



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

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For further information contact:

Main office

UNFCCC secretariat

UN Campus

Platz der Vereinten Nationen 1

53113 Bonn

Germany

Telephone +49. 228. 815-10 00

Telefax +49. 228. 815-19 99

Email: secretariat@unfccc.int

Website: <https://unfccc.int>

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United Nations Climate Change
Katowice Committee on Impacts

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

Mandate description

This work is an output of the implementation of activity 9 of the workplan of the forum on the impact of the implementation of response measures and its Katowice Committee of Experts on the Impacts of the Implementation of Response Measures¹.

Activity 9: Identify and assess the impacts of the implementation of response measures taking into account intergenerational equity, gender considerations and the needs of local communities, indigenous peoples, youth and other people in vulnerable situations.

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Lead Author: Kusum Lata (UNFCCC)

Contributors: Angelina Tutuah Mensah (KCI, Ghana); Agung Adhiasto (UNFCCC); Philip Bonera Bananayo (UNFCCC)

Reviewers: Gita Gardner (KCI, Antigua and Barbuda); Steven Brine (KCI, Australia); Angelica Romero (KCI, Chile); Ivone Kaizeler (KCI, Estonia); Stanislas Stephen Mouba Olouna (former KCI, Gabon); Moustapha Kamal Gueye (KCI, International Labour Organization); Ali Shareef (KCI, Maldives); David Heck (KCI, Germany); Sofia Litvinova (KCI, Russian Federation); Noura Alissa (KCI, Saudi Arabia); Peter Govindasamy (KCI, Singapore); Mustafa is-hag Abdullah Yahia (KCI, Sudan).

Design: Sangeeta Mande (RangSangat Kala Kendra, New Delhi, India)

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Preface

By the Co-chairs of the Katowice Committee of Experts on the Impacts of the Implementation of Response Measures

Climate change mitigation is reshaping economies and societies at an unprecedented pace. As countries accelerate efforts to reduce greenhouse gas emissions and advance low-emission development pathways, the ways in which climate policies affect people—across generations, genders, communities, and regions—have become central to effective and just climate action. This policy brief seeks to highlight this phenomenon and provide insights on approaches to minimize potential adverse impacts on people in vulnerable situations while ensuring the benefits are equitably distributed. It brings together emerging evidence, methodologies and practical insights to help policymakers assess and anticipate the socioeconomic, environmental and distributional impacts of mitigation measures.

By placing intergenerational equity, gender equality, local community well-being and the rights of Indigenous Peoples at the heart of climate policy assessment, the brief underscores that ambitious climate action and equity are mutually reinforcing goals. It highlights that while mitigation policies generate new opportunities—green jobs, cleaner technologies, economic diversification—they can also intensify existing vulnerabilities when not carefully designed.

This policy brief aims to support policymakers, practitioners and stakeholders in developing inclusive, evidence-based climate policies aligned with the principles of just transition. Through illustrative examples, methodological guidance and actionable recommendations, it seeks to ensure that climate response measures leave no one behind and that the transition to a sustainable future is equitable, participatory and grounded in the lived realities of the people it intends to serve.



Moustapha Kamal Gueye



Angelina Tutuah Mensah

Acronyms and abbreviations

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



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Background

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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.



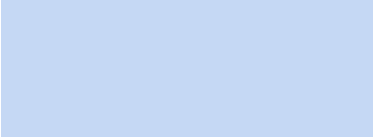
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Intergenerational equity

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A. Understanding intergenerational equity and why it matters

8. Ensuring intergenerational equity will be key in the transition to low carbon economies. 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. Recent data suggests that an estimated 25 per cent of the world's population are children between 0-14 years of age (UNCTAD, 2024), and are at risk of taking over a planet threatened by increased climate challenges.
9. Thus, it is important that actions and strategies responding to the increasing threats of climate change consider both present and future generations. This has been reiterated by various scholars positing that the approaches taken to manage nature and the environment can threaten human survival (Gündling, 1990). Similarly, (D'Amato, 1990) discusses how environmental action could have long-lasting environmental and social effects.
10. The policy brief "To think and Act for Future Generations" by the United Nations Executive Office of the Secretary-General (EOSG) also highlights that actions today may have some negative impacts, for example with regards to biodiversity loss, pollution, exacerbated inequalities, unsustainable consumption and production patterns, amongst others. On the other hand, it also emphasizes the potential of technological advancements in creating opportunities for the good of both present and future generations (Secretary-



General (EOSG), 2023). This implies 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.

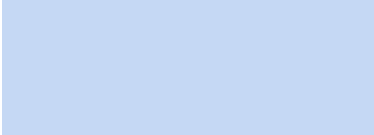
11. While a consensus on the definition of intergenerational equity has not yet been reached, intergenerational equity can be understood as a concept that advocates for fairness between present and future generations (Weiss, 2021). Its recent origins can be traced to the first principle of the Stockholm Declaration of the United Nations Conference on the Human Environment of 1972 that states, in part; "Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations" (United Nations, 1973). Similarly, the third principle of the Rio Declaration on Environment and Development of 1992 also states that "The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations" (Convention of Biological Diversity, 2006).
12. Multilateral discussions on the concept of intergenerational equity are still ongoing. For instance, the report of the United Nations Secretary General on intergenerational solidarity outlines how intergenerational equity could be addressed within the United Nations and analyses how it is incorporated into sustainable development, current treaties, resolutions, and intergovernmental decisions (United Nations, 2013). The Secretary General's policy brief "To think and Act for Future Generations" also reiterates a vision for a declaration to define and make concrete the duties to future generations as well as a dedicated forum to advance its implementation (Secretary-General (EOSG), 2023). These efforts culminated in the High-Level Committee on Programmes (HLCP) developing a set of common principles for the United Nations system which would serve as a basis for shared understanding of future generations and intergenerational equity (United Nations-CEB, 2023).
13. Lastly, 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

14. Ensuring intergenerational equity requires analysing how response measures could affect future generations. From the environmental dimension, a focus area is the sustainable management of natural resources to ensure equitable access to resources for future generations. Climate policies made today can simultaneously 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.
15. 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. It is critical to ensure that current actions do not result in 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, it is important to consider the long-term requirements of the green transition. These include sufficient investments and reforms in the education sector to ensure long-term compatibility between labour demand and supply.



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16. 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.

Gender considerations

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17. Climate change impacts on women and men often differ owing to historical and current gender inequalities and multidimensional factors, and may lead to exacerbated vulnerabilities for women (Turquet et al., 2023; Fruttero et al., 2023; Onyango et al., 2023). Similarly, gender roles, sociocultural norms, and systemic barriers can significantly shape how women experience the effects of climate policies.
18. 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 (ILO, 2017). Thus, any assessment of climate policy impacts on women may benefit from considering both formal and informal economies to ensure specific needs are not overlooked in decision-making.
19. 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

¹ Decision 7/CP.29.

can not only enhance gender equality but also contribute to more ambitious climate action.

20. 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 KCI has also undertaken gender-disaggregated impact assessment research [see for example (KCI, 2022; UNFCCC-KCI, 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 (see for example, GEF, 2024). Similarly, the Green Climate Fund incorporates in its programming gender-responsive impact assessments, stakeholder consultations and initiatives that promote gender equality and women's empowerment in climate action.³
21. 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



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² Green Climate Fund gender assessment and action plan template: https://www.greenclimate.fund/sites/default/files/document/form-09-gender-assessment-and-action-plan-template_0.pdf

(WHO, 2011). Women often experience higher exposure to indoor air pollution from traditional cooking methods. Transitions to cleaner energy sources can significantly improve their respiratory health and reduce their disease burden (WHO, 2014). Therefore, it is imperative that cleaner energy sources be affordable and accessible in order to reap these benefits. Other co-benefits of gender-responsive mitigation policies include reducing the time poverty of women,⁴ improving educational outcomes for girls and enhancing livelihood opportunities for women entrepreneurs, for instance in the renewable energy sector (Chandrasekaran et al., 2023).

22. Gender considerations in climate change mitigation policies in agriculture, forestry and land use sectors can enhance women's land rights, decision-making power and access to resources. Gender-responsive approaches to climate-smart agriculture have been demonstrated to improve both productivity and women's empowerment (FAO and CARE, 2019; Puskur and Aayushi, 2024). Payments for ecosystem services programmes that actively include women as beneficiaries have been shown to have positive impacts on household income and women's 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. Larson et al. (2018), find that for REDD+ activities, limited gender considerations resulted in disproportionate decrease in perceived welfare outcomes amongst women. Bryan et al. (2024) also emphasize that climate action in food systems and agriculture that do not adequately take gender differences may exacerbate inequalities in food systems such as the reduction of decision-making abilities, declining incomes, and reduced access and control of assets.
23. The underrepresentation of women in climate governance and the lack of appropriate gender expertise can lead 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 (Salamon, 2023; Ortiz and Ensor, 2023). 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). 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

⁴ 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).

socially acceptable solutions (IPCC, 2023). These studies hence demonstrate the importance of meaningfully engaging women and gender-diverse groups in policy design, planning, implementation, and monitoring, evaluation and learning processes.

24. Mitigation policies can also 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 (Addati et al., 2018). Well-designed clean energy transitions can significantly reduce the time women spend collecting firewood and other household tasks. Some studies have shown 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, thus, 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. To understand gendered impacts, some assessments have utilized time-use surveys to understand the impacts of climate policies on the distribution of unpaid care work and on women's time poverty (Elson, 2017).

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

1. Gendered social effects

25. 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 (WHO, 2025). The Global Health Observatory data can 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.
26. Similarly, national demographic and health surveys that include gender-disaggregated data are invaluable for exploring how climate change mitigation policies impact women's health (see for example, USAID, n.d). These surveys collect information on diseases and conditions that may be exacerbated by climate change, including respiratory diseases and heat stress, as well as relevant household characteristics such as the use of clean fuels and technologies.

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.

27. Health impact assessments also offer a comprehensive approach to understanding how mitigation policies might influence public health. 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 (Delpla et al., 2021; Hess et al., 2020). These 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.
28. Gender-responsive budgeting methodologies can assess how financial resources allocated to climate change mitigation are distributed between genders (UNDP, 2021). 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, 2023b).
29. 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 (Jost, Ferdous, and Spicer, 2014). 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).

Sector spotlight: Gender-responsive impact assessment in the transport sector

30. When designing response measures or assessing their impacts in the transport sector 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 (Gauvin et al., 2020; Pourhashem et al., 2022; Borker, 2024). 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. It is, therefore, important for impact assessments to 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 (International Transport Forum/OECD, 2023).
31. It is also important for assessments to account for the unique barriers that women 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.
32. Integrating safety and security indicators such as the prevalence of gender-based violence, public perceptions of safety, and the availability of gender-responsive infrastructure—like the access to and availability of well-lit pathways, secure waiting areas and emergency response systems—can provide a fuller picture of gendered impacts when evaluating mitigation policies in the transport sector. 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. Gender-responsive climate change mitigation policies will, thus, be key in ensuring that infrastructure developed as

part of energy-efficient transport systems is designed with women's specific needs in mind.

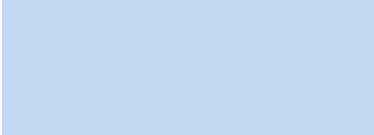
33. The UNDP Gender and Climate Change Adaptation Toolkit (UNDP, 2024) offers valuable insights into integrating gender-sensitive safety considerations into urban mobility planning. The toolkit provides guiding questions and a framework for ensuring that mitigation policies do not unintentionally exacerbate 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

34. 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. Some estimates suggest that 80% of potential new jobs created through transition away from fossil fuels will be in male-dominated industries, with only 20% being in industries dominated by women (UN Women, 2023a). This may be due to structural barriers, skills gaps, and gendered labour market segmentation. Without targeted policies to address these challenges, these disparities can hinder women's economic empowerment and exacerbate existing inequalities (International Labour Office, 2018; ILO, 2022a).



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35. Comprehensive impact assessments can not only help 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 can take into account 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).
 36. Gender-disaggregated employment data are valuable for tracking the impacts of climate policies across industries. Policymakers can take into account the proportion of men and women employed in various sectors, especially in low-emission industries, and monitor how those proportions change as climate policies are implemented. Participation rates in reskilling and capacity-building programmes could 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

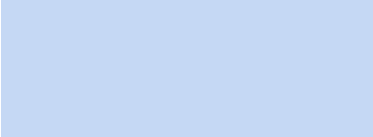
37. The UNDP Gender Responsive Indicators guide is an important resource for ensuring that impact assessments of gender dimensions are comprehensive and effective (UNDP, 2020a). By incorporating gender-disaggregated data into their evaluations, policymakers can monitor and analyse how effectively women 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.
38. 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. Time-use surveys, conducted by national statistics offices [see for example (Government of India, 2025)] and organizations such as the United Nations Statistics Division [see for example (UN Statistics Division, 2025)], provide critical insights into the

division of labour in households and can highlight whether energy transitions alleviate or exacerbate time poverty among women. They can assist the policymaking process by tracking daily hours spent on unpaid work by gender, and thus, help determine whether mitigation policies increase or decrease the workload burden on women over time (Charmes, 2019). It is, therefore, necessary that impact assessments consider how mitigation policies affect the redistribution of unpaid labour and the security of informal work.

39. 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.
40. 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).
41. 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

42. 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. Such strategies may limit women's access to critical natural resources needed. It is important that this be considered in impact assessments. In assessing these impacts, policymakers can 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).

43. There is also a risk that some climate policies such as the installation of renewable energy projects, 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.
44. Access to climate finance and social protection 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 can 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, can 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

45. 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.

46. 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 integrity⁵.



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47. 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)

48. 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

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

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

49. Case studies and comparative studies can be used to examine how gender considerations are integrated into mitigation projects. For example, a global comparative 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). The study utilized indicators on the women's knowledge of REDD+ activities; involvement in decision-making; and women's participation rates in forest decisions to determine the role of women in REDD+ implementation. The study concluded that "participation" itself is not sufficient for women's empowerment, and analyses could also consider social and cultural norms in assessing REDD+ initiatives.

4. Intersectional analysis

50. 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

51. Different gender impact assessment methodologies have various strengths (UN Women, 2021; European Institute for Gender Equality, 2016). One key advantage 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 and boys. By safeguarding against potential pitfalls and maximizing potential benefits, better climate policies can be designed.

52. 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.
53. Another advantage of these methodologies is their direct and indirect effects on the demand for more and better statistics and sex-disaggregated data. Such statistics and data not only enrich the policymaking process but also enhance understanding of gendered structural inequalities.
54. 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.
55. 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.
56. 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 on gender-responsive assessment of response measures

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

57. 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.
58. 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

59. 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 Arofah, 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).

60. 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.



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Local communities and Indigenous Peoples

4

61. 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 can 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).
62. Steps have been taken to strengthen the engagement of local communities and Indigenous Peoples 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

63. Local communities and Indigenous Peoples 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 local communities and Indigenous Peoples 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.

64. 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 local communities and Indigenous Peoples and compromise the effectiveness of collective efforts to address climate change.
65. 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, 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.
66. Assessing the integration of knowledge systems belonging to local communities and Indigenous Peoples 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 can 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

67. Shifts to low-emission energy systems and large-scale land-use changes can have far-reaching implications for local communities and Indigenous Peoples. 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 (Yenneti, Day, and Golubchikov, 2016). 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 (Amber, Agrawal, and Zoe, 2023).
68. 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).



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69. 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).

70. 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 local communities and Indigenous Peoples 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). For example, Wade and Ellis (2022), highlight how the risk of the assetization of wind resources by various interest groups such as landowners and public authorities can exacerbate inequalities within communities.
71. Assessing the impacts of mitigation policies on local communities and Indigenous Peoples requires a comprehensive analysis of how transitions affect land security, resource access and socioeconomic stability. Land tenure records, such as those compiled by FAO (2025), provide critical insights into ownership patterns and potential displacement risks. 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).
72. Community-based surveys and sector-specific labour market data also contribute to understanding economic displacement and just transition pathways. These tools can help evaluate whether affected workers in local and indigenous communities can access new opportunities in the green economy and whether policies are effectively addressing the needs of vulnerable groups.

3. Ensuring free, prior and informed consent

73. 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).

74. Effective climate policy design requires transparent, participatory decision-making that respects Indigenous governance structures and customary laws. Dialogue between governments, private sector actors, and communities prior to project implementation can help reflect community perspectives and views on proposals affecting their lands and resources.
75. 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 critical to ensuring the aversion of harm to Indigenous Peoples.

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

76. 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

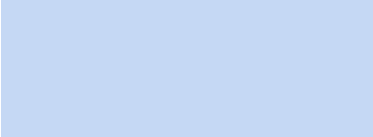
77. Household surveys are widely used to collect data on income levels, land-use practices and adaptation strategies. Studies show that household-level socioeconomic analysis is critical in identifying how mitigation policies shift income distribution and economic resilience across different societal groups.
78. 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).

79. Similarly, in Ethiopia, an analysis of a forest carbon project used the sustainable 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.
80. 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

81. 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.
82. 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.

83. 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

84. 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.
85. 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).
86. 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).

87. Similarly, in a 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, 2025). 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.



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88. The findings from the socioeconomic impact analysis indicated that the mitigation policies would result to reduced household welfare, driven by higher production costs and declining wages. The study also disaggregated results by income levels showing that welfare increases were only experienced by households in the top two income brackets and the lowest income bracket. The lowest income households were shielded from impacts due to government transfers while the richest two households benefit from higher capital returns. The analysis illustrates the importance of domestic interventions that minimize the negative consequences of mitigation actions and highlights the concerns regarding the equitable distribution of benefits from climate policies.
89. The above studies illustrate that with sufficient data, macroeconomic modelling can be used to assess welfare impacts of households in different communities. Such modelling can also be important in evaluating inequality outcomes from the implementation of various mitigation policies.

4. Mixed-method approaches

90. 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.
91. 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.
92. 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.
93. The table below provides a summary of the methodologies and indicators for assessing the impacts of climate policies on local communities and Indigenous Peoples. This table is not exhaustive and serves to highlight a few examples.

Table: 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 local communities and Indigenous Peoples

94. 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.
95. 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 (Kilic et al., 2017).



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96. However, household surveys have notable limitations. Data collection is time-consuming and resource-intensive, requiring significant effort to gather reliable, representative samples (Kilic et al., 2017). 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 can capture localized economic effects such as remote indigenous communities, they may struggle to connect the findings to broader environmental or policy-level trends, making it difficult to assess large-scale mitigation impacts comprehensively.

97. Remote sensing can be 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. Remote sensing also allows for data collection for a wide coverage and provide multi-temporal and multispectral capabilities (Yang et al., 2013). This could be useful in assessing changes over time in land and resource use and access in communities affected by policies such as those in the forestry sector.
98. 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 (McCarthy et al., 2025), such as those of farmers or pastoralists affected by policies. In addition, interpretation challenges arise when trying to attribute observed land-use changes directly to policy interventions (Bojer et al., 2025), as multiple external factors such as climate variability and local governance may also play a role in such changes.
99. 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.
100. 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, local communities and Indigenous Peoples, 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.

101. 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 on the impacts of response measures on local communities and Indigenous Peoples

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

102. 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.

103. 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

104. 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.

105. Tladi, Kambule, and Modley (2024) conduct 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.
106. 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 a 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.
107. 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.

Assessment of climate policy impacts on other groups in vulnerable situations

5

108. 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

109. 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 (ILO, 2022b). As countries move towards green low-emission economies, these sectors may 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.

110. 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 (ILO, 2022b). 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.
111. Facilitating youth participation in climate policy development is essential in ensuring that young people are not only the recipients of climate action but also active contributors to shaping the future of climate policy. It is crucial to develop targeted interventions that promote skills development and green job creation for the youth. Interventions can include training programmes for skills required in emerging sectors, especially in locations where climate policies are likely to lead to job displacement (see for example UNDP Viet Nam, 2025). Measuring youth participation in policy development and decision-making processes can also provide valuable insights into the inclusivity of climate policies for youth.
112. Similarly, prioritizing reskilling programmes to smoothly transition out-of-work youth into green sectors is key for a just transition. Policymakers can consider creating incentives, such as financial subsidies and tax breaks, support to public, private, and micro-entrepreneurs with high potential for youth employment, and active labour market policies– such as support to green enterprises employing the youth (ILO, 2019). Creating alternative employment opportunities is also crucial to avoid youth migration in search of jobs, as is implementing labour policies that efficiently manage and accommodate both transitioning workers and new workforce entrants.
113. Finally, it is important to consider the needs of children in climate impact assessments. Despite being among the 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 can 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

114. Elderly people face unique challenges relating to climate change mitigation policies. Since the elderly generally experience a reduction in incomes over their lifetimes in most low- and lower-middle income countries (Yang and Suh, 2021), policies that increase the cost of living or energy prices disproportionately affect older individuals who may already be struggling to meet their basic needs. For countries with limited resources for public programs such as social protection mechanisms, these effects have been shown to be exacerbated (Tian et al., 2023). In some countries, elderly people are also more likely to live in energy-inefficient housing (Office for National Statistics, 2021), face mobility issues, or have health conditions that make them more vulnerable to the physical and social impacts of climate change (Miller, Vine, and Amin, 2017). Unless mitigation policies specifically address the needs of older populations, the transition to low-emission economies could exacerbate their vulnerabilities.



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115. Thus, assessing the impacts of mitigation policies on the elderly requires a focus on both economic and social dimensions of those impacts. Understanding how changes in energy pricing, transportation systems or housing policies might affect elderly individuals is key in designing and implementing climate policies. Data on the income and pension levels of elderly people, particularly those on fixed incomes, are therefore 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) can 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.

116. Social protection mechanisms that shield older individuals from economic disruptions can help to minimize the negative impacts of response measures on the elderly. Strengthening pension systems and ensuring that elderly populations have access to adequate healthcare are key measures. Policies can 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

117. Persons with disabilities also 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.
118. When assessing the impacts of climate policies on persons with disabilities, it is also 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, 2023a). Addressing the needs of persons with disabilities could also involve mandating universal design principles that cater to people with mobility or sensory impairments.
119. Furthermore, policies could also 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 can help policymakers gauge the inclusiveness of their policies.

D. Informal sector workers: Supporting transition and social protection

120. Informal sector workers, who make up a large portion of the workforce in many developing countries, often face heightened vulnerabilities in the context of 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.
121. 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).
122. Informal sector workers operate outside the formal economy and as such, are often not protected by labour laws or social safety nets (OECD, 2023; ILO, 2023b). 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.
123. 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 informal workers are most at risk. Assessments can 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.

124. To address the needs of informal sector workers in climate policy impact assessment, policymakers can 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, can ensure they are not left behind in the transition to a green economy.



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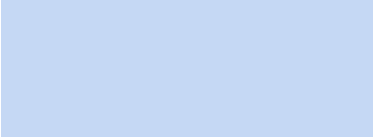
Government initiatives to account for the needs of people in vulnerable situations

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125. 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.
126. 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).
127. 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).
128. 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, 2025).

129. 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, 2025).
130. Canada's climate action is being co-shaped by the leadership of Indigenous Peoples. The Indigenous Leadership Fund, backed by an investment of CAD 180 million, supports Indigenous-owned and -led renewable energy, energy efficiency, and low-carbon heating projects to support Indigenous climate action (Government of Canada, 2025). 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).
131. With regards to 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).
132. 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, 2025b). 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).

133. 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).
134. The United States has applied 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).
135. 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.
136. 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.

Conclusions

7

137. 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.
138. 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.
139. 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.

140. 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.



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141. 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, 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.

142. 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 data and 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.

143. 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;

144. Stakeholders such as civil society organizations, businesses, research institutions and financial institutions may consider to:

- 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.
145. 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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References

- Addati L, Cattaneo U, Esquivel V, et al. 2018. *Care work and care jobs for the future of decent work*. ILO. Available at <https://www.ilo.org/publications/major-publications/care-work-and-care-jobs-future-decent-work>.
- Adom RK, Reid M, Afuye GA, et al. 2024. Assessing the Implications of Deforestation and Climate Change on Rural Livelihood in Ghana: a Multidimensional Analysis and Solution-Based Approach. *Environmental Management*. 74(6): pp.1124–1144. Available at <https://doi.org/10.1007/s00267-024-02053-6>.
- Aggarwal A and Brockington D. 2020. Reducing or creating poverty? Analyzing livelihood impacts of forest carbon projects with evidence from India. *Land Use Policy*. 95: pp.104608.
- Alkire S, Meinzen-Dick R, Peterman A, et al. 2013. The Women's Empowerment in Agriculture Index. *World Development*. 52: pp.71–91. Available at <https://www.sciencedirect.com/science/article/pii/S0305750X13001629>.
- Amber C, Agrawal S and Zoe C. 2023. Just transition in the northwest territories: Insights and values from indigenous and non-indigenous northerners. *Heliyon*. 9(8):. Available at <https://www.sciencedirect.com/science/article/pii/S2405844023060450>.
- Anderson N. 2009. *REDDy or not? The effects on indigenous peoples in Brazil of a global mechanism for reducing emissions from deforestation and degradation*.
- Astuti SP. 2017. *An analysis of household transition to modern fuel under Indonesia's energy conversion programme*.
- Astuti SP, Day R and Emery SB. 2019. A successful fuel transition? Regulatory instruments, markets, and social acceptance in the adoption of modern LPG cooking devices in Indonesia. *Energy Research & Social Science*. 58: pp.101248.
- Barnsley I. 2009. *UNU-IAS Guide: Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD): a Guide for Indigenous Peoples*. Institute of Advanced Studies, United Nations University.
- Bojer AK, Abshare MW, Mesfin F, et al. 2025. Assessing climate and land use impacts on surface water yield using remote sensing and machine learning. *Scientific Reports*. 15: pp.18477. Available at <https://doi.org/10.1038/s41598-025-03493-8>.
- Borker G. 2024. Understanding the constraints to women's use of urban public transport in developing countries. *World Development*. 180: pp.106589. Available at <https://www.sciencedirect.com/science/article/pii/S0305750X24000597>.
- Bryan E, Alvi M, Huyer S, et al. 2024. Addressing gender inequalities and strengthening women's agency to create more climate-resilient and sustainable food sys-

tems. *Global Food Security*. 40: pp.100731. Available at <https://www.sciencedirect.com/science/article/pii/S2211912423000615>.

Budya H and Yasir Arofah M. 2011. Providing cleaner energy access in Indonesia through the megaproject of kerosene conversion to LPG. *Clean Cooking Fuels and Technologies in Developing Economies*. 39(12): pp.7575–7586. Available at <https://www.sciencedirect.com/science/article/pii/S0301421511001534>.

C40 Cities. 2022. *How to support informal workers and economies in a just transition*. Available at https://www.c40knowledgehub.org/s/article/How-to-support-informal-workers-and-economies-in-a-just-transition?language=en_US#:~:text=In%20the%20Global%20North%2C%20informal,the%20delivery%20of%20climate%20actions.

California Air Resources Board. 2023. *Community Air Protection Program Blueprint 2.0*. Available at https://ww2.arb.ca.gov/sites/default/files/2024-04/BP2.0_FULL_FINAL_ENG_2024_04_09.pdf.

CGIAR. 2023. *CGIAR GENDER Impact Platform*. Available at <https://gender.cgiar.org/tools-methods-manuals/gender-action-learning-system-gals>.

Chandrasekaran M, Krishnapriya PP, Jeuland M, et al. 2023. Gender empowerment and energy access: evidence from seven countries. *Environmental Research Letters*. 18(4): pp.045003. Available at <https://dx.doi.org/10.1088/1748-9326/acc2d3>.

Charlebois S, Saxena S, Abebe G, et al. 2024. Implications of carbon pricing on food affordability and agri-food sector in Canada: A scoping review. *Transportation Research Interdisciplinary Perspectives*. 28: pp.101271.

Charmes J. 2019. *The Unpaid Care Work and the Labour Market: An analysis of time use data based on the latest World Compilation of Time-use Surveys*. ILO Geneva.

Clancy J, Barnett A, Cecelski E, et al. 2019. *Gender in the transition to sustainable energy for all: From evidence to inclusive policies*.

Convention of Biological Diversity. *Rio Declaration on Environment and Development*. Available at <https://www.cbd.int/doc/ref/rio-declaration.shtml>.

Curvelo WG and Schwartz S. 2023. Wayuu Winds. *Anthropology News*. 64(5): pp.34.

D'Amato A. 1990. Do We Owe a Duty to Future Generations to Preserve the Global Environment? *American Journal of International Law*. 84(1): pp.190–198. Available at <http://www.jstor.org/stable/2203019>.

Delpla I, Diallo TA, Keeling M, et al. 2021. Tools and Methods to Include Health in Climate Change Adaptation and Mitigation Strategies and Policies: A Scoping Review. *International Journal of Environmental Research and Public Health*. 18(5):

pp.2547. Available at <https://doi.org/10.3390/ijerph18052547>.

Ding H, Yu T, Levin D, et al. 2023. Tackling the challenges of assessing socioeconomic impacts of farmland restoration: The case of Malawi. *Ecological Indicators*. 148: pp.110068. Available at <https://www.sciencedirect.com/science/article/pii/S1470160X23002108>.

Elson D. 2017. Recognize, Reduce, and Redistribute Unpaid Care Work: How to Close the Gender Gap. *New Labor Forum*. 26(2): pp.52–61. Available at <https://doi.org/10.1177/1095796017700135>.

European Commission. n.d. *The Just Transition Mechanism: making sure no one is left behind*. Available at <https://chatgpt.com/c/67f5397e-6d5c-800e-8759-95d19b75c3f8>.

European Institute for Gender Equality. 2016. *Gender Impact Assessment: Gender Mainstreaming Toolkit*.

European Youth Forum. 2024. *Generation Austerity: When governments cut budgets young people suffer. Don't do it again*. Available at <https://www.youthforum.org/policy-library/generation-austerity-when-governments-cut-budgets-young-people-suffer-dont-do-it-again>.

Fajardo Mazorra AP. 2023. *The Role of Justice in Colombia's Renewable Energy Transition: Wind Energy Development in Wayúu Territory*.

FAO. 2025. *Governance of Tenure: SOLA Suite*. Available at <https://www.fao.org/tenure/sola-suite/en/>.

FAO and CARE. 2019. *Good Practices for Integrating Gender Equality and Women's Empowerment in Climate-Smart Agriculture Programmes*. Atlanta: FAO and CARE. Available at https://www.care.org/wp-content/uploads/2020/05/good_practices_integrating_3.26.19.pdf.

French Ministry of Ecological Transition. 2024. *Plan de gestion des vagues de chaleur*. Available at <https://www.ecologie.gouv.fr/sites/default/files/documents/Plan%20gestion%20des%20vagues%20de%20chaleur%20MAJ%202024%20V18-06-2024.pdf>.

Fruttero A, Halim DZ, Broccolini C, et al. 2023. *Gendered Impacts of Climate Change: Evidence from Weather Shocks*. Policy Research working paper. Washington, D.C.: World Bank Group. Available at <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099342305102324997/IDU0ba259bd2039ca04fa20b87a0893bb487e014>.

Gauvin L, Tizzoni M, Piaggese S, et al. 2020. Gender gaps in urban mobility. *Humanities and Social Sciences Communications*. 7(1): pp.11. Available at <https://doi.org/10.1057/s41599-020-0500-x>.

GEF. 2018. *Guidance to Advance Gender Equality in GEF Projects and Programs*. GEF Secretariat. Available at <https://www.thegef.org/publications/gef-guidance-gender-equality>.

GenderCC-Women for Climate Justice. 2022. *The Gender Assessment and Monitoring of Adaptation and Mitigation [GAMMA] methodology – a practical handbook on gender and urban climate policy*. Available at https://gendercc.net/wp-content/uploads/2024/05/2021-GAMMA-booklet_web.pdf.

German Federal Ministry for the Environment. 2021. *Climate Change Act 2021. Intergenerational contract for the climate*.

GI-ESCR. 2020. Available at <https://gi-escr.org/en/resources/publications/renewable-energy-and-gender-justice-briefing-paper>.

Government of Canada. 2025. *The Government of Canada is supporting 13 Indigenous-led clean energy projects through the Low Carbon Economy Fund's Indigenous Leadership Fund*. Available at <https://www.canada.ca/en/environment-climate-change/news/2025/07/the-government-of-canada-is-supporting-13-indigenous-led-clean-energy-projects-through-the-low-carbon-economy-funds-indigenous-leadership-fund.html>.

Government of India. 2025. *Time Use Survey (TUS), January 2024–December 2024*. Available at <https://microdata.gov.in/NADA/index.php/catalog/236>.

Gündling L. 1990. Our Responsibility to Future Generations. *American Journal of International Law*. 84(1): pp.207–212. Available at <http://www.jstor.org/stable/2203021>.

Hess JJ, Ranadive N, Boyer C, et al. 2020. Guidelines for modeling and reporting health effects of climate change mitigation actions. *Environmental Health Perspectives*. 128(11): pp.115001. Available at <https://doi.org/10.1289/EHP6745>.

Hill C, Madden C and Collins N. 2017. *A Guide to Gender Impact Assessment for the Extractive Industries*.

Hyde E, Greene ME and Darmstadt GL. 2020. Time poverty: Obstacle to women's human rights, health and sustainable development. *Journal of global health*. 10(2): pp.020313.

ICIMOD. 2021. *Towards energy justice: Addressing gender inequalities in energy policies in the HKH*. ICIMOD.

IEA, IRENA, UNSD, World Bank, WHO. 2021. *Tracking SDG 7: The Energy Progress Report*. Available at https://iea.blob.core.windows.net/assets/b731428f-244d-450c-8734-af19689d7ab8/2021_tracking_SDG7.pdf.

ILO. 2024. *Gender, equality and inclusion for a just transition in climate action: A policy guide*. Available at https://www.ilo.org/sites/default/files/2024-11/EN%20GUIDE%20_%2007%2024.pdf.

ILO. 2022a. *Gender equality, labour and a just transition for all*. Available at https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_emp/%40emp_ent/documents/publication/wcms_860569.pdf.

ILO. 2017. *Gender, labour and a just transition towards environmentally sustainable economies and societies for all*. Available at https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_protect/%40protrav/%40ilo_aids/documents/publication/wcms_592348.pdf.

ILO. 2022b. ISBN Web PDF: 9789220367681. *Global Employment Trends for Youth 2022: Investing in transforming futures for young people*. ILO. Available at <https://www.ilo.org/publications/major-publications/global-employment-trends-youth-2022-investing-transforming-futures-young>.

ILO. 2022c. *Indigenous Peoples and a Just Transition for All*. Available at https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_emp/%40emp_ent/documents/publication/wcms_860607.pdf.

ILO. *Labour force surveys*. Available at <https://webapps.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&ps=15&repo=LFS>.

ILO. 2023a. *Making the green transition inclusive for persons with disabilities*. Available at https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_emp/@ifp_skills/documents/publication/wcms_901753.pdf.

ILO. 2019. *Promoting green jobs for youth through national employment policies and programmes*. Available at <https://www.ilo.org/publications/promoting-green-jobs-youth-through-national-employment-policies-and>.

ILO. 2023b. *Statistics on the informal economy: Report for discussion at the Tripartite Meeting of Experts in Labour Statistics on the Revision of the Standards for Statistics on Informality*. ILO. Available at <https://www.ilo.org/resource/conference-paper/report-discussion-tripartite-meeting-experts-labour-statistics-revision-0>.

ILO. 2020. *The migrant pay gap: Understanding wage differences between migrants and nationals*. Available at https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@migrant/documents/publication/wcms_763798.pdf.

International Labour Office. 2018. *World employment and social outlook 2018: Greening with jobs*. International Labour Organisation (ILO).

International Transport Forum/OECD. 2023. *The Gender Indicators*. Available at <https://www.itf-oecd.org/gender-indicators>.

IOM. 2020. *World Migration Report 2020*.

IPBES. 2019. *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Available at <https://zenodo.org/records/3553579>.

IPCC. 2023. *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Core Writing Team, H Lee, and J Romero (eds.). Geneva: IPCC. Available at <https://www.ipcc.ch/report/ar6/syr/>.

Israel F and Murugan P. 2015. Livelihood impacts of forest carbon project and its implications for forest sustainability: the case of regenerated forest in Humbo District, Southwestern Ethiopia. *Ethiopian Journal of the Social Sciences and Humanities*. 11(2): pp.57–85.

Jost C, Ferdous N and Spicer TD. 2014. publisher: CGIAR Research Program on Climate Change, Agriculture and Food Security. *Gender and Inclusion Toolbox: Participatory Research in Climate Change and Agriculture*. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security, CARE International and the World Agroforestry Centre. Available at <https://ccaafs.cgiar.org/index.php/resources/tools/gender-and-inclusion-toolbox>.

Just Transition Commission. 2024. *Measuring and Evaluating Success in the Scottish Just Transition*. Available at <https://www.justtransition.scot/wp-content/uploads/2025/03/Measuring-and-evaluating-success-in-the-Scottish-Just-Transition-March-2025.pdf>.

KCI. 2023. *Implementation of just transition and economic diversification strategies: a compilation of best practices from different countries*. UNFCCC. Available at <https://unfccc.int/documents/624596>.

Kilic T, Serajuddin U, Uematsu H, et al. 2017. *Costing Household Surveys for Monitoring Progress Toward Ending Extreme Poverty and Boosting Shared Prosperity*. Policy Research Working Paper. World Bank Group. Available at <https://openknowledge.worldbank.org/entities/publication/2accda3c-eb75-54e8-ad84-6bfcf-7b5014a>.

Kolev A, La J and Manfredi T. 2023. *Extending social protection to informal economy workers: Lessons from the Key Indicators of Informality based on Individuals and their Household (KIbIH)*. OECD Development Centre Working Papers. OECD. Available at https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/11/extending-social-protection-to-informal-economy-workers_883d837f/ca19539d-en.pdf.

Krishnapriya PP, Chandrasekaran M, Jeuland M, et al. 2021. Do improved cookstoves save time and improve gender outcomes? Evidence from six developing

countries. *Energy Economics*. 102: pp.105456. Available at <https://www.sciencedirect.com/science/article/pii/S0140988321003431>.

Kusumawardhani N, Hilman R, Laan T, et al. 2017. *Gender and fossil fuel subsidy reform: An audit of data on energy subsidies, energy use and gender in Indonesia*.

Larson AM, Dokken T, Duchelle AE, et al. 2015. The role of women in early REDD+ implementation: lessons for future engagement. *International Forestry Review*. 17(1): pp.43–65. Available at <https://www.ingentaconnect.com/content/cfa/ifr/2015/00000017/00000001/art00005>.

Larson AM, Solis D, Duchelle AE, et al. 2018. Gender lessons for climate initiatives: A comparative study of REDD+ impacts on subjective wellbeing. *World Development*. 108: pp.86–102. Available at <https://www.sciencedirect.com/science/article/pii/S0305750X1830072X>.

Liu Z, Yan J, Dong H, et al. 2024. The impact of policy measures on livelihood diversification of smallholders: empirical evidence from the Tibetan Plateau, China. *Mitigation and Adaptation Strategies for Global Change*. 29(8): pp.85.

Maduekwe M and Factor AG. 2021. Gender assessment in energy projects: perceptions, practices and the role of a regional directive in ECOWAS. *Impact Assessment and Project Appraisal*. 39(3): pp.251–261. Available at <https://doi.org/10.1080/14615517.2021.1904711>.

Marino E and Ribot J. 2012. Special issue introduction: adding insult to injury: climate change and the inequities of climate intervention. *Global Environmental Change*. 22(2): pp.323–328.

Mavisakalyan A and Tarverdi Y. 2019. Gender and climate change: Do female parliamentarians make difference? *European Journal of Political Economy*. 56: pp.151–164. Available at <https://linkinghub.elsevier.com/retrieve/pii/S0176268017304500>.

McCarthy MJ, Herrero HV, Insalaco SA, et al. 2025. Satellite remote sensing for environmental sustainable development goals: A review of applications for terrestrial and marine protected areas. *Remote Sensing Applications: Society and Environment*. 37: pp.101450. Available at <https://doi.org/10.1016/j.rsase.2025.101450>.

Miller W, Vine D and Amin Z. 2017. Energy efficiency of housing for older citizens: Does it matter? *Energy Policy*. 101: pp.216–224. Available at <https://www.sciencedirect.com/science/article/pii/S0301421516306553>.

Ministry for Ecological Transition and Demographic Challenge. 2023. *Spain, 4 years towards a just energy transition*. Available at https://www.transicionjusta.gob.es/content/dam/itj/files-1/Documents/Publicaciones%20ES%20y%20EN/Spain_4%20years%20towards%20a%20just%20energy%20transition.pdf.

- Ministry for the Environment of New Zealand. 2022. *Aotearoa New Zealand's first national adaptation plan*. Wellington: Ministry for the Environment.
- Ministry of Economy and Finance, Republic of Korea. 2020. *Government Announces Overview of Korean New Deal*. Available at <https://english.moef.go.kr/pc/selectTbPressCenterDtl.do?boardCd=N0001&seq=4940>.
- Ministry of Environment and Sustainable Development, Colombia. 2022. *Visión Amazonía REM: A New Vision for Amazonia – Colombia's First Performance-Based Program to Reduce Deforestation in the Amazon*. Available at <https://visionamazonia.minambiente.gov.co/content/uploads/2023/11/LIBRO-REM-COLOMBIA-ENGLISH.pdf>.
- NDI FA. 2024. Land acquisition, renewable energy development, and livelihood transformation in rural Kenya: The case of the Kipeto wind energy project. *Energy Research & Social Science*. 112: pp.103530. Available at <https://www.sciencedirect.com/science/article/pii/S221462962400121X>.
- Neugarten RA, Langhammer PF, Osipova E, et al. 2018. *Tools for measuring, modelling, and valuing ecosystem services*. Gland, Switzerland: IUCN.
- Niboye EP. 2023. Universal or specific?–Violence against women in public spaces in Tanzania: Experiences from public bus stations in Dar es Salaam City. *Social Sciences & Humanities Open*. 7(1): pp.100430.
- Norwegian Ministry of Finance. 2022. *Sovereign wealth fund and energy transition*. Available at <https://www.regjeringen.no/en/dokumenter/nou-2022-12/id2928618/>.
- Office for National Statistics. 2023. *Who is most likely to live in homes that are harder to keep warm?*. Available at <https://cy.ons.gov.uk/peoplepopulationandcommunity/housing/articles/whoismostlikelytoliveinhomesthatarehardertokeepwarm/2023-12-14>.
- Ohlendorf N, Jakob M, Minx JC, et al. 2021. Distributional impacts of carbon pricing: A meta-analysis. *Environmental and Resource Economics*. 78: pp.1–42.
- Onyango EA, Banwell N, Mose TM, et al. 2023. Editorial: Gendered impacts of climate change: women and transformative research, policy and practice. *Frontiers in Climate*. 5: . Available at <https://www.frontiersin.org/journals/climate/articles/10.3389/fclim.2023.1215661>.
- Ortiz E and Ensor MO. 2023. *The WPS Index and the Gender–Climate–Security Nexus*. Georgetown Institute for Women, Peace and Security. Available at <https://giwps.georgetown.edu/resource/the-wps-index-and-the-gender-climate-security-nexus/>.
- Parikh J. 2007. *Gender and climate change framework for analysis, policy & action*. : . Available at https://archive.nyu.edu/bitstream/2451/34216/2/gnder_cc.pdf.

Pillarisetti A, Vaswani M, Jack D, et al. 2014. Patterns of Stove Usage after Introduction of an Advanced Cookstove: The Long-Term Application of Household Sensors. *Environmental Science & Technology*. 48(24): pp.14525–14533. Available at <https://doi.org/10.1021/es504624c>.

Plan International. 2022. *Young People and Green Skills: Preparing for a Sustainable Future*. Available at https://plan-international.org/uploads/2022/11/ATB2877_PlanGreenSkills_Nov2022_ENGLISH.pdf.

Pourhashem G, Malichová E, Piscová T, et al. 2022. Gender Difference in Perception of Value of Travel Time and Travel Mode Choice Behavior in Eight European Countries. *Sustainability*. 14(16).

Presidential Climate Commission. 2022. *A Framework for a Just Transition in South Africa*. Available at <https://pcccommissionflow.imgix.net/uploads/images/A-Just-Transition-Framework-for-South-Africa-2022.pdf>.

Puskur R and Aayushi M. 2024. *Rethinking climate-smart agriculture for gender equality and women's empowerment*.

Raftopoulos M. 2016. REDD+ and human rights: addressing the urgent need for a full community-based human rights impact assessment. *The International Journal of Human Rights*. 20(4): pp.509–530.

Rainforest Alliance. 2022. *Guidance T: Free, Prior and Informed Consent (FPIC) Processes*. Available at <https://www.rainforest-alliance.org/wp-content/uploads/2022/07/SA-G-SD-45-V1-Guidance-T-Free-Prior-And-Informed-Consent-FPIC-Processes.pdf>.

RECOFTC and GIZ. 2011. *Free, Prior, and Informed Consent in REDD+: Principles and Approaches for Policy and Project Development*. Available at https://redd.unfccc.int/uploads/2_74_redd_20130710_recoftc_free_2C_prior_2C_and_informed_consent_in_reddplus.pdf.

Robson JP, Wilson SJ, Sanchez CM, et al. 2020. Youth and the future of community forestry. *Land*. 9(11): pp.406.

Salamon H. 2023. The effect of women's parliamentary participation on renewable energy policy outcomes. *European Journal of Political Research*. 62(1): pp.174–196. Available at <https://doi.org/10.1111/1475-6765.12539>.

Sauer A and Stieß I. 2021. Accounting for gender in climate policy advice: adapting a gender impact assessment tool to issues of climate change. *Impact Assessment and Project Appraisal*. 39(3): pp.262–273. Available at <https://doi.org/10.1080/14615517.2021.1904710>.

Shang B. 2023. The poverty and distributional impacts of carbon pricing: Channels and policy implications. *Review of Environmental Economics and Policy*. 17(1): pp.64–85.

Sikhosana N, Nzewi O, Ndlovu M, et al. 2024. Gender-Responsive Budgeting in Climate Change Financing: A Panacea for Confronting Climate Change Vulnerability in South Africa? In: TA Ojo (ed.). *Gender-Responsive Budgeting in Africa: Access and Future Measures*. Cham: Springer Nature Switzerland. pp.21–34. Available at https://doi.org/10.1007/978-3-031-53333-4_3.

Smith J and Scherr SJ. 2003. Capturing the Value of Forest Carbon for Local Livelihoods. *World Development*. 31(12): pp.2143–2160. Available at <https://www.sciencedirect.com/science/article/pii/S0305750X03001694>.

Tan NQ, Truong LT, Van NTH, et al. 2010. Evaluation and verification of the free, prior and informed consent process under the UN-REDD programme in Lam dong province, Vietnam. *The Center for People and Forests*. Bangkok. https://www.un-redd.org/sites/default/files/2021-09/Viet_Nam_FPIC_Final_Evaluation_Report_5258.pdf (Accessed on: 25/08/2021).

The Connexion. 2023. *This is how the French government plans to deal with future heatwaves*. Available at https://www.connexionfrance.com/news/this-is-how-the-french-government-plans-to-deal-with-future-heatwaves/178211?utm_source=chatgpt.com.

The Institute of Sustainability and Environmental Professionals. 2025. *Young people struggling to secure green jobs*. Available at <https://www.iema.net/articles/young-people-struggling-to-secure-green-jobs?t=156564>.

Theodorou E, Spyrou S and Christou G. 2023. The future is now from before: youth climate activism and intergenerational justice. *Journal of Childhood Studies*. 48(1): pp.59–72.

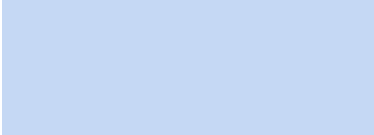
Thoday K, Benjamin P, Gan M, et al. 2018. The Mega Conversion Program from kerosene to LPG in Indonesia: Lessons learned and recommendations for future clean cooking energy expansion. *Energy for Sustainable Development*. 46: pp.71–81.

Tian P, Feng K, Zheng H, et al. 2023. Implementation of carbon pricing in an aging world calls for targeted protection schemes. *PNAS Nexus*. 2(7): pp.pgad209. Available at <https://doi.org/10.1093/pnasnexus/pgad209>.

Tladi B, Kambule N and Modley L-A. 2024. Assessing the social and environmental impacts of the just energy transition in Komati, Mpumalanga Province, South Africa. *Energy Research & Social Science*. 111: pp.103489. Available at <https://www.sciencedirect.com/science/article/pii/S221462962400080X>.

Tombe T and Winter J. 2024. *Does Emissions Pricing Hurt Affordability? Quantifying the Effects on Canadian Households*.

Trott CD. 2024. "It Can't Just Be the Younger People": Exploring Young Activists' Perspectives on Intergenerational Tensions and Solidarities for Climate Justice. *Journal of Community & Applied Social Psychology*. 34(6): pp.e70001.



Turquet L, Tabbush C, Staab S, et al. 2023. *Feminist Climate Justice: A Framework for Action*. Progress of the World's Women. New York: UN Women. Available at <https://www.unwomen.org/en/digital-library/publications/2023/11/feminist-climate-justice-a-framework-for-action>.

Ullah A, Sam AS, Sathyan AR, et al. 2021. Role of local communities in forest landscape restoration: Key lessons from the Billion Trees Afforestation Project, Pakistan. *Science of The Total Environment*. 772: pp.145613. Available at <https://www.sciencedirect.com/science/article/pii/S0048969721006811>.

UN Women. 2023a. *A gender-responsive just transition for people and planet*. UN Women. Available at <https://www.unwomen.org/en/digital-library/publications/2023/11/policy-brief-a-gender-responsive-just-transition-for-people-and-planet>.

UN Women. 2023b. *Action kit: Engaging parliaments in gender responsive budgeting*. Available at <https://www.unwomen.org/en/digital-library/publications/2022/11/action-kit-engaging-parliaments-in-gender-responsive-budgeting>.

UNCTAD. *Population and inclusiveness: Data insights*. Available at <https://unctad-stat.unctad.org/insights/theme/257>.

UNDP. 2024. *Gender and Climate Change Adaptation Toolkit*. Available at https://www.undp.org/sites/g/files/zskgke326/files/2025-01/gender_cca_toolkit_2.pdf.

UNDP. 2021. *Gender Responsive Climate Budgeting in Indonesia*. UNDP. Available at <https://www.undp.org/indonesia/publications/gender-responsive-climate-budgeting-handbook>.

UNDP. 2020a. *Gender responsive indicators: Gender and NDC planning for implementation*. Available at https://climatepromise.undp.org/sites/default/files/research_report_document/undp-ndcsp-gender-indicators-2020.pdf.

UNDP. 2023. *Gender-Responsive and Socially Inclusive Public Climate Finance*.

UNDP. 2020b. *Guidance Note- UNDP Social and Environmental Standards*. Available at https://info.undp.org/sites/bpps/SES_Toolkit/SES%20Document%20Library/Uploaded%20October%202016/UNDP%20SES%20Indigenous%20Peoples%20GN_Final_December%202020.pdf.

UNDP. 2022. *UNDP Tax for SDGs*. Available at <https://www.taxforsdgs.org/stf>.

UNDP Viet Nam. 2025. *Youth Engagement for a Sustainable Future: Strengthening Climate Change Education in Viet Nam*. UNDP Viet Nam. Available at <https://www.undp.org/vietnam/publications/youth-engagement-sustainable-future-strengthening-climate-change-education-viet-nam>.

UNESCO. 2021. *Indigenous Peoples and UNESCO 2021: Outcomes of the Questionnaire for the 22nd Session of the UN Permanent Forum on Indigenous Issues*. Available at https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2022/03/UNESCO-Consolidated-Report-UNPFII-22_final.pdf.

UNFCCC-KCI. 2025a. *Impacts of the implementation of domestic and global response measures: Case study on Maldives*. Available at <https://unfccc.int/documents/646106>.

UNFCCC-KCI. 2024. *Impacts of the implementation of response measures on intergenerational equity, gender, local communities, Indigenous Peoples, youth, and people in other vulnerable situations*. Available at <https://unfccc.int/documents/638245>.

UNFCCC-KCI. 2025b. *Just transition coverage in nationally determined contributions and long-term low-emission development strategies, implementation within key sectors, and tracking its progress*. Available at <https://unfccc.int/documents/645834>.

UNFCCC-TEC. 2024. *Gender-responsive technology and infrastructure for sustainable urban mobility*. Available at https://unfccc.int/ttclear/misc_/StaticFiles/gnwork_static/tec_transport/b637fc16c2c84b6bb39280ecf04f419b/ba89403202d-84067b2a8664767e0c7ae.pdf.

UNICEF. 2020. *Are climate change policies child-sensitive?* Available at https://www.unicef.org/media/72561/file/Are-climate-change-policies-child-sensitive-2020_0.pdf.

UNICEF. 2021. *Children's Climate Risk Index Interactive Atlas*. Available at <https://experience.arcgis.com/experience/0d9d2209bf104584a65e012b03b6d3f8/>.

United Nations. 1973. *Report of the United Nations Conference on the Human Environment*. Available at <https://docs.un.org/en/A/CONF.48/14/Rev.1>.

United Nations Chief Executives Board for Coordination. 2023. *Summary of deliberations: United Nations System Common Principles on Future Generations*. Available at <https://unsceb.org/sites/default/files/2023-08/United%20Nations%20System%20Common%20Principles%20on%20Future%20Generations.pdf>.

United Nations Environment Programme. 2021. *Costa Rica's Nature-Based Climate Strategies*. Available at <https://www.unep.org/resources/report/costa-ricas-nature-based-climate-strategies>.

United Nations Executive Office of the Secretary-General. 2023. *To Think and Act for Future Generations*. United Nations Office of the Secretary-General (EOSG) Policy Briefs and Papers. United Nations Executive Office of

the Secretary-General. Available at <https://www.un-ilibrary.org/content/papers/10.18356/27082245-24>.

United Nations Secretary-General. 2013. *Intergenerational solidarity and the needs of future generations: report of the Secretary-General*. New York: . Available at <https://digitallibrary.un.org/record/756820?ln=en&v=pdf>.

United Nations Statistics Division. 2025. *Time-use statistics: Data and Metadata*. Available at <https://unstats.un.org/UNSDWebsite/demographic-social/time-use/data-and-metadata>.

United States Environment Protection Agency. 2025. *Summary of Inflation Reduction Act provisions related to renewable energy*. Available at <https://www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy>.

USAID. *The Demographic and Health Surveys Program - Available Datasets*. Available at <https://dhsprogram.com/data/available-datasets.cfm>.

Van Aelst K and Holvoet N. 2016. Intersections of Gender and Marital Status in Accessing Climate Change Adaptation: Evidence from Rural Tanzania. *World Development*. 79: pp.40–50. Available at <https://www.sciencedirect.com/science/article/pii/S0305750X15002776>.

Vega-Araújo J and Heffron RJ. 2022. Assessing elements of energy justice in Colombia: A case study on transmission infrastructure in La Guajira. *Energy Research & Social Science*. 91: pp.102688. Available at <https://www.sciencedirect.com/science/article/pii/S221462962200192X>.

Vierros M. 2017. Communities and blue carbon: the role of traditional management systems in providing benefits for carbon storage, biodiversity conservation and livelihoods. *Climatic Change*. 140(1): pp.89–100. Available at <https://doi.org/10.1007/s10584-013-0920-3>.

Wade R and Ellis G. 2022. Reclaiming the Windy Commons: Landownership, Wind Rights, and the Assetization of Renewable Resources. *Energies*. 15(10).

Weiss EB. 2021. Intergenerational Equity. Oxford Public International Law Max Planck Encyclopedia of Public International Law. Available at <https://opil.ouplaw.com/display/10.1093/law:epil/9780199231690/law-9780199231690-e1421>.

WHO. 2016. *Burning opportunity: clean household energy for health, sustainable development, and wellbeing of women and children*. Available at https://iris.who.int/bitstream/handle/10665/204717/9789241565233_eng.pdf?sequence=1.

WHO. 2014. *Gender, Climate Change and Health*. Geneva: WHO. Available at https://apps.who.int/iris/bitstream/handle/10665/144781/9789241508186_eng.pdf.

- WHO. 2025. *Global Health Observatory*. Available at <https://www.who.int/data/gho>.
- WHO. 2011. *Health in the green economy: health co-benefits of climate change mitigation – housing sector*. Available at <https://iris.who.int/handle/10665/44609>.
- Wijayaningtyas M, Lukiyanto K, Nursanti E, et al. 2022. The effect of economical phenomenon on informal construction workers earnings within Covid-19 pandemic: A mixed method analysis. *Heliyon*. 8(8): pp.e10321. Available at <https://www.sciencedirect.com/science/article/pii/S2405844022016097>.
- World Bank. *Living Standards Measurement Study (LSMS)*. Available at <https://microdata.worldbank.org/index.php/catalog/lsms/?page=1&ps=15&repo=lsms>.
- Yamamoto Y. 2018. *Now is the Time! Reduce and redistribute the unpaid domestic and care work burden of women for sustainable development*. Available at https://www.undp.org/sites/g/files/zskgke326/files/migration/asia_pacific_rbap/RBAP-Gender-2018-Now-is-the-Time.pdf.
- Yang H and Suh S. 2021. Economic disparity among generations under the Paris Agreement. *Nature Communications*. 12(1): pp.5663.
- Yang J, Gong P, Fu R, et al. 2013. The role of satellite remote sensing in climate change studies. *Nature Climate Change*. 3(10): pp.875–883.
- Yenneti K, Day R and Golubchikov O. 2016. Spatial justice and the land politics of renewables: Dispossessing vulnerable communities through solar energy mega-projects. *Geoforum*. 76: pp.90–99. Available at <https://www.sciencedirect.com/science/article/pii/S0016718515303249>.
- Zhao S, Fujimori S, Hasegawa T, et al. 2022. Poverty and inequality implications of carbon pricing under the long-term climate target. *Sustainability Science*. 17(6): pp.2513–2528.



United Nations Climate Change Katowice Committee on Impacts

Katowice Committee of Experts on the Impacts of the Implementation of Response Measures is a constituted body which was established in Katowice December 2018 to support the work programme of the forum on the impact of the implementation of response measures

CONTACT DETAILS

The Katowice Committee on Impacts may be contacted through the UNFCCC secretariat:

Platz der Vereinten Nationen 1,
53113 Bonn
Germany

Email:

KCI@unfccc.int

Website: <https://unfccc.int/constituted-bodies/KCI>

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