Ensuring Inclusive and Equitable Outcomes: The Social Impact of Climate Actions

Insights from the LOCALISED project

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Policy Brief
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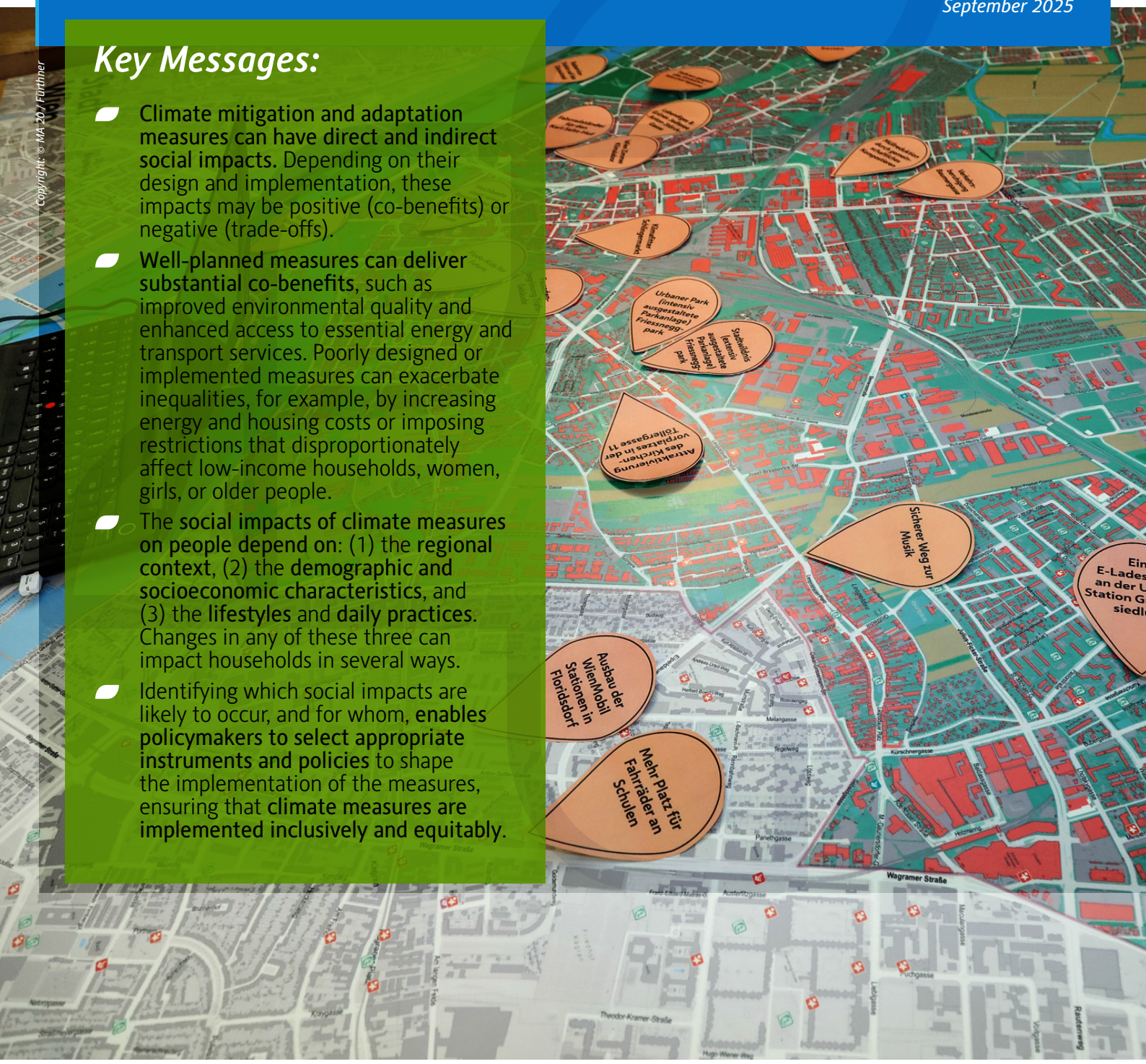
Key Messages:

- **Climate mitigation and adaptation measures can have direct and indirect social impacts.** Depending on their design and implementation, these impacts may be positive (co-benefits) or negative (trade-offs).
- **Well-planned measures can deliver substantial co-benefits**, such as improved environmental quality and enhanced access to essential energy and transport services. Poorly designed or implemented measures can exacerbate inequalities, for example, by increasing energy and housing costs or imposing restrictions that disproportionately affect low-income households, women, girls, or older people.
- The **social impacts of climate measures on people depend on**: (1) the **regional context**, (2) the **demographic and socioeconomic characteristics**, and (3) the **lifestyles** and **daily practices**. Changes in any of these three can impact households in several ways.
- Identifying which social impacts are likely to occur, and for whom, **enables policymakers to select appropriate instruments and policies** to shape the implementation of the measures, ensuring that **climate measures are implemented inclusively and equitably**.



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LOCALISED project overview

The Horizon 2020 Project LOCALISED disaggregated national decarbonisation plans, consistent with Europe's net-zero target, to NUTS3 (regional) and LAU (local) levels across the EU [1]. It provides regions and municipalities with various climate action measure sets optimised for investment costs, emission reduction, climate vulnerability, and social impacts, which are made accessible and customisable through the Climate Action Strategiser web application. Previously, this was possible only with great effort and detail for individual regions.

LOCALISED combines disaggregated national plans, regional statistics, and a newly developed modelling approach to achieve its targets. The project goes beyond pursuing a net-zero and climate-resilient Europe by also aiming to ensure a just transition for citizens. When identifying the most suitable measures for a region or municipality, LOCALISED considers costs, emissions reductions, risk mitigation potential, and the social implications of their implementation. Specifically, (1) each measure is assessed for potential positive or negative social impacts on specific population groups and recommended (or not) based on the demographic composition and characteristics of the target region; and (2) an innovative methodology has been developed to evaluate how measures can produce social impacts, ensuring that climate action plans can be tailored to promote equity alongside effectiveness.

Background

Europe stands at a pivotal moment in its pursuit of climate neutrality. The ambitious decarbonisation targets of the European Green Deal require rapid transformations in energy, transport, housing, and food systems [2]. While these changes are essential to cut greenhouse gas (GHG) emissions and help cities adapt to climate impacts, they risk deepening existing social inequalities if not carefully managed [3–5].

Climate mitigation and adaptation measures can have significant social impacts, both direct and, in particular, indirect ones. For example, when social impacts are considered during planning, these measures can deliver co-benefits, improve outcomes for vulnerable population groups, and increase acceptance of climate action [6,7]. Conversely, poorly designed measures may unfairly raise living costs, restrict mobility for some, or displace vulnerable tenants [5,8]. These impacts emerge from the interplay between regional infrastructures (the state of the infrastructure), citizens' lifestyles (their expenditure patterns and daily habits), and socio-economic and demographic vulnerabilities (such as physical aspects like gender, age, minority status or capability-related aspects such as spoken languages, education, knowledge) [9,10].

Municipalities are at the frontline of the climate transition and are responsible for implementing climate mitigation and adaptation measures while safeguarding residents from harm. However, local decision-makers often lack the tools to anticipate where direct or indirect social impacts may occur or where social vulnerabilities exist.

This Policy Brief addresses this gap by reviewing the social impacts of mitigation measures and providing guidance on how to detect them, using energy poverty as an illustrative example. By that, this Policy Brief aims to support just, equitable, and context-sensitive climate action.

A Social Impacts Assessment

Which social impacts of mitigation and adaptation measures are observed?

Mitigation measures, such as carbon pricing, building retrofits, and transitions to low-carbon transport and energy systems, can raise living costs, disproportionately affecting vulnerable populations. For example, low-income groups are vulnerable to changes in energy prices as they pay a higher fraction of their income for rent and energy. Older adults, women, and girls are particularly vulnerable to changes in the transport system (and prices), as they make more public transport trips. **Tenants, migrants, and educationally disadvantaged populations are more likely to be excluded from the social benefits of low-carbon transitions** [11–13].

Adaptation measures like urban greening, flood protection, and irrigation also have social implications. As highlighted by Reckien et al. (2023) [5], adaptation can sometimes turn out negatively for some groups or systems not targeted with the adaptation measure. If these negative social impacts are recognisably large, science has coined the term maladaptation. **Some measures, such as nature restoration, reducing ecosystem stressors, and improving farming or fishery practices, often generate broad co-benefits, enhancing ecosystem services, supporting long-term resilience, and benefiting low-income groups**. Other measures, such as coastal infrastructure and water storage projects, can emit large amounts of greenhouse gases, damage ecosystems, and exacerbate inequalities by primarily protecting wealthier areas and neglecting marginalised communities.

However, the **assessment of social impacts presents significant challenges**. First, although the social impacts of mitigation and adaptation have been reported across Europe, the social impacts of measures are usually highly context-specific [5]. Second, specific vulnerable population groups – such as low-income households, older adults, women and girls, tenants, migrants, educationally disadvantaged populations, rural communities, and people with chronic illnesses – experience social impacts differently [9]. Third, social impacts often are intersectoral and intersect with each other.

Thus, **it is important to identify not only which social impacts and who are experiencing them, but also the ways these social impacts operate**. In the case of adaptation, the NAM (Navigating the Adaptation–Maladaptation continuum) framework argues for two main outcome types of adaptation, either at a system-level criteria (like the impact on ecosystems and ecosystem services, synergies on GHG emissions, or systemic changes) or at an equity-related criteria (like impacts on specific vulnerable groups) [5]. Similarly, studies on a low-carbon transition argue that population groups can experience social impacts through their regional context, demographic and socioeconomic characteristics, and changes in their lifestyles and daily practices [9]. Through a well-known example like energy poverty, the following section will depict a **structured approach to identify social impacts in a specific context**.

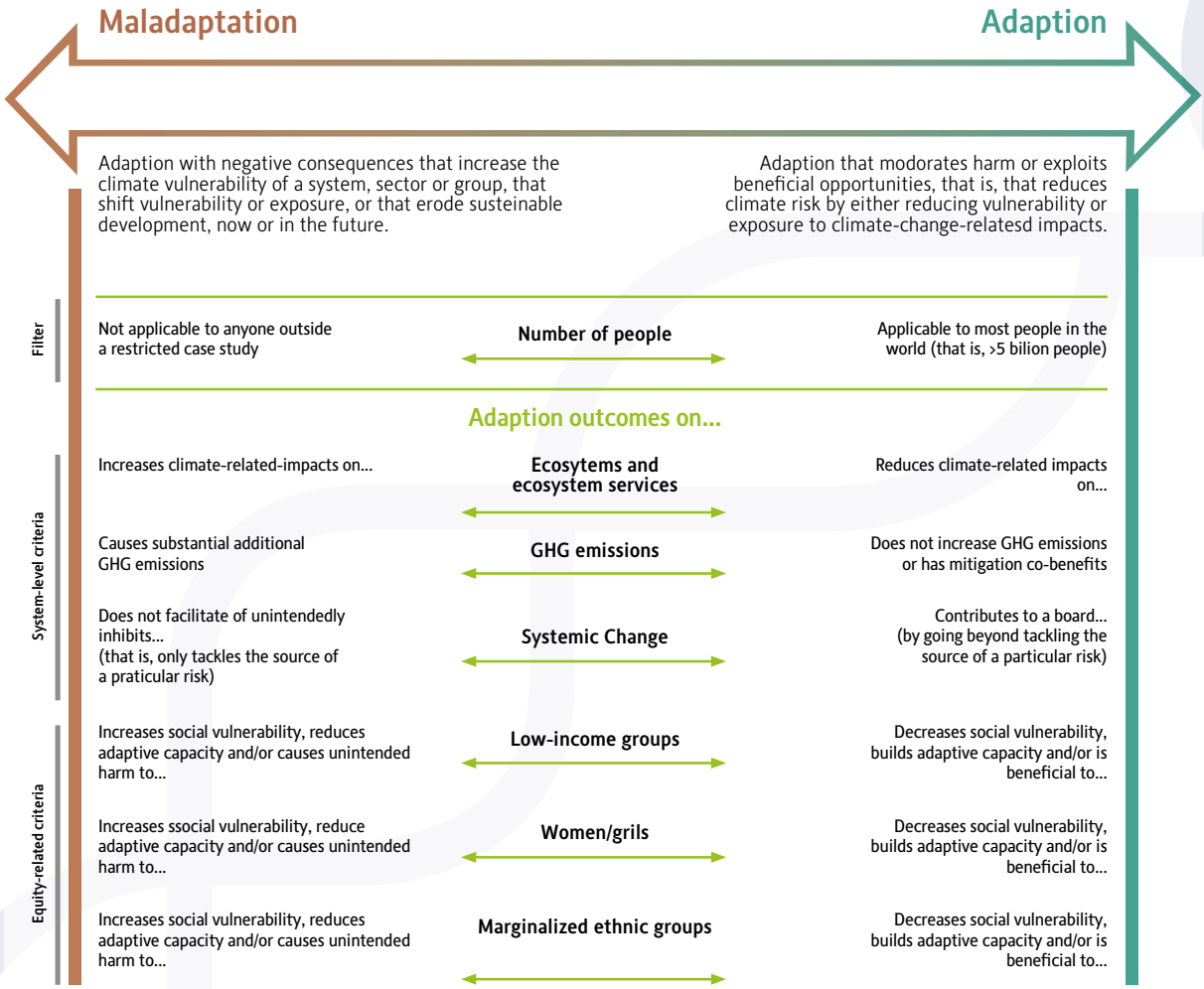

***Figure 1**: Adaptation and maladaptation are conceptualised as the two endpoints of a continuum, with every response undertaken in the name of adaptation locating somewhere along the continuum based on six outcome criteria. Source: [5]*

Example: Energy Poverty

Energy poverty is when a household must reduce its energy consumption to a degree that negatively impacts the inhabitants' health and well-being. It is one of the most critical social impacts of the low-carbon transition. The most common example could be when, following a price increase for energy due to the low-carbon transition of the energy system, people would need to economise their energy consumption or heating. In extreme cases, people are saving on food input only to meet their energy needs, unable to fulfil their nutritional needs [8]. This is called the heat-or-eat dilemma, an upcoming and pressing concern in Europe.

The Heat-or-Eat Risk Index (HERI) is an indicator designed to pinpoint population groups and regions where the combined pressures of high food prices and energy costs are likely to undermine well-being [9]. By revealing where vulnerabilities cluster and which households are affected, HERI demonstrates how climate measures can harm specific groups and regions, due to increasing energy prices.

HERI captures this risk through three dimensions:

a) **Regional dimension:** Reflects the infrastructural conditions of a region and analyses whether regional energy systems are prepared for decarbonisation, could lead to higher energy prices, or supply instabilities that burden citizens.

b) **Lifestyle dimension:** Examines household expenditure and consumption patterns, such as the income spent on energy or food. Because different households have different needs and limited flexibility, some may face disproportionate impacts. For instance, households already spending a high share of their income on transport could be more affected by cost increases in this sector.

c) **Socioeconomic-demographic dimension:** Captures socioeconomic and demographic factors (such as income, age, education, and household composition), which can shape a household's capacity to cope with rising costs or adopt low-carbon alternatives.

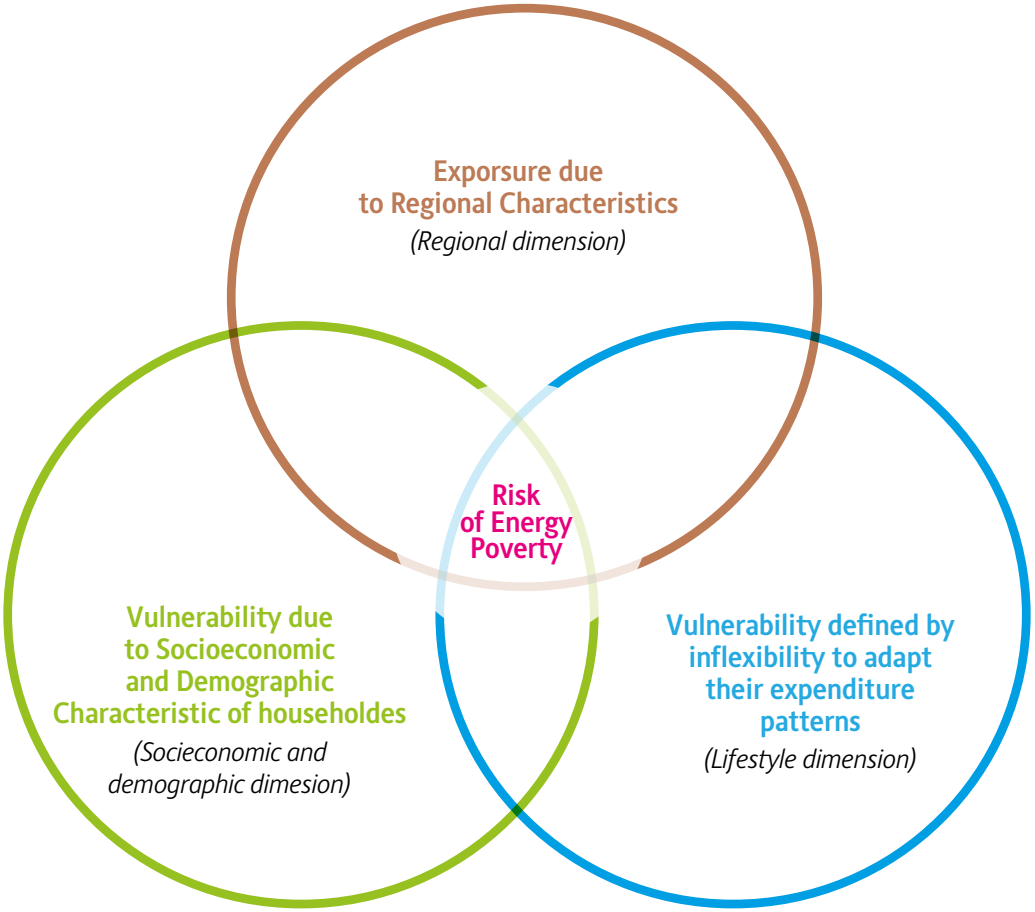

***Figure 2**: Framework depicting the risk of energy poverty for households as a function of exposure from the regional dimension, vulnerability due to the socioeconomic and demographic dimension, and vulnerability defined by their inflexibility to adapt their expenditure patterns to lifestyle changes (lifestyle dimension). Source: [9].*

HERI reveals that the burdens of the low-carbon transition are not evenly shared. For example, older adults or people with chronic diseases are highly exposed to the heat-or-eat dilemma due to fixed incomes, higher energy needs, and limited mobility to access cheaper food or energy. Low-income households are especially sensitive to cost increases

from carbon pricing or energy market reforms, often forced to reduce either heating or food consumption. Households with children and two-adult households also face higher combined energy and food expenditure burdens, making them vulnerable to price shocks. **Understanding how HERI's three dimensions interact in a specific region can help identify which population groups are most likely to experience the social impacts of a low-carbon transition.**

While this section exemplifies the issue focusing on interactions between the food and energy sectors, similar synergies exist for basic lifestyle needs, such as healthcare, education, or transport. However, **not all groups will be equally vulnerable to the same trade-offs**. The rural population might be more susceptible to changes produced in the transport sector. At the same time, households with children might need more resources to spend on primary education and healthcare. More information on this intersectionality can be found in LOCALISED D6.2 - Report on energy justice for vulnerable households.

Policy Recommendations

Recognising and addressing these social impacts is therefore essential. **Municipalities and policymakers must anticipate who gains and who loses from proposed measures when designing policies that safeguard vulnerable groups while advancing climate and equity goals**. Without deliberate attention to social outcomes, well-intentioned climate actions risk undermining the resilience and well-being of those most in need. Thus, we highlight the following policy recommendations:

Intersectionality:

- The **social impacts** of climate action are not only a direct consequence of their implementation but can also be an indirect consequence. These **can be positive and negative**. Moreover, they do not occur only from the implementation of a measure itself, but also due to an interaction of the implementation of the measure, the vulnerability of the regional infrastructure, the socioeconomic and demographic composition of the regions, and the lifestyle of different households. **Considering integrated urban planning with other sectors and response types can help reduce negative social impacts and enhance positive ones**.

Equity and Justice:

- Different groups might face different social impacts. **While it is important to benefit society, negative social impacts on any specific population group shall be addressed**. The implementation of measures benefiting only specific groups while harming others exacerbates existing inequalities [3].
- I**ntegrate equity and justice assessments in climate planning**, paying particular attention to recognitional, procedural, and distributional justice; **cooperating**, if needed, **with equity and justice experts and organisations, and co-designing plans with the identified vulnerable groups** (low-income households, elderly people, women and girls, tenants, migrants, educationally disadvantaged populations, rural communities, and people with chronic illnesses) to ensure no one is harmed by the implementation of a low-carbon transition. For more detailed recommendations on justice and co-creation in local climate policy, read our dedicated LOCALISED Policy Brief "Justice Dimensions of Co-creation in Local Climate Policy".

Monitoring Social Impacts:

- Monitor social outcomes of adaptation and mitigation measures. When monitoring the impact of mitigation and adaptation strategies, it is important that local decision-makers do **not only focus on GHG emissions or climate risk reduction as indicators of success, but also on synergies with other policy areas, such as social policy**.
- The **development of multidimensional indicators like the HERI can provide valuable information to improve the selection of climate actions to be implemented**. They offer a good overview of the population's vulnerability to social impacts and a detailed assessment of how those can be identified, enhanced (for co-benefits), and reduced (for trade-offs).

Informing Climate Planning:

- **Prioritise the measures according to the most positive social impacts** for those living in a specific region or city.
- If certain social impacts on vulnerable groups cannot be prevented, **use tailored instruments, such as subsidies, grants, exemptions, or flexible policies, to shape the implementation of adaptation and mitigation measures**, trying to minimise the negative social impacts produced, and enhancing the positive ones.
- Social Impact Assessments of climate strategies or specific measures to identify vulnerable groups can be performed at the city and regional administrations' level, a priori and a posteriori implementation. **Step-by-step guidance and methods for Social Impact Assessments and Co-creation** are provided in Chapter 2 of the LOCALISED Citizen Engager Manual.

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