



# IMPACTS OF THE IMPLEMENTATION OF RESPONSE MEASURES ON INTERGENERATIONAL EQUITY, GENDER, LOCAL COMMUNITIES, INDIGENOUS PEOPLES, YOUTH AND PEOPLE IN OTHER VULNERABLE SITUATIONS

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**United Nations** Climate Change  
Katowice Committee on Impacts

**IMPACTS OF THE IMPLEMENTATION OF RESPONSE  
MEASURES ON INTERGENERATIONAL EQUITY, GENDER,  
LOCAL COMMUNITIES, INDIGENOUS PEOPLES, YOUTH  
AND PEOPLE IN OTHER VULNERABLE SITUATIONS**

## **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 Measures.<sup>1</sup>

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.

## **ACKNOWLEDGEMENT**

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<sup>1</sup>As contained in annex II of decisions 4/CP.25, 4/CP.15 and 4/CMA.2.

# PREFACE

## BY THE CO-CHAIRS OF THE KCI

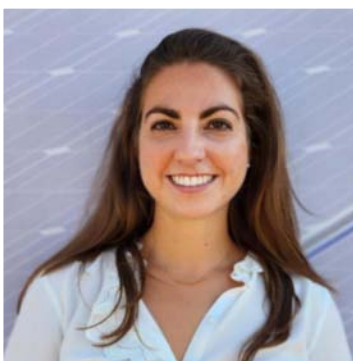
Assessing and analysing the impacts of the implementation of response measures is one of the four work areas of the forum on the impact of the implementation of response measures and its KCI. Towards this end, this technical paper contributes to activity 9 of the KCI's six-year workplan. The paper identifies and assesses 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 people in other vulnerable situations.

Through its comprehensive study of the impacts, the paper also achieves the following two objectives:

1. The paper fills the current gap where there are limited studies that quantify and assess the economic and social impacts of response measures on people in vulnerable situations. Notably, the literature examined in this technical paper reveals that where this research exists it mainly focuses on the policymaking process and participation, and is largely adaptation-centric which emphasizes vulnerabilities and capacity to adapt.
2. The paper considers a select set of mitigation policies consistent with pathways to holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and with pathways to limiting the temperature increase to 1.5 °C above pre-industrial levels.

*'What cannot be measured, cannot be addressed'*

We trust that this paper, and earlier papers published by the KCI will serve to support parties' understanding of the impacts of implementation response measures, and attendant actions needed to address these impacts, and inspire parties in the direction of efforts needed to keep a limit of 1.5 °C temperature rise within reach.



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## ACRONYMS AND ABBREVIATIONS

<b>CBCGDF</b>	China Biodiversity Conservation and Green Development Foundation
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>EU</b>	European Union
<b>GHG</b>	Greenhouse gas
<b>IEA</b>	International Energy Agency
<b>ILO</b>	International Labour Organization
<b>IPCC</b>	International Panel on Climate Change
<b>IRENA</b>	International Renewable Energy Agency
<b>KCI</b>	Katowice Committee of Experts on the Impacts of the Implementation of Response Measures
<b>NDC</b>	Nationally determined contribution
<b>OHCHR</b>	Office of the United Nations High Commissioner for Human Rights
<b>REDD</b>	Reducing emissions from deforestation and forest degradation in developing countries
<b>REDD+</b>	Reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
<b>UNDP</b>	United Nations Development Programme
<b>UN-REDD Programme</b>	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries.
<b>WHO</b>	World Health Organization

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# EXECUTIVE SUMMARY



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The studies and stakeholder inputs reviewed in this technical paper confirm that response measures can have amplified impacts on people in vulnerable situations, and show that the negative impacts of response measures exacerbate vulnerabilities by further compounding inequalities, for example across generations and genders.

There are limited studies that quantify and assess the economic and social impacts of response measures on people in vulnerable situations, including women, the poor and Indigenous Peoples. The literature examined in this technical paper reveals that where this research exists it mainly focuses on the

policy-making process and participation, and is largely adaptation-centric (i.e. emphasizing vulnerabilities and capacity to adapt). A UNFCCC document from 2023<sup>2</sup> that synthesized information from NDCs notes that gender is most commonly mentioned in NDCs, followed by the local communities and Indigenous Peoples.

The main messages from the literature and from stakeholders on the impacts and co-benefits of the implementation of response measures on people in vulnerable situations can be summarized as follows:

<sup>2</sup> FCCC/PA/CMA/2023/12.



1. People in vulnerable situations are often marginalized during the planning and implementation of response measures;
2. Women are generally more negatively affected by mitigation policies than men, whereas the impacts of these policies are erroneously viewed by policymakers as gender-neutral. Women can experience positive impacts, for example from mitigation policies that reduce their domestic burden and fuel-gathering activities, but also experience negative impacts from policies that give them unequal land tenure rights or marginalize their participation in the workforce;
3. Local communities and Indigenous Peoples can be affected by mitigation measures such as renewable energy and forestry projects that affect their land rights and result in environmental degradation and possible displacement and loss of land. Positive impacts include socioeconomic and energy access benefits;
4. Youth are one of the groups most likely to be affected in the future by both climate change and the implementation of response measures;
5. The elderly and children are currently, in many cases, the most affected by climate change, especially by higher temperatures and pollution from burning fossil fuels. Climate policies, for example those involving energy transition and energy efficiency, can improve air quality and indoor temperatures;
6. Persons with disabilities have generally not been considered in assessments of the impacts of response measures on people in vulnerable situations. Climate policies such as increasing electrification and automation can reduce risks for persons with disabilities, improve energy and transport accessibility, and reduce climate change impacts on health;
7. The poor feature in various studies of the impacts of response measures, possibly because the impacts of climate change fall

to a large extent on them. Positive impacts include improved energy access, while negative impacts include the exacerbation of poverty and job losses, especially among rural households.

The active engagement of people in vulnerable situations throughout the design and execution of climate policies is required in order to reduce the impacts of the implementation of response measures on them. To optimize the outcomes, it is crucial to employ targeted strategies that minimize the negative effects and maximize the positive impacts on them.

There is an urgent need for further research on measuring the impacts of response measures on people in vulnerable situations. Stakeholder engagement at the national level and wider engagement in general are necessary to better understand the impacts of response measures on people in vulnerable situations. Where quantitative data are missing, they should be obtained from a qualitative analysis, such as primary research based on direct input from and engagement with vulnerable groups.



# INTRODUCTION

Assessing and analysing the impacts of the implementation of response measures is one of the four work areas of the forum on the impact of the implementation of response measures and its KCI. This technical paper contributes to activity 9 of the KCI six-year workplan<sup>3</sup> by providing information about identifying and assessing 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.

## OBJECTIVES

The objective of this technical paper is to 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. It considers a select set of mitigation policies consistent with pathways to holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and with pathways to limiting the temperature increase to 1.5 °C above pre-industrial levels. The paper includes a brief summary of case studies of people in vulnerable situations (including the assessment methods used and descriptions of possible socioeconomic impacts), references to relevant work in previous KCI technical papers, inputs from stakeholders, and the process and reasons for

selecting particular policies and measures. The approach to preparing this paper included:

1. Identifying the impacts of response measures by examining generic and case-specific qualitative and quantitative publicly available literature on the effects of selected policies consistent with 2 °C and 1.5 °C pathways;
2. Identifying the methodologies used in existing research to assess the impacts of response measures, where relevant;
3. Reviewing inputs from stakeholders and experts (including relevant UNFCCC constituencies and constituted bodies) to identify descriptions of policies or measures consistent with 2 °C and 1.5 °C pathways and the socioeconomic impacts of implementing strategies on different countries or groups identified through different forms of engagement;
4. Inferring, where relevant and appropriate, the effects and impacts on people in vulnerable situations from the effects on larger subsets of the population that include them.

<sup>3</sup>As contained in annex II to decisions 4/CP.25, 4/CP.15 and 4/CMA.2.









# BACKGROUND

## CONTEXT

Achieving the long-term temperature goal of the Paris Agreement requires global GHG emissions peaking as soon as possible, followed by a rapid reduction in net GHG emissions, most notably anthropogenic CO<sub>2</sub>, emissions, reaching net zero in the early 2050s (IPCC, 2022b).

Achieving climate change targets requires enhanced ambition and effective implementation of GHG mitigation policies and actions (IPCC, 2022b). Response measures are understood as policies, actions and measures taken in response to climate change, such as mitigation policies and actions, taken by Parties to the Convention, the Kyoto Protocol and the Paris Agreement. Under the Convention, the term ‘response measure’ is usually associated with the social, economic and environmental impacts of implementing climate change mitigation policies. Such impacts can be direct and/or indirect, intended and/or unintended, or short, medium and/or long term. They can occur in the implementing countries and/or in other countries, which are known as cross-border impacts. The various potential inequality impacts of selected climate change mitigation policies are summarized in Markkanen and Anger-Kraavi (2019), which emphasizes outcomes on health, wealth or income, gender and ethnic inequalities. Additional details on response measures and analysis of the impacts of their implementation can be found in KCI (2022a). Additional details on tools and methodologies for modelling and assessing these impacts can be found in KCI.

The nature and scale of the potential negative and positive impacts arising from the implementation of response measures vary across and between regions and countries, but can be particularly pronounced for developing countries (KCI, 2022a). Furthermore, there is recognition that “[t]he risk of negative outcomes is greater in contexts characterized by high levels of poverty, corruption and economic and social inequalities, and where limited action is taken to identify and mitigate potentially adverse side-effects” (Markkanen and Anger-Kraavi, 2019), implying that the effects of response measures are more amplified among people in vulnerable situations. Climate change raises serious problems of justice between current and future generations in general, as well as current and future generations of people in vulnerable situations specifically (Government of Ghana, 2022). Vulnerability to climate change appears most likely to negatively affect poor people, particularly women, and to widen existing inequalities, both at the socioeconomic and energy access level. Widening inequality in energy access has severe negative implications, because energy poverty remains a critical challenge facing a large subsection of people in vulnerable situations (notably women, children, the elderly and the poor), with more than 770 million people living without access to electricity, mostly in Africa and Asia (IEA, 2021), and around 2.3 billion people lacking access to clean cooking fuel (WHO, 2022).

To that end, it is important to identify the impacts of response measures on people in vulnerable situations, as these impacts, both direct and indirect, can exacerbate their vulnerability. Alleviating negative impacts requires the implementation of targeted measures commensurate with the specific impacts.

The impacts of climate change on people in vulnerable situations are well documented in the literature on social science, and examination of the impacts of climate change mitigation is growing rapidly (IPCC, 2018, 2022a, 2022b; ILO, 2022b). Nevertheless, compared with the general population, there is limited research on quantifying the social and economic impacts of response measures on the people in vulnerable situations who are the subject of this technical paper, namely women, local communities, Indigenous Peoples, youth and other people in vulnerable situations, including the elderly, persons with disabilities and the poor. Furthermore, and as far as can be established, among research on the impacts of response measures on people in vulnerable situations, there are more assessments concerning women and the poor than for any other category of people in vulnerable situations. As climate change mitigation policies are particularly concerned with balancing environmental protection with economic efficiency (Schuppert, 2011), the largest body of qualitative and quantitative studies on the effects of response measures tends to be generic, examining country-wide economic impacts or effects on households.

Climate change has implications for intergenerational equity because its effects are temporally delayed, and, similarly, climate change mitigation policies have implications for intergenerational equity (Aldy et al., 2016; IPCC, 2022b; Liu, Fujimori, and Masui, 2016; Vrontisi et al., 2018). Intergenerational equity is an important element in the literature on the impacts of response measures given the widening disparity in which the benefits and burdens of climate change are and will be distributed among present and future generations (Page, 1999; Yang and Suh, 2021).

It has been established in the literature that the effects of and attitudes towards climate change vary intergenerationally. Such disparity reflects the fact that more than half of the world's population are in older generations, while climate change effects will be felt more by the youth and children of today, who will be elderly by mid-century and beyond. It is important to examine intergenerational implications of response measures as they have an impact on people's incomes, energy access and well-being, which in turn affects their behaviours and consumption patterns, welfare, health, political actions and climate (Albrecht et al., 2007; Clayton et al., 2015; Fritze et al., 2008; IPCC, 2022b). In the literature addressing the impacts of these policies on youth and the elderly, there is a general focus on the risk of job losses and livelihoods.

The rapid rise of youth climate mobilizations across the globe has succeeded in framing global climate inaction and inertia as a problem and in framing climate change from the perspective of justice and intergenerational equity (Han and Ahn, 2020). While youth are taking action to combat climate change, their power is constrained owing to limited effective participation in climate change governance and policy making (Han and Ahn, 2020; Sanson, Van Hoorn, and Burke, 2019; UNDP, 2015).

Women and girls can be vulnerable because, for example, they face high rates of child marriage, domestic violence, sexual violence, human trafficking and labour displacement, vulnerabilities that climate change can aggravate at the social, economic and cultural level (CBCGDF, 2022; IPCC, 2022b; Osman-Elasha, 2009).

At the intersection between gender and climate change policy, gender equality is mainly addressed through a gender justice lens (Wilson and Chu, 2020). However, research on mitigation policies is "preoccupied with techno-economic transformations" that are perceived to be gender-neutral (Michael et al., 2020):



1. A study examining impacts on the economic empowerment of women shows that the superficial inclusion of gender issues in green economy perspectives perpetuates gender differences and inequality among climate policymakers (Wilson and Chu, 2020);
2. There is a growing consensus that the impacts of climate change and non-inclusive climate action have gendered effects and exacerbate gender inequalities in the workplace. These effects consequently harm women, who are the agents of change in building a just transition that can promote inclusive opportunities in a low-carbon economy (ILO, 2022b);
3. In qualitative assessments, there is evidence that climate change action that uses a gender lens to inform analysis and priorities can create rapid improvements in gender equality and women's empowerment, and that better climate and environmental outcomes can be achieved through addressing gender-specific barriers and enablers to women's empowerment and decent work (Livingstone, Jenkins, and Cardinal, 2021) (Di Persio, 2019).

Indigenous Peoples and local communities are connected to nature and possess deep traditional knowledge and historical practices that contribute to the protection of biodiversity and natural resources and to the design of better climate change mitigation and adaptation policies (Bonilla-Moheno and García-Frapolli, 2012; Iocca and Fidélis, 2021; IPCC, 2022b). There has been only limited research on climate change and its impacts on traditional communities, and there is an uneven distribution of case studies across the different regions (Iocca and Fidélis, 2021).

Studies tend to focus more on these communities' vulnerability to climate change and on how traditional practices can inform policy and practice, rather than on the impacts of response measures on them. Engaging with

these communities is critical for protecting them from the impacts of climate change and integrating their knowledge into resilient policymaking (Iocca and Fidélis, 2021; IPCC, 2022a, 2022b). Reducing the negative effects of mitigation policies requires an increased involvement of Indigenous Peoples and local communities, as they can play a leading role in the global response to climate change, especially Indigenous women, who play a vital role as stewards of natural resources (Inter-Agency Support Group on Indigenous Peoples' Issues, 2008).

Other groups of people in vulnerable situations, namely the elderly, persons with disabilities and the poor, are also largely affected by climate change and the effects of climate measures. Among studies on the impacts of response measures on those identified as people in vulnerable situations, the poor are more represented than the other groups (examples available in KCI (2022b)), possibly because the largest share of climate impacts would fall on the poor (Muttitt and Kartha, 2020).

There is an objection to accelerated mitigation policies that cause a risk of job losses, increase inequality, including gender inequality, diminish competitiveness or have negative impacts on people in vulnerable situations and on vested interests (IPCC, 2022b). In response, across all groups of people in vulnerable situations there is evidence from the literature that there is increased climate activism among people in vulnerable situations, especially youth, women, leaders of local communities and Indigenous Peoples, to influence response measures and exert political influence (Claeys and Delgado Pugley, 2017; Grady-Benson and Sarathy, 2016; Helferty and Clarke, 2009; IPCC, 2022a, 2022b). These efforts contribute to raising awareness, strengthening climate leadership in many countries and changing broad social norms by increasing knowledge of Indigenous governance systems that have supported sustainable life over thousands of years (IPCC, 2022b; Temper et al., 2020). In the context of climate policymaking,

there is a need to align NDC targets with the needs for people in vulnerable situations, such as through the UNDP's Climate Promise, which supports countries to include gender consideration during the NDC development and implementation process.<sup>4</sup>

As a large proportion of response measures are implemented by and support for just transition policies is provided through the private sector, businesses are an important vehicle for implementing climate change mitigation and transmitting impacts, both positive and negative, on people in vulnerable situations. The United Nations Guiding Principles on Business and Human Rights<sup>5</sup> outline how States and businesses should implement the United Nations "Protect, Respect and Remedy" Framework in order to better manage business and human rights challenges. These guiding principles were unanimously endorsed by the United Nations Human Rights Council in 2011 (United Nations, 2011).

In cases where no specific literature on the impacts of response measures on people in vulnerable situations was identified, this technical paper infers, to the extent possible, the effects on them with reference to studies on the impacts of response measures on larger groups that include people in vulnerable situations. Such inference is possible if the people in vulnerable situations are included in the labour market, sectoral employment, or larger populations.

Although people in vulnerable situations are affected by both adaptation and mitigation policies to climate change, this technical paper focuses mainly on examining the impacts of mitigation policies on people in vulnerable situations given the limited data on the impacts of adaptation policies on them.

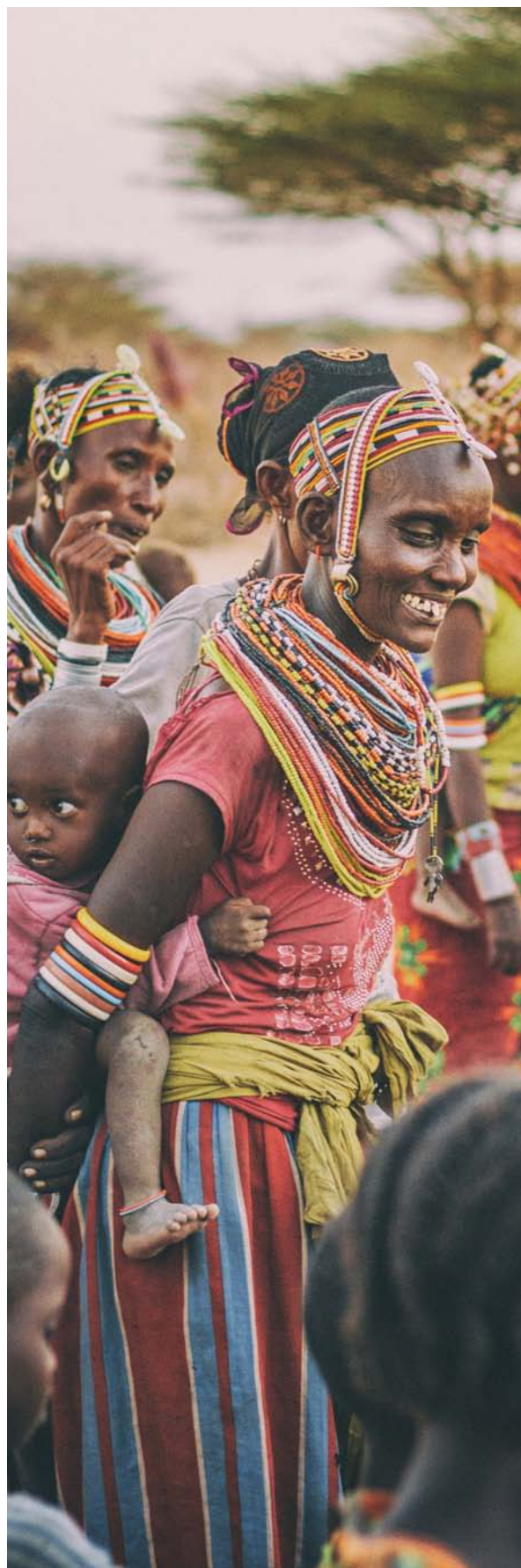


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<sup>4</sup> <https://climatepromise.undp.org/what-we-do/areas-of-work/inclusion>.

<sup>5</sup> Available at <https://digitallibrary.un.org/record/720245?ln=en>.

## DEFINITIONS

### GENDER EQUITY

Gender equity is equity between women and men with regard to their rights, resources and opportunities. In the case of climate change, gender equity recognizes that women are often more vulnerable to the impacts of climate change and may be disadvantaged in the process and outcomes of climate policy (IPCC, 2022b).

### INTERGENERATIONAL EQUITY

Intergenerational equity articulates the concept of fairness among all generations in the use and conservation of the environment and its natural resources. In the context of climate change, it acknowledges that the effects of past and present emissions, vulnerabilities and policies impose costs and benefits for people in the future and of different age groups (IPCC, 2022b). The Convention embeds intergenerational equity as a founding principle within the international climate change regime (Venn, 2019), framed as the need to “protect the climate system for the benefit of present and future generations of humankind”,<sup>6</sup> which is further reinforced by the inclusion of sustainable development as a core principle within the Convention and the Paris Agreement preamble.

### LOCAL COMMUNITIES

There is no universally accepted definition for local communities, and they are at times defined in conjunction with Indigenous Peoples as vital custodians of the world’s remaining natural landscapes (WWF et al., 2021). More specifically, local communities represent a heterogenous group of people living in the same country and who have a common interest or passion, and include communities that hold collective knowledge, and whose livelihoods are tightly connected to a common ecosystem or natural resources (Athayde et al., 2021). They might or might not have formal recognition of specific rights over their lands, territories and cultural identity.

### INDIGENOUS PEOPLES

Indigenous Peoples are inheritors and practitioners of unique cultures and ways of relating to people and the environment. They have retained social, cultural, economic and political characteristics that are distinct from those of the dominant societies in which they live. Despite their cultural differences, Indigenous Peoples from around the world share common problems related to the protection of their rights as distinct people (UN DESA, n.d.). They are usually rights-holders with special rights formally recognized under some jurisdictions’ constitutions or other laws. Indigenous Peoples’ rights are protected under of the United Nations Declaration on the Rights of Indigenous Peoples.<sup>7</sup>

### YOUTH

There is no universally agreed international definition of the youth age group; however, youth is best understood as a period of transition from the dependence of childhood to adulthood’s independence. The United Nations defines youth as those persons between the ages of 15 and 24 years, as endorsed by the General Assembly in resolution 36/28 of 1981 (United Nations, n.d.).

### PEOPLE IN VULNERABLE SITUATIONS

People in vulnerable situations are groups and communities that have been adversely affected by climate hazards and have limited ability to recover by themselves. This definition includes vulnerable groups and communities that have been severely affected by droughts, floods, coastal inundation and extreme temperatures (UNFCCC, 2018). According to a resource guide published by the state of California, for public agencies, there are various indicators used in vulnerability assessment tools under each of the following factors: existing inequities, institutionalized racism or exclusion; physical states or conditions that increase vulnerability; poor environmental conditions, access to services or living conditions; and lack of investment

<sup>6</sup> Article 3, paragraph 4 of the Convention. The Convention is available at <https://unfccc.int/resource/docs/convkp/conveng.pdf>.

<sup>7</sup> Available at <https://www.un.org/development/desa/indigenouspeoples/declaration-on-%20the-rights-of-indigenous-peoples.html>



and opportunities. The guide further sets an additional set of vulnerability indicators for analysing and defining vulnerable communities. These include indicators that are related to demographics, housing security, mobility, health services, environmental hazards, business or jobs, public and private utilities, social services, governance, community, fiscal health and culture (Governor's Office of Planning and Research, State of California, 2018).

### **GROUPS OF PEOPLE IN VULNERABLE SITUATIONS**

For the purpose of this technical paper, the term people in vulnerable situations denotes the collective set of the groups on whom the impacts of response measures are examined, namely women, local communities, Indigenous Peoples and other people in vulnerable situations. For the purpose of this technical paper, other people in vulnerable situations consist of:

#### **1. ELDERLY PEOPLE**

There is no universally accepted definition of elderly people. Traditionally, the United Nations, policymakers and researchers have most commonly used measures and indicators of population ageing that are mostly or entirely based on people's chronological age, defining older persons as those aged 60 or 65 years or more (United Nations, 2019);

#### **2. PERSONS WITH DISABILITIES**

According to the Convention on the Rights of Persons with Disabilities,<sup>8</sup> persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments that in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others;

#### **3. THE POOR**

While definitions vary across and within States, it is generally acceptable that poor people are members of groups,

populations, households or countries that suffer poverty. The United Nations Administrative Committee on Coordination defines, fundamentally, poverty as a denial of choices and opportunities and a violation of human dignity. It is a lack of basic capacity to participate effectively in society. Poverty means not having enough money to feed and clothe a family, not being able to visit a school or clinic, not having land on which to grow one's food or a job to earn one's living and not having access to credit. Poverty also means insecurity, powerlessness and exclusion of individuals, households and communities. It also means susceptibility to violence, and often implies living in marginal or fragile environments, without access to clean water or sanitation (United Nations, 1998). For the purpose of this technical paper, unless otherwise specified, "the poor" refers to low-income groups.



Photo by <https://unsplash.com/@Domi-Chung>

<sup>8</sup> Available at <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-Persons-with-disabilities.html>.



# III SELECTED POLICIES AND THEIR IMPACTS

Achieving the long-term temperature goal of the Paris Agreement requires the implementation of mitigation policies and response measures that help to reduce and limit GHG emissions over the next decades to reach net zero by 2050. Policies consistent with 2 °C pathways refer to pathways of policies and technologies that can reduce and limit GHG emissions to a level sufficient for holding the increase in the global average temperature to well below 2 °C above pre-industrial levels. Policies consistent with 1.5 °C pathways refer to those that can help to reduce emissions to a sufficient level to limit the increase in the global temperature to 1.5 °C above pre-industrial levels by 2050. Lower GHG emissions in 2030 can lead to a higher chance of keeping peak warming to 1.5 °C (IPCC, 2022a, 2022b). Measures consistent with 2 °C and 1.5 °C pathways include economic and fiscal instruments (such as taxes and subsidies), regulations, research and development of technologies, government provision of public goods or services, and nature-based solutions, including forestry (Government of Ghana, 2022; IPCC, 2022b). See IPCC (2022b) for a detailed list of policies.

In assessing the literature on the impacts of response measures on people in vulnerable situations, this technical paper selects the following response measures as key policies consistent with 2 °C and 1.5 °C pathways:

1. General emission reduction policies, such as carbon trading and energy efficiency;
2. Phase-down of coal and removal of inefficient fossil fuel subsidies;

3. Adoption of renewable energy;
4. Mitigation policies in the forestry sector.

The following sections describe each of the above policies and summarize their impacts on people in vulnerable situations. The table below provides a summary of the impacts on each identified category of people in vulnerable situations as detailed below.

## EMISSION REDUCTION POLICIES

Among the wide range of emission reduction policies, the first policy option selected for this technical paper is the imposition of carbon taxes, or carbon prices generated as a result of the emissions cap associated with the introduction of a carbon trading scheme. This was selected because economic frameworks have generally accepted that carbon pricing (based on economic principles that extend to other GHG emissions) is the most cost-effective way to reduce emissions, notwithstanding various market failures that could limit its effectiveness (Stern, 2015). Subsequently, this technical paper covers impacts other than emission reduction policies.

Carbon taxes along with fossil fuel taxes are more prevalent among developed countries (IPCC, 2022b). The implementation of carbon taxes in countries based on emissions from the products they produce does not account for where these products are consumed. Thus, it exacerbates inequalities among nations and their 'carbon equity' – a concept proposed by



the CBCGDF denoting people's equal carbon emission rights (CBCGDF, 2022).

Cap-and-trade schemes, carbon taxes and personal ecological space quotas are shown not to be compatible with the principles of intragenerational and intergenerational justice (Schuppert, 2011). This suggests that existing proposals for the distribution of emission rights and climate change related costs need to be supported by additional evidence for intergenerational justice.

Carbon pricing and taxes can have direct negative socioeconomic impacts on the poor and may exacerbate socioeconomic pressures on poorer households (Jakob et al., 2014; Maestre-Andrés, Drews, and van den Bergh, 2019). Carbon pricing may be regressive and perceived as the imposition of additional costs by both households and industries, could increase household energy expenses, especially for the poor, which, in turn, could reduce policy acceptability (IPCC, 2022b; Martinez and Viegas, 2017; McDonald et al., 2020), and could render green infrastructure investments politically unfeasible (Copland, 2020; Douenne and Fabre, 2020).

These distributional effects can be addressed by combining the redistribution of revenues with support for low-carbon innovation. Therefore, carbon pricing policies could receive higher acceptance if they explicitly reflect fairness and distributive consideration in revenue distribution. To that end, it is important to couple the implementation of carbon taxes with other fiscal instruments (such as the reduction of other taxes) in order to compensate people in vulnerable situations for the resulting negative impacts (IPCC, 2022b).

Beyond the above-mentioned impacts on intergenerational equity and the poor, there are limited studies that quantify the effects of carbon pricing and carbon markets on the other groups of people in vulnerable situations. Therefore, this technical paper summarizes other studies that quantify the household, economic, labour or welfare effects

of carbon-related policies on populations in general. Given that by definition the general population includes people in vulnerable situations, the results of these studies imply the expected minimum impacts on people in vulnerable situations, given that the impact on the latter is expected to be amplified by their vulnerabilities (per para. 6 above). Among the key literature on the general population:

1. A study quantifying the gains and costs and welfare implications of a 2 °C pathway climate scenario with emissions trading in China and India found that negative economic impacts of international climate policy are generally larger in China than in India (Johansson et al., 2015);
2. A study of the cross-border impacts of the implementation of carbon pricing response measures (namely a carbon tax, an energy input tax and a quantity restriction instrument) on Kenya and Senegal used a global CGE model that is soft-linked to a single-country CGE model. It found that impacts depend greatly on the type of response measure implemented, with more muted effects under a carbon tax (McDonald et al., 2020). Impacts on rural households are likely to be greater than on their urban counterparts because the former are systematically poorer. These results suggest an important conclusion that the cross-border effects of people in vulnerable situations vary depending on whether they form part of poorer households;
3. Another study on options for transferring carbon tax revenue in India, using a general equilibrium assessment, found that the welfare effects of an international climate regime vary by household type and are affected by international price repercussions (Weitzel et al., 2015).

The implementation of carbon taxes or carbon trading mechanisms can result in unmeasured or inaccurately measured impacts on industries employing people in vulnerable situations. This result is due to existing variations and regional and/or in-country inconsistencies in measuring carbon emissions per industry or product

and, therefore, by country and per capita (Shehabi et al., 2021). These inconsistencies can unintentionally exacerbate existing inequalities and have negative effects on people in vulnerable situations.

As part of mitigating this problem, the CBCGDF (2022) proposed the use of alternative methods for calculating emissions and apportioning responsibility to countries based on their emissions through tracking each person's consumed carbon emissions.

With women being negatively affected by some mitigation policies, programmes can be implemented to minimize negative gender impacts. Examples include programmes specifically targeting underdeveloped areas with high carbon emissions, such as the Chinese Rural Revitalization programme (CBCGDF, 2022). Another example is the introduction of various indicators to measure and raise women's participation in skilled and management positions to a given level (15 per cent) (Bonsucro, 2022). Such indicators promote gender inclusion in management and skilled positions in mill and agriculture operations and offer community-based women's empowerment training and recruitment. Women, as well as racialized and

marginalized groups, largely benefit from policies that increase their political access and participation which, in turn, increase their climate action and render climate mitigation policies more effective (IPCC, 2022b).

A positive correlation exists between effective climate policy and gender equality as well as between effective climate policy and the participation of Indigenous Peoples and women in decision-making (IPCC, 2022b). Indigenous Peoples and women have, in general, lower carbon footprints than other groups, and their increased participation in the decision-making process can increase their influence on grass-roots change (IPCC, 2022b).

Mitigation measures generally are shown to result in a disparity in economic impacts (costs and benefits) across generations. The elderly generally experience a net reduction in lifetime gross domestic product per capita, while youth will gain net benefits from climate change mitigation in most lower (lower-middle- and low-) income countries (Yang and Suh, 2021). By contrast, in many higher-income countries, none of the age cohorts enjoy net benefits. The rise of youth in climate movements across the world cannot be explained by economic self-interest in the short term, although youth



benefit from climate change mitigation in the long term.

Other emission-reducing mitigation policies include bottom-up industrial initiatives, such as building clean cookstoves with clay construction techniques to reduce solid fuel use. These clean cookstoves reduce firewood toxic fumes by 75 per cent, improving the health and livelihood of women (IPCC, 2022b; WECF, 2022) and children (IPCC, 2022b). Such positive health improvements are likely to extend to other categories of people in vulnerable situations, especially youth, children, the elderly and persons with disabilities. Beyond the health improvements, clean cookstoves also allow women and children to spend less time collecting firewood and cooking, thus increasing the time available for rest, communication, education and other productive activities (IPCC, 2022b) and empowering women to engage in local advocacy, gain technical skills and join income-generating activities (IPCC, 2022b; WECF, 2022).

Energy efficiency measures, especially in buildings, have positive effects on the elderly through alleviating energy poverty and reducing fuel consumption and therefore associated financial stress. Many elderly people live in fuel poverty and in cold and damp houses, and suffer various health effects, including excess winter mortality and increased morbidity due to respiratory, cardiovascular, and arthritic and rheumatic diseases (Camprubí et al., 2016; Lacroix and Chaton, 2015; Ormandy and Ezratty, 2016; Payne, Weatherall, and Downy, 2015; Thema et al., 2017). Furthermore, economic pressures associated with high energy bills exacerbate negative mental health outcomes, and high temperatures, especially during summer, can also be dangerous for those living in buildings with inadequate thermal insulation and inappropriate ventilation (Ormandy and Ezratty, 2016; Sanchez-Guevara et al., 2019; Thomson et al., 2019). As such, by reducing energy expenditures and increasing productive time for women and children, sufficiency and efficiency measures lead to poverty reduction, especially in developing countries.

They also improve health conditions for the elderly through reducing the effects of high temperatures and improving indoor air quality and thermal comfort (IPCC, 2022b).

Downsizing dwellings through co-housing strategies is another policy that provides mitigation benefits along with positive impacts on the elderly and intergenerational equity (IPCC, 2022b). In contrast to typical residential developments, co-housing communities are purposefully created to foster and promote multigenerational living arrangements. They help elderly people to overcome a range of housing obstacles, which include concerns related to housing supply, access, cost, stability and social isolation. Simultaneously, these policies facilitate the establishment of senior cooperative housing and eco-villages by repurposing both existing and new buildings into multifamily structures instead of single-family dwellings, integrating shared spaces such as communal areas for laundry, dining and various other purposes. These strategies reduce demand for materials in construction and energy demand for heating (IPCC, 2022b), and can encourage intergenerational cohousing and interactions among people of different backgrounds (IPCC, 2022b; Lietaert, 2010).

Mitigation policies relating to urban planning, infrastructure, transport and the automation of vehicles have positive effects on persons with disabilities and the elderly. There is increased pressure to engage people with disabilities in the consultation and decision-making processes of urban governance in order to create a more inclusive and effective urban environment that avoids negative impacts on persons with disabilities (Colenbrander et al., 2019; IPCC, 2022b). Improving the transport sector and road accessibility will enhance the welfare of persons with disabilities by offering them more inclusive, affordable, safe, and clean passenger and freight mobility (IPCC, 2022b). The automation of vehicles to become driverless could improve vehicle efficiency and reduce congestion and, consequently, emissions (Massar et al., 2021; Vahidi and Sciarretta,



2018), which could increase travel demand for the elderly (Harper et al., 2016) and make transport for persons with disabilities and the elderly more accessible and less risky (Auld, Sokolov, and Stephens, 2017; Sonnleitner, Friedrich, and Richter, 2022). Similarly, pro-climate physical infrastructure designed to reduce carbon emissions and facilitate low-carbon mobility and energy can have positive impacts on children by making low-carbon mobility, such as walking and cycling, safer for them (IPCC, 2022b).

Increasing electrification can support and reduce the costs of key elements of human development, such as education, health and employment (IPCC, 2022b), which will largely affect women, youth and children. For example, increasing electrification offers greater access to irrigation opportunities for agricultural communities, which in turn increases their incomes (Peters and Sievert, 2016). Coordinated electrification policies can improve enrolment for all forms of education (Kumar and Rauniyar, 2018; López-González, Domenech, and Ferrer-Martí, 2020), including for children through reducing the time they

spend on biomass collection and expanding the time available for schooling (Khandker et al., 2014).

Demand-side mitigation measures, such as energy efficiency, can also have multiple interacting and positive benefits for the poor (IPCC, 2022a, 2022b). Improving energy services to meet energy and other needs can provide the poor and citizens of less-developing countries with much needed access to the safe and low-emissions energy sources necessary for decent living, and can increase energy savings by 20–25 per cent (IPCC, 2022b).

Minimizing the impacts of response measures on people in vulnerable situations requires incorporation of actions that speak to gender and people in vulnerable situations and just transition concepts into climate policies and/or NDCs (Climate Strategies, 2022; Government of Ghana, 2022; ILO, 2022b).

Just transition policies can eliminate occupational gender stereotypes that prevent women from benefiting from the economy. There is a significant risk that without a just



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transition, it will not be possible to achieve low-carbon, environmentally sustainable economies with decent work and social justice. These goals are essential to the well-being of current and future generations, as well as gender equality and inclusiveness in the workplace (ILO, 2022b).

Incorporation of such actions and just transition concepts into climate policies and/or NDCs is also key to ensuring a well-planned and equitable transition that is aligned with a country's development frameworks and priorities and the Paris Agreement, and to addressing key effects on vulnerable groups (Climate Strategies, 2022; Government of Ghana, 2022). Just transition policies also need to be accompanied by skills development and social protection policies to ensure women's safety and well-being and to provide adequate conditions for women's engagement in the labour market (ILO, 2022b).

Some efforts have been made to increase stakeholder engagement with government officials and different social groups, such as women, local communities and Indigenous Peoples, and to aid in mainstreaming these groups in climate action (Climate Strategies, 2022; Government of Ghana, 2022; ILO, 2022b; WECF, 2022; World Bank, 2022). Efforts also include programmes of action to build the resilience of citizens, the majority of whom are youth and women, while reducing GHG emissions and creating jobs, as well as targeted training for institutions to better understand the social and employment implications of climate policies and NDCs (Government of Ghana, 2022).

As businesses are the engine for job creation and the channel by which any mitigation measures are implemented, governments can develop industrial, sectoral, enterprise development and rights at work policies as channels within the just transition framework to facilitate an optimal business environment that is consistent with the United Nations Guiding Principles on Business and Human Rights, ensures decent work and quality jobs that encompass healthy working conditions,

and offers equal opportunities and treatment (ILO, 2022b). Just transition policies need to be based on statistical information grounded in international statistical standards and include information on vulnerability, including but not limited to gender, disability and age (ILO, 2022b).

## **PHASE-DOWN OF COAL AND REMOVAL OF INEFFICIENT FOSSIL FUEL SUBSIDIES**

Phasing down of coal and removal of inefficient fossil fuels subsidies are key response measures but pose challenges for public policy owing to the possible social and economic consequences. The fossil fuel industry offers business and rent-seeking opportunities along its value chain, including mining or extraction, transport, distribution and power generation. Closing or repurposing mines and fossil fuel-based power plants can cause major economic and social impacts in a region which economy relies on the operation of such mines and power plants. Policies for phasing down or removing inefficient fossil fuel subsidies need careful planning in order to mitigate impacts on workers and the community. Fossil fuel subsidies are in place in both developed and developing countries. Despite countries committing to the Paris Agreement, coal remains attractive for many countries, especially those with fast-growing economies, owing to its power system stability and low electricity costs for consumers (Jakob and Steckel, 2022), a scenario similar for other fossil fuels. A study showed that if a subsidy on coal is reduced too quickly, it could have consequences on sectoral and macroeconomic structures but a minimal impact on gross domestic product and GHG emissions, as imported coal is expected to replace domestic (Welsch, 1998).

Fossil fuel subsidies are most commonly prevalent in developing countries, and are implemented for socioeconomic and development purposes to increase energy



access and reduce energy poverty by reducing the cost of energy, or as rent distributive mechanisms in countries that rely heavily on rents from fossil fuel exports (Shehabi, 2017). Fossil fuel subsidies incentivize the increased use of fossil fuels, and they benefit the rich more than the poor, are distortionary and are inefficient (Lockwood, 2015). Nonetheless, they also provide access to modern energy sources for the poor (Kimemia and Annegarn, 2016). The impacts of climate change mitigation options and a low-carbon transition vary and are experienced differently by different countries and social actors. Among the social actors, Indigenous communities face multiple threats and are subjected to unequal power dynamics (Sovacool, 2021) because the energy transition is dominated by the interests of the fossil fuel producers and investors, who belong to powerful groups or companies that could be vocal if their interests are at risk (Lazarus and van Asselt, 2018). This reality implies that people in vulnerable situations, especially Indigenous communities, who are subject to unequal power relations, are at risk in the transition process. Social equality is thus at the

heart of the transition process in general and in fossil fuel dependent economies in particular (IPCC, 2022b).

In this context, studies on the impacts on women are limited. Women and migrants tend to be overrepresented in indirect or supportive roles to the energy sector – such as lower-paid service work and unpaid care work. As such, they often do not access the worker compensation and re-training policies that are proposed to mitigate the negative effects of coal phaseout and fossil fuel subsidy reform (Bacchiocchi, Sant, and Bates, 2022; Piggot et al., 2019).

Like other general energy transition projects, the phasing out of coal will cause job losses for those working in the coal sector, rendering the expansion of jobs and support for the transition to low-carbon energy a key priority (IPCC, 2022b).

As far as can be established, there are no studies that directly measure the impacts of phasing out coal and inefficient fossil fuel

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subsidies on intergenerational equity, youth, the elderly and persons with disabilities. Effects on their health are inferred from studies on the general population. For example, phasing out fossil fuels is likely to improve air quality and reduce emissions (IPCC, 2022a, 2022b), which will improve the health of people in vulnerable situations, especially those living with respiratory illnesses, which are often common among the elderly and children.

A study on the impacts of phasing out coal plants focusing on labour and economy-wide effects in general shows that phasing out of coal-powered plants in Chile would result in a significant negative impact on the overall labour market, including the progressive disappearance of 4,000 jobs in coal power plants by 2030 or 2050, depending on the scenario, but that such effects are not significant when compared with Chile's labour markets and gross domestic product (Vogt-Schilb et al., 2019).

The phasing out of coal and other fossil fuels and their subsidies raises questions relating to climate justice. Poor households and poor people in vulnerable situations tend to allocate a larger share of their incomes to energy and other basic needs. Coal can also be a more affordable energy source than renewable energy, therefore implementing response measures such as removal of fossil fuel subsidies will have a larger impact on the livelihoods of the poor and other vulnerable populations (Couharde and Mouhoud, 2018; IPCC, 2022b; KCI, 2022b) and will therefore exacerbate their vulnerability. A transition must respect and uphold the rights of groups harmed by the loss of affordable and/or subsidized coal and other fossil fuels, including consumers and workers in the extractive industries (Muttitt and Kartha, 2020).

The negative impacts of eliminating fossil fuel subsidies can be alleviated if a subsidy reduction is accompanied by income transfers aimed at poor households or the domestic production of petroleum products (Siddig et al., 2014; Vogt-Schilb et al., 2019). A study on options for mitigating adverse effects using a

CGE model suggests that removing subsidies for fossil fuels would create opportunities if done in tandem with complementary policies, such as agricultural productivity improvements and a reduction in trade transaction costs (Wesseh and Lin, 2017). Cash transfer programmes, which have been implemented in almost all countries (Beegle, Coudouel, and Monsalve, 2018), are central to the success of energy subsidy reforms (Rentschler and Bazilian, 2017).

In addition to mitigating climate change, the introduction of biofuels coupled with a careful selection of bioenergy feedstocks can also reduce the negative impacts of response measures on people in vulnerable situations, especially those facing the risk of hunger (Kline et al., 2017; United States Government Accountability Office, 2009). Managing trade-offs from balancing bioenergy demands with food and biodiversity, and with competition for land and water, will require targeted policies that stimulate changes in food systems in ways that reduce food poverty (Henry et al., 2018; Xu and Ramanathan, 2017). Such policies include agricultural intensification, open trade, less consumption of animal products, reduced food losses and advanced biotechnologies (Henry et al., 2018; Xu and Ramanathan, 2017).

In summary, examining the literature related to phase-down of coal and removal of inefficient fossil fuel subsidies shows that these studies tend to focus on the general population or the effects on poor households. Studies examining in-country effects focus largely on the impacts on household income, livelihoods, job losses and poverty, and, to a lesser degree, women. The scope of these studies reveals a gap in assessments on the impacts of response measures on people in vulnerable situations.

## **ADOPTION OF RENEWABLE ENERGY**

The implementation of renewable energy technologies, such as solar (photovoltaic or concentrating solar power), wind and hydropower, but also geothermal power

and biomass, is an integral component of mitigation policies consistent with 2 °C and 1.5 °C pathways (ILO, 2022a; IPCC, 2022b; KCI, 2022a). The energy transition away from fossil fuels has accelerated with the rapid rise in the adoption of renewable energy technologies over the past decade, partly owing to the reduction of their production costs to levels competitive with those of fossil fuels in many jurisdictions (IPCC, 2022b). Models of future emission pathways show that net zero emissions target cannot be achieved without integrating renewable energy solutions with other solutions (such as energy storage and energy efficiency) (IEA, 2021; IPCC, 2022b). As such, international and local policymakers are attempting to accelerate the transition to renewable energy through policies such as increasing renewable energy investments, implementing subsidies for green jobs training or retraining programmes, improving energy technology standards and emission regulations (ILO, 2022a).

Expanding renewable energy can be a critical solution for reducing energy poverty and access to energy in various countries. Furthermore, implementing renewable energy technologies and subsidies that encourage their production and adoption can result in various positive social and economic impacts, such as boosting jobs in the renewable energy sector and other green jobs (ILO, 2022a; IPCC, 2022b), reducing electricity blackouts (KCI, 2022a), improved health, energy independence, and innovation and technological advancements in the clean energy sector. The application of a robust renewable energy sector can diversify economies that are heavily reliant on fossil fuels, reducing vulnerability to commodity price fluctuations. Nevertheless, the higher initial capital expenses associated with renewable energy sources, despite the significant cost reductions, remain a drawback due to economic and political considerations.

Simultaneously, the expansion of renewables has negative effects. Hydroelectric power plants can have significant environmental impacts, particularly on local ecosystems and

aquatic habitats owing to dam construction and the alteration of water flow. Such impacts include habitat alteration, displacement of communities and changes in water availability downstream, which can have economic repercussions on agriculture, fisheries and other water-dependent industries. They also cause job losses in the industries they replace (KCI, 2022a), displace communities from land used for renewable energy production and increase gender inequality (IRENA, 2019). Expanding renewables through hydropower can cause dam-induced displacement (Kirchherr, Ahrenshop, and Charles, 2019) and enclosure of land, displacing pastoral use by communities in vulnerable situations. These impacts constitute forms of spatial injustice. Similar large-scale installation of solar photovoltaics, although generally environmentally friendly, may also result in habitat disruption, land degradation, agricultural land loss, changes in land use, environmental pollution from toxic materials and stress on local water resources in arid regions.

Strategic and integrated spatial planning is thus required to ensure that land use for renewable energy does not displace households in vulnerable situations and addresses trade-offs between using land for renewable energy and food production. Examples of such strategic special planning solutions include co-locating agriculture with solar photovoltaics (Barron-Gafford et al., 2019) or with wind power (Miller and Keith, 2018), and integrating renewable energy with mobility and housing (Hurlbert et al., 2019).

In developing countries, studies show that having access to renewable energy sources, such as small-scale biofuel production, can help to ensure that Indigenous Peoples and other remote rural populations have greater energy security and higher living standards, thereby reducing regional economic inequalities and even ethnic conflict (for example: Bezerra et al., 2017; Bhattacharyya, 2013; REN21, 2023).

Renewable energy transitions in rural and

impoverished locations can simultaneously reinforce and disrupt local power structures and inequalities (IPCC, 2022b), directly affecting local communities and Indigenous Peoples. Indigenous Peoples are often marginalized in development decisions on renewable energy because the burdens and risks placed on them are not properly integrated in those decisions, while risk assessments often fail to differentiate between the burdens and risks of different groups, thereby reinforcing existing power imbalances (Healy, Stephens, and Malin, 2019; Kojola, 2019).

The expansion of large-scale renewable energy projects (including wind and marine) can harm Indigenous Peoples and local communities because these projects are land intensive and often require access to tribal land. These projects sometimes lack consultations in the early stages, including those that can identify the effects on women. At times, these projects also have complex legal frameworks surrounding stakeholder consultation and involvement, tribal autonomy and self-determination (Bacchiocchi, Sant, and Bates, 2022; GI-ESCR et al., 2022; Kerr et al., 2015; Unger, 2009) that are complex for many members of local communities and Indigenous Peoples.

Indigenous communities whose lands are used for these projects often have no way to actively share their concerns or be heard in formal processes and often have not given their free, prior and informed consent to the construction of projects on their lands (GI-ESCR et al., 2022; OHCHR, 2017). There are also findings that Indigenous concerns are being co-opted or side-lined through formal and legal decision-making processes (Bacchiocchi et al., 2022). This indicates that the formal consultation processes for assessing mitigation policies fail to meet the standards for energy justice by inadvertently giving more weight to the voices of lesser affected communities because of a lack of inclusive processes and decision-making.

Expanding large-scale renewable projects can also negatively affect women, as they tend

to have highly unequal land tenure rights and are commonly marginalized from the processes of negotiation, consultation and compensation between project developers and local communities (GI-ESCR, 2020; GI-ESCR et al., 2022).

The expansion of off-grid, small-scale, decentralized and community-based energy models can also enable households and individuals to collectively meet their local energy needs at lower emissions levels while encouraging democratic control of new renewable energy systems. A study of the impacts of small-scale solar power deployment through a gender lens showed significant socioeconomic benefits resulting from improving access to renewable energy (Gray et al., 2019). Off-grid small-scale renewable energy also empowers women through lifting their domestic care burden and providing them with leadership opportunities to learn how to install, use and repair off-grid energy solutions (GI-ESCR et al., 2022).

A study by IRENA (2019) estimated that the number of jobs in the renewables sector could increase from 10.3 million in 2017 to nearly 29 million by 2050. Engaging women in the consultation processes for renewable energy projects improves their ability to advocate for socioeconomic advancement (such as investments in schools, health care and infrastructure) as part of compensation plans for large-scale development projects (GI-ESCR et al., 2022; IPCC, 2022b). Although the share of women in the renewable energy workforce (32 per cent) is higher than in the total energy sector workforce (22 per cent), women may not occupy a substantial share of the new jobs in renewable energy because their level of employment in science, technology, engineering and mathematics jobs is low (GI-ESCR et al., 2022; IRENA, 2019).

Measures that ensure equitable access to new technologies (such as financial support through subsidies or microcredit for poorer households) benefit women and the general population by improving access to energy in remote communities (Markkanen and Anger-Kraavi, 2019).



Motivations among some Indigenous communities for pursuing sustainable energy projects are linked to exercising autonomy and self-determination, and exerting sovereignty (Hasegawa et al., 2018; Jaffar, 2015). Communication with local and Indigenous communities is important, as part of their Indigenous self-determination, to evaluate the positive socioeconomic impacts of the energy transition on them while mitigating negative impacts (Fitzgerald and Lovekin, 2018; Mercer et al., 2020). Listening to the voices of Indigenous communities enables the identification issues that are considered the most pressing energy-related challenges in their communities (IPCC, 2022b; Mercer et al., 2020). Lack of transparent information sharing by electric utilities and their authoritative advantage caused power imbalances between utilities and Indigenous proponents. Opportunities for Indigenous inclusion, for example through partnership, can reduce these power imbalances (Fitzgerald and Lovekin, 2018).

Renewable energy technology is likely to reduce health risks for the elderly (IPCC, 2022b). Renewable energy-based electrification of the energy system reduces outdoor air pollution and improves indoor air quality through reducing smoke from heating and cooking (Kjellstrom and McMichael, 2013).

It is likely that the expansion of renewable energy can increase energy access in energy-poor areas. At the same time, it can increase poverty in countries that depend on fossil fuel subsidies (Shehabi, 2022).

Energy poverty is defined as not having the socially and materially necessary level of domestic energy services (Thomson et al., 2019). This is caused by an interplay of three main factors, namely no access to energy sources, low affordability (low incomes and high energy prices) and a high energy need (owing to inefficient housing).

Energy poverty has been studied across the EU, and adequate levels of heating, hot

water, cooling, lighting and energy to power appliances, are considered as essential for guaranteeing energy-efficient homes, basic level and decent standard of living and health.<sup>9</sup> Unlike in the EU, energy poverty studies in Africa and Asia are limited in terms of availability, quality and quantity.

About 770 million people worldwide still live without access to electricity, mostly in developing countries in Africa and Asia (IEA, 2021). Energy poverty can also be an issue in developed countries; for example, the European Commission estimates that about 34 million people in the EU are experiencing energy poverty to varying degrees (Pfeiffer and Marwah, 2022).

Energy access issues are traditionally considered as problems associated with access to fossil fuels, particularly where there is a lack of infrastructure. A new form of energy access issue is now emerging in the low-carbon energy transition: access to low-carbon energy and low-carbon systems or technologies (Johnson et al., 2020; Sovacool et al., 2021).

Addressing energy poverty and climate change is critical for achieving Sustainable Development Goal 7 (ensuring access to affordable, reliable, sustainable and modern energy for all). However, the relationship between energy access and climate action is often overlooked in both policy and practice. It is also important for an effective implementation of NDCs (IRENA, 2021). According to IRENA, to reach Sustainable Development Goal 7 of 100 per cent energy access by 2030, Africa would need to connect electricity to around 85 million people every year. Furthermore, it is estimated that to address energy poverty in African countries by increasing the role of mini-grids, there is a need for approximately 210,000 mini-grids by 2030 (Mudasia and Sekarintias, 2023).

It is estimated that even if today's policy settings are implemented, there will be about 670 million people without access to electricity

<sup>9</sup>[https://energy-poverty.ec.europa.eu/about-us\\_en](https://energy-poverty.ec.europa.eu/about-us_en).



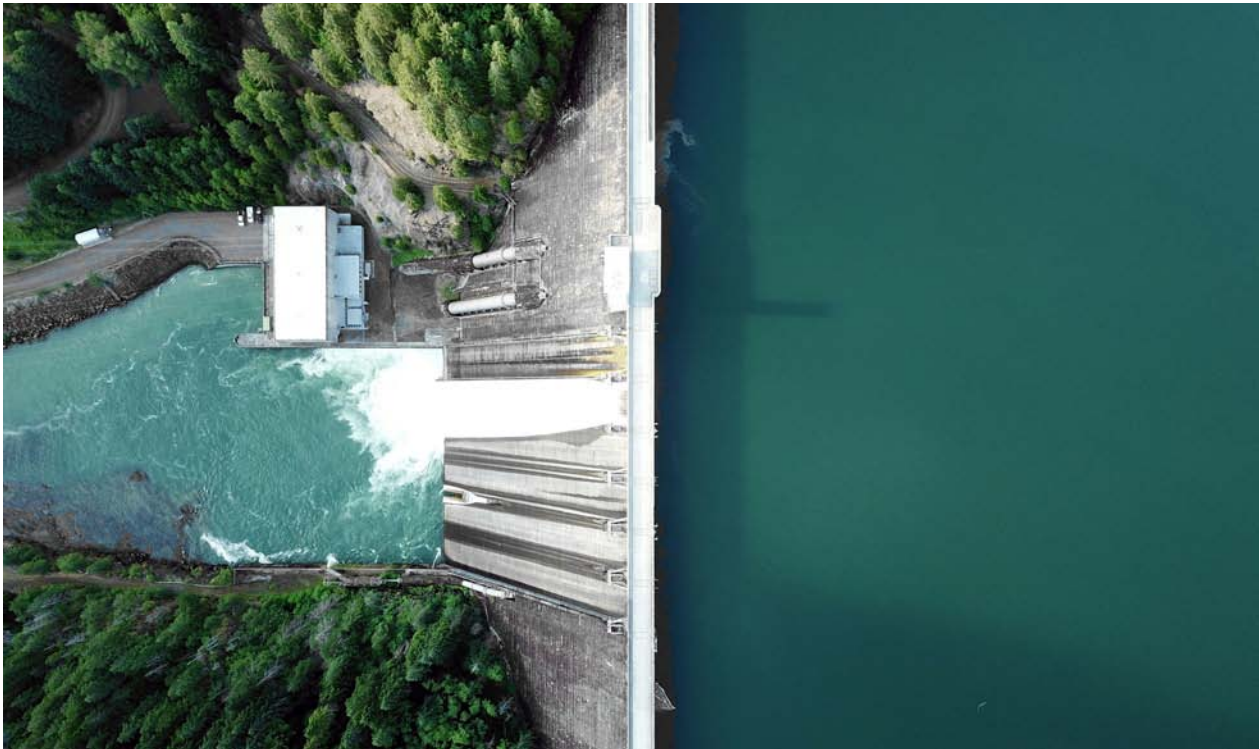


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in 2030 and 2.1 billion without access to clean cooking fuel (IEA, 2021). The IEA landmark Net Zero Emissions by 2050 Scenario charts a narrow but achievable road map to a 1.5 °C stabilization in rising global temperatures and the achievement of other energy-related Sustainable Development Goals (IEA, 2023a).

Emerging issues linked to energy poverty include good governance, citizens' agency, new energy services and new threats from the energy transition (Stojilovska et al., 2022). Elevated electricity prices create barriers for people, particularly poor people, in accessing affordable energy, consequently impacting their energy accessibility. To mitigate this, countries have implemented redistributive measures, including energy poverty alleviation policies. In addition, there is also evidence that linked policies are helpful. For example, countries with a long tradition of addressing energy poverty, such as France and the United Kingdom of Great Britain and Northern Ireland, integrate energy poverty in linked policies. Policy integration is reflected in the EU's efforts to include energy poverty in climate and energy policies (Stojilovska et al., 2022). Yet, studies suggest that these policies have limitations in their effectiveness, with countries in the EU still facing considerable rates of

energy poverty, affecting anywhere from 5 to 40 per cent of their populations (Belaïd, 2022). In sub-Saharan African countries, energy access rates in 2022 are the lowest globally, with only 49.4 per cent of the population having access to electricity and only 18.5 per cent having access to clean cooking (IEA, 2023b). It is crucial to consider the relationship between climate action and energy affordability, especially for developing countries with limited resources and infrastructure. This emphasizes the need to integrate energy poverty themes, such as affordability and access, into climate policies and strategies. Success in tackling climate change and energy poverty depends on factors such as political will, international cooperation, institutional capacity and financial resources. An integrated approach that considers various factors and stakeholders is essential to achieve both equity and the climate goals (Belaïd et al., 2023; Jessel, Sawyer, and Hernández, 2019).

New technologies are not always properly designed to cover the required needs of people in vulnerable situations. Although energy demand increases with age (Estiri and Zagheni, 2019; Inoue, Matsumoto, and Mayumi, 2022), elderly people generally retain outdated and energy-inefficient home appliances because of their familiarity, even if they can afford to

buy new and efficient appliances.<sup>10</sup> Thus, in addition to a technological focus, there is also a need to promote a human-centric transition (Nguyen and Batel, 2021). Furthermore, if an affordability-based definition of energy poverty is applied, many climate policy proposals risk raising the number of energy-poor people if they are not accompanied with complementary measures (Bouzarovski, Thomson, and Cornelis, 2021; Streimikiene et al., 2020; Vandyck et al., 2023). Income-targeted revenue recycling schemes are necessary as new climate policies support households out of energy poverty (Nolden et al., 2022; Stojilovska et al., 2022; Vandyck et al., 2023). A study in Japan concluded that promoting the use of solar energy among energy-poor households, regardless of the capacity of solar deployment that they own, could considerably help to alleviate energy poverty when policies are designed adequately (Castaño-Rosa and Okushima, 2021).

## MITIGATION POLICIES IN THE FORESTRY SECTOR

Mitigation policies in the forestry sector are part of nature-based solutions. They aim at increasing forest coverage to develop and preserve carbon sinks. These policies have become important solutions to the high level of CO<sub>2</sub> in the atmosphere. As natural carbon sinks, forests absorb atmospheric CO<sub>2</sub> from the atmosphere, accumulate it as carbon in trees, vegetation and soils in terrestrial ecosystems, then release oxygen into the atmosphere (IPCC, 2022b). This carbon sequestration ability of forests has attracted interest as a relatively inexpensive means of addressing climate change. Policies to increase forestry include REDD, REDD+ and payments for ecosystem services schemes that promote biodiversity in forests.

Although a very important and effective mitigation measure, increasing forestry requires access to land often inhabited and/or used by populations, particularly local

communities and Indigenous Peoples. The effects of forestry on these groups have been documented in the literature and from inputs from stakeholders.

Carbon sequestration and GHG emission reduction options have both co-benefits and risks related to biodiversity and ecosystem conservation, food and water security, wood supply, livelihoods, land tenure and land-use rights of local communities, Indigenous Peoples and small-scale landowners. Many options have co-benefits, but those that compete for land and land-based resources can pose risks (IPCC, 2022b). To increase carbon and economic equality and to minimize the negative effects of response measures, projects such as the UN-REDD Programme can aid in establishing carbon data-collection systems to identify and minimize the effects on Indigenous Peoples and local communities (CBCGDF, 2022).

At a general level, forestry schemes such as REDD and REDD+ can exacerbate income inequalities and increase the risk of conflict when their ensuing financial benefits are not equally distributed, property rights are not granted to selective local beneficiaries and people in vulnerable situations or distant foreign users<sup>11</sup> are not provided with opportunities to engage in the decision-making for these schemes (Bee, 2017; Duker et al., 2018; IPCC, 2022b; Khatun et al., 2015; Nhantumbo and Camargo, 2015).

Valuing, managing and minimizing these trade-offs and maximizing synergies can be accomplished through practices such as increasing the involvement of local communities and Indigenous Peoples, through benefit sharing and through emphasizing capacity-building, finance, governance, technology transfer, investments, development and social equity considerations with the meaningful participation of Indigenous Peoples and other vulnerable populations (IPCC, 2022b).

<sup>10</sup> Proceedings of the 35th Conference on Energy, Economy, and Environment, 292-, 2019.

<sup>11</sup> Distant foreign users are those whose participation may be constrained by informal rules, customary laws, social norms and bias.



Mitigation programmes in the agriculture, forestry and other land use sector, such as the UN-REDD Programme, can respond to the needs of multiple stakeholders to maximize co-benefits while limiting trade-offs (IPCC, 2022b). Furthermore, beyond reducing emissions, the regeneration of millions of trees through agroforestry systems has significant other positive impacts. It decreases erosion, provides animal fodder, recharges groundwater, generates nutrition and has income benefits, thereby serving as safety nets for rural households in vulnerable situations during climate or other shocks (Bayala et al., 2014; Binam et al., 2015; Ilstedt et al., 2016; Sinare and Gordon, 2015). Ensuring co-benefits from land-based mitigation and other policies that reduce emissions from food systems requires greater planning and coordination among policymakers (IPCC, 2022b).

The effects on women of policies that promote increasing forestry feature in different studies. Women routinely experience discrimination and harmful outcomes in their use of land

and natural resources and in gaining rights to them (World Bank, 2022). Gendered forms of injustices manifest, in existing schemes or programmes, in the way that men and women access forest resources and participate in decision-making processes. Building the REDD+ strategy upon the operational framework of these existing schemes and programmes (such as the Joint Forest Management programme in India) can be considered as a tool to integrate gender concerns through compulsory representation of women (Michael et al., 2020). Women's participation in assessments of technologies to address water shortage owing to deforestation can enable a gender-responsive emergency preparedness programme targeted at women (WECF, 2022). The deployment of biodigester to produce biogas from organic materials such as cassava peelings and other household waste contributed to efforts to combat deforestation and reduced pollution from burning firewood, thereby reducing respiratory and eye diseases for women. This technology also increased women's income and reduce financial burden

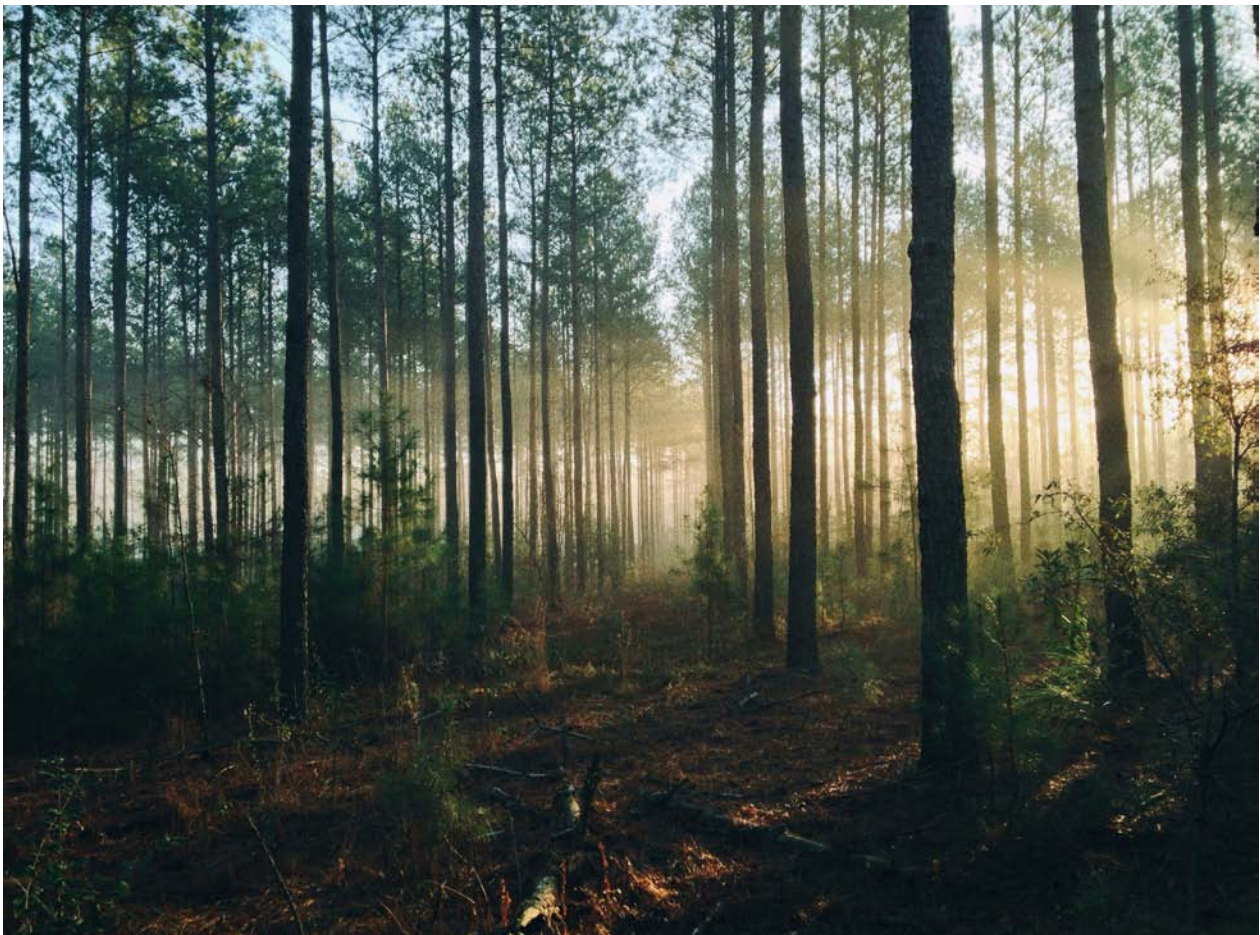


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of purchasing fertilizers (IPCC, 2022b; NGO Africa Hope, 2022).

Afforestation or the production of biomass crops, however, when poorly implemented can result in negative socioeconomic and environmental impacts, and can harm local livelihoods and the rights of Indigenous Peoples if implemented at large scales and where land tenure is insecure (IPCC, 2022b). The literature on REDD+ and increasing forestation and conservation suggests that there is little attention to the well-being of populations in rural and agricultural areas (Kongsager and Corbera, 2015), and that there are ensuing negative impacts on Indigenous communities, including Indigenous women, as follows:

1. In countries examined in the available literature, forests are primarily public land and usually formally administered by the State, which increases potential risks of land-grabbing by outsiders and the loss of local user rights to forests and forest land by Indigenous and local rural communities. In many cases, authorities are being empowered to arrest and prosecute people for illegal logging and encroachment of land and to confiscate land and destroy crops. This has resulted in Indigenous and/or local rural communities, including Indigenous women, being at risk of deprivation of their rights (Larson et al., 2015). Within Indigenous groups, women's voices are often marginalized owing to a common tendency to view members of local communities undifferentiated (IPCC, 2022b; Larson et al., 2015). Failures to recognise gender differences connected to social structures of forest communities and forest resource distribution and uses result in greater hardships for women (Killian and Hyle, 2020; Larson et al., 2015);
2. At a general level, initiatives for forest conservation can harm socioeconomic equality among different local communities and ethnicities, as the use of land can displace these communities' members and cause loss in their livelihoods (Bhattacharya,

Pradhan, and Yadav, 2010; Jindal, Kerr, and Carter, 2012; Khatun et al., 2015; Robinson, Holland, and Naughton-Treves, 2014; Smith et al., 2014). Yet, these effects can be mitigated, and equality increased if communal land rights are formally acknowledged and the financial and other benefits from project participation exceed any negative impacts;

3. Efforts to manage and increase forestry have prevented some Indigenous Peoples and local communities from carrying out traditional environmental management practices, including rotational agriculture and animal grazing (Haenssger et al., 2022). Some local regulations under forestry plans continue to deprive Indigenous Peoples of their rights by empowering authorities to confiscate their land and destroy their crops or even arrest and prosecute them for illegal logging and encroachment of land (Phongchiewboon et al., 2020);
4. Policies to halt deforestation can force forest-dwelling communities and some Indigenous Peoples into a precarious existence, and undermine forest conservation goals. These impacts occur due to a misunderstanding of the realities and priorities Indigenous Peoples, which include land-tenure rights, governance autonomy, human dignity, material livelihoods and cultural production (Haenssger et al., 2022). Policies of reforestation and conservation in South America, Asia and Africa have worked to legitimize State control of ancestral lands and interfere with local (often sustainable) forest management practices, thereby creating artificial pressures on land that accelerate deforestation and land degradation (Phongchiewboon et al., 2020);
5. Some forestry and forest policies have been very successful in generating economic benefits, for example in Chile, but to the detriment of local and traditional communities. The creation of some exotic plantation or monocrop forests has had negative socioeconomic and environmental impacts on local communities and



Indigenous Peoples, and consequently raised inequalities and conflicts at the local level (Reyes and Nelson, 2014).

The literature offers various ways in which negative impacts on local communities and Indigenous Peoples and women can be reduced. For example, the documentation of rights to land and the processes for titling or certifying rights should be accessible to men and women and should address specific barriers facing women in minority ethnic groups (World Bank, 2021). Increasing Indigenous women's access to land tenure rights allows women farmers to develop agroforestry activities while promoting ancestral knowledge, and empowers Indigenous women by increasing their food security and incomes, which promotes gender equality (WECF, 2022). Institutionalizing payments for carbon sequestration and biodiversity conservation values of ecosystems services from global to local communities has been conceptualized as a 'win-win-win' for climate mitigation, the protection of biodiversity and conservation of indigenous culture (IPCC, 2022b). Such institutionalization occurred through mechanisms such as REDD+ and The Economics of Ecosystems and Biodiversity, a United Nations Environment Programme global initiative focused on "making nature's values visible".<sup>12</sup>

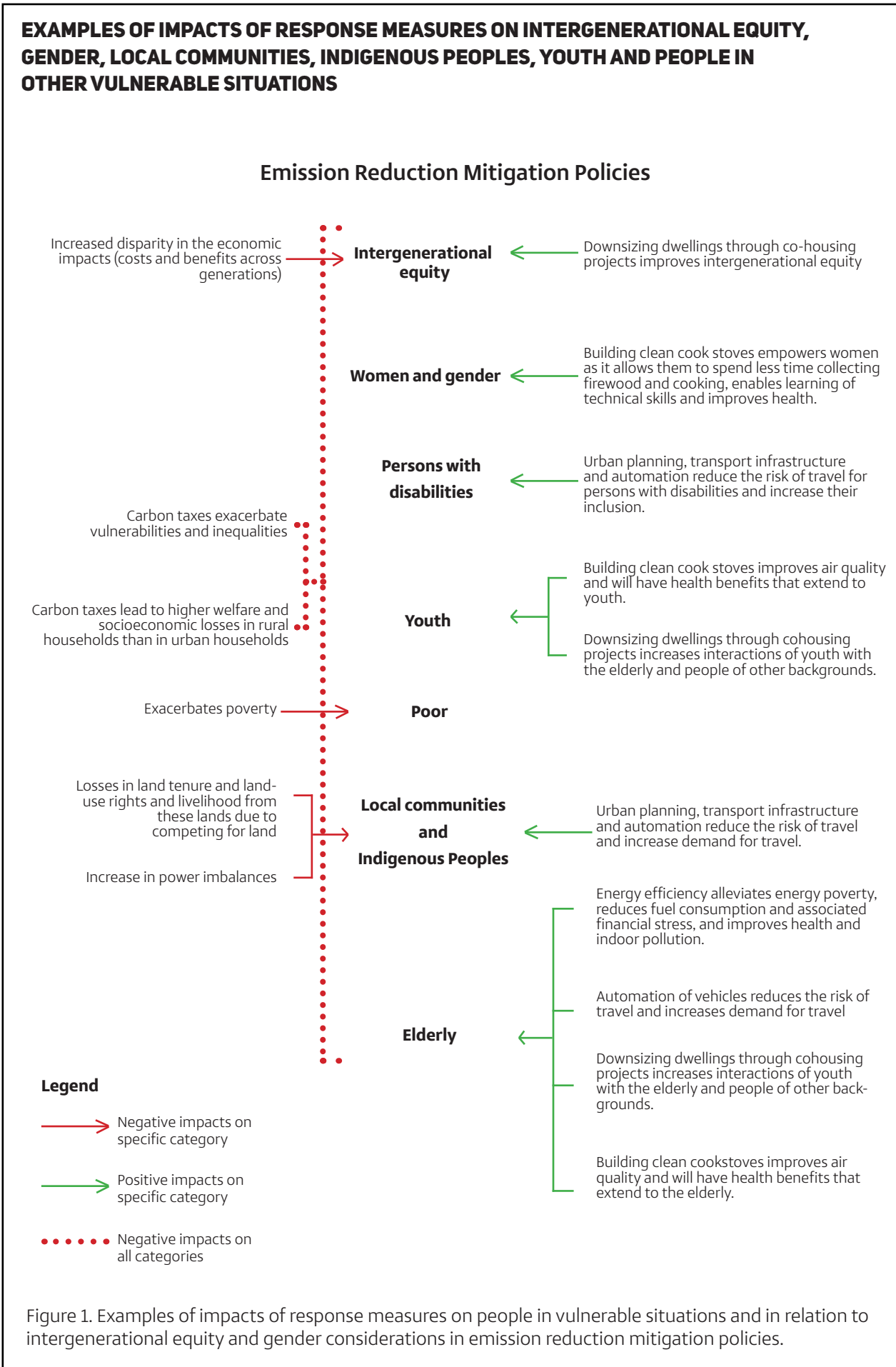
A study examining the effects on youth and migration in the Global South shows that community forestry largely increases migration of youth out of these areas (Brown, 2021). Those who remain are often highly dependent on forests for goods and services for their livelihoods. As such, community forestry can be an effective strategy for sustainable forest management and livelihoods. However, youth have often been marginalized in benefiting from or participating in decision-making about community forests owing to local, cultural and traditional norms that give priority to older generations in decision-making (Brown, 2021). Policies that expand urban forestry green infrastructure are likely to have positive health

impacts on all people in vulnerable situations, especially the elderly. Forests and green infrastructure reduce heat stress (IPCC, 2022b; Kim and Coseo, 2018) and improve air quality by absorbing pollutants and sequestering carbon emissions (De la Sota et al., 2019; Scholz, Hof, and Schmitt, 2018). In turn, these effects improve the health conditions aggravated by climate change of people in vulnerable situations, particularly the elderly.



photo by <https://unsplash.com/@GreenLiu>

<sup>12</sup> <https://teebweb.org>.



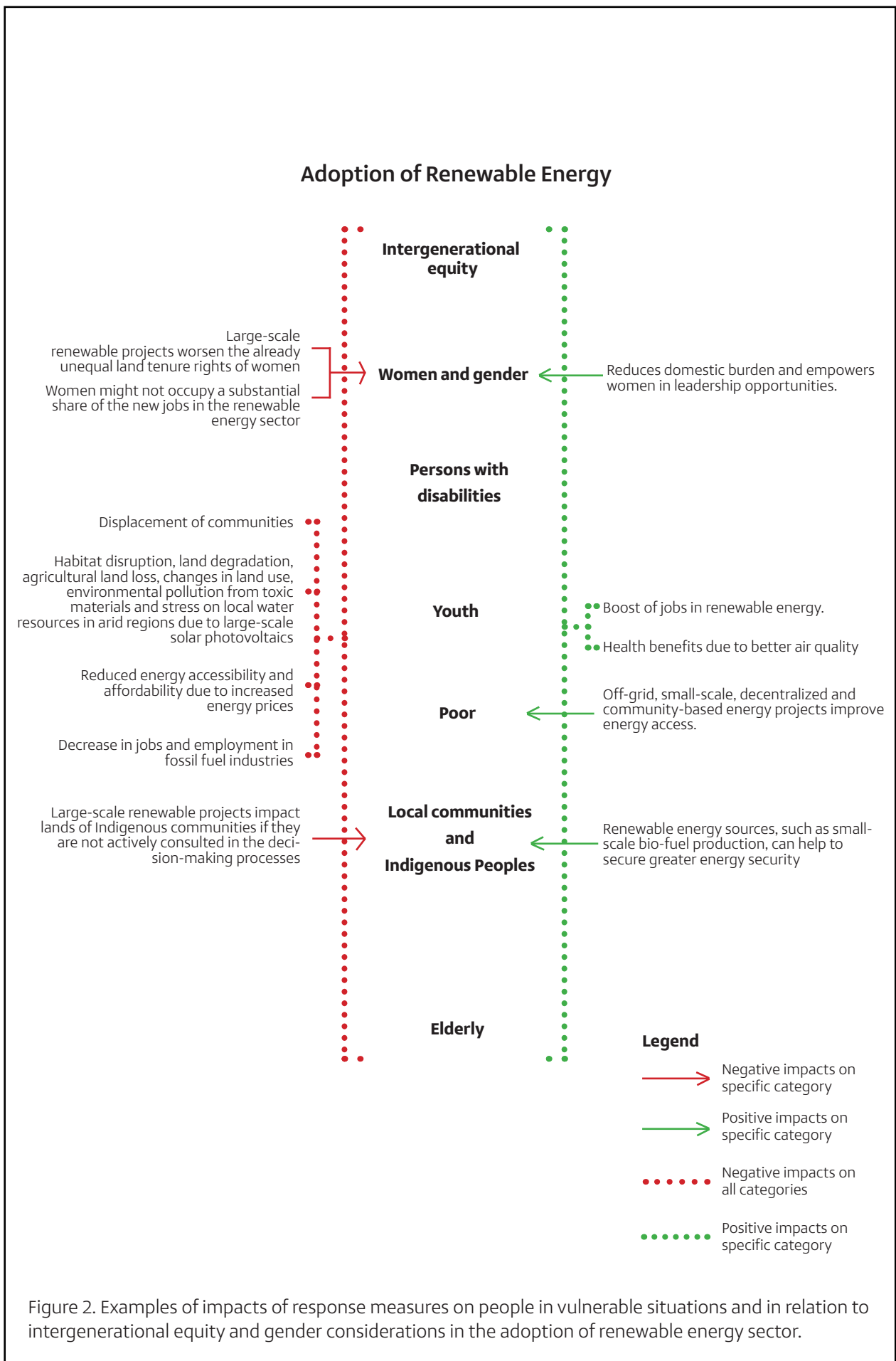
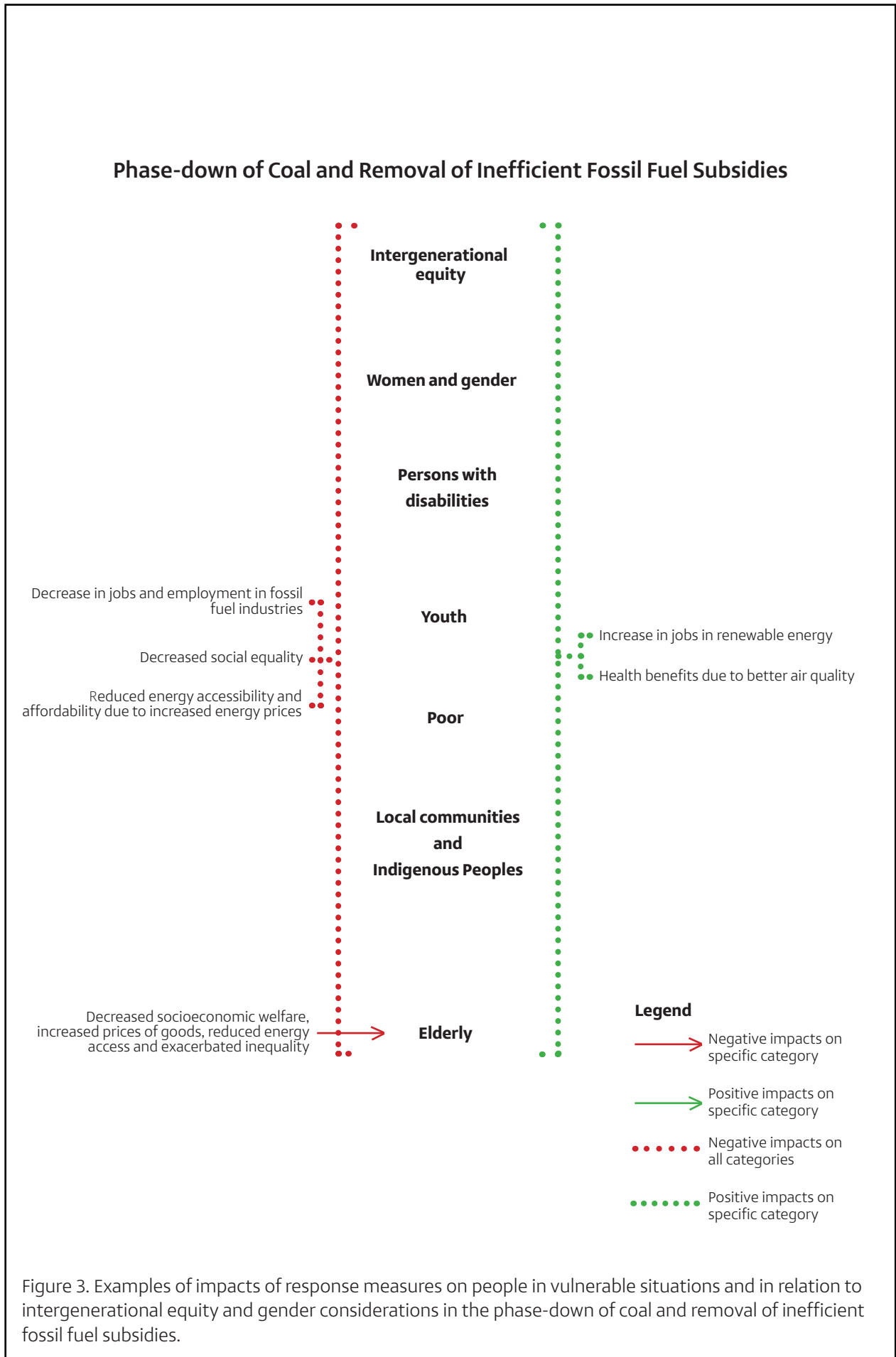
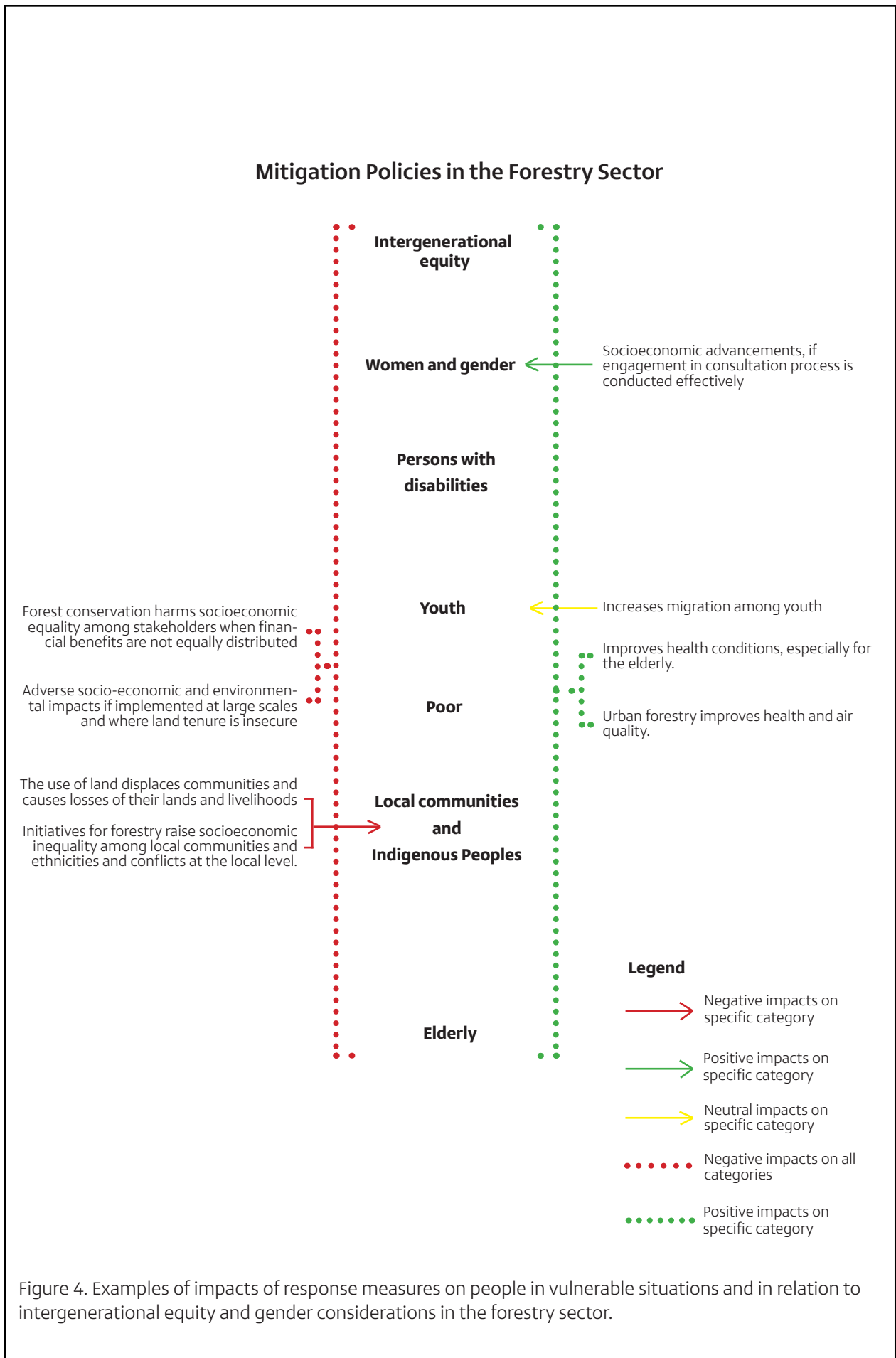


Figure 2. Examples of impacts of response measures on people in vulnerable situations and in relation to intergenerational equity and gender considerations in the adoption of renewable energy sector.









# CONCLUSIONS

This technical paper reiterates previous conclusions from KCI technical papers on the impacts of response measures, recognizing the importance of evaluating both the positive and the negative socioeconomic impacts of climate change response measures on people in vulnerable situations.

There is relatively limited research on assessing and quantifying the social and economic impacts of response measures on people in vulnerable situations. Where the literature exists, there is more focus on policymaking processes and participation rather than on assessing the impacts of the implementation of policies on people in vulnerable situations. There is also a lack of literature examining the impacts of pro-climate actions of enterprises and business on people in vulnerable situations.

In the literature reviewed there is an evident variation and unequal coverage across and within the groups of people in vulnerable situations. The literature that engages with social identities, such as gender and other identities of people in vulnerable situations, is largely adaptation-centric, with a limited focus on mitigation. The reviewed literature can be summarized as follows:

1. Across all selected mitigation policies and for all identified groups of people in vulnerable situations, there are various positive and negative impacts and co-benefits of the implementation of response measures on them, yet there is general agreement in the literature that response measures exacerbate these groups' vulnerability;
2. People in vulnerable situations are consistently marginalized in the process of planning and implementing response measures;
3. Among the groups of people in vulnerable situations identified, women and the poor are the groups most examined in assessments of response measures;
4. Climate change mitigation policies have implications for intergenerational equity, and attitudes towards them vary intergenerationally. For example, carbon-related mitigation policies, such as cap-and-trade schemes, carbon taxes and personal ecological space quotas, are shown to be incompatible with the principles of intragenerational and intergenerational justice. Another example is that policies that support downsizing dwellings through cohousing strategies can improve intergenerational equity;
5. Women are generally more negatively affected by mitigation policies than men when the impacts of these policies are erroneously viewed by policymakers as gender-neutral, because that results in ignoring negative impacts on women and therefore exacerbating them. Response measures that require land use, such as the expansion of renewable energy, negatively impact women as they tend to have highly unequal land tenure rights and are commonly marginalized in decision-making processes. Energy transition policies

that generate new job opportunities disproportionately benefit men rather than women, given that women are less represented in these industries or hold low-paid or unpaid work. By contrast, women reap empowerment and socioeconomic benefits from energy transition policies that reduce their domestic burden and fuel-gathering activities, as implementing these policies enables them to participate in revenue-generating activities and increase their power and political participation. Just transition policies are necessary to reduce occupational gender stereotypes, especially in the emerging green economy, and to ensure that women can benefit from the created new jobs;

6. Local communities and Indigenous Peoples are also examined in the context of the impacts of mitigation measures that affect the use and rights of their land, such as for renewable energy projects and forestry. There can be an imbalance of power in the policies impacting local communities and Indigenous Peoples, which results in their needs often being ignored or represented by people who are not members of their communities. They can reap some socioeconomic benefits from mitigation policies that expand energy access and security but also suffer environmental degradation and possible displacement and loss of land. Indigenous knowledge can play a critical role in the success of response measure implementation;

7. Youth will be the most affected in the future by both climate change and the implementation of response measures. The rapid rise of youth climate mobilizations globally has succeeded in framing global climate inaction and inertia as a problem and in framing climate change in the perspective of justice and intergenerational equity. Yet youth remain marginalized in participating in decision-making for mitigation policies;

8. The elderly and children are currently the most affected by climate change, especially by higher temperatures and pollution from burning fossil fuels. Mitigation policies involving energy transition and energy efficiency can improve air quality and indoor temperature, thereby improving climate-related health conditions affecting the elderly and children;

9. Persons with disabilities have generally not been considered in assessments of the impacts of response measures on people in vulnerable situations or larger populations. Mitigation policies that increase electrification and automation can reduce risks for persons with disabilities and improve energy and transport accessibility and health conditions;

10. The poor feature in various studies of the impacts of response measures, possibly because the largest impacts fall on them. The implementation of response measures such as carbon taxes, phasing out the use of coal and reducing fossil fuel subsidies can affect poor households, particularly rural ones (which tend to be poorer than their urban counterparts), as these measures raise energy and non-energy prices and therefore exacerbate their poverty. People working in fossil fuel industry will also be negatively affected through job and welfare losses, although some would benefit from retraining and opportunities in new clean energy sectors.

Two common themes emerge in the studies and inputs from stakeholders reviewed in this technical paper. First, that stakeholder engagement at the national level and wider engagement in general are necessary to better understand the impacts of response measures on people in vulnerable situations. Second, that the effectiveness of the implementation of response measures requires engaging people in vulnerable situations throughout the design



and execution of climate policies. For optimal results, focused strategies that minimize the negative effects and maximize the positive impacts, informed by both pre- and post-assessment of policies, are crucial.

The analysis and conclusions of this technical paper point to an urgent need for further research for measuring the potential and actual impacts of response measures on people in vulnerable situations, for incorporating the ensuing research results in the design of response measures and for designing policies that reduce the negative impacts of response measures on people in vulnerable situations.

Response measures need to be framed, understood and implemented from a perspective that prioritizes the concepts of gender justice and equality, intergenerational equity, energy democracy, energy affordability and energy poverty, as well as the rights of local communities and Indigenous Peoples and of youth, the elderly and persons with disabilities.

As data on people in vulnerable situations are not always readily available, the research needs to also include qualitative analysis as well as primary research based on direct input from and engagement with vulnerable groups.

The private sector can also be a channel for such meaningful engagement and for creating jobs that benefit people in vulnerable situations. Government policies on enterprise and business development play a critical role in successful climate action. These policies can support businesses to implement mitigation policies in a manner that extends meaningful engagement to actions that minimize the negative and maximize the positive impacts of these measures on people in vulnerable situations.

Although gender, educational activities related to youth and the role of Indigenous Peoples

are included in a number of NDCs, the other vulnerable groups still need attention when updating NDCs.





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**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

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