution of unpaid labour and the security of informal work. To assist in their assessments, policymakers can utilize time-use surveys that measure daily hours spent on unpaid work by gender, that help determine whether mitigation policies increase or decrease the workload burden on women over time. These surveys, conducted by national statistics offices and organizations including ILO and the United Nations Statistics Division, provide critical insights into the division of labour in households and can highlight whether energy transitions alleviate or exacerbate time poverty among women.

42. Labour force participation data can be used to track changes in employment trends across the formal and informal sectors, offering insights into how mitigation policies affect women's participation rates in stable income-generating activities. The labour force surveys of the ILO (ILO, 2025) and national employment data sets can be used to analyse the extent to which women in informal sectors for example, are affected by climate policies.

43. Household expenditure and energy access surveys, such as the World Bank's Living Standards Measurement Study (World Bank, 2025), can help in assessing whether energy transitions increase the financial burden on women, particularly in low-income households in which women manage household expenses. Studies have shown that policies promoting clean cooking technologies and affordable renewable energy access can significantly reduce the economic and physical burden on women, improving overall well-being and economic resilience (Clancy et al., 2019; IEA, IRENA, UNSD, World Bank, WHO, 2021; WHO, 2016).

44. Social protection and safety net programme evaluations provide valuable data on how climate policies intersect with economic security for women in informal labour. The UNDP's *Now is the Time!* report underscores the importance of policies that recognize and redistribute unpaid labour while ensuring that women in informal sectors are not left without financial and social protections (Yamamoto, 2018). Assessments of social assistance programmes, such as cash transfers and targeted subsidies, can highlight whether policy interventions effectively address the economic vulnerabilities created by energy transitions and labour market shifts.

4. Gendered effects on access to natural resources and climate finance

45. In many developing countries, women have limited land ownership rights and access to natural resources, a situation that can be exacerbated by large-scale mitigation strategies such as renewable energy expansion and afforestation programmes. Impact assessments of mitigation strategies involving large areas of land should ensure that those strategies do not displace women or limit their access to critical natural resources needed for their livelihoods. In assessing these impacts, policymakers should analyse land ownership statistics, evaluate women's access to essential natural resources such as water and forests, and review legal frameworks ensuring equal land rights. The ILO policy guide *Gender, Equality and Inclusion for a Just Transition in Climate Action* emphasizes the importance of gender-equitable land policies and resource governance (ILO, 2024).

46. There is also a risk that renewable energy projects for example, can further exacerbate already strained land tenure rights for women owing to women's alienation from negotiation, consultation and compensation processes (GI-ESCR, 2020). Engaging women in these processes could empower them to advocate for welfare and socioeconomic progress, which may lead to better educational and health outcomes.

47. Financial and social protections are also important elements of gender consideration aimed at ensuring response measures equitably benefit all groups. Women often face barriers in accessing climate finance, limiting their ability to benefit from mitigation initiatives. The proportion of climate funds allocated to women-led projects or to women entrepreneurs in the green economy should be assessed during the planning and implementation of climate policies. The UNDP policy brief *Gender Responsive and Socially Inclusive Public Climate Finance* is a useful resource that outlines indicators for assessing whether climate finance mechanisms are equitably designed and implemented (UNDP, 2023). Additionally, the adequacy of social protection programmes, which can be a lever for women's participation in the green economy, must be evaluated to ensure they address the needs of women who are affected by job losses or experience increased economic burden as a result of climate policies.

B. Methodological approaches for assessing the gendered impacts of climate policies

1. Gender impact assessment methods

48. Gender impact assessment methods and tools are ex ante analysis approaches for measuring the likelihood of a policy or programme having negative effects on the status of equality between men and women (European Institute for Gender Equality, 2016). They have been used in numerous fields and sectors to assess the different impacts of policies and programmes on men and women (Maduekwe and Factor, 2021; Hill, Madden, and Collins, 2017). It is important to note that while gender impact assessment methods are commonly used in studies, they are not always suitably tailored for assessing the gendered impacts of climate mitigation actions.

49. Sauer and Stieß (2021) developed a gender impact assessment method specifically for analysing the impacts of climate policies. The method, which builds on the work of previous analytical approaches with gender aspects, incorporates six gender-specific dimensions for climate policy impact assessment: the care economy, employment, the

shaping of public infrastructure, institutionalized rationalities, participation in decision-making and physical integrity[4].

50. The method was tested on an initiative to reduce the degree of motorization as a contribution to a compact mixed-function city. The assessment was conducted to analyse the potential impacts of the initiative on the care economy and employment. The findings showed that reducing motorization had potential gendered impacts related to the care economy. For instance, caring for family members with restricted mobility, a task that mostly falls on women, may require a greater time commitment as a result of the initiative. However, if the initiative is accompanied by safe cycling and walking infrastructure, it may improve mobility and health outcomes for women.

2. Gender Assessment Method for Mitigation and Adaptation (GAMMA)

51. The Gender Assessment Method for Mitigation and Adaptation, developed by GenderCC-Women for Climate Justice, was designed to guide impact evaluations of climate actions in cities and urban areas (GenderCC-Women for Climate Justice, 2022). The method is aimed at assessing the gendered impacts of both mitigation and adaptation actions and identifying gaps in gender mainstreaming in climate policies. It is an important tool for policymakers in advocating for gender-responsive policy design and implementation which contributes to the aversion of the exacerbation of climate change-related challenges, such as inequality, and maximizing social and gender benefits. To assess the gendered socioeconomic aspects of climate policies, the method evaluates, amongst other aspects, whether there are any potential social co-benefits of climate policies; whether changes in resilience and well-being are being tracked across all groups of society, including women and girls; and whether climate-related planning incorporates frameworks that address social and gender dimensions of climate actions.

3. Case studies and comparative analysis

52. Case studies can be used to examine how gender considerations are integrated into mitigation projects. For example, a case study on the inclusion of gender considerations in REDD+ initiatives, found that gender equality was often equated with women's participation rather than with the broader concept of women's empowerment (Larson et al., 2015). Comparative analysis across different climate policies revealed that simply increasing the number of women in decision-making processes did not necessarily translate into meaningful empowerment (Sarmiento Barletti et al., 2022).

4. Intersectional analysis

53. There is growing consensus amongst activists and scholars for the need to integrate intersectional analysis into evaluation of the gendered impacts of mitigation actions. Intersectional analysis ensures that overlapping social indicators not sufficiently covered by other assessment methods, such as age, class, race and marital status, are effectively considered during the assessment of climate policies. For example, in the rural areas of the United Republic of Tanzania, married women were found to have greater access to adaptive strategies (such as livelihood diversification and agricultural water management) than widowed or unmarried women, highlighting the need for policies that account for varying social statuses (Van Aelst and Holvoet, 2016).

C. Strengths and limitations of methodological approaches for assessing the gendered impacts of climate policies

54. Different gender impact assessment methodologies have various strengths (UN Women, 2021; European Institute for Gender Equality, 2016). One key advantage they all have is the ability to provide insights into the different impacts of policies on specific groups. As they are ex ante in nature, they provide timely discovery of the potential unintended negative consequences of policies, differentiated between women and men and between girls

[4] See Sauer & Stieß, 2021 for more details on the dimensions

and boys. By safeguarding against potential pitfalls and maximizing potential benefits, better climate policies can be designed.

55. The use of these methodologies also contributes to better governance in policymaking as they help enhance the representation of the needs of various groups in society. Further, they promote increased citizen participation, including that of women and girls at all levels of society, in policymaking processes, and by enabling historically marginalized groups to share their views during the policy design stage, promotes transparency and inclusiveness.

56. Another advantage of these methodologies is their direct and indirect effects on the demand for more and better statistics and sex-disaggregated data on gender. Such statistics and data not only enrich the policymaking process but also enhance understanding of gendered structural inequalities.

57. Despite their strengths, existing methodologies for assessing the gendered impacts of climate policies have notable limitations. One major challenge is their overreliance on sex-disaggregated data. While disaggregation of data by sex is an essential first step in gender analyses, it often fails to capture the structural and institutional barriers that shape gender inequalities. For instance, data on women's participation in renewable energy jobs may indicate their increased employment in the sector, but without accompanying qualitative insights, it will remain unclear whether these jobs offer women fair wages, decision-making power and long-term career stability. A reliance on quantitative data risks oversimplifying gender issues and can lead to misleading conclusions about progress towards gender equality.

58. Another key limitation is the lack of longitudinal analysis by most gender impact assessment methodologies. Many assessments based on these methodologies evaluate the gendered effects of policies at a single point in time, making it difficult to track long-term changes in gender roles, economic opportunities and social mobility. Climate change mitigation policies often have delayed effects, particularly those relating to land-use change and renewable energy, where economic transformation unfolds gradually. Without long-term studies, policymakers may struggle to understand the lasting consequences of mitigation measures on gender equity.

59. Moreover, measuring empowerment remains a significant challenge in gender impact assessments. Many studies equate women's participation with empowerment, assuming that if women are involved in climate decision-making processes, they automatically gain agency and influence. The reality is more complex – participation does not always translate into power. In some cases, gender quotas in climate governance structures result in surface-level inclusion, where women are present but lack decision-making authority. This highlights the need for more nuanced indicators that measure not only representation, but also the quality of participation and the extent of women's influence in policy outcomes.

D. Case studies

1. Impacts of carbon pricing policies on gender equity: Canada and Sweden

60. Various studies from Canada and Sweden have examined the socioeconomic impacts of carbon pricing, particularly on low-income households and on gender equity. Researchers have employed a mixed-method approach, combining quantitative analyses of household expenditure surveys with policy simulation models, to assess how carbon pricing affects different income groups. Interviews with stakeholders, including low-income families and women's advocacy groups, provided contextual insight into the lived experience of these policies.

61. The findings indicate that while higher-income households consume more energy overall, lower-income households, often headed by women, spend a larger proportion of their income on energy-related expenses, making them more vulnerable to energy price increases. To mitigate these regressive effects, the studies recommend implementing revenue recycling measures, such as lump-sum rebates or tax credits targeted at vulnerable populations, to offset increased costs and support poverty reduction efforts (Charlebois et al., 2024; Ohlendorf et al., 2021; Shang, 2023; Tombe and Winter, 2024; Zhao et al., 2022)

2. Gendered impacts of fossil fuel subsidy reform: Indonesia

62. In 2007, the Indonesian Government launched a kerosene to LPG programme reform, known as the Zero Kero Program, the primary aim of which was to reduce the expenditure burden associated with kerosene subsidies. The Government selected LPG as the form of energy to be distributed to households across the country because, compared with kerosene, it is cheaper and cleaner, produces less GHG emissions, and is easier to distribute to rural and remote areas of the country (Budya and Yasir Arofat, 2011; Thoday et al., 2018). The impacts of this policy have been of interest to researchers, with studies being conducted on the changes in energy use and household incomes (Astuti, 2017), on the changes in air pollution and health outcomes (Thoday et al., 2018) and on the regulatory requirements, market conditions and social acceptance of the policy (Astuti, Day, and Emery, 2019).

63. Studies analysing the impacts of the policy on women are scant. However, Kusumawardhani et al. (2017) conduct a synthesis of the impacts of fossil fuel reforms on women in Indonesia. Using a qualitative research design, in particular literature review and content analysis from reports and other relevant documents, they found that price increases resulting from subsidy reforms may disproportionately affect women. Women in poor and near-poor households were least able to adjust to any energy cost increases, leaving them more vulnerable than men. Regional impacts were also identified, with women and men from rural areas at greater risk of not benefiting from the subsidy reforms than those in urban areas.

IV. Local communities and Indigenous Peoples

64. Local communities and Indigenous Peoples often bear the brunt of climate change impacts while playing a critical role as custodians of traditional knowledge and in sustainable resource management and community-based adaptation. Climate policies and actions must be designed to recognize and uphold the rights of local communities and Indigenous Peoples, ensure their participation in decision-making and address disproportionate impacts in order to contribute to enhanced quality of life as well as the conservation, restoration and sustainable use of nature (IPBES, 2019).

65. Steps have been taken to strengthen the engagement of Indigenous Peoples and local communities in the UNFCCC process; for example, the Local Communities and Indigenous Peoples Platform fosters knowledge-sharing, capacity-building and direct participation in climate action and governance.

A. Consideration of local communities and Indigenous Peoples in climate policy impact assessment

1. Integrating Indigenous and traditional local knowledge systems into climate policies

66. Indigenous Peoples and local communities have long maintained knowledge systems that sustain ecosystems and promote climate resilience. Such traditional knowledge, including on sustainable agricultural systems, agroforestry, rotational grazing and ecosystem-based conservation, has been shown to enhance carbon sequestration, preserve biodiversity and strengthen ecosystem resilience (Vierros, 2017). Knowledge systems of local communities and Indigenous Peoples are often intimately tied to cultural identity and reciprocal interactions with nature. Recognizing these rich cultural values, practices and knowledge systems cultivates deeper consideration for sustainability and future generations, forming the basis of just and ecologically sound transitions (ILO, 2022c). Such recognition is also likely to foster community cohesion and investment in the resilience that has sustained communities over generations. Weaving the worldviews, values and knowledge systems of Indigenous Peoples and local communities into global efforts to address climate change, rather than treating them as peripheral, can reduce maladaptation risks, strengthen biodiversity and enrich climate action with place-based insight.

67. Indigenous and local knowledge systems often remain overlooked in mainstream mitigation policies, resulting in conflicts over resource extraction, land use and natural resource management (Marino and Ribot, 2012). If not carefully implemented, response

measures can further exacerbate the challenges faced by Indigenous Peoples and local communities and compromise the effectiveness of collective efforts to address climate change.

68. The REDD and REDD+ activities could have a migratory effect on some community members, especially youth, who have been shown to leave forest communities to urban areas in search of better opportunities (Robson et al., 2020). Cascading effects of REDD and REDD+ activities including loss of land for agriculture and loss of welfare could result in social disruption and, thus, significant loss of traditional knowledge and practices linked to rural-urban migration (Anderson, 2009). A more inclusive approach to the implementation of REDD and REDD+ requires incorporating local communities and Indigenous Peoples' knowledge systems alongside scientific frameworks, ensuring that climate policies respect traditional practices. Establishing mechanisms for knowledge-sharing among local communities and Indigenous Peoples, policymakers and scientific institutions can help bridge the gap between various traditional knowledge systems and scientific methodologies, hence promoting holistic and equitable climate action.

69. Assessing the integration of knowledge systems belonging to Indigenous Peoples and local communities into climate policies involves multiple indicators and data sources. The inclusion of such knowledge in NDCs and national adaptation plans provides an indicator of their recognition in policy. Records of participation in climate policymaking processes reveal the extent to which Indigenous voices shape decision-making. Case studies documenting successful mitigation initiatives led by Indigenous Peoples, such as those compiled by UNESCO (2021), offer valuable insights into best practices of the inclusion of traditional knowledge systems into climate policies. By leveraging these indicators and data sources, policymakers can ensure that Indigenous knowledge and local knowledge are not only acknowledged but also used to inform climate actions.

2. Considering land rights and resource access

70. Shifts to low-emission energy systems and large-scale land-use changes can have far-reaching implications for Indigenous Peoples and local communities. Renewable energy projects, afforestation initiatives, development of carbon markets, and industrial transition can alter land tenure arrangements, disrupt traditional livelihoods and restrict access to vital natural resources. At the same time, the phase-out of carbon-intensive industries may lead to job displacement and economic instability, particularly in communities heavily reliant on extractive industries.

71. REDD and REDD+ activities in developing countries, if implemented poorly, can harm local communities and Indigenous Peoples. Since forests are owned by the State in many countries, many Governments often do not take into consideration the customary rights of Indigenous Peoples when designing and implementing climate policies. This leaves much of the forests susceptible to land grabbing by outsiders and the loss of user rights by local communities and Indigenous Peoples (Barnsley, 2009).

72. In addition, unclear land rights have been shown to expose local communities to increased risk of conflict with Governments and companies given that land earmarked for mitigation projects is usually already the subject of bitter dispute (Raftopoulos, 2016). This has been observed, for example, with the REDD+ interventions in the Rufiji Delta in the United Republic of Tanzania, which were viewed as unjust and were resisted by local communities (Marino and Ribot, 2012).

73. The deployment of renewable energy projects often requires considerable land capital and involves the risk of environmental degradation due to, for example, dam construction and the alteration of water flows. The risks involved in these projects may lead to community displacement and changes in water availability downstream, which can have adverse effects for pastoralists, fishermen and farmers (UNFCCC-KCI, 2024). Furthermore, expanding renewable energy can have the unintended effect of reinforcing inequalities. As Indigenous Peoples and local communities are often not meaningfully engaged in the design and implementation of energy transition interventions, their concerns and the risks to their well-being are not taken into consideration during impact assessments, thus exacerbating inequalities (UNFCCC-KCI, 2024).

74. Assessing the impacts of mitigation policies on Indigenous Peoples and local communities requires a comprehensive analysis of how transitions affect land security, resource access and socioeconomic stability. Land tenure records, such as those compiled by FAO, provide critical insights into ownership patterns and potential displacement risks (FAO, 2025). Employment shifts, tracked by ILO labour force surveys, can reveal the extent of job losses in carbon-intensive industries and the availability of re-employment opportunities in emerging sectors (ILO, 2025). Biodiversity and ecosystem tools for measuring ecosystem services by organizations such as International Union for Conservation of Nature help determine the environmental consequences of land-use changes, ensuring that mitigation strategies do not inadvertently degrade ecosystems or reduce resource availability for communities dependent on them (Neugarten et al., 2018).

75. Community-based surveys and sector-specific labour market data also contribute to understanding economic displacement and just transition pathways. These tools help evaluate whether affected workers can access new opportunities in the green economy and whether policies are effectively addressing the needs of vulnerable groups. Integrating Indigenous and local knowledge systems into impact assessments is essential for fostering sustainable land stewardship while upholding the rights and economic inclusion of affected communities.

3. Ensuring free, prior and informed consent

76. Ensuring free, prior and informed consent is a fundamental principle in protecting the rights of Indigenous Peoples in climate change mitigation policies, as outlined in the United Nations Declaration on the Rights of Indigenous Peoples. Failing to obtain genuine informed consent can lead to land dispossession, cultural disruption and social conflict, as has been shown, for example, for large-scale renewable energy development, afforestation projects and carbon offsetting initiatives that proceeded without obtaining full and informed consent from affected communities (NDI, 2024).

77. Climate policies must ensure transparent, participatory decision-making that respects Indigenous governance structures and customary laws. Governments and private sector actors should engage in meaningful consultations before project implementation, ensuring that communities have the power to accept or reject proposals affecting their lands and resources.

78. Key assessment metrics for the inclusion of free, prior and informed consent include status of ownership of and usage rights relating to affected lands, risk of physical and/or economic displacement, access to natural resources (such as streams, forests and rivers) and level of community participation in environmental impact assessments (RECOFTC and GIZ, 2011; UNDP, 2020b; Rainforest Alliance, 2022; Tan et al., 2010). Monitoring whether free, prior and informed consent mechanisms lead to equitable benefit-sharing agreements is also critical to ensuring the eversion of harm to Indigenous Peoples.

B. Methodologies for assessing the livelihood-related impacts of climate policies on local communities, Indigenous Peoples and other vulnerable groups

79. Various studies have assessed the impacts of climate change policies on communities dependent on natural resources and traditional industries using a combination of household-level socioeconomic analysis, geospatial analysis, environmental monitoring and macroeconomic scenario modelling. This subchapter synthesizes the insights from multiple studies and highlights how different methodologies have been applied to assess the livelihood effects of climate policies, with a focus on smallholder farmers, Indigenous Peoples and other groups in vulnerable situations groups. The strengths and limitations of different approaches are also analysed to capture the complex interplay between climate change policies and economic well-being.

1. Household surveys and socioeconomic analysis: understanding direct livelihood impacts

80. Household surveys are widely used to collect data on income levels, land-use practices and adaptation strategies. Studies show that household-level socioeconomic analysis is critical in identifying how mitigation policies shift income distribution and economic resilience across different societal groups.

81. In India, a study on forest carbon projects used household surveys and economic valuation techniques to assess how afforestation and reforestation initiatives affected farmers with varying landholding sizes. The study found that smallholder farmers were disproportionately impacted by the initiatives, experiencing economic losses as a result of restrictions on agricultural activities and delayed carbon revenue payments. By employing a net present value analysis, the researchers quantified the long-term financial trade-offs, showing that while owners of larger landholdings could absorb income fluctuations, smallholder farmers faced severe financial strain (Aggarwal and Brockington, 2020).

82. Similarly, in Ethiopia, an analysis of a forest carbon project used the **s**ustainable livelihood framework to evaluate changes in access to land, economic opportunities and community well-being (Israel and Murugan, 2015). The findings indicated that while the project generated revenue from carbon sequestration, it inadvertently restricted access to forest resources, negatively affecting subsistence farming and livestock rearing. Household surveys revealed that 62.9 per cent of households reduced their livestock holdings owing to a lack of grazing land, which in turn eroded their financial security.

83. In Ghana, a study was carried out to evaluate how deforestation mitigation policies affected rural communities and Indigenous populations dependent on forest resources (Adom et al., 2024). As part of the study, a household survey was used to develop a livelihood dependency index for measuring the extent to which different groups within the community relied on forest-based resources such as firewood, non-timber forest products and small-scale farming. The results revealed that while some mitigation projects provided short-term employment opportunities, they failed to replace the long-term economic value of access to forests, which had been lost.

2. Geospatial analysis and environmental monitoring: tracking changes in land use and resource access

84. When climate change policies involve large-scale land-use changes, such as afforestation and reforestation, or involve conservation programmes that alter the accessibility of land and natural resources for communities that depend on them, geospatial analysis and remote sensing techniques allow researchers to objectively track changes over time and correlate them with socioeconomic and environmental impacts to support policymakers. Combining geospatial analysis with socioeconomic data ensures that land-use policies promote both environmental sustainability and community well-being.

85. In Ghana, the Normalized Difference Vegetation Index, using data from satellite imagery, provided a metric to assess deforestation rates and evaluate how mitigation policies influenced forest cover over two decades (Adom et al., 2024). This approach helped quantify the extent to which conservation programmes successfully curbed deforestation while also revealing the unintended consequences of reduced land availability for farming and grazing. By applying an integrated analysis of remote sensing data and household survey data, the study was able to establish a direct link between land-use policies and economic well-being.

86. Forest cover change rates enable researchers to assess whether reforestation efforts have significant impacts on the livelihoods and well-being of local communities (see table 2 below). For example, as part of a study aimed at understanding the socioeconomic impacts of farmland restoration in rural areas in Malawi, (Ding et al., 2023) developed a household restoration intensity score to measure the scale of land restoration activities for each household. The study found positive impacts between restoration efforts and agricultural outputs, which then translated to improved household incomes over time. Other studies have emphasized the meaningful engagement of local communities, especially in compensation processes, as key to enhancing the benefits of restoration programmes, including the benefit of avoiding the potential loss of income (Ullah et al., 2021; Smith and Scherr, 2003).

3. Macroeconomic scenario modelling: examining broad economic shifts

87. While localized studies capture the immediate livelihood effects of response measures, macroeconomic modelling provides a long-term perspective on how climate policies shape employment, income distribution and economic stability at a broader scale.

88. A study on the global poverty implications of mitigation policies employed the Regional Integrated Climate and the Economy model to simulate how different policy interventions, such as carbon pricing, energy transitions and land-use restrictions, affect economic growth and poverty levels. Using sectoral employment analysis, researchers tracked job loss in fossil fuel industries and job creation in renewable energy industries, revealing significant disparities in who benefits from the transition to a low-emission economy (Aggarwal and Brockington, 2020).

89. The same study also applied the Household Energy Burden Index to measure the proportion of income spent on energy before and after mitigation policies were implemented. The findings showed that while clean energy transitions improved public health outcomes and environmental sustainability, they often resulted in higher energy costs for low-income households, exacerbating financial strain unless compensatory measures were introduced (Aggarwal and Brockington, 2020).

90. Similarly, in an upcoming study by the KCI, a computable general equilibrium model was used to analyse the potential impacts of global and domestic mitigation actions on selected economic sectors in Maldives (UNFCCC-KCI, forthcoming-a). This modelling exercise simulated the impacts of applying a global carbon tax, implementing a global policy for reducing emissions from ships and introducing carbon offsetting in international aviation. The findings indicate that the mitigation policies will have economy-wide effects, including on employment patterns, income and wage levels, production costs and household expenditure. The study emphasized the importance of domestic interventions that minimize the negative consequences of mitigation actions.

4. Mixed-method approaches

91. Mixed-method approaches to impact assessment combine qualitative and quantitative research designs. By taking advantage of the depth and contextual richness of qualitative methods and the generalizability and reproducibility of quantitative methods, mixed-method approaches can produce robust research results, addressing the respective limitations of each individual approach.

For example, a study by (Liu et al., 2024) used a mixed-method approach in examining how mitigation policy interventions influence the livelihood diversification strategies of smallholder farmers in the Hehuang Valley and Pumqu River Basin on the Tibetan Plateau and whether these policies support or hinder the farmers' adaptive capacity. The study combined household surveys with economic modelling to understand the extent to which smallholders diversified their income sources in response to climate stress and policy changes. While the study highlights adaptation as a response, its core analysis was centred on the impact of mitigation policies on the economic resilience and diversification strategies of smallholder farmers. Data were collected from 1,193 smallholder households, covering demographic characteristics, agricultural practices, income structures and perceptions of climate risk. To analyse the relationship between policy measures and livelihood diversification, researchers applied the tobit model, which is particularly useful in estimating the extent of diversification while accounting for constraints imposed by policies and environmental factors. The study found that the policy measures negatively impacted smallholder diversification across different income groups. Table 2 below provides a summary of the methodologies and indicators for assessing the impacts of climate policies on populations in vulnerable situations. This table is not exhaustive and serves to highlight a few examples.

Table 2
Methodologies and indicators for assessing the livelihood-related impacts of climate policies on groups in vulnerable situations

Assessment dimension	*Methodology*	*Indicator*	*Targeted social group*	*Key insight*
Livelihoods and income	Household surveys	Net present value Livelihood dependency index	Smallholder farmers and Indigenous Peoples	Smallholder farmers and forest-dependent communities face economic losses when their access to land is restricted
Land-use and resource access	Remote sensing and GIS	Normalized Difference Vegetation Index Forest cover change rate	Rural populations reliant on forest-based resources	Deforestation-based mitigation efforts protect forests but can lead to land dispossession if community rights are not secured
Employment and just transition	Macroeconomic modelling	Impact on sectoral employment Participation in reskilling programmes	Low-income workers in carbon-intensive industries	Green jobs are growing, but job losses in fossil fuel industries disproportionately affect low-skilled workers
Energy affordability	Cost–benefit analysis	Household Energy Burden Index	Low-income households	Rising energy costs due to carbon pricing policies can exacerbate poverty in the absence of compensatory measures

C. Strengths and limitations of methodologies for assessing the livelihood impacts of climate policies on vulnerable groups

92. Household surveys, geospatial analysis and macroeconomic modelling are commonly used approaches but while each approach provides valuable data, it also faces challenges in fully capturing the complexity of mitigation policy effects on livelihoods.

93. Household surveys provide a direct and detailed understanding of how mitigation policies affect individuals and communities, particularly those engaged in agriculture, forestry and other resource-dependent livelihoods. These assessments allow policymakers to analyse changes in income levels, employment trends, access to natural resources and adaptive strategies used by populations affected by a policy. Furthermore, these surveys can be designed to capture the gender and social equity dimensions of policy impacts, making them a valuable tool for assessing how different demographic groups experience policy implementation.

94. However, household surveys have notable limitations. Data collection is time-consuming and resource-intensive, requiring significant effort to gather reliable, representative samples. Furthermore, response biases and recall errors – that is, participants underreporting or misinterpreting information – may affect data accuracy. Another key limitation is that while these surveys capture localized economic effects, they struggle to connect the findings to broader environmental or policy-level trends, making it difficult to assess large-scale mitigation impacts comprehensively.

95. Remote sensing is a powerful tool for tracking land-use changes, deforestation rates and ecosystem shifts resulting from mitigation policies. These methods allow policymakers to monitor the effectiveness of afforestation, conservation and land-based carbon sequestration initiatives in real time. One of their key strengths is their ability to provide objective large-scale time-series data, making them particularly useful for evaluating long-term environmental trends.

96. Nevertheless, they have inherent limitations. While they effectively measure land-use changes, they lack the capacity to capture social and economic dynamics such as household income shifts, employment changes and cultural disruptions. Without integrating socioeconomic data, remote sensing alone cannot provide a holistic assessment of how mitigation policies affect livelihoods. In addition, interpretation challenges arise when trying to attribute observed land-use changes directly to policy interventions, as multiple external factors such as climate variability and local governance may also play a role in such changes.

97. Macroeconomic models, such as the Regional Integrated Model of Climate and the Economy, offer a broad perspective on how mitigation policies shape employment trends, economic stability and income distribution. These models help forecast long-term economic consequences, identify trade-offs between climate action and economic development, and simulate policy scenarios to guide decision-making. They are particularly valuable in assessing the distributional impacts of mitigation policies, such as job shifts from fossil fuels to renewable energy, or changes in household energy costs due to carbon pricing.

98. Despite their utility, macroeconomic models have significant limitations. They often lack granularity and struggle to capture localized and community-specific impacts, making it difficult to assess how smallholder farmers, Indigenous Peoples and local communities and informal sector workers are affected by policies. The accuracy of these models is also highly dependent on data availability and assumptions about future economic and technological trends, which introduces uncertainty. Moreover, informal economies and non-market activities, which play a crucial role in rural and Indigenous livelihoods, are often poorly reflected in macroeconomic projections, limiting their applicability in certain contexts.

99. To fully capture the complexity of mitigation policy impacts, mixed-method approaches are essential. Combining household surveys with remote sensing can link economic and environmental changes, while integrating macroeconomic modelling with field data can enhance the accuracy of policy impact projections. By leveraging the strengths of each methodology while mitigating its weaknesses, policymakers can ensure that mitigation efforts are not only environmentally effective but also socially and economically just.

D. Case studies

1. Impacts of the installation of wind farms on Indigenous Peoples: Colombia

100. The coastal region of La Guajira in Colombia is one of the windiest places in South America. It is also the ancestral home of the Wayuu people, the largest Indigenous population in Colombia and the Bolivarian Republic of Venezuela. The Wayuu depend on the land for their livelihoods, carrying out activities which include goat grazing, fishing, salt mining and small-scale agriculture. La Guajira has deposits of coal and natural gas and has long suffered from the negative effects of natural resource extraction, including widespread dispossession and violence against Indigenous communities. Wind energy is seen as an alternative energy source for Colombia’s transition away from fossil fuels, and La Guajira has been identified as the location for 16 approved and another 41 planned wind farms.

101. Studies indicate there has been inadequate and ineffective Indigenous community participation in consultations about the wind farms, and that consultations are often carried out under unequal conditions- with some communities being more represented than others. They also indicate that conflicts between Wayuu families regarding representation in negotiations with energy companies are increasing. Concerns with the installation of the windfarms include reduced biodiversity, deforestation and livelihood impacts on Indigenous Peoples’ communities. Studies have used qualitative research design, particularly interviews

with Indigenous Peoples' communities and authorities and patchwork ethnography, to evaluate the impacts of the wind farms on Indigenous Peoples' communities in La Guajira (Curvelo and Schwartz, 2023; Vega-Araújo and Heffron, 2022; Fajardo Mazorra, 2023).

2. Impacts of power station closure on workers and the local community: South Africa

102. The Komati power station in Mpumalanga, South Africa, was commissioned in the 1960s as part of Eskom's expansion to meet growing electricity demand in the country. Eskom is the country's largest producer of electricity, generating approximately 95 per cent of South Africa's electricity, with 90 per cent of the generated electricity being coal-powered. As part of its efforts to transition to cleaner energy sources, South Africa decommissioned the Komati power station in 2022.

103. Tladi, Kambule, and Modley, 2024 conducted a study to assess the socioeconomic impacts of the decommissioning of the Komati power station on workers and local residents. The study used a mixed-method approach in its analysis. The quantitative analysis used simple descriptive statistics derived from information gathered from questionnaires to obtain findings on socioeconomic impacts. The qualitative analysis comprised in-depth interviews with environmental experts to gauge opinions regarding the energy transition.

104. The study found that local communities were concerned with the impacts of decommissioning on livelihoods, job security, community development and energy access. Job loss was the paramount concern as the power station accounted for 65 and 10 per cent of formal and informal labour respectively. Job loss affects the affordability of basic needs and services as well as standard of living. Furthermore, as a result of increased financial stress, respondents faced risks of increased mental health issues such as anxiety and depression. In addition, local residents reported their lack of awareness of and consultation on the closure of the power station, which contributed to the overall lack of social support relating to the planned decommissioning.

105. The study emphasizes the importance of raising community awareness and providing opportunities for meaningful engagement when designing and implementing mitigation policies. It also highlights the essential role safety net programmes play in ensuring a just energy transition.

V. Assessment of climate policy impacts on other groups in vulnerable situations

106. It is essential to recognize that certain groups, such as youth, the elderly, persons with disabilities, children, migrants and informal sector workers, are particularly vulnerable to the effects of both climate change and the policies put in place to mitigate it. Understanding and assessing the impacts of mitigation policies on these groups is critical to ensuring a just transition, where no one is left behind. Policymakers must be proactive in considering these groups in the design and implementation of mitigation strategies.

A. Youth and children: navigating the crossroads of the employment transition

107. The youth population, particularly in developing countries, is at the forefront of the challenges posed by climate change mitigation policies. Young people often find themselves employed in industries that are most affected by those policies, such as agriculture, fossil fuel extraction and manufacturing. As countries move towards green low-emission economies, there is a risk that these sectors will shrink or undergo significant transformation, potentially leading to job losses for youth. In addition, young people, particularly young women, may be ill-prepared to participate in the labour market for green jobs as available training programmes may not match the requirements for such jobs (Plan International, 2022; The Institute of Sustainability and Environmental Professionals, 2025). Without the proper skills, competencies and education to adapt to the changing job market, young people may struggle to find new employment opportunities in emerging green sectors. Workers already in the job

market with transferrable skills may be better equipped to adjust to the transition to a green economy.

108. When assessing the impacts of mitigation policies on youth, policymakers need to consider several key factors. Economic impacts, such as youth unemployment in traditional sectors, are a primary concern. Data on youth unemployment rates, particularly in sectors most at risk of disruption due to mitigation measures, can help track the extent of risk of economic impacts. It is also crucial to assess the accessibility to youth of training and education opportunities related to green technologies, sustainable agriculture, renewable energy and climate adaptation, including by tracking youth enrolment in relevant programmes.

109. Measuring youth participation in policy development and decision-making processes can provide valuable insights into the inclusivity of climate policies for youth. Policymakers should focus on developing targeted interventions that promote skills development and green job creation for youth. Interventions include training programmes for skills required in emerging sectors, ensuring that they are accessible to youth, especially in locations where climate policies are likely to lead to job displacement. Similarly, policymakers should utilize reskilling programmes to smoothly transition out-of-work youth into green sectors. Policymakers can also consider creating incentives, such as financial subsidies and tax breaks, for businesses to hire young workers in green jobs in, for example, renewable energy, waste management and sustainable agriculture. Furthermore, it is essential to facilitate youth participation in climate policy development, ensuring that young people are not only the recipients of climate action but also active contributors to shaping the future of climate policy. Lastly, it is essential for Governments to create alternative employment opportunities to avoid youth migration in search of jobs and to implement labour policies to efficiently manage and accommodate both transitioning workers and new workforce entrants.

110. Finally, it is also important to consider the needs of children in climate impact assessments. Despite being most affected by climate-related risks, children are often left out in national climate policies (UNICEF, 2020). Assessing the impacts of mitigation policies on children requires consideration of both short-term and long-term impacts, including environmental and health indicators such as changes in air quality and susceptibility rates to respiratory illnesses, and access to nutritious food and water. Tools like UNICEF's Children's Climate Risk Index provide useful child-specific data to inform such assessments (UNICEF, 2021). Other data sources include national demographic and health surveys and the World Banks World Development Indicators. Incorporating these datasets into climate impact analyses can help ensure that children's well-being and rights are protected in the transition to a low-emission economy.

B. The elderly: ensuring accessibility and social protection

111. Elderly people face unique challenges when it comes to climate change mitigation policies. Policies that increase the cost of living or energy prices disproportionately affect older individuals who may already be struggling to meet their basic needs. Elderly people are more likely to live in energy-inefficient housing, face mobility issues, or have health conditions that make them more vulnerable to the physical and social impacts of climate change. Unless mitigation policies specifically address the needs of older populations, the transition to low-emission economies could exacerbate their vulnerabilities.

112. Assessing the impacts of mitigation policies on the elderly requires a focus on both economic and social dimensions of those impacts. Policymakers should consider how changes in energy pricing, transportation systems or housing policies might affect elderly individuals. Data on the income and pension levels of elderly people, particularly those on fixed incomes, are crucial for understanding the economic vulnerability of this group. Similarly, data on access to healthcare by elderly people and the specific health risks they face owing to climate change (such as heatwaves, respiratory issues and social isolation) should be considered when assessing policy impacts. Tracking the availability of age-friendly infrastructure, such as accessible public transport and energy-efficient housing, is also essential.

113. To minimize the negative impacts of response measures on the elderly, policymakers should prioritize social protection mechanisms that shield older individuals from economic disruptions. Strengthening pension systems and ensuring that elderly populations have access to adequate healthcare are key measures. Policies should focus on inclusive infrastructure design, ensuring that housing, transport and public spaces are accessible to those with mobility challenges or disabilities associated with ageing. Lastly, integrating climate resilience into healthcare systems, particularly those serving elderly populations, will ensure that their unique needs are addressed during climate-related events such as extreme heatwaves or storms.

C. Persons with disabilities: promoting accessibility and inclusion

114. Persons with disabilities face unique risks from climate change mitigation policies. While the transition to low-emission economies offers opportunities in emerging sectors, persons with disabilities may be excluded from those opportunities if policies do not promote inclusivity. In addition, the physical infrastructure required to support a transition to renewable energy or sustainable practices may not always be designed with accessibility in mind, further marginalizing this group.

115. When assessing the impacts of climate policies on persons with disabilities, it is essential to focus on both the economic and the social aspects of those impacts. The economic impacts include limited access to or exclusion from green job opportunities by persons with disabilities owing to a lack of suitable accommodations- such as inclusive transport infrastructure, non-adaptive equipment, and digital platforms- or appropriate training programmes (ILO, 2023). Addressing the needs of persons with disabilities could also involve mandating universal design principles that cater to people with mobility or sensory impairments.

116. Furthermore, policies should promote the inclusion of persons with disabilities in the green workforce by providing incentives for businesses to make reasonable accommodations and offer training programmes tailored to this group. Government financial support for assistive technologies that facilitate participation in the workforce is also crucial for enabling persons with disabilities to benefit from green job opportunities. Data on workforce participation for persons with disabilities in the green economy and the accessibility of infrastructure and assistive technologies will help policymakers gauge the inclusiveness of their policies.

D. Informal sector workers: Supporting transition and social protection

117. Informal sector workers, who make up a large portion of the workforce in many developing countries, are often some of the most vulnerable workers when it comes to climate change mitigation policies (C40 Cities, 2022). The vulnerabilities they face vary by sector and country. The main informal sectors impacted by climate change policies include agriculture, waste management, construction, and urban services such as street vending and informal transport, which are often subject to shifts in demand, rising input costs, and changing regulatory environments. In Indonesia for example, informal workers comprise 99 per cent of the workforce in the construction sector (Wijayaningtyas et al., 2022). Thus, mitigation measures in this sector must not exacerbate the vulnerabilities of informal workers but should be perceived as an opportunity for formalization of the workers and of the sectors they work in.

118. A unique category of informal sector workers is migrant workers and other displaced persons, who may find themselves in marginal socio-economic positions, often lacking legal protections and representations which may exacerbate vulnerabilities. Migrants have been shown to be overrepresented in low-skill, low-wage, and often precarious employment (ILO, 2020; IOM, 2020).

119. Informal sector workers operate outside the formal economy and as such, are often not protected by labour laws or social safety nets. As mitigation policies lead to structural changes in industries such as agriculture, construction, waste management and transportation,

informal sector workers are at risk of losing their livelihoods without the support needed to transition into new, more sustainable industries.

120. Assessing the impacts of mitigation policies on informal sector workers requires a focus on both economic and social dimensions of those impacts. The economic impacts are clear: when informal workers lose their jobs and have no alternative sources of income or opportunities for retraining, they will face poverty. Socially, informal workers may not have access to the benefits of climate resilience initiatives, such as social protection mechanisms or retraining opportunities. Accurate and up-to-date data and information on the size of the informal economy and the specific sectors most impacted by mitigation policies will help policymakers understand where these workers are most at risk. Assessments should also consider labour changes in the informal economy by using tools, for example, voluntary surveys to investigate impacts on informal sector workers over time. Tracking access to social protection and skills development programmes for informal workers will help assess the inclusivity of policies.

121. To address the needs of informal sector workers in climate policy impact assessment, policymakers should focus on formalizing informal labour markets by creating pathways for informal workers to transition into the formal economy. Offering training and retraining programmes tailored to informal sector workers can help them acquire the skills needed to participate in green jobs. These programmes should be designed to be flexible, affordable and accessible to informal workers, many of whom have limited access to education or training resources. Providing social protection to informal workers, such as health insurance, pensions and unemployment benefits, will ensure they are not left behind in the transition to a green economy.

VI. Government initiatives to minimize the adverse impacts of response measures on people in vulnerable situations

122. Good climate policies not only cut emissions but also take a people-centred approach in order to ensure people are not left behind. Countries around the world are implementing strategies that address power imbalances, historical inequities and economic disruptions through inclusive decision-making and equitable distribution of costs and benefits.

123. South Africa's Presidential Climate Commission exemplifies an inclusive governance model. Established in 2020, the Commission brings together Government, business, labour, civil society and community leadership to build consensus on climate policies. Its focus on transparency, community engagement and adoption of a just transition framework in 2022 highlight that inclusive policymaking accelerates policy implementation and fosters public trust (Presidential Climate Commission, 2022).

124. Spain and Scotland have also institutionalized just transition principles. Spain's Just Transition Agreements provide financial support, retraining programmes and economic diversification strategies for coal-dependent regions, ensuring that workers affected by the clean energy transition are not left behind(Ministry for Ecological Transition and Demographic Challenge, 2023) Similarly, Scotland's Just Transition Commission advises the Government on achieving net zero emissions while protecting workers and communities and encouraging social dialogue between labour unions, businesses and policymakers (Just Transition Commission, 2024).

125. To ensure a just transition in Chile, the Government has developed a just transition strategy for the energy sector to guide the phase-out of coal. It outlines four key priorities for the energy sector, namely people-focused transition, economic development and productive promotion, environmental development and territorial approach, and participatory governance and public–private articulation (UNFCCC-KCI, forthcoming-b).

126. The financing of just transitions is key to their success. The Canadian Government has made significant investments in the workers and communities most affected by the phase-out of coal mines in the country. In its 2019 budget, Canada allocated 35 million Canadian dollars for transition centres supporting skills development and community development initiatives. The Government also earmarked 150 million Canadian dollars for infrastructure

and economic diversification policies for communities affected by the phase-out (UNFCCC-KCI, forthcoming-b).

127. Canada's climate action is being co-shaped by the leadership of Indigenous Peoples. The Indigenous Climate Leadership Agenda, backed by an investment of USD 29.6 million, supports self-determined climate solutions, ensuring that policies respect Indigenous Peoples' sovereignty and knowledge systems (Government of Canada, 2023). Elsewhere though, challenges remain as seen in New Zealand, where Māori knowledge systems (mātauranga Māori) have been marginalized in climate policymaking and implementation processes, demonstrating the need for deeper decolonization of governance structures (Ministry for the Environment of New Zealand, 2022).

128. Regarding addressing the intergenerational equity dimension of climate policy, Germany and France provide relevant models. A Constitutional Court ruling in Germany in 2021 mandated stronger climate policies to prevent burdening future generations, leading the Government to bring forward its carbon neutrality target from 2050 to 2045 (German Federal Ministry for the Environment, 2021). France has also developed a 15-step national heatwave plan to protect vulnerable populations, which involves early warning systems, public cooling centres and the mobilization of youth to support at-risk individuals (French Ministry of Ecological Transition, 2024; The Connexion, 2023).

129. Economic security is another critical aspect of a just transition. The European Commission Just Transition Fund has disbursed EUR 19.7 billion to fossil fuel dependent regions, helping them shift towards sustainable industries (European Commission, n.d.). Estonia, for example, has used the Fund to partially financially support workers laid off as a result of the phase-out of shale oil (UNFCCC-KCI, forthcoming-b). Norway's Sovereign Wealth Fund, financed by oil revenues, ensures long-term financial stability for the country while investing in green technologies (Norwegian Ministry of Finance, 2022). The Republic of Korea's Green New Deal integrates climate goals with social protections, aiming to create 1.9 million green jobs while supporting workers by the transition (Ministry of Economy and Finance, Republic of Korea, 2020).

130. Costa Rica provides an example of successfully integrating environmental conservation with economic security. Its Payments for Ecosystem Services programme compensates farmers and Indigenous communities for protecting forests, thus ensuring that conservation efforts support local livelihoods (United Nations Environment Programme, 2021). Colombia links climate action with post-conflict recovery under its Amazon Vision Program, which combines conservation initiatives with job creation for Indigenous communities and former combatants (Ministry of Environment and Sustainable Development, Colombia, 2022).

131. The United States applies layered policy frameworks to align emission targets with economic protection. The Inflation Reduction Act (2022), which represents the largest federal climate investment, incorporates workforce development and economic diversification programmes for fossil fuel dependent communities (United States Environment Protection Agency, 2025). At the state level, California, recognizing that gender equity is fundamental to effective climate action, has developed gender-responsive climate policies to ensure that women's leadership and participation are embedded in climate decision-making (California Air Resources Board, 2023).

132. As countries navigate the complexities of climate transition, financial mechanisms play a crucial role in ensuring fairness in the transition. In Germany, youth organizations advocate for financing climate action through debt reform and progressive taxation, arguing that austerity measures disproportionately impact vulnerable groups (European Youth Forum, 2024). This approach highlights the need for equitable financing strategies that do not place the cost of mitigation on those least responsible for emissions.

133. These diverse examples show that by integrating social justice into climate action, ambitious mitigation policies and equity goals need not be seen as competing priorities but rather as essential elements of effective and fair climate governance. Ensuring that transitions are just and inclusive will determine whether climate policies empower societies or deepen existing inequalities.

VII. Conclusions

134. The complex landscape of climate change mitigation demands that response measures be implemented in a just, inclusive, and sustainable manner. Meaningful climate action must be grounded in careful consideration of multidimensional impacts on various stakeholders, particularly those in vulnerable situations.

135. The findings confirm that success in climate action depends not only on reducing greenhouse gas emissions but also on how these reductions are achieved. Without deliberate safeguards, response measures risk exacerbating existing inequalities. Women, youth, local communities and Indigenous Peoples, the elderly, and informal workers often disproportionately bear adverse impacts—such as job displacement, diminished access to resources, and increased time poverty due to caregiving responsibilities.

136. Well-designed mitigation policies can generate significant positive outcomes. Gender-responsive energy policies can improve women's health, reduce unpaid care burdens, and support girls' education. Inclusive climate governance and targeted support for women in green sectors can advance gender equity by fostering economic empowerment and leadership opportunities. For Indigenous Peoples, recognizing and integrating traditional knowledge into climate action can enhance biodiversity conservation, strengthen community resilience, and promote culturally appropriate solutions. When Indigenous rights, free, prior and informed consent, and land access needs are recognized, climate policies contribute to stronger stewardship of natural resources and more equitable benefit-sharing. These examples illustrate that intentionally participatory and inclusive response measures can become powerful tools for advancing both climate and social justice objectives.

137. The report outlines a range of methodologies to assess the impacts of climate change mitigation policies, particularly on vulnerable groups with a view to make them inclusive. These include household-level socioeconomic analysis, which captures changes in income, resource access, and adaptive strategies; remote sensing and GIS, used for tracking land-use changes and ecosystem impacts; and macroeconomic scenario modelling, such as computable general equilibrium models, which simulate economy-wide effects like employment shifts and income distribution. Additional tools and methods include cost–benefit analysis, indices such as the Household Energy Burden Index, mixed-method approaches combining surveys with modelling, and gender impact assessment methods. Participatory research methods and intersectional analysis further enrich understanding by incorporating local knowledge and uncovering overlapping vulnerabilities related to gender, age, and class. These methodologies not only assess outcomes but also identify risks, trade-offs, and opportunities, ensuring that mitigation efforts are inclusive, just, and effective. Collectively, they improve evidence-based policymaking by connecting micro-level effects with macro-level trends and highlighting the need for safeguards, compensation mechanisms, and inclusive planning processes.

138. Policy impact assessments have become indispensable tools for designing inclusive and effective response measures. This report highlights key considerations, data sources, and tools to support such assessments, particularly regarding marginalized groups. Multidimensional impact assessments provide a comprehensive framework for evaluating climate policies across economic, social, and environmental dimensions. When carefully designed and implemented, climate mitigation measures can have lasting effects on both present and future generations—shaping labour dynamics, skill requirements, gender distribution of employment opportunities, and community access to natural resources. By embedding intergenerational equity as a core principle and applying long-term indicators alongside scenario modelling, policymakers can better anticipate and mitigate adverse impacts while maximizing co-benefits. These assessments help build a robust evidence base on response measures, informing future policy development with empirical insights. Ultimately, the urgent task of climate change mitigation cannot be separated from the imperative of sustainable development and social justice—ensuring response measures benefit all segments of society and leave no one behind.

139. Moving forward, several strategic directions stand out for policymakers and stakeholders:

(a) Policy Coherence: Ensuring alignment between response measures and national development frameworks, as well as international commitments, is essential for effective implementation. Strong governance and policy coherence enhance the maximization of co-benefits and facilitate the development of integrated safeguards, such as connection with national social protection frameworks.

(b) Participatory Governance: Climate policy development must actively engage those most affected, ensuring that marginalized voices shape the decisions that impact their lives. This includes meaningful representation of women, Indigenous Peoples, local communities, and youth in decision-making processes.

(c) Multi-Dimensional Assessment Approaches: Climate policies must be evaluated across economic, social, environmental, and governance dimensions to avoid unintended burdens on vulnerable groups and maximize positive outcomes.

(d) Data-Driven Policy Design: Integrated data frameworks with disaggregated information are essential for planning, monitoring progress and impacts, enabling evidence-based adjustments to ensure desired benefits and no one is left behind. Careful consideration should be given in the collection of data on historically excluded populations, such as disaggregated gender data, data on children, youth, local communities and Indigenous Peoples amongst others, in order to understand the impacts of response measures on such groups,

(e) Economic and Social Safeguards: Transition strategies must incorporate robust support mechanisms including retraining programs, social protection, and diversification strategies to prevent disproportionate burdens on vulnerable populations.

140. Based on these conclusions the following recommendations are formulated:

(a) Ensure the coherence of mitigation policies across different sectors to prevent or minimize negative spillover effects and to maximize the benefits of response measures;

(b) Integrate impact assessments as part of climate policy design, thus ensuring comprehensive analysis of the socioeconomic and environmental impacts of response measures, including as they relate to intergenerational equity, gender and the needs of people in vulnerable situations;

(c) Establish multistakeholder platforms that adequately engage women, the youth, children, persons with disabilities and that include local communities and Indigenous Peoples' knowledge into climate policies to ensure fair distribution of benefits and burdens and incorporate traditional and local knowledge to enhance the legitimacy and effectiveness of climate policies;

(d) Redesign educational curricula, including curricula for technical and vocational education and training, and develop skilling and reskilling programmes for youth, to ensure improved competencies in participating in a green economy. In parallel, design and implement training programmes that facilitate women's participation in green jobs and in leadership roles in climate governance to ensure gender-inclusive workforce development;

(e) Include considerations of the rights of children and Persons with Disabilities in the design and implementation of climate policies and incorporate, programs ensuring safe and equitable access to infrastructure, inclusive communication on climate initiatives, and equitable distribution of green jobs with sufficient accommodations.

(f) Strengthen existing or implement new social protection mechanisms, including reskilling initiatives, employment guarantees and income support, and target them to communities disproportionately affected by climate mitigation policies. At the same time enhance access to concessional finance and grant-based funding mechanisms to ensure that response measures do not exacerbate existing economic vulnerabilities;

141. Stakeholders such as civil society organizations, businesses, research institutions and financial institutions should:

(a) Integrate social and environmental responsibility into corporate climate strategies, thus ensuring that transitions to low-emission economies benefit all societal groups;

(b) Collaborate with governments to ensure that climate policies include social safeguards, such as compensation for affected workers and the development of alternative local economic development pathways;

(c) Enhance research by investing in systems for collecting disaggregated data that will enable assessment of the different impacts of response measures on youth, women, local communities and Indigenous Peoples, persons with disabilities, children and other people in vulnerable situations;

(d) Promote community-led solutions to climate change that empower Indigenous Peoples, local communities and other groups of people in vulnerable situations;

(e) Include the consideration for social impact in providing finance.

142. The secretariat and the UNFCCC constituted bodies may consider to:

(a) Develop standardized methodologies and guidelines for assessing the economic, social and environmental impacts of response measures across different regions, sectors and populations;

(b) Organize workshops, technical dialogues and regional events to facilitate the exchange and dissemination of best practices on just transition and equity-centred policy design;

(c) Assist countries in integrating intergenerational equity, gender considerations and the rights of Indigenous Peoples, local communities and people in vulnerable situation into their climate action plans and NDCs.

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