TiCCA4DANU
TRANSFORMATIVE INNOVATION POLICY FOR CLIMATE CHANGE ADAPTATION

Guidance on Just Transformative Adaptation

D4.4

Grant Agreement number: 101214311

Project acronym: TiCCA4DANU

Project title: Transformative Innovation for Climate Change Adaptation in the Danube Region

Project co-ordinator name, title and organisation:

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Submission Date: 01.06.2026 **Due date:** 31.05.2026

Nature: Report **Dissemination level:** Public

Funded by the European Union

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Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Version history

Version	Date	Changes made	By
0	20.05.2026	Initial version	Elliott Woodhouse, Xiran Dong, Susanne Hanger-Kopp
1.0	29.05.2026	Integrated feedback from internal reviewer	Elliott Woodhouse, Xiran Dong

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Federal Department of Economic Affairs, Education and Research EAER State Secretariat for Education, Research and Innovation SERI
Swiss Confederation
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Executive summary

This deliverable provides city and regional governments with guidance on how to think about and incorporate justice into their planning and management of transformative climate change adaptation. The report is largely non-normative in that it acknowledges that different groups of people with different values and in different social and geographical contexts may prefer that their administration uses one justice principle rather than another one when making planning decisions.

Pursuing justice in climate change adaptation planning ultimately promotes transformative adaptation, and vis-a-versa.

Justice is multifaceted and we consider four "forms": *recognitional justice* in who is owed consideration in society; *procedural justice* in how we include in and structure decision making; *distributional justice* in who benefits or not from said decisions made; and *transitional justice*, referring to trade-offs that may be necessary in order to achieve justice objectives. In many ways justice is an inherent part of transformative adaptation – which concerns depth, scope, speed, and limits of adaptation and which ideally addresses root causes of vulnerability, which in turn often are structural elements locking-in injustices with respect to the above-mentioned forms.

Guidance on justice in climate change adaptation planning

"The Adaptation Justice Explorer" complements the *ICLEI Urban Sustainability Management Model* (USM) by allowing users to identify where different kinds of justice considerations become relevant at different stages of urban sustainability management when planning for CCA adaptation measures. It builds on the Adaptation Justice Index, omitting however any prescriptive aspect.

Figure 1 Homepage of the Adaptation Justice Explorer

Methods for identifying root causes of social vulnerability

Tackling the root causes of social vulnerability is a central aspect of both transformative and just adaptation; but limited methodological guidance exists for city/regional governments to assess what these root causes are in their social and administrative context. We introduce, review, and assess purported methods for root cause analysis.

Guidance on involving vulnerable groups in climate change adaptation planning

In line with the imperative to "Leave no one behind", involving vulnerable groups in participatory decision-making process has gained traction. We therefore digest information on engaging vulnerable groups and summarise practical steps for fairer and more inclusive CCA. The practical guide (5.3) is complementary to distributional, recognitional, and especially procedural justice indicators in the Adaptation Justice Explorer described in 3.5.

We summarise key practical steps at each phase of engagement from Initiation, including Recruitment, Resources, Trust and Reciprocity, to Design, including both Design Environment and Activities, and finally Implementation and Evaluation. We find that while guidance for engaging vulnerable groups is not substantially distinct from good practice in public participation processes, there are higher constraints that require more resources and considerations regarding power imbalances and barriers. It is also more difficult to move beyond the consultation level of engagement.

1 Introduction

As climate change progresses social and economic systems across scales are increasingly experiencing its effects. Climate Change Adaptation (CCA) refers to actions that can be taken across ecological, social or economic to respond to the effects of this changing climate; both to minimise the harms it threatens to bring, and to identify any new opportunities or beneficial ways of living which it may open (IPCC, 2022). Adaptation can cover many kinds of action, as climate change has diverse effects which differ from region-to-region and impact upon unique social contexts. Common-place and well-known forms of adaptation are preparations for impacts of natural hazards that become more frequent and intense under climate change: flood defences, measures for controlling wildfire, shelters from extreme heat, early warning systems from storms. Other forms of adaptation focus on longer term changes that are needed to live in a warmer world: switching to new or drought resistant crops, retrofitting the built environment, climate resilient infrastructure, new systems of water storage, health care systems prepared for novel risks. It can also include shifts in how communications, government policies, and business practices are conducted.

Two concepts have become increasingly prominent in the literature and practice of climate adaptation: **Justice** and **Transformation**. **Justice** is relevant to climate adaptation on two counts – because the impacts of climate change, and consequently the need for adaptation, is not shared equally between people either globally, nationally, and within sub-national contexts and rarely if ever tracks the extent to which people have contributed to climate change. Often the people who most require adaptation have done the least to cause the problem. Secondly because the actual process of designing and implementing adaptation measures can result in or exacerbate existing injustices and vulnerabilities. Central to the literature on climate justice has been the concept of "vulnerability" – the extent to which people who are exposed to climate hazards possess capacities to respond to the challenges it brings. Frequently these vulnerabilities are formed in social processes – gender inequality, racism, poverty, existence of a social network, access to political representation, access to social services, and more. Tackling these *social vulnerabilities* is often a demand of justice too and thus in principle promoting justice could be beneficial to adaptation policy, a visa-versa. Sections 2.1 and 2.2 of this report give deeper overviews of both the concept of justice and its link to adaptation.

Transformative adaptation refers to a subset of adaptation policies or measures defined by the depth, scope, speed, and ambition of action. Transformative adaptation is frequently contrasted with "incremental adaptation/coping mechanisms" – measure for reducing the impact of new climate hazards. Instead, transformative adaptation measures look to large scale changes to socio-economic systems to make thorough adaptations that go beyond responding to hazards, but to tackling the "root causes of vulnerability". These kinds of changes may be increasingly necessary as climate change progresses, and the frequency of which incremental adaptation options appear to be "maladaptive" (Schipper 2020). The centrality of tackling the root cause of vulnerability to the transformative adaptation concept may additionally suggest a synergy with the idea of just adaptation; and this connection is explored further in section 2.3 and 2.4.

This report was developed as part of the Transformative Innovation Policy for Climate Change Adaptation in the Danube Region project (TiCCA4Danu). TiCCA4Danu works with four City/Regional scale partner governments from the EU Danube Macro Region to innovate on and co-develop just and transformative adaptation measures. This report supports this work by provide guidance on understanding the concepts of justice and transformation; and by providing practical knowledge and methods for supporting city/regional governments in approaching these topics through their climate adaptation planning. While the recommendations of this report are tailored to this project they are also intended to be broadly applicable to the other projects within the EU Mission Adaptation orbit and beyond.

Beyond the conceptual overview of just and transformative adaptation that forms section two of the report, three further sections contribute to providing guidance for adaptation planners. Section three gives an overview of a process for developing a new interactive tool *The Adaptation Justice Explorer* for identifying where different forms of justice consideration become relevant across a generic climate adaptation planning process. This builds on the *Urban Sustainability Management Model* developed by ICLEI and used within the TiCCA4Danu project, and maps relevant indicators from the *Adaptation Justice Index* to the appropriate stages.

While the Adaptation Justice Explorer focuses on supporting just adaptation, section four identifies relevant tools and methodologies for transformative adaptation. “Addressing the root cause of vulnerability” is central to the transformative adaptation concept, but there has been comparatively little guidance provided on the appropriate methods for administrations at any level for systematically and reliably identifying what root causes are within their social context. In section four a number of purported methods for root cause analysis are presented and reviewed. It is planned that further work within the TiCCA4Danu project will assess the suitability of these methods for transformative climate adaptation planning.

Further linked to both just and transformative adaptation is the ability of adaptation to respond to the needs of vulnerable groups in society, and attend to the specificities of their needs. Indicators for the level of engagement with vulnerable groups play a key role in the Adaptation Justice Explorer; and the techniques of root cause analysis in section 4 are purported to be able to identify the social causes of their vulnerability. Central in both cases is bringing these vulnerable groups into political and deliberative processes, so their needs can be properly identified, and they can play a meaningful role in deliberating over and determining what adaptation policy to pursue. In section five of this report, we provide guidance for city/regional scale administration in methods of vulnerable group engagement. This knowledge synthesis draws together best practices from ten European projects and condenses and compares their findings. Special attention is placed on projects which have developed recommendations tailored to municipal governments within the EUSDR region and a Southeastern Europe context and have developed tailored recommendations for citizen engagement that recognises the cultural, historical, and political specificities of the region.

2 Just and Transformative Adaptation

2.1 What is Justice?

2.1.1 Understanding the Concept of Justice

At the highest-level, "justice" refers to a sub-category of ethical reasoning that deals with **duties and enforceable obligations** (Buchanan, 1987; Rawls, 1971). Moreover, justice deals with the behaviour and function of social institutions – it is about the way in which societies are organised and how they distribute rights and duties, advantages and disadvantages, costs and benefits, to their members. Justice is therefore a relevant feature when thinking about how public administrations, such as city or regional governments behave, within any given situation – since these administrations are an organ through which social benefits and disbenefits are distributed.

The remit of justice as a species of ethical thinking is duties and obligations, rather than more general questions about what it would be "good" or "bad" to do. A somewhat typical definition of the concept of justice is given by Miller (2021) as:

> "the constant and perpetual will to render to each [their] due"

This definition is helpful, since it points to the fact that justice is about what individual claimants *(each)* are owed (*due)* from some second agent – be they an individual or an institution, such as a government. Likewise, justice is about what agents (individuals or institutions) are duty-bound to provide to others. Justice is therefore a kind of minimum standard – it's about what individuals or institutions are morally required to provide rather than about what it would be nice or good for them to do. By the same token, justice is something that we can *claim* from others – if a theory of justice says that we are owed x, y, z then these are something that a claimant can theoretically demand or enforce the provision of from those who are obliged to provide it. For these reasons, it is somewhat common to think about justice as being like a kind of contract we make between the members of a social group; where certain terms and conditions are agreed upon and can be appealed to if they are not being met. A situation is "just" when the conditions are being fulfilled, and "unjust" when it is not.

However, what the exact terms of this "contract" are, is the subject of deep contestation and disagreement. In most cases there is no written agreement we can look to which will tell us what we owe, and can claim, from others. Our beliefs about what is and what is not just are some of the most deeply held of people's views, and they vary from person to person, group to group, and society to society. Different philosophers and political theories have tried to answer what justice demands in practice, and try to use principles of logical argumentation to develop "theories" of justice that provide accounts of what individuals are owed that can then be applied to specific cases (such as climate adaptation) and tell us what we are duty-bound to provide in each situation. There is now a rich and growing literature on justice in climate adaptation and urban governance that apply these theories to give definitions of what Just Adaptation means.

However, focussing on only one understanding of justice runs the risk of overlooking how perspectives on what a just transformative adaptation looks like can be contextually specific and differ from place to place. **The objective of this deliverable is *not* to argue that one theory of justice is *the only correct one.*** Instead, its aim is to provide city and regional governments with guidance on how to think about and incorporate justice into their planning and management of transformative climate change adaptation.

2.1.2 Forms and Principles of Justice

Within the literature on environmental justice, climate justice, and just transitions it is typical to conceptualise justice as containing multiple component "forms", each dealing with different kinds of obligations that are owed. In this deliverable, we utilise a framework – *The Applied*

Justice Taxonomy and Assessment Framework – for breaking down justice into five such forms, which is discussed in greater detail in Section 2.2.1. These forms are:

Table 1 Short descriptions of different forms of justice

Form	Description
Distributional	refers to justice in the way that the costs and benefits of climate change adaptation are shared.
Procedural	refers to the justness of the processes which are used to make decisions about the climate change adaptation measures and implementation.
Recognitional	refers to the justness of how climate adaptation planning acknowledges and responds to differences in needs, desires, and (vulner)abilities within the groups and individuals who comprise a society.
Corrective	refers to justice in how we respond to those who have already been wronged, and the duties and obligations climate adaptations planners have when operating in an unjust world.
Transitional	refers to justice in the trade-offs that are made in the pursuit of justice under non-ideal circumstances, for example, when there are costs to one form of justice in pursuing another.

When we talk about justice in climate adaptation these "forms" are a useful way of specifying what we are talking about. All of these forms have relevance to climate adaptation planning since they are all relevant to how social institutions – such as city and regional governments - make decisions about how to distribute social goods and share social costs within the social contexts that they are responsible for (Shue, 2009). Upton (2002) and Siders (2022) note that urban/developmental planning is a kind of applied ethics – as planning decisions are guided by conscious or unconscious values of those making these decisions. Justice is therefore an unavoidable aspect of the operation of local administration and planning bodies, not something which an administration can choose to pursue or choose to ignore. It is implicit in anything it does.

Different people will interpret what justice requires – e.g. what is and what is not just – in different ways. This may be illustrated by a survey conducted in 2024 by the European Investment Bank of almost 25,000 EU citizens asking what they saw as the fair way to prioritise climate adaptation support (EIB 2024). The results show an almost even split between the three options:

- 38% everyone should benefit equally.
- 28% thought that older people should be prioritised.
- 23% said that people living in high-risk areas should be the first to receive support.

There is therefore a cause for caution when approaching just adaptation – as people are not likely to share a conception of "justice" and this may be split along political and cultural lines (Shapiro, 2001).

Different "theories" of justice provide accounts of what justice requires and these may roughly track to what different individuals or groups perceive to be just (though in reality people's perceptions of justice are unlikely to track exactly to philosophical theories of justice which prioritise internal logical coherence in ways which the everyday reasoning of people does not). The table below outlines some key/influential theories of distributive justice.

Table 2 Overview of cost/benefit sharing principles for climate change adaptation rooted in theories of distributive justice

Theory of Distributive Justice	Description	Example in a CCA context	Example Sources
Equality of Outcomes	Outcome egalitarian approaches think that the distributions of benefits and burdens are fair when all parties can expect to receive roughly equal outcomes in life no matter what role they fulfil in society and that governments/states as the arbiter of justice should make policies that redistribute goods to ensure that all members of society can expect approximately equal outcomes.	An Equality-of-Outcome CCA strategy should commit to ensuring that all people within the municipality have equal protection from flooding, regardless of the amount they contribute to public budgets. An adaptation strategy might link with a broader strategy to reduce income inequality.	Ikeme, 2003 Dworkin, 1981 Sen, 1999 Nussbaum, 2009
Equality of Opportunities	Equality of Opportunity theories think that justice requires that all parties have equal chances to succeed in life, but inequalities which result from effort, hard work, or enterprise are permitted. They think that states/governments are required to minimise the impact of factors such as inherited wealth, status, and the impact of social background have in determining how someone's life goes; but are not required to redistribute to account for all inequalities in outcomes.	An Equality-of-Opportunity CCA strategy should commit to ensuring that social disadvantage or pre-existing poverty is not a factor in vulnerability to climate change; but may permit that individuals or businesses may use their own resources to purchase better insurance or protections, so long as their access to these additional resources have been earned through a genuinely meritocratic system.	Ikeme, 2003 Temkin, 2016 Swift, 2005
Sufficientarian	Sufficientarian theories of justice think that distributions are just when all parties have a total above a certain threshold or "minimum standard", such as enough of some good that their "basic needs" are met. Inequalities are justifiable as long as all	A sufficientarian CCA strategy should commit to ensuring that all members of a community are ensured a minimum threshold of protection from climate impacts; for instance, a guaranteed level of insurance or flood	Ikeme, 2003 Huseby, 2010

	parties are above the minimum threshold. States and governments may be required to redistribute benefits and burdens to ensure no parties fall below these minimum standards but have no obligation to intervene once these standards are met.	protection for all households. It should prioritise funding for communities identified to fall below certain pre-defined sufficiency thresholds for different kinds of protection.	
Utilitarian	Utilitarians believe that outcomes are just when the results of the decisions that a state/government makes provide the greatest possible benefit for the greatest possible number. This may be operationalised in terms of ensuring that when an administration makes decisions it aims to produce the maximum possible benefit overall for the least possible cost – without necessarily being concerned with whether those benefits are distributed evenly across society.	A utilitarian CCA strategy might focus on ensuring that public budgets for adaptation are prioritised for measures with a high cost-to-benefit ratio. Low - cost solutions with widespread effects are likely to be good options, as are measures that affect densely populated urban areas. But targeted measures for specific communities or costly bespoke measures that affect just a few households may be deprioritised.	Ikeme, 2003 Goodin, 1995 Arrow, 1973

These different distributive approaches are examples of ways in which a city/regional administration might seek to make decisions of how to target investments and share costs and burdens that are associated with its planning processes. The purpose of this report is not to claim that one principle *should* be used or is more just than another one. Rather we take it that different groups of people with different values and in different social and geographical contexts may prefer that their administration uses one principle rather than another one when making planning decisions. A principle which is perceived as a fair way to distribute public resources in one context may be seen as unfair in another.

2.2 Justice in Climate Change Adaptation

2.2.1 Why Justice is relevant to Climate Change Adaptation

The previous section gave a high-level overview of what we mean by “justice” – the duties and obligations that social institutions like public administrations have to those they govern in terms of how they share benefits and costs. In this sense justice is relevant to all activities that public administrations perform, including climate change adaptation.

But climate change adaptation also has specific justice implications to it which are worth specifying (Pellerey, 2025). These can be differentiated into the “uneven burdens of climate change” and more specific factors that accompany the planning of adaptation measures. The following tables outlines why and how it is a justice issue that the burdens of climate change are not shared evenly; and generic examples of justice issues that can arise during CCA planning and implementation.

Table 3 The Uneven Burdens of Climate Change

Form of Justice	Burden
Distributive	Climate impacts and risks are not distributed evenly, and the distribution does not reflect the extent to which people are responsible for contributing to climate change. Some people are therefore impacted by climate change in ways which are disproportionate to their contribution to the problem.
Procedural	Climate change acts on a world where there are deep disparities of access to power and decision-making authority. Groups lacking access to the fora where decisions on climate change are made, or the power to influence decision making, are frequently unable to make their experience of climate change known or advocate for their needs in regard to adaptation.
Recognitional	Climate change impacts on a world that is already unequal in ways that are intersectional and often unjust. Different social groups therefore experience the impact of climate change in different ways and with differing degrees of vulnerability. Often this is not recognised by the public authorities who are obligated to provide for these people.

These issues of the uneven impacts of climate change help to explain why the need for adaptation is a justice issue – because existing injustices impact how climate change affects communities and thus shapes their adaptation requirements. But beyond these high-level inequalities in how the impacts of climate change are shared, there are also specific justice issues that can arise in planning and implementing different kinds of adaptive measures. The following Table 4 gives an overview of some common justice issues which can occur when justice is not considered in how adaptation is implemented, though it is not intended to be exhaustive.

Table 4 Overview of common justice issues and maladaptive risks that can arise in climate adaptation implementation

Problem	Description	Form of Justice	Sources
Green Gentrification.	New investment in green spaces as a form of climate adaptation can make a neighbourhood more desirable to more affluent people, and risk displacing existing communities.	Distributive	Ruiz de Gopegui, et al. (2026) Bressane et al. (2024)
Displacements in Disaster Recovery.	Efforts to rebuild in the wake of flood or fire disaster, including well intentioned efforts to "build back better" can lead to gentrification processes. Likewise short-term objectives to reconstruct fast can lead to lack of consultation or analysis of population needs.	Distributive Recognitional	Tafti & Tomlinson, (2019)

Relocation and right to place.	Relocation is sometimes positioned as a transformative adaptation option when measures for reducing risk approach the limits of adaptation, but may violate rights/expectations that communities have to remain in-place, or continue to be able to access the communities, jobs, and opportunities that are able to access currently	Distributive, procedural, recognitional	Norman et al., (2021) Ncube & Murray (2026)
(Mis)prioritisation for protection.	New protections in hazard defences can raise the property values for the areas they protect, providing windfall benefits for some citizens; planners have to consider also which areas will be allowed to be exposed to hazards if resources are insufficient to cover all areas. It is logical for planners to seek high return on investment in prioritising protective measures, but this logic can leave already vulnerable communities further exposed.	Distributive	Thaler & Hartman (2016) Hendricks & van Zandt (2021)
New vulnerabilities through fire protection.	Controlled burns of vegetation are proposed as a means of mitigating wildfire, but smoke from these burns disproportionately impact already vulnerable communities.	Distributive	Driscoll (2010)
Uneven access to insurance.	Access to insurance is a major variable in a community's ability to rebound from climate disasters; but the most vulnerable and exposed communities are often the ones least able to afford insurance. Insurers often require investments in physical protection against hazards, the poorest cannot afford, and thus end up paying higher premiums.	Distributive	Jarzabkowski et al. (2019)
Water retention related displacements	New methods for holding water and slowing its transit through the system is a key flood prevention measure. Creating new stores of water can lead to displacements of people in upstream areas.	Distributive	Warner & Weigel (2021)
Disagreements over where adaptation responsibilities lie.	The recognition of the need to adapt to climate change can lead to disputes over the fair way to share responsibilities for implementing adaptation measures. Perceptions of unfairness can stem from unclear	Procedural	Winter & Fried (2000)

	responsibilities between governments and property owners over who's duties it is to provide protective measures.		
Risk & Hazard redistribution	Protective measures to relieve certain hazards, particularly flood water, can redistribute which areas are exposed to the hazard. For example, systems to move flood water can increase flood risk exposure for communities downstream. When an administration plans to move flood water in this way, they are choosing to make certain communities more exposed at the risk of others. The principles they use to determine when and why it is permitted to do this are a question of justice.	Distributive, Procedural.	Liao et al. (2019)

This list is not an exhaustive account of injustices that can occur in the implementation of adaptation measures, but should illustrate why there are risks in assuming that new adaptation measures are automatically an improvement on the existing state of affairs, leave a situation "just-er" than before, or succeed in delivering benefits to the policies intended beneficiaries.

2.2.2 Why should climate adaptation planners consider justice?

There are several reasons why public administrations should actively think about justice when planning for transformative climate change adaptation.

Firstly, because promoting justice is right to do!

Failing to actively consider justice in climate adaptation planning or any other area of public planning risks failing to fulfil moral obligations/duties which a public authority may have to those that it governs. It is for justice's sake that administrations should consider justice in their works.

Secondly, because making just policy is linked to making publicly acceptable climate policy.

There is now a growing body of evidence that suggests that *public perceptions* that a policy is fair or just is the main determinant in whether the public accepts climate policy (Berquist et al., 2022; Thaller et al., 2023). Climate policymakers therefore are incentivised to understand what drives public perceptions of fairness within the social context they operate in, in order to design policy that meets expectations of fairness.

Thirdly, because just adaptation policy may improve the effectiveness of adaptation policy:

Many actions that are associated with making just adaptation policy may also support making more effective adaptation policy overall (Schipper, 2020; Shah et al., 2025, Breil et al., 2021; IPCC, 2022).There are several possible mechanisms for this:

Table 5 Pathways/Mechanisms for more effective climate adaptation through justice. Drawing from examples of challenges to adaptation from Schipper et al., 2022

Adaptation Challenge	Possible Solution	Link to Justice
Poorly planned adaptation projects exacerbate or introduce new drivers of vulnerability (maladaptation), owing to a poor understanding of vulnerability amongst adaptation planners.	Adaptation actions proceed after a thorough analysis of the root causes of vulnerability and adaptation measures seek to tackle these root causes rather than the symptoms of the problems.	**Distributive & Procedural Justice –** Tackling these root causes of vulnerability may require thinking about how the current system distributes resources in a way that leaves some groups more vulnerable to climate change than others; and altering governance processes in a way which allows them to make their needs known to planners and able to effectively use local government to advocate for their interests.
Adaptation projects fail to deliver benefits to those they were designed to support, leading to intended beneficiaries becoming more vulnerable.	Ensure that planning and project development processes include vulnerable groups; and ensure that they are structured to prevent powerful actors from influencing the process and further marginalising the vulnerable intended beneficiaries.	**Procedural & Recognitional justice –** The specific needs of the most vulnerable have to be *recognised* within the planning and development process and not assumed to be co-specific with the needs of those people who are ordinarily consulted in adaptation planning; and that there is a reform of planning processes that enable participatory involvement of citizens and vulnerable groups may also be a requirement of theories of procedural justice. Likewise vulnerable groups may have specific "expertise" is CCA through their lived experience of the problem that is valuable for making informed and evidence-based decisions.
Locking in development pathways that prevent future adaptation, remove access to resources, provide temporary solutions, or create a false sense of security, or incentivise individuals to make adaptation decisions for short term benefit (e.g., migration or sale of assets)	Linking adaptation policy to targeting poverty and meeting developmental objectives. Carefully assessing the system wide impacts of adaptation measures.	**Distributive justice** – many theories of distributive justice will call for measures to reduce wealth disparities (egalitarian theories) or otherwise target poverty (sufficientarian and utilitarian theories). Adaptation policies that link adaptation to tackling inequality or the root causes of vulnerability may also satisfy broader demands for greater distributive justice.

Finally, because there may be legal or statutory requirements for administrations to consider justice.

In an EU context, member states have legal obligations to ensure non-discrimination based on any ground (Article 21) and to guarantee social protection (Article 34), health care (Article 35) and equal access to services (Article 36) as included in the Charter for Fundamental Rights which is part of the Treaty on the Functioning of the EU (EU 2020). Member States have also committed to the Aarhus Convention which requires them to comply with procedural justice in any type of environment-related decision making. (EEA, 2025)

2.3 Transformative Adaptation

Transformative Adaptation is a somewhat contested term (Biesbroek et al., 2026) which refers to a subcategory of adaptation planning implying a more thorough and encompassing change than its alternatives – "incremental adaptation" (reactions to climate risks) and/or "coping mechanisms" (reacting to extreme weather or specific hazard events) (Cools et al., 2024). Transformative adaptation is thought to instead involve systemic and long-lasting changes in its approach to climate change. Transformative adaptation is not *inherently* preferable to incremental and coping mechanisms. Both incremental adaptation and coping responses will be essential to reducing the damage, hardships, and suffering that climate change will cause. Likewise, both transformative and non-transformative approaches may entail maladaptive risks if improperly planned and implemented.

Nonetheless, it has been argued that the extent of the challenges that climate change will bring requires governing authorities to consider transformative approaches. Clarity in definitions is therefore valuable for identifying when proposed measures are "transformative" or merely "incremental". In the 6th Assessment report the IPCC developed a taxonomy of adaptation measure to assess them for their transformational potential. Five dimensions of the adaptation (Overall, Depth, Scope, Speed, and Limits) are assessed from "low", "medium", or "high" based on alignment with an ideal account.

Table 6 Taxonomy of the Transformative Potential of Adaptation Measures. Source: IPCC AR6 Table 16.1

Taxonomy of Transformative Adaptation			
Dimension	**Low**	**Medium**	**High**
Overall	Adaptation is largely sporadic and consists of small adjustments to Business-As-Usual. Coordination and mainstreaming are limited and fragmented.	Adaptation is expanding and increasingly coordinated, including wider implementation and multi-level coordination.	Adaptation is widespread and implemented at or very near its full potential across multiple dimensions.
Depth	Adaptations are largely expansions of existing practices, with minimal change in underlying values, assumptions or norms.	Adaptations reflect a shift away from existing practices, norms or structures to some extent.	Adaptations reflect entirely new practices involving deep structural reform, complete change in mindset, major shifts in perceptions or values, and changing institutional or behavioural norms.
Scope	Adaptations are largely localised and	Adaptations affect wider geographic	Adaptations are widespread and

	fragmented, with *limited evidence* of coordination or mainstreaming across sectors, jurisdictions or levels of governance.	areas, multiple areas and sectors, or are mainstreamed and coordinated across multiple dimensions.	substantial, including most possible sectors, levels of governance, and actors.
Speed	Adaptations are implemented slowly.	Adaptations are implemented moderately quickly.	Change is considered rapid for a given context.
Limits	Adaptations may approach but do not exceed or substantively challenge soft limits.	Adaptations may overcome some soft limits but do not challenge or approach hard limits.	Adaptations exceed many soft limits and approach or challenge hard limits.

Further attempts to provide an overarching definition of transformative adaptation for EU Adaptation Projects are provided by Cools et al. (2024). To the IPCC definition, they add a 5th dimension of "inclusivity" though do not provide "low, medium, high" examples. Their definition of inclusivity contains three elements: **equitable, SDG-aligned,** and **synergetic.**

Inclusivity	A transformational change programme should benefit all groups of the population, and thus follow the "leave no one behind" principle **(equitable)** (Scolobig et al., 2023) and preferably address other Sustainable Development Goals in addition to climate action **(SDG-aligned).** Transformational change is also considered to be **synergetic,** e.g. delivering other benefits than adaptation. A typical synergy on climate action contributes to both climate adaptation and mitigation

Another commonplace way of identifying/defining "transformative" adaptation measures zooms in on the above dimensions of scope and depth. It promotes that when successfully implemented, transformative adaptations ***address the underlying/root causes of vulnerability to climate change risks*** by steering systems away from unsustainable or unfavourable paths (Biesbroeck et al., 2026; Fedele et al., 2019, O'Brien, 2012; Olsson et al., 2014). This focus on "vulnerability" follows from an IPCC aligned understanding of climate risk as a trivalent relationship between the risks of: the likelihood of "**Hazards"** (floods, fires, droughts, etc); the degree of "**Exposure"** that a population has to these hazards (e.g., the proportion of a population living in a flood risk area), and the "**Vulnerability"** that they face from the hazards they are exposed to.

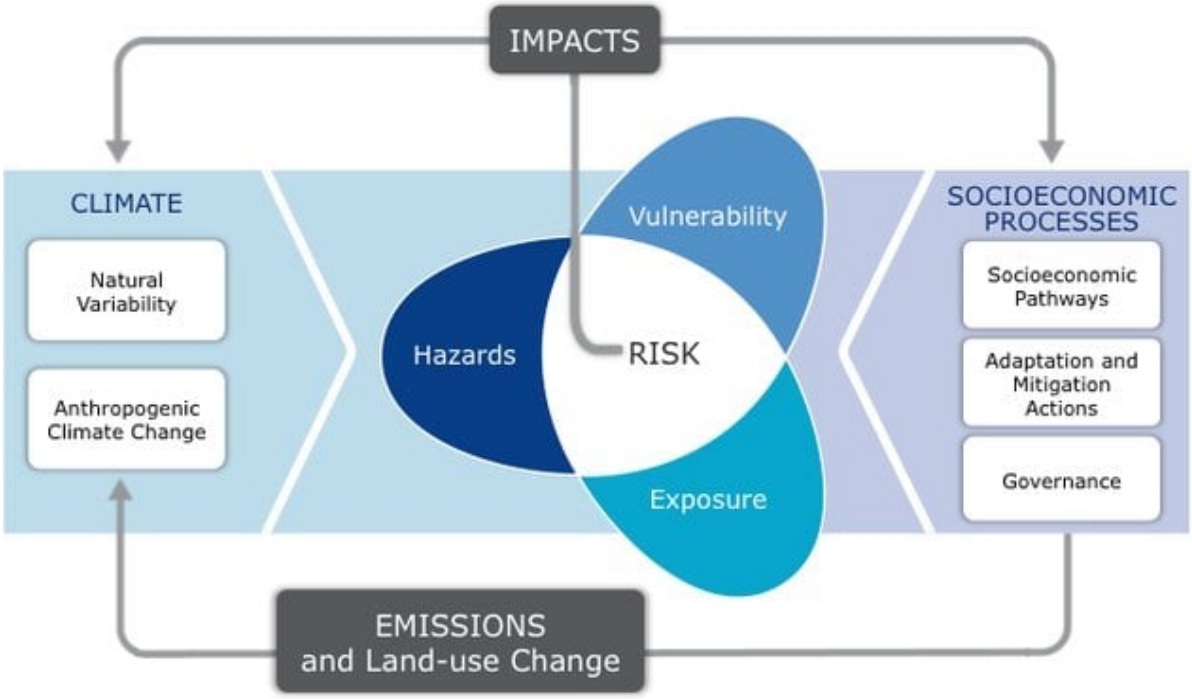

Figure 2 IPCC trivalent model of risk as a factor of natural and climate driven "hazards" and social and economic drivers of "vulnerability" and "exposure" to those hazards. Source: IPCC 2014, p.3.

This allows us to conceptualise transformative adaptations as those which seek to mitigate impacts by altering the socio-economic processes which drive vulnerability. But more so than just acting on these processes, the language of "root causes" implies that only certain kinds of processes at basal points of the system being acted on are the appropriate targets of truly transformative adaptation.

In a recent Biesbroeck et al. (2026) Delphi study of 99 experts in transformative adaptation, the idea that transformative adaptation should address "root causes" of vulnerability achieved the highest degree of acceptability amongst those involved. The final definition achieved through that process puts addressing root-causes front and centre of the transformative adaptation concept:

> *"TA to climate risks fundamentally restructures socioecological systems by **addressing root causes of vulnerability**, ensuring climate resilience across several scales and considering the long-term future. It is context-specific, prioritizes distributive justice and is informed by diverse knowledge systems. TA entails profound change in societal norms and values and recognizes the systemic nature of climate risks and responses. It secures persistent commitments and avoids maladaptation and lock-ins". (Biesbroeck et al., 2026, Box 1, p. 278)*

However, despite the apparent centrality of the "addressing root causes" component of the definition, there has been very few attempts to systematically define what root causes *are* and specific methods for climate adaptation planners for identifying them. A range of methodologies which may be useful for identifying root causes of vulnerability are reviewed in Section 3: Tools and Methods for Identifying Roots Causes of Vulnerability.

2.4 Linking Transformative Adaptation to Justice

2.4.1 Conceptual Overview of the Transformative/Just relationship.

Transformative Adaptation intersects with ideas of Just Adaptation. We see this for example in the definition of Transformative Adaptation developed as the shared vision for EU Horizon

Projects. Cools et al.'s (2024) definition adds "equity" (a synonym for justice) as a defining feature of what makes a transformative adaptation transformative. They write that:

> *"Socially, [transformative adaptation] can lead to more inclusive and equitable societies, empowering communities to make decisions about their futures in the face of climate change" (Cools et al., 2024).*

This attempt to draw an inherent link between "transformation" and "justice" is not unique to EU shared understanding. In the Delphi study, participants narrowly agreed that Transformative Adaptation by definition "prioritizes distributive justice" (Biesbroeck et al., 2026). It is also notable that distributive justice won acceptance into the definition while procedural justice failed to meet the threshold for inclusion; implying that experts viewed transformative adaption more-so as a transformation of the system of how costs and benefits ae shared within a society rather than as a transformation of the way in which administrative decisions are made and the political settlement of public involvement in adaptation planning.

However, it's worth interrogating further what this connection between "transformative" and "just" is in more thorough terms than those provided in the Cools et al.[1]. The table below offers explanations of why four forms of justice imply the necessity of transformative approaches to adaptation.

Table 7 Overview of why transformative adaptation is linked to four forms of justice.

Form of Justice	Link to Transformative Adaptation
Distributive Justice	Transformative adaptations may focus on interventions designed to tackle the system that produces vulnerability (Carr, 2019; Vogel & O'Brien, 2022). In many cases, this will involve making changes to the way our economic systems distribute costs and benefits and could align with the recommendations of many theories of distributive justice that often call for more egalitarian distributions of resources across scales.
Recognitional	Transformative adaptation may require transformations in the working practices of those who plan and implement adaptation actions (Taylor et al., 2025), including reflections on core assumptions, beliefs, and values. This can involve changes to the processes used to make adaptation decisions and improve the recognition of different actors within administrative and governance processes (Shi & Moser, 2021**)**
Procedural	Transformative adaptation, in order to succeed at challenging systems, which produce uneven vulnerability, needs to "open space" in governance processes to allow people in positions of vulnerability to use new levers of power to advocate for their needs (Erikson et al., 2015; Colloff et al., 2021; Schipper et al., 2022). This may align with demands of procedural and recognitional justice which call for increased participation of people in the decisions which affect their lives.

[1] Noting that Cool's et al.'s definition of transformative adaptation contains a requirement that it is inclusive, equitable and follows the "no one left behind" principle. Therefore, any adaptation which doesn't lead to more equitable societies fails to meet their standard for "transformative". Simply stating then that transformative adaptation leads to inclusive and equitable societies does not tell us anything new – the reasoning is circular.

Transitional	Transformative adaptation prompts consideration of what the purpose of a system is and what other goals it might be designed to promote. Conversely incremental adaptation measures may focus on treating the symptoms of climate change while leaving the current social-system/business-as-usual processes intact (Kates et al., 2012; Park et al., 2012). While incremental solutions are not necessarily unjust, (and may be necessary) they may miss an opportunity to address an unjust system. Adaptation does not always reduce vulnerability (Schipper, 2020; Shah et al., 2025) when justice is not considered.

2.4.2 The EU and the "Leaving No One Behind" Principle

In its thinking about just adaptation, the EU has made the principle of "Leaving no one behind" central (EEA, 2025). "Leaving no one behind" (LNOB) is defined as:

> *"[ensuring] the distribution of benefits and burdens of adaptation responses among social groups and encompasses fair and transparent processes including the fair distribution of political power and participation in policymaking, avoiding decision-making which leads to maladaptive outcomes and targeting the underlying causes of pre-existing inequalities." (EEA, 2025, p.22)*

The EEA 2025 Report "Social fairness in preparing for climate change: how just resilience can benefit communities across Europe" gives a very useful overview of the relationship between climate adaptation/resilience and justice, including mirroring many of the recommendations of this report for approaching justice in a non-normative manner, and encouraging CCA practitioners to identify the drivers of perceptions of fairness specific to the local context they operate in, and considering justice across multiple forms.

However, there has to date been no systematic effort to connect the "leaving no one behind" principle to transformative adaptation or produce a framework showing the relationship between the two concepts despite their centrality to EU Adaptation planning. A link between the concepts may however be inferred from the requirement that LNOB "[targets] the causes of pre-existing inequalities". Likewise in the Cools et al. (2024) definition of "inclusivity" as a component of transformative adaptation, they assert that this entails alignment with the LNOB principle. This would imply that in order to be a transformative adaptation measure, the measure needs to adhere to LNOB.

2.4.3 Final Recommendations for understanding the relationship of Transformative and Just.

There is a potential risk in over implying the connection between "transformative" and "just"; or defining transformative in terms that require it meets justice criteria. An intervention could plausibly meet all of the IPCC criteria for deep, widespread, fast, and limit-challenging change without actively considering justice. This should make us doubtful that transformative change is *sufficient* to ensure that an adaptation process is just. There are plausible socio-economic transformations that may have adaptive potential which may leave injustices intact or formulate new ones.

A more plausible link between the two concepts is that justice *requires* transformation. This is especially plausible if the definition of transformative adaptation being employed is one where "tackling the root causes of vulnerability" is used. This is because vulnerability is, typically, a factor of lack of resources (or unequal distribution of resources in society), and a lack of access to political power; which are typical examples of distributive and procedural/recognitional justice concerns.

Nonetheless justice will also likely require incremental options too, and justice is still relevant to discuss in the way that a government or society plans for incremental adaptation measures. Just because an administration is not aiming to make transformative changes, it does not mean that it does not need to consider justice. Justice is central concept in evaluating and understanding how social institutions function, and is therefore an applicable concept in thinking about the planning, development, and implementation of incremental adaptation options too.

The “Leaving No One Behind” principle that is central to the EU understanding of just adaptation implies a link to transformative adaptation by requiring that adaptation projects tackle the underlying causes of inequalities. However further conceptual clarity on whether LNOB *requires* transformational adaptation or is compatible with incremental approaches would be welcome, as it substantially impacts how demanding the LNOB principle is. Further methodological guidance on appropriate methods for identifying underlying causes of inequality and methods for tackling them through adaptation projects should be developed and tested.

3 Identifying Justice Considerations in CCA planning

The previous section of this report has outlined what justice is and how it relates to the idea of transformative adaptation at a conceptual level. The remainder of this report focusses on providing guidance that could be used by city and regional scale administrations to approach justice throughout a (transformative) climate adaptation planning process.

This section details the development within the TiCCA4Danu project of a new diagnostic tool “The Adaptation Justice Explorer” to complement the *ICLEI Urban Sustainability Management Model* (USM) by allowing users to identify where different kinds of justice considerations become relevant at different stages of the USM when planning for CCA adaptation measures. While these outputs were specifically developed for the TiCCA4Danu project and tailored to the project management model used therein, the conclusions are of broader relevance to city and regional governments embarking into a climate adaptation planning cycle.

3.1 The Urban Sustainability Management Model

Within the TiCCA4Danu project, four partner city/regional governments were coached on adaptation planning following a management model developed by ICLEI – *Urban Sustainability Management (USM)* model. The USM is a management framework designed to synthesise insights from existing management models into a simple, practical, and flexible framework for planning urban sustainability interventions, particularly for supporting the *Local Green Deal* process. It contains two dimensions: five “action-oriented phases” and five “impact layers” which occur at each phase. The phases are sequential actions which a city/region should take as it plans and implements its CCA actions in a cycle as the ambition and scale of action grows. These are:

- **Activate**: build the foundation for action: mandate, team, and political support.
- **Analyse**: deepen your understanding of the system: map challenges, gaps, and leverage points.
- **Apply/Plan**: co-design your action plan: a roadmap, KPIs, and clear responsibilities.
- **Act**: Execute your action: turn planning into practice.
- **Accelerate**: scale what works: integrate, replicate, embed.

At each of these phases, cities and regions work through the five “impact layers” to ensure that the phases meaningfully deliver on its goal and lays a solid foundation for the next phase. These are:

- **Inputs**: what is needed to begin the phase.
- **Activities**: what is done during the phase.
- **Outputs**: tangible results or deliverables produced.
- **Outcomes**: what changes as a result of the phase.
- **Impact:** the long-term contribution toward the city’s transformation goals.

General descriptions of actions within each phase may be found in the 5x5 matrix below:

Phase	Inputs	Activities	Outputs	Outcomes	Impact
Activate	Political mandate, core team, initial idea ‘bought in’	Kick-off workshop; stakeholder mobilisation; drafting a shared charter or vision	Engagement charter; initial stakeholder plan, team chart	Shared understanding across departments; political and managerial buy-in	Foundation for trust, collaboration and co-creation
Analyse	Policies & plans, financial resources; stakeholder inputs	System analysis; stakeholder needs assessment; integrative policy assessments validation sessions	System map; gap & needs report	Clarity on leverage points and system bottlenecks; understanding of implementation gaps and policy trade offs	Robust diagnosis to inform a realistic and strategic action
Apply/Plan	System analysis insights; intervention design; resources and timelines	Co-designing actions / action agreements; roadmap development; defining KPIs and responsibilities	Implementation Plan; KPI dashboard; timeline and budget plan; monitoring plan, other formal agreements (LGDs, CCCs); sectorial strategies	Feasible and legitimate plan(s); internal ownership and resource clarity	Strong base for implementation with political and operational support
Act	Implementation plan	Implementation of action(s); monitoring activities; coordination meetings	Documented implementation steps; action logs; iteration notes	Visible improvements in targeted areas; feedback from stakeholders and team	Steps towards transformation in administrative practices that support green & democratic goals
Accelerate	Early results and feedback; monitoring data; new political or institutional factors	Embedding into rules/protocols; sharing lessons; stakeholder communication & PR; replication or upscaling	Revised and additional action plans & formal agreements informing into the policy cycle	Broader change across city systems; readiness to scale or sustain	Institutionalised innovation, stronger democratic green governance

Figure 3 The ICLEI Urban Sustainability Management Model 5x5 Phase/Layer Matrix

As the USM structures actions from the planning to the implementation stage of CCA project development it provides an appropriate structure to build a diagnostic tool around. A diagnostic tool can provide city/regional governments using the USM model a guide to where different justice considerations become relevant at different phases/layers of action, identify relevant indicators to assess how well the consideration was planned for, and identify relevant tools and methods for successfully achieving the indicator.

3.2 Identifying Justice Indicators

Two existing frameworks were used to shape how justice was conceptualised in the design process: The Applied Justice Taxonomy and Assessment Framework (AJUST) (Hanger-Kopp et al., 2024) and the Adaptation Justice Index (AJI) (Juhola et al., 2022). The following section details how these were used in developing a set of diagnostic indicators to use with the USM model.

3.2.1 The AJUST Framework

The AJUST Framework conceptually disaggregates the idea of "justice" and structures how researchers and policymakers engage with it and has been designed to facilitate "justice assessments". Justice is a malleable term and is used by different groups of people to mean different things in different contexts. This issue is both terminological – where people use the same word to mean different things (e.g., when you say justice you mean X, but I mean Y) or different words to mean the same thing (e.g., Distributive Justice or Outcome Justice); but also because different individuals and groups of people have different understandings of what justice is, when justice is achieved, and what justice requires us to do. When discussing justice, it is therefore valuable to have a consistent source of reference to standardise terminology and provide a taxonomy of different views on what justice means to allow us to be explicit about what we mean when use contested terminology. The AJUST Framework therefore does not try to define a specific view as "just" but provides a framework for recognising and reveal different views on what justice means, communicate them neutrally, and approach this complexity in a systematic way.

The AJUST Framework provides a conceptual schema for breaking down the concept of "justice" into its component parts.

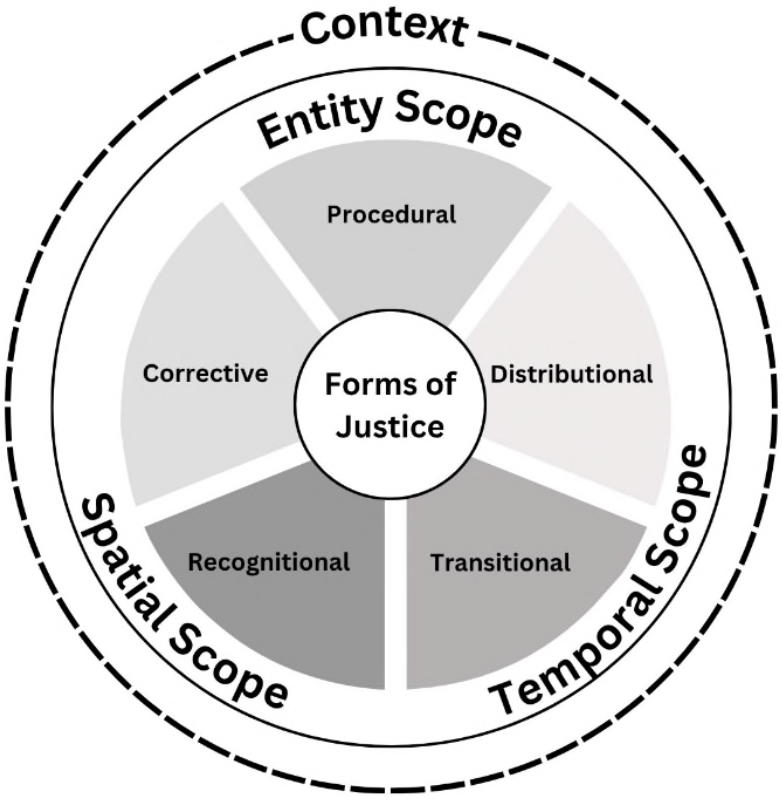

Figure 4 The Applied Justice Taxonomy and Assessment Framework (AJUST)

At the highest level the study of justice is bounded by the "Context" the research is conducted in. It is then bounded by three kinds of scope considerations: spatial scope of the research (how is the assessment geographically bounded), the temporal scope (over what time scale will justice be assessed), and what is termed the "entity" scope (between which kinds of entities is justice analysed: between individuals, states, non-human animals etc). For the development of the *Diagnostic Tool* within the Ticca4Danu project we can define our context and scope as:

- **Context**: The Diagnostic Tool will be used to assess justice within transformative climate adaptation processes.
- **Spatial Scope**: The City and Regional Scale, comprising the spatial extent of the authorities of Municipal and Regional government actors, within a broader national, Danubian, and European Context.
- **Temporal Scope**: Across a Climate Change Adaptation planning and development cycle, divided into 5 semi-discrete management "phases" as defined within the ICLEI *Urban Sustainability Management Model.* Indicators should be robust enough to cover both long- and short-term impacts of CCA measures being implemented.
- **Entity Scope**: The citizens/publics which City/Regional governments have mandated responsibilities towards.

There are then five conceptually discrete "forms" which justice considerations can take: the "distributional", "procedural", "recognitional", "corrective", and "transitional". Depending on the context and scope of the project, each of these forms of justice will have different metrics or indicators which it is relevant to measure and assess.

- **Distributive Justice:** refers to justice in the way that the costs and benefits of climate change adaptation are shared.
- **Procedural Justice:** refers to the justness of the processes which are used to make decisions about the climate change adaptation measures and implementation.
- **Recognitional Justice:** referring to the justness of how climate adaptation planning acknowledges and responds to differences in needs, desires, and (vulner)abilities within the groups and individuals who comprise a society.
- **Corrective Justice:** refers to justice in how we respond to those who have already been wronged, and the duties and obligations climate adaptations planners have when operating in an unjust world.
- **Transitional Justice:** refers to justice in the trade-offs that are made in the pursuit of justice under non-ideal circumstances, for example, when there are costs to one form of justice in pursuing another.

3.2.2 The Adaptation Justice Index

The Adaptation Justice Index (AJI) is a tool developed by Juhola et al. (2022) for *ex post* assessing the integration of justice into climate adaptation strategy and planning. Drawing on the results of conceptual literature on the justice in climate adaptation, and previous studies of justice in climate adaptation contexts, the authors develop an "index" of indicators which can be used to evaluate and compare climate adaptation plans in different contexts and at different scales. They develop between three and five indicators for four "forms" of justice: distributive, procedural, recognitional, and "restorative" (which contains elements of the AJUST concepts of distributive, corrective, and transitional justice). Each indicator contains a four-point (0 to 3) scale of achievement, where 0 indicates the indicator has not been achieved at all, and a score of 3 indicates a full achievement. This allows for climate adaptation strategies to be evaluated on the extent to which justice considerations have been included, to identify areas for

improvement, and to compare how justice is being approached and which forms are being prioritised in different strategies, at different scales, and in different reasons. Table 1 below gives an overview of the indicators, and a full table including the scale of achievement is included in the appendix to this report.

Table 8 Indicators for Measuring the Integration of Four "Forms" of Justice into Climate Adaptation Plans. From Juhola et al. (2022)

Distributive	Procedural	Recognitional	Restorative
2.1 A Risk Mapping or Assessment has been conducted	3.1 The adaptation strategy details who participates in the strategy process	1.1 The strategy acknowledges that adaptation needs are different across groups in society.	4.1 The strategy acknowledges the need to compensate for the diverging impacts of climate change.
2.2 There is a process for identifying vulnerable groups	3.2 The adaptation strategy has involved participation during different phases of the process	1.2 The strategy acknowledges the impact of existing societal structures on vulnerable groups in adapting to the impact of climate change.	4.2 The strategy has compensation measures to deal with maladaptation
2.3 There is a process that assesses the distribution of benefits of adaptation	3.3 The strategy allocates responsibility for adaptation	1.3 The strategy acknowledges adaptation as a way to secure basic human rights.	4.3 The unequal distribution of resources is compensated for by redistribution.
2.4 There is a process that assess the distribution of costs of adaptation	3.4 The adaptation strategy has a structured plan for implementation.	/	/
2.5 The strategy identifies the possibility of a distribution of negative impacts (e.g., maladaptation)	3.5 The adaptation strategy has a plan. for updates and evaluation.	/	/

3.2.3 Summary

The Adaptation Justice Index was identified as a useful basis for developing a tool for identifying justice considerations within the TiCCA4Danu context.

- It was tailored for use in a climate adaptation context and had a set of indicators already identified which had been drawn from a synthesis of the available literature.
- It is a tested tool which has been used to evaluate city level CCA planning in a European context but has not yet been applied to a South-Eastern European/Danubian context.
- It was designed to be applied at the scale that TiCCA4Danu operates at: city government level strategic planning, but also at the national strategic planning scale. There are no prima-facie reasons for thinking it would not be useful for at the regional government planning scale too.
- It covers a range of "forms" of justice, aligning with the state of the art of the trivalent/three-tenant approach of breaking justice into Distributive, Procedural, and Recognitional; and with useful overlap in the "Restorative" category with our interest in exploring "Transitional" and "Corrective" justice.
- It allows for both evaluations, but also comparison, of how justice is incorporated into CCA planning. As a tool it can be used to explore how the different partners in the TiCCA4Danu project approach justice in their planning, which forms of justice they prioritise, and how these compare to the case studies provided in the original Adaptation Justice Index paper.

However, some limitations were noted:

- The Index has a prescriptive rather than a pluralist approach to justice. It sets clear expectations of what a CCA plan must do to be "just" and is not open to their being different understandings of what justice requires in different regional contexts.
- There is potentially some overlap between the distributive justice indicators on assessing the costs and benefits of adaptation and the restorative justice indicators on requirements for compensation. Likewise depending on the jurisdictional authority being examined, some City/Regional authorities may lack the proper means to authorize redistributive and compensatory measures.
- The Adaptation Justice Index is used for reviewing existing strategies and plans. However, the *Diagnostic Tool* needs to be useful for guiding action in the development of a CCA plan.
- While aimed at Climate Adaptation Strategy and Planning there is some need to adapt the index for use with the USM Model.

3.3 Mapping the Adaptation Justice Index to the Urban Sustainability Model

In order to allow the AJI indicators to guide the just implementation of Climate Change Adaptation within TiCCA4Danu project it was necessary to map the indicators to the phases and levels of the USM Model, in order to provide a practical guide for city and regional governments using this management model to identify where different indicators were relevant as they progress along their planning process. The following set of tables breaks down each phase of the USM by its levels and maps relevant AJI indicators. Explanatory justifications are provided to show why each indicator is relevant

3.3.1 Activate Phase

Phase 1: "Activate"	Inputs	Activities	Outputs	Outcomes	Impact
	Political mandate, core team, initial idea 'bought in'	Kick-off workshop; stakeholder mobilisation; drafting a shared charter or vision	Engagement charter; initial stakeholder plan, team chart	Shared understanding across departments; political and managerial buy-in	Foundation for trust, collaboration and co-creation
Recognitional Justice Indicators	**1.1 The strategy acknowledges that adaptation needs are different across groups in society** **1.3 The strategy acknowledges adaptation as a way to secure broader societal transformations**				
Justification	In the activate phase of the USM planners are encouraged to begin engaging stakeholders and developing a shared visions for what they hope to achieve through the development program. This can be an opportunity to have stakeholders identify from the outset what their priorities are and align the process to meeting their specific adaptation needs or root causes of social vulnerability. The *Engagement Charter* is the opportunity to lay out the municipalities commitments to including stakeholder involvement across the project.				
Distributional Justice Indicators	**2.2 There is a process for identifying vulnerable groups**				
Justifications	Systematic methods for identifying which stakeholders/communities to engage should be employed from the beginning of the project. Social vulnerability assessment is an important tool to employ throughout the project, especially in the "Analyse" phase, but pre-existing assessments can be used as an objective measure for identifying communities most at risk from climate change, and who will be important to bring into creating a shared vision for a *Local Green Deal.*				
Procedural Justice Indicators	**3.1 The adaptations strategy details who participates in the strategy process** **3.2 The adaptation strategy has involved participation during different phases of the process** **3.3 The strategy allocates responsibilities related to adaptation**				
Justification	An *Engagement Charter* sets out the processes which you will use to involve stakeholder throughout the project and should detail when and how you will enable participation into the project, and who will be able to participate. As you begin to develop a shared understanding between departments you can begin to detail how responsibilities for implementing the project are allocated.				

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Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

3.3.2 Analyse Phase

Phase 2: "Analyse"	Inputs	Activities	Outputs	Outcomes	Impact
	Policies & plans, financial resources; stakeholder inputs	System analysis; stakeholder needs assessment; integrative policy assessments validation sessions	System map; gap & needs report	Clarity on leverage points and system bottlenecks; understanding of implementation gaps and policy trade offs	Robust diagnosis to inform a realistic and strategic action
Recognitional Justice Indicators	**1.1 The strategy acknowledges that adaptation needs are different across groups in society** **1.2 The strategy acknowledges the impact of existing societal structures on vulnerable groups in adapting to the impacts of climate change**				
Justification	The objective of the analyse phase is to diagnose the CCA issues that your City/Region faces and which you will attempt to address through a *Local Green Deal* or through targeted CCA measures. Understanding the different adaptation challenges that different segments of society face will be a vital piece of data collection at this stage, and will later provide you with necessary information to target measures at meeting these identified needs. The existence of pre-existing social inequities/injustice is a factor which impacts the adaptive capacities of different social groups. The analyse stage can be an opportunity to identify from your stakeholder groups what the root causes of the adaptation risks the face are. *Transformative* CCA planning means going beyond only using reactive hazard response measures, and linking adaptation planning to address the sources of social vulnerability in order to build adaptive capacity in your City/Region is a just and transformative approach to CCA planning.				
Distributive Justice Indicators	**2.1 A Risk Mapping has been conducted** **2.2 There is a process for identifying vulnerable groups** **2.3 There is a process that assesses the distribution of benefits from adaptation.** **2.5 The strategy identifies the possibility of the distribution of negative impacts (maladaptation)**				
Justification	The Analyse phase focusses on identifying the challenges, risks, and opportunities that climate change will bring to your City/Region. It is the phase of the USM where your administration should perform its data analysis tasks. Collecting the right kind of data is important for distributively just CCA as it is used to inform how we allocate costs and benefits in appropriate ways to meet the needs of different people. Risk/Hazard mappings allow us to make assessments of which areas within your administrative areas are likely to experience climate related hazards, often displayed in a spatially explicit form. In order to assess how the costs and benefits				

	of adaptation are shared, risk maps are essential for providing the data you need to understand who would be impacted by not adapting, and provide information needed to prioritise resources and efforts. Risk mappings are now often linked to vulnerability assessment, but it is essential to distinguish vulnerability from hazard exposure. Vulnerability is a complex social phenomenon and requires different forms of data collection. Accurate vulnerability assessment can allow you to begin identifying who vulnerable groups are in your area. The analyse phase is also where a process for assessing the who benefits from adaptation can begin. Inferences from this can be drawn from the risk and vulnerability mapping. A just process is also needed to determine how the evidence from the hazard and vulnerability mapping will be used to make decisions over where to prioritise for investment and/or what adaptation options are appropriate. The analyse phase should also include consideration of potential negative consequences of the adaptation options being considered. It is important to assess whether an adaptation option could have negative consequences, such as shifting vulnerability to another region, creating new problems, or hinder the achievement of other objectives (such as sustainable development).
Procedural Justice Indicators	**3.2. The adaptation strategy has involved participation during different phases of the process**
Justification	Participation from stakeholders in the analyse phase is instrumentally valuable because the “lived experience” of stakeholders can hold information you would need to accurately assess vulnerability, hazard exposure, and maladaptive risks. Citizen input could also be valuable for determining what indicators it’s relevant to capture and ensuring that the information you gather is relevant to the needs, interests, priorities of the community the administration serves. This can feed into the *Stakeholder Needs Assessment.*
Restorative Justice Indicators	**4.1. The strategy acknowledges the need to compensate for the diverging impacts of climate change**
Justification	In order for wrongdoing to be rectified, and justice restored, it essential that there is a recognition of uneven impact of climate change and the way in which current vulnerability to its effects are structured through a history of (potential) injustices. The analyse phase is where the techniques of uncovering the root causes of vulnerability is performed, allowing potential transformative interventions to be identified and planned for in the Apply & Plan phase.

3.3.3 Apply & Plan Phase

Phase 3: "Apply/Plan"	Inputs	Activities	Outputs	Outcomes	Impact
	System analysis insights; intervention design; resources and timelines	Co-designing actions / action agreements; roadmap development; defining KPIs and responsibilities	Implementation Plan; KPI dashboard; timeline and budget plan; monitoring plan, other formal agreements (LGDs, CCCs); sectorial strategies	Feasible and legitimate plan(s); internal ownership and resource clarity	Strong base for implementation with political and operational support
Recognitional Justice Indicators	**1.1 The strategy acknowledges that adaptation needs are different across groups in society** **1.2 The strategy acknowledges the impact of existing societal structures on vulnerable groups in adapting to the impacts of climate change** **1.3 The strategy acknowledges adaptation as a way to secure [basic human rights] broader societal transformations**				
Justification	The final plan for an adaptation strategy or measure developed in the Apply & Plan stage should be designed to cater to different adaptation needs that have been identified in the Analyse phase, rather than relying on "one-size-fits-all" solutions. A just plan will be tailored to the actual identified needs of those it serves. Co-designing the plan with stakeholders and ensuring that those groups who are at risk are present in the planning stage can help ensure that these diverging needs are recognised in the plan. Likewise, a recognitionally just and *transformative* climate adaptation strategy might go beyond targeting interventions to addressing the most vulnerable groups (identified in hazard and vulnerability mapping) but also develop interventions that target the *root causes* of social vulnerability. This requires reflection on how existing social structures produce vulnerability, but also seeing adaptation as a bigger project than simply responding to climate hazards, but as an opportunity to make changes that contribute to a broader project of social and economic development.				
Distributional Justice Indicators	**2.1 A Risk Mapping has been conducted** **2.2 There is a process for identifying vulnerable groups** **2.3 There is a process that assesses the distribution of benefits from adaptation.** **2.4 There is a process for assessing how the costs of adaptation are divided**				
Justification	The risk, hazard, and vulnerability maps produced in the analyse phase are essential datapoints in determining the final plan of adaptation measures that is developed at this stage, as they can inform the distribution of new measures, investments,				

	and allocation of limited resources. While there are different conceptions of what a just share of resources for adaptation will be, and the principle which should govern how and why they are distributed in a particular way, an understanding of hazard exposure and need will be required for all of them. This phase is when this evidence will be brought together and the principes used to make allocation decisions are utilised. Furthermore, the planning stage is when also the time when cost sharing will be discussed. There are different interpretations about what a distributively fair way to share the cost of adaptation is. Input from stakeholders at this stage can help identify a cost-sharing strategy that tracks local perceptions of fairness.
Procedural Justice Indicators	**3.1 The adaptations strategy details who participates in the strategy process** **3.2 The adaptation strategy has involved participation during different phases of the process** **3.3 The strategy allocates responsibilities related to adaptation** **3.4. The adaptation strategy has a structured plan for participation in the implementation** **3.5. The adaptation strategy has a plan for updating and evaluating the strategy**
Justification	The apply/plan stage focusses on making formal agreements to deliver climate adaptation objectives which have political buy-in and legitimacy – and therefore fair processes are central. A component of the planning stage will be delegating responsibility for delivering on the plan and setting the conditions under which deals that the city/region makes partnerships with the private sector, NGOs, and citizen and civil society. Civil society input into the terms of these agreement and transparency in how the city/regional administration makes agreements for services with the private sector will be essential elements of a procedurally just strategy. Clear responsibilities for all agreed measures should be allocated, KPIs agreed on, and terms of engagement set. It is typical for citizens to be *consulted* on a plan, but just and transformative adaptation will expect a deeper degree of collaboration, where citizens can expect their input to have a meaningful impact on the design of the plan. A clear strategy to bring citizens and stakeholder into the planning process is needed and resources and time should be devoted to facilitating this kind of engagement. Having a clear plan for monitoring and evaluation is also relevant to procedural justice. Partly this is because it is important for reasons of transparency that partners in an implementation plan understand the terms under which they will be evaluated/assessed. Additionally, different groups of stakeholders/groups of citizens may have different preferred success metrics, and so involving them in KPI settings can ensure that the terms used to determine whether the project was successful are agreeable to all who will be affected by the plan. Additionally, vulnerability to climate risk is dynamic and changing, and the needs of different groups may change. Thus, it's valuable for a strategy to have a clear and transparent processes for reviewing the success and evaluation criteria.

Restorative Justice Indicators	**4.1. The strategy acknowledges the need to compensate for the diverging impacts of climate change.** **4.2. The strategy has compensation measures to deal with maladaptation** **4.3. The unequal distribution of resources for adaptation is compensated by redistribution**
Justification	A component of the planning stage may be identifying measures for compensating communities who are vulnerable to climate change through no fault of their own. This may be approached through the social vulnerability assessments and root cause analysis conducted in the Analysis stage, which should have identified who the communities facing the greatest losses are. Ongoing work on climate attribution seeks to identify measures of linking a particular climate hazard event (e.g. a flood) to climate change, and the debate at an international level on loss-and-damage and attribution of damages to specific emitters is relevant here, but the methodologies are not well developed – especially given the more complex webs of causes and attribution that apply in climate adaptation contexts. However, these forms of analysis may become more relevant in future. Prioritising resources to these most-affected communities may be understood as a form of restoration for past wrongdoing – as may focussing on addressing the root causes of existing vulnerability. Compensation measures for any maladaptation (e.g., new vulnerabilities or costs that can be attributed to failed implementation or planning) which may occur could in principle be built into concrete agreements to provide specific adaptation measures – e.g., as a form of insurance policy. At this stage, this is speculative and more case study evidence on the design of such principles is needed before specific methodological advice is given. In a more general sense, a transformative adaptation plan may seek to link adaptation policy to achieving a broader justice-oriented transformation of a city/region – for instance one which tries to tackle social inequalities and reallocate resources. A change in the broader social order towards more material equality may both satisfy restorative justice demands but also be a form of climate adaptation if it raises the adaptive capacities of vulnerable communities. When planning, you may search for synergies and alignments of the adaptation plan with broader developmental and social justice measures your administration is considering.

3.3.4 Act Phase

Phase 4: "Act"	Inputs	Activities	Outputs	Outcomes	Impact
	Implementation plan	Implementation of action(s); monitoring activities; coordination meetings	Documented implementation steps; action logs; iteration notes	Visible improvements in targeted areas; feedback from stakeholders and team	Steps towards transformation in administrative practices that support green & democratic goals
Recognitional Justice Indicators	/				
Justification	/				
Distributional Justice Indicators	**2.5 The strategy identifies the possibility of the distribution of negative impacts (maladaptation)**				
Justification	Maladaptation refers to the process that an intentional adaptation action may lead to negative effects which increase vulnerability, diminish well-being or undermine sustainable development. Maladaptive effects may be avoidable through careful planning and assessment in the planning phase; but often maladaptation can become evident only when projects reach an implementation stage. While maladaptation is an *unintended* consequence of adaptation efforts it is likely still an injustice if a community is left *worse off* as a result of a poorly planned adaptation project. The "Act Phase" should therefore include within its monitoring and reporting actions ongoing review of implemented projects to assess whether maladaptation has occurred, and a process to rectify or compensate for increased vulnerability or diminished well-being.				
Procedural Justice Indicators	**3.2 The adaptation strategy has involved participation during different phases of the process** **3.4 The adaptation strategy has a structured plan for participation in the implementation** **3.5 The adaptation strategy has a plan for updating and evaluating the strategy**				
Justification	There are opportunities to involve citizens and stakeholders throughout the Act Phase, and doing so provides an opportunity for an administration to demonstrate a commitment to meaningful engagement that goes beyond consulting stakeholders and is instead collaborative and continuous. In the Apply and Plan phase of the project you should have a clear plan for how stakeholders will be involved in project implementation and the ongoing monitoring of the project results, how their input will be used, and a clear and transparent process for acting on input (e.g., on identified maladaptation). A related issue is the need to have a plan for updates and evaluation of the strategy; this again related to maladaptive risk and the need to continually monitor the project in a transparent and structured way to evaluate what the long-term effects of the project are on people's vulnerability and wellbeing.				

Restorative Justice Indicators	**4.2. The strategy has compensation measures to deal with maladaptation** **4.3. The unequal distribution of resources for adaptation is compensated by redistribution**
Justification	Linked to the distributive justice points above, the Act Phase is when plans to compensate for maladaptation are put into practice. Clear measures should be identified from the outset for how you will respond to identified maladaptation; including setting aside resources for compensating communities who are made more vulnerable in the event of failed adaptation. Transformative adaptation should tackle the root causes of vulnerability to climate change, and therefore is related to indicator 4.3. Transformative adaptation measures may act as a kind of compensatory measure for inequalities in adaptive capacity that exist within a society. In the Act Phase, transformative adaptation project will evaluate how successfully projects are at raising adaptive capacity and helping progress towards a socially just outcome for the community in question. You may seek to integrate new adaptation measures into broader packages of actions aimed at reducing social and material inequalities – though it is important that climate adaptation projects are additional to already ongoing development initiatives.

3.3.5 Accelerate Phase

Phase 5: "Accelerate"	Inputs	Activities	Outputs	Outcomes	Impact
	Early results and feedback; monitoring data; new political or institutional factors	Embedding into rules/protocols; sharing lessons; stakeholder communication & PR; replication or upscaling plans	Revised and additional action plans & formal agreements informing into the policy cycle	Broader change across city systems; readiness to scale or sustain	Institutionalised innovation, stronger democratic green governance
Recognitional Justice Indicators	**1.1 The strategy acknowledges that adaptation needs are different across groups in society** **1.3 The strategy acknowledges adaptation as a way to secure [basic human rights] broader societal transformations**				
Justification	As adaptation advances and social transformations develop, and climate change progresses, the constellation of vulnerabilities, adaptive capacity, and social and political capital, and hazard exposure will change. A just climate strategy will need to commit to continually assessing changing adaptation needs between groups in your social context. Accelerating adaptation requires a combination of both building on past successes but also remaining open to new challenges developing that require bespoke approaches. Accelerating and building off past successes is needed for moving from incremental to transformative adaptation. Nonetheless, it remains important in the Accelerate Phase to assess how and whether successes in the previous stages have contributed to tackling the root causes of vulnerability to climate hazards; and whether they have contributed to broader social justice objectives such as reducing inequalities in adaptive capacity. Acceleration should not be confined to increasing the rate at which an administration can deliver incremental changes; but also the ability of the administration to target and provide deep and meaningful changes and social transformations.				
Distributional Justice Indicators	**2.2 There is a process for identifying vulnerable groups** **2.3 There is a process that assesses the distribution of benefits from adaptation** **2.4 There is a process for assessing how the costs of adaptation are divided**				
Justification	The Accelerate Phase requires the administration to begin again the cycle of identifying potential adaptation measures to pursue, next stages in their green deals, projects to fund, which process to upscale and which to revise or abandon. How your administration makes these decisions will require them to evaluate again how a decision will impact the distribution of benefits and costs within the social context you are responsible for. When reviewing the achievements of the previous round				

	of implementation, it is important to assess how they have broadly impacted social welfare across society and their impact on important social metrics.
Procedural Justice Indicators	**3.2 The adaptation strategy has involved participation during different phases of the process** **3.4 The adaptation strategy has a structured plan for participation in the implementation**
Justification	Continuous participation of those impacted by adaptation measures should continue into the post- implementation evaluation and acceleration phases. Citizens might be involved in decisions over what to bring forward into the next implementation phase, as well as providing evidence and evaluation of what worked in previous phases, the metrics to be used in evaluating success, and how to prioritise interventions. A component of the Accelerate Phase should also be a normalisation of how the administration deals with citizens. While in initial rounds administrations may be new to facilitating participatory processes, and objective of accelerator rounds may be to institutionalise involving citizens and stakeholders into planning processes; scaling and deepening the level of participation which is possible, and making such process a “normal” part of how the administration functions so that running them is less resource intensive that it may have been initially. A factor in social vulnerability to climate change is the lack of ability of certain groups to influence political decision making – which limits their ability to have the state/administration take their adaptation needs into account. Therefore, strengthening the institutional processes by which different voices can make themselves known to the administration is in itself an adaptation measure, and focus on institutionalising these procedures is in itself a desirable outcome of the Accelerate Phase.
Restorative Justice Indicators	**4.3. The unequal distribution of resources for adaptation is compensated by redistribution**
Justification	In the Accelerate Phase, the administration begins again the process of determining how and what to scale; where to target to measures; and how to learn from and build upon the lessons of the previous cycle. As with the distributive justice indicators, it remains essential to continually assess how existing vulnerabilities and inequalities impact the ability of communities to adapt to climate hazards; and the extent to which these have been improved by the last round of measures. Continuing to see Transformative Adaptation as an opportunity for tackling existing social injustice should run through the evaluation of the past round and influence decisions on how and what to accelerate going forward.

3.4 Mapping Adaptation Justice Index to relevant tools and methods

The Adaptation Justice Index provides guidelines for when certain tasks need to be performed during the development of CCA plans and strategies in order to make sure that four forms of justice are met, through the provision of a set of indicators. However, it does not provide specific methodological guidance for national, regional, or city level planners involved in the drafting of CCA plans on the appropriate methods or techniques needed to meet the prescribed indicators. The following section builds on a compendium of tools and methods for climate adaptation planning developed within the TiCCA4Danu project and maps them to the AJI indicators. This allows for adaptation planners using the AJI to identify the relevant tools they need to ensure that their CCA strategies achieve the indicators of just adaptation planning. This full compendium of tools was submitted as part of Deliverable 4.6 "Report on CCA Synergy Workshop" in December 2025, and will be further expanded and elaborated in Deliverable 4.7 on "Mission Synergy Tools" and will be incorporated into the final version of the Adaptation Justice Explorer.

Table 9 Recognitional justice indicators and a selection of relevant tools

Recognitional Justice Indicator	Relevant Tools
1.1. The strategy acknowledges that adaptation needs are different across groups in society	• Social Vulnerability Index Tool (SVI-Tool) • Climate Impact Diagrams
1.2. The strategy acknowledges the impact of existing societal structures on vulnerable groups in adapting to the impacts of climate change	• Methods for Identifying Roots Causes of Vulnerability
1.3. The strategy acknowledges adaptation as a way to secure basic human rights	• ARCADIA Transformative Adaptation Scorecard • EU Leave-No-One-Behind Index • Social Progress Initiative Just Transition Score

Table 10 Distributive justice indicators and a selection of relevant tools

Distributive Justice Indicator	Relevant Tools
2.1. A risk mapping/assessment is conducted	• Pluvial hazard & risk assessment and adaptation • Thermal Assessment Tool • Windstorm damage assessment tool • Crowdsource module for climate hazard mapping • DRMKC Risk Data Hub • CLIMADA Climate Risk Assessment and Adaptation Option Appraisal • MYRIAD ArcGIS Hazard Story Maps
2.2. There is a process for identifying vulnerable groups	• Social Vulnerability Index Tool (SVI-Tool) • Dynamic Integrated Flood Insurance Model

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Project funded by

Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra

Federal Department of Economic Affairs, Education and Research EAER State Secretariat for Education, Research and Innovation SERI

Swiss Confederation

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

	• Her4Climate • ClimateJust Climate Vulnerability Indicators
2.3. There is a process that assesses the distribution of benefits from adaptation 2.4. There is a process that assesses how costs of adaptation are divided	• Adaptation Pathway Generator Tool • Resilience Pathway Visualisation Tool • CLIMADA Climate Risk Assessment and Adaptation Option Appraisal • Adaptation Community Cost Benefit Assessment template
2.5. The strategy identifies the possibility of the distribution of negative impacts, e.g., maladaptation, of adaptation measures	• REGILIENCE maladaptation risk self-assessment tool.

Table 11 Procedural justice indicators and a selection of relevant tools

Procedural Justice Indicator	Relevant Tools
3.1. Adaptation strategy details who participate in the strategy process	• MIP4Adapt D.I.Y Manual for stakeholder and citizen engagement • Guide to a Participatory Theory of Change • Assembling and Assembly Guide • KNOKA guidance on the commissioning and development of Climate Assemblies • Adaptation-AGORA Engagement Principles • LOCALISED Citizen Engager • Guide to Multi-Level Governance for Local and Regional Authorities
3.2. The adaptation strategy has involved participation during different phases of the process	• MIP4Adapt D.I.Y Manual for stakeholder and citizen engagement • Guidance for Engaging Vulnerable Groups • Climate Citizens Engagement Toolbox for Climate Assemblies • Adaptation Workshops Guide • Our Climate Toolkit for Citizen Climate Monitoring • LOCALISED Citizen Engager
3.3. The strategy allocates responsibilities related to adaptation	• Guide to a Participatory Theory of Change
3.4. The adaptation strategy has a structured plan for participation in the implementation	• NEVERMORE Engagement Strategy Methodology • MIP4Adapt D.I.Y Manual for stakeholder and citizen engagement
3.5. The adaptation strategy has a plan for updating and evaluating the strategy	• ARCADIA Transformative Adaptation Scorecard • CCA Monitoring and Evaluation Toolbox • Good Practice Guide on Indicator Selection for CCA MRV • EU Just Transition Fund Monitoring Just Transitions Guidance

3.5 Synergy Workshop and Feedback on Indicators

A draft version of the *Adaptation Justice Explorer* was presented to the City/Regional partners of the TiCCA4Danu project at the *TiCCA4Danu Synergy Workshop* held at the offices of the CMCC in Caserta, Italy on the 27th and 28th of November 2025. The results of this workshop are reported on in *D4.6 Report on the CCA Synergy Workshop.*

At this workshop, representatives of Burgas, Maribor, and Debrecen were given the opportunity to use an early version of the tool which mapped the indicators of the *Adaptation Justice Index* to a different management model for urban sustainability – *The Local Green Deals Framework* (ICLEI, 2025). City/Regional government representatives were then asked to provide feedback through a questionnaire on **familiarity with**, and **enablers and barriers to using**, a range of techniques/methodologies for achieving the different indicators identified in the tool for three forms of justice: *distributive, procedural, and recognitional.* The results of this are presented below:

3.5.1 Familiarity with Techniques/Methods for Just CCA planning and implementation

Distributive Justice

Respondents were asked to assess their familiarity with techniques for meeting the five distributive justice indicators from the *Adaptation Justice Index*:

- Conducting a climate risk mapping [2.1]
- Conducting a vulnerability assessment [2.2]
- Assessing the distribution of benefits of adaptation policies/measures [2.3]
- Assessing how the costs of climate adaptation policies/measures were divided [2.4]
- Assessing the risks of maladaptation [2.5]

No technique had any respondents who ranked themselves as being “highly familiar” with it – indicating that they used this with regularity in their work. **Assessing the distribution of benefits** was the technique that most respondents felt familiar with, with all respondees indicating that they were “Somewhat” or “Moderately familiar”. Likewise conducting both **Climate Risk Maps** and **Vulnerability Assessments** also had comparatively high levels of familiarity. Assessing how **the costs of adaptation measures would be shared** had a lower level of familiarity, perhaps reflecting the fact that city/regional authorities receive their budgets from above and thus lack institutional mechanisms for assessing cost sharing. Non-financial costs of adaptation measures may also be unfamiliar to the respondents, who also ranked as their least familiar technique approaches for **assessing the risks of maladaptation.**

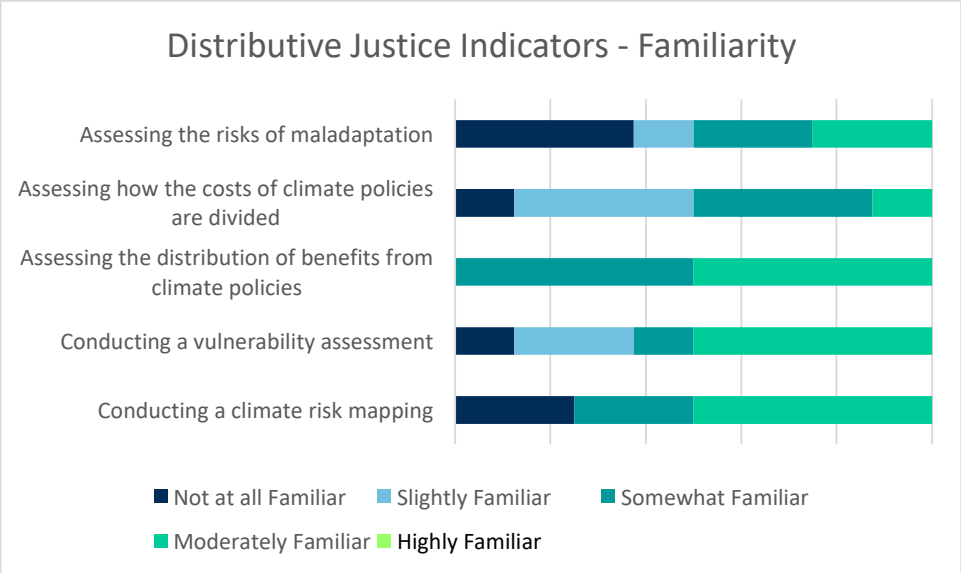

Figure 5 Overview of familiarity with techniques for distributively just CCA

Procedural Justice

Respondents were asked to assess their familiarity with techniques for meeting the five procedural justice indicators from the *Adaptation Justice Index*:

- Enabling citizen participation in climate adaptation planning [3.1a]
- Enabling vulnerable group participation in climate adaptation planning [3.1b]
- Creating opportunities for stakeholder engagement throughout the project [3.2]
- Creating accountability measures for strategic partners in climate adaptation planning and implementation [3.3]
- Having a transparent process for identifying participants for inclusion in project planning and implementation [3.4]

In this case our questions deviated slightly from the indicators from the *AJI.* Indicator 3.1 "Adaptation strategy details who participates in the strategy process" was broken down to assess knowledge of citizen engagement techniques in general and then specific techniques for engaging vulnerable groups as a subset of the public.

Our results show that respondees were much more confident in their knowledge of these procedural justice techniques than they were for the distributional. While no distributional justice techniques had respondees who felt "highly familiar" with them and used them with regularity, **all of the techniques tested showed respondees who were highly familiar**. Likewise, **no techniques had respondents with no familiarity** and the only technique, where any respondent told us that they had only "slight" familiarity, was enabling citizen participation. However, these responses conflict with responses heard elsewhere from the City/Regional planners who report persistent challenges with citizen engagement.

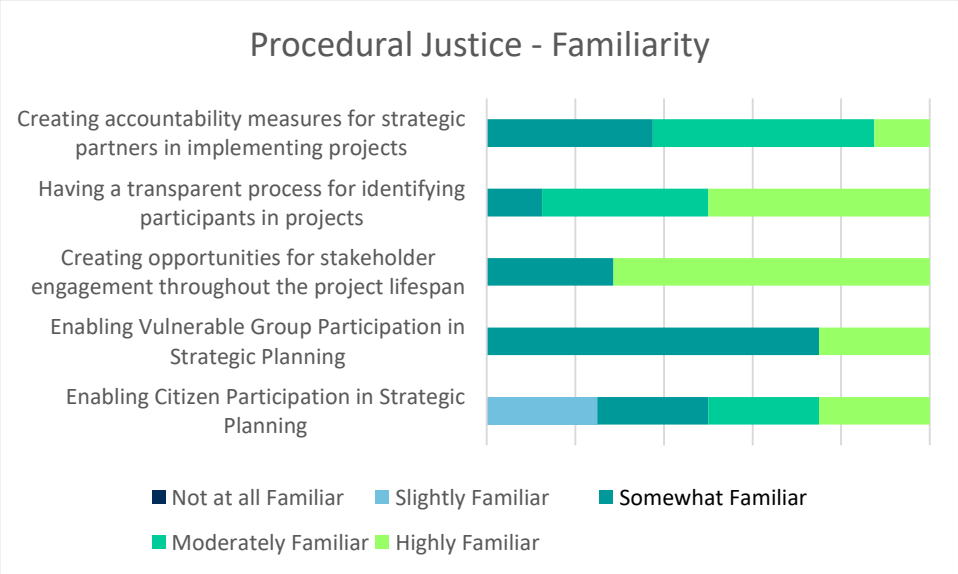

Figure 6 Overview of familiarity with techniques for procedurally just CCA

Recognitional Justice

Respondents were asked to assess their familiarity with techniques for meeting four procedural justice indicators from the *Adaptation Justice Index*:

- Allowing citizens groups to identify their needs to you and have them factored in to the planning process [1.1a]
- Assessing and identifying indicators of the non-climatic determinants of vulnerability [1.2a]
- Identifying and analysing indicators of social vulnerability [1.1c]
- Knowledge of regionally specific causes of social vulnerability and social exclusion [1.1d] [1.2b]

These questions primarily relate to techniques for meeting the different tiers of achievement of indicator 1.1 – "the strategy acknowledges that adaptation needs are different across different groups within society" – where the highest and second highest tiers of achievement are based in assessing differences in adaptation needs through consultation with citizen groups, and expert review of relevant indicators respectively. As indicators 1.2 "the strategy acknowledges the impact of existing societal structures on vulnerable groups in adapting to the impacts of climate change"; and 1.3 "the strategy acknowledges adaptation as a way to secure basic human rights" refer mainly to the way climate adaptation strategy is framed rather than specific methods and techniques, modified questions about familiarity with vulnerability assessments and regionally specific social structures were included in their place.

These results show the widest range of familiarities. Most respondents reported familiarity with allowing citizens to inform them of their needs and factoring this into their planning. However most respondent only reported slight-to-no familiarity with making assessments of different kinds of social vulnerability and the structural causes of vulnerability. These factors that specifically pertain to meeting recognitional justice objectives may therefore be a priority for additional guidance.

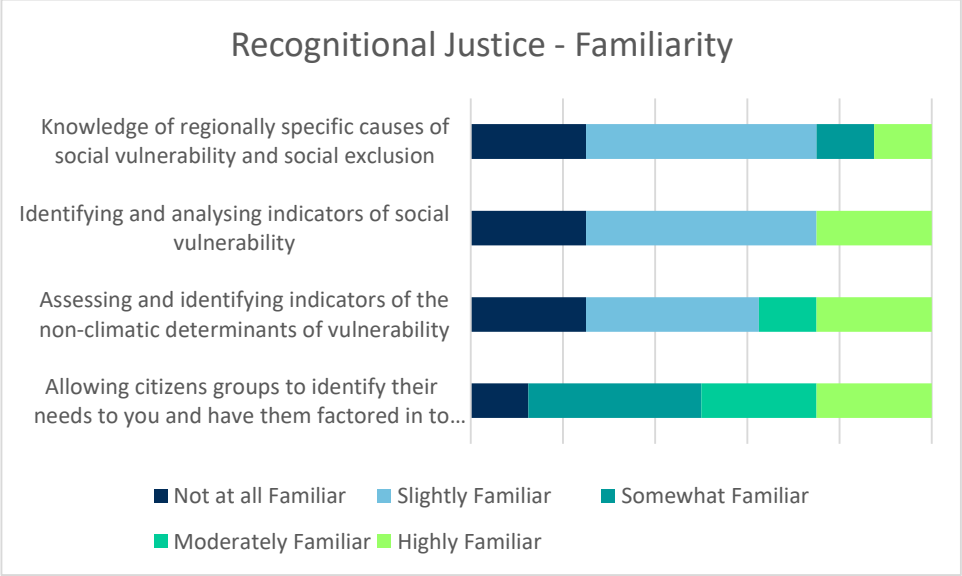

Figure 7 Overview of familiarity with techniques for recognitionally just CCA

3.5.2 Enablers and Barriers

In addition to assessing familiarity with methods/techniques for just CCA planning, we also sought to assess **enablers and barriers for city/regional administrations using these techniques** within their workflows. Responses were sought through the questionnaire as well as through short written responses from the workshop participants to identify additional enablers and barriers.

For each form of justice assessed (distributional, procedural, recognitional) the same set of enablers and barriers conditions were assessed. These were:

- **Time and Staffing** requirements.
- **Skills and Experience** within your team.
- Access to/Knowledge of **relevant tools and methods.**
- **Willingness** to use the techniques and methods.
- **Expectations of the general public** in how they expect their local authorities to behave.
- **Affordability.**

For the **Distributive Justice** techniques, all respondees strongly felt that access to specific tools and methods would be a major positive to them being able to advance distributive justice. In practice this is tools for a) identifying maladaptation, b) measures for assessing social vulnerability, c) methods for assessing the overall distribution of how costs and benefits are shared within their administrative context.

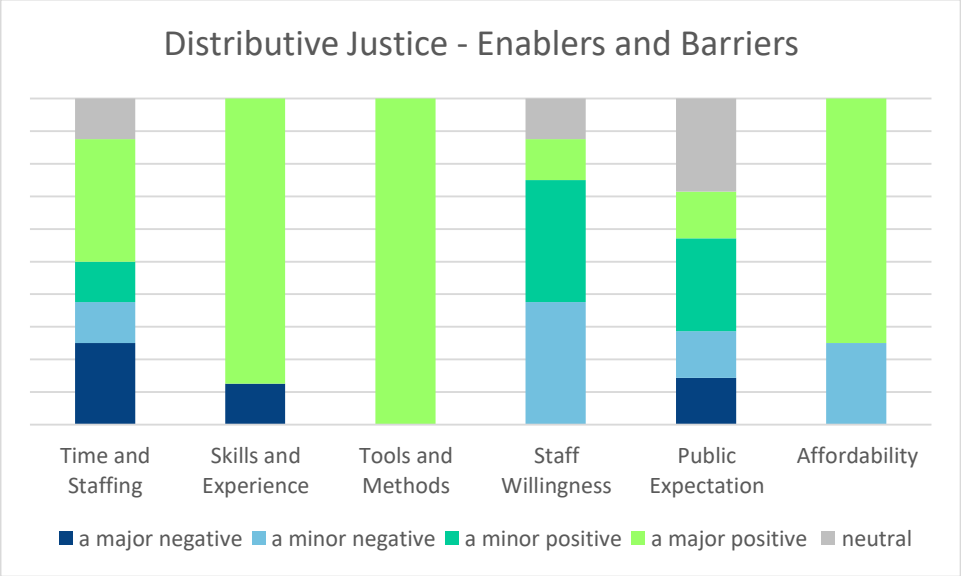

Figure 8 Overview of Enablers and Barriers to Using Distributive Justice Techniques

Respondees also gave us factors which would enable or hinder them in using the distributive justice techniques:

- **Synergetic value of the indicators/techniques** – if the data being collected has value elsewhere in the administrations work it's a "major positive" towards adopting or employing the techniques.
- **Accountability/Impact –** linked to the synergy value of the data being collected, but clear guidance on how to generate impact through the technique being utilized, and referring to external/stakeholder expertise, how to create accountability systems to generate impactful work.
- **Compulsion–** city/regional governments can be compelled into using certain approaches and methods by a higher level of authority, either within the administration (for individual planners tasked with implementing CCA measures) or on a city/regional administrative level by national authorities setting standards on the workflows that lower-level authorities need to use in their CCA planning.
- **Willingness** - enthusiasm within a team may be influenced by a scepticism towards the value of putting in time, effort, or expense to pursue just CCA in the face of more fundamental operation challenges that the department faces in bringing CCA projects to fruition.

For the **procedural justice** techniques skills and experience in the team as well as tools and methods were identified as the key enablers, pointing to a lack of familiarity and know how amongst the team surveyed for engaging citizens in participatory forms of governance. The most notable result is the high neutral/negative score attached to "public expectation", implying that the surveyed administrations felt that there was little pressure from below for them to begin using more participatory governance styles.

As with distributive justice, a respondent highlighted the important of "interoperability, possibility to use the outcomes as widely as possible, in other projects as well" as an enabling factor. No additional barriers were identified by participants.

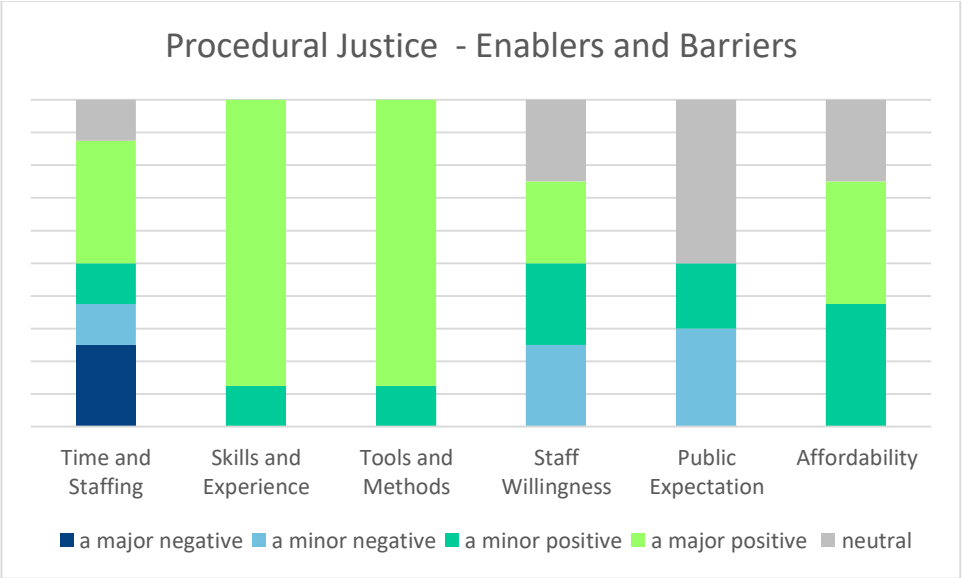

Figure 9 Overview of Enablers and Barriers to Using Procedural Justice Techniques

The results for **recognitional justice** closely mirror those for procedural justice. Respondents point to the importance of clear tools and methods as being an enabler for them to bring these techniques into their work. However, unlike procedural justice, the respondents were less confident in the ability of their teams to have the necessary skills to perform these techniques – again potentially pointing to a need for clear tools and methodologies. As with recognitional justice, the role of "public expectations" was muted, with the majority of the respondents saying it would have no effect or even a slightly negative impact on the administrations' ability to undertake the work. This aligns with other statements from partners about the they perceive there to be little interest from publics in the region for their local authorities to include them in planning processes; and explains why public expectations are not perceived as an enabling factor.

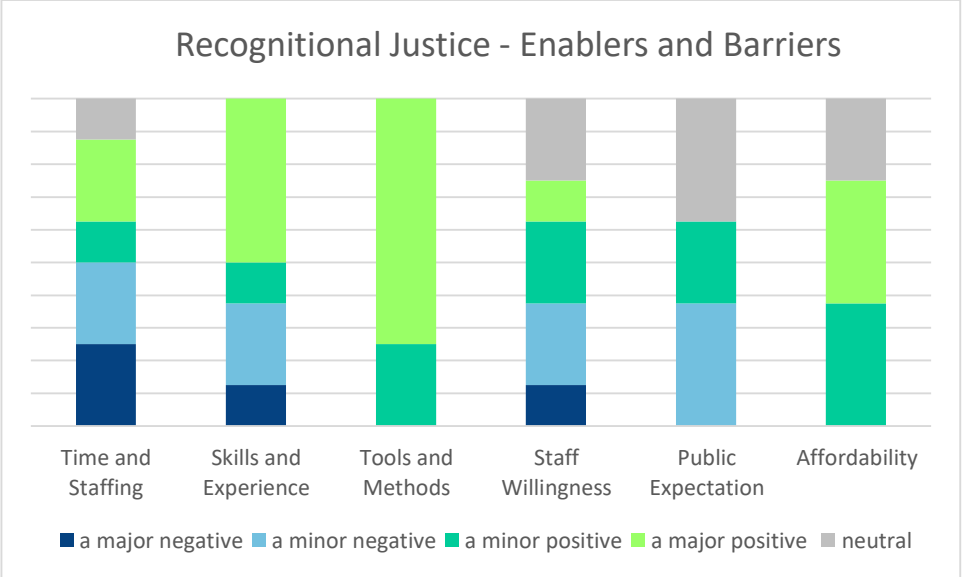

Figure 10 Overview of Enablers and Barriers to Using Recognitional Justice Techniques

One respondent also pointed to the main barrier to them was "lack of access to different groups". This points to the need for further methodological guidance on how to identify and make initial contact with specifically vulnerable groups that goes beyond generic advise for engaging citizens in general.

3.5.3 Overview and Recommendations

Overview of the findings:

- Administrations reported **the highest familiarity with procedural justice** techniques but comparatively **low familiarity with recognitional justice.** This is despite the occasionally presumed similarity between these "forms". There is a potential risk that City/Regional administrations may have just processes but lack the granularity of knowledge to bring the necessary people to the table, make their voices heard within the processes, and act on this knowledge to address specific and targeted problems that groups face.

- Overall, the challenges remain similar over all forms of justice. **Time and resources** of city/regional administrations to incorporate new techniques and pursue lengthy engagement process is an important factor that should not be underestimated.

- The importance of **clear tools and methodologies** for performing justice relevant assessments is required and clearly identified as a requirement, alongside **skills and expertise** available to administrations to conduct these.

- The value of **public expectations** is contested, especially as an enabler for pressuring administrations to incorporating procedural and recognitional justice techniques into their workflows. This aligns with anecdotal evidence from the partner regions that **publics within their geographical and historical context** are unfamiliar with and disinterested in being involved in participatory processes. This is potentially driven by a civic epistemology of publics as customers/recipients of services from their local/city governments and not as co-participants in governance; and where a perception of just and effective governance is driven more by perceptions of efficiency, impartiality, and incorruptibility of the administration rather than the extent to which it includes publics in planning and decision-making.

Recommendations for mainstreaming justice into CCA project workflows:

- **Value Statement:** Clearly demonstrate to City/Regional authorities the value that justice has to their work, identify reasons why any new techniques that may be employed (e.g., an overhaul in how citizens are engaged) can benefit other areas of their work (e.g., improving quality of the data being collected, creating more buy in for the authorities work)

- **Workflow and Data Collection Synergy:** Identify where administrations are already doing work that is relevant to justice (e.g., hazard mapping) or have relevant data that could be used in different ways (e.g., data on social vulnerability) – highlight that making efforts towards justice in CCA planning may not require entirely new ways of working but bringing together existing work and operating cohesively.

- **Do not underestimate the demands of justice** or assume that the work you are doing is sufficient for *just and transformative CCA*. **Avoid seeing justice as a "nice-to-have"** addition to a project, and plan to enable it early. This is especially relevant for ongoing processes of transformative adaptation – administrations should understand that promoting justice is a long-term commitment and ongoing feature of how they think and plan that does not start and end over the lifespan of a singular project.

- **Standardise procedures and create accountability** both within administrations and at a national level, to ensure that there are compliance procedures for using the relevant techniques and methods while allowing municipalities flexibility in techniques to respond to contextual challenges and situations.

- **Appropriate tools and methods** needed to achieve each justice indicator should be highlighted. While many tools now exist within the EU ecosystem and developed within previous projects, a greater effort is needed to actively disseminate these tools and have them embedded into processes and workflows; and to make the link to enabling just CCA emphasised.

3.6 Adaptation Justice Explorer

The final result of the process detailed above is the *Adaptation Justice Explorer.* The *Adaptation Justice Explorer* is an interactive tool designed to complement the *Urban Sustainability Management Model*, and which can be used by City/Regional authorities to identify where indicators of four forms of justice become relevant as they move through the urban sustainability management model to develop climate adaptation measures. In its final version it will incorporate click through links to the relevant tools for each indicator detailed in the mapping above.

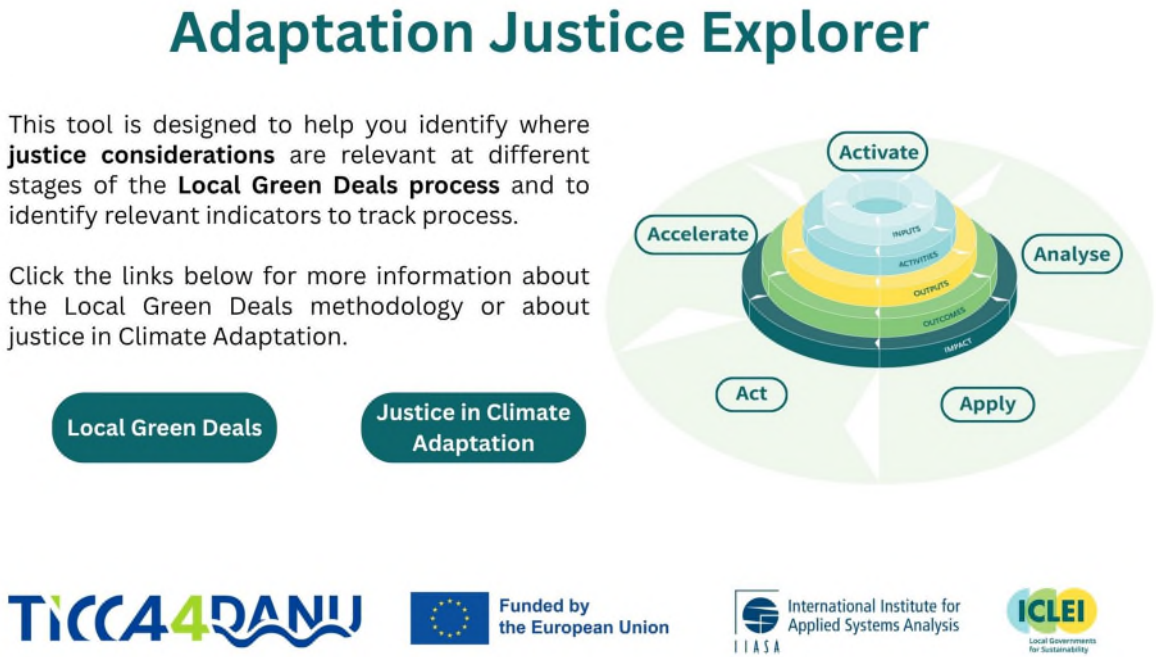

Figure 11 Homepage of the Adaptation Justice Explorer

The *Adaptation Justice Explorer* allows City/Regional administrations to identify which indicators from the *Adaptation Justice Index,* segregated by the four "forms" of justice are relevant to the activities they will conduct at the "Activities" layer of the five different phases of the *Urban Sustainability Model* workflow*.* An example slide is presented below showing distributive justice indicators that are relevant at the "activate" phase of the USM model.

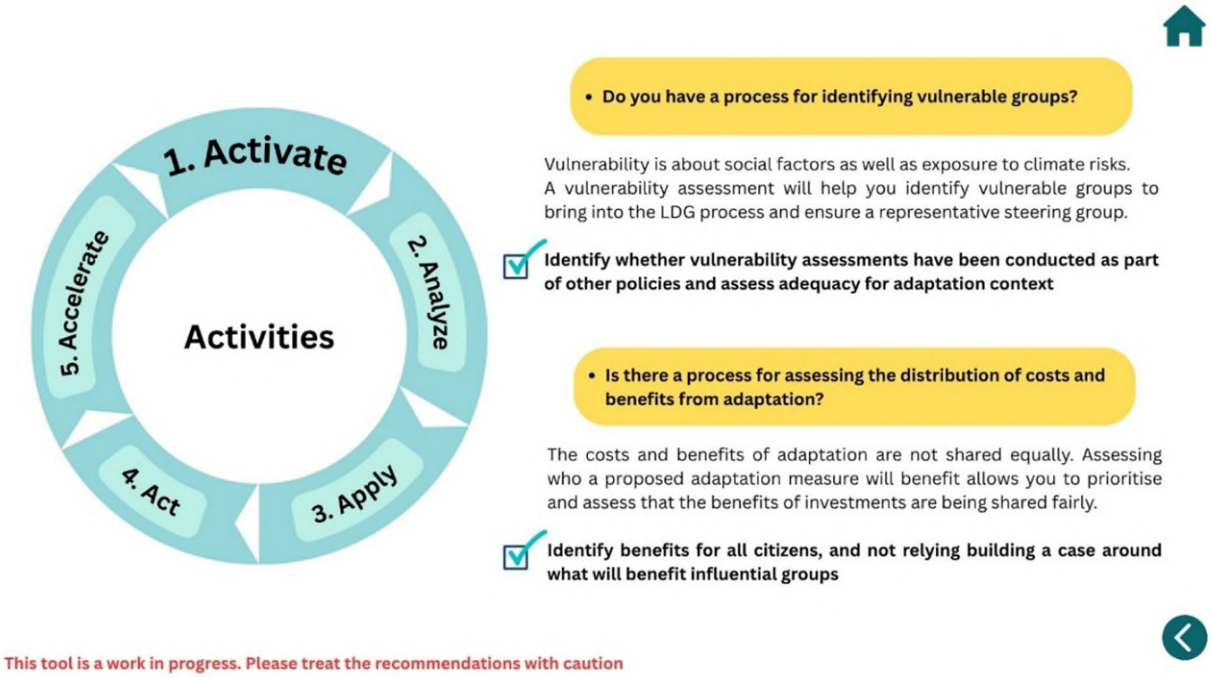

Figure 12 Example page of the Adaptation Justice Explorer (Activate Phase/Distributive Justice)

The Adaptation Justice Explorer will be available an openly accessible web tool as part of the TiCCA4Danu project (https://iiasa.ac.at/models-tools-data/adaptation_justice_explorer).

4 Methods for Identifying Roots Causes of Vulnerability

"Transformative" adaptation measures are often distinguished from "incremental" adaptation measures because they seek to address the root causes of vulnerability to the impacts of climate change (Biesbroek et al., 2026). Root causes can be understood as underlying structural/systemic issues, or in the sense that addressing them contributes to systemic change (Engbersen et al., 2024; Fedele et al., 2019; Owen, 2020; Teebken, 2024).

Various tools and methods exist for identifying the root causes of problems within the process management, technical design, and in healthcare settings, but have seen limited application within climate adaptation planning. Nonetheless, these techniques can play a role in the planning process for identifying which problems to address in order to make truly transformational adaptation interventions. In turn this can support efforts to pursue just adaptation by identifying the social roots of vulnerability or ensuring that planned interventions effectively tackle people's needs, improve the capacities of people to live decent lives, and address the structural issues which cause differentiation in outcomes that are experienced by different groups.

The following is a list of potential techniques for identifying the root causes of problems in adaptation settings:

4.1 Five Whys Analysis

"Five Whys" Analysis is a basic technique from management studies, popular in industrial engineering but also in health systems management, for identifying root causes by iteratively asking "why" an event occurred. Asking "why" five times sequentially is a simple technique for identifying what the root cause of a problem may be and allowing you to identify some potentially counter intuitive causes and solutions that would not have been evident at the outset. Five whys analysis might be used amongst a team of practitioners but could also form the basis of interviews or workshops with participants.

Figure 13 Example of a Five-Whys Analysis of the Root Causes of Low High School Graduation Rates for Ethnic Minority Children. Source: National Implementation Resource Network (2021)

However Five-Whys has been critiqued for being somewhat simplistic and arbitrary (Card, 2017), fails to capture multiple interlocking causes of events or the fact that problems can have multiple root causes (Bui and Papi-Thornton, 2024), and is reliant on the partial and limited view of the problem or system held by the question asker. On the latter point, consider how in the example provided the structural contributor factor would not have been identified if the question answer shared the anti-immigrant sentiments.

4.2 Fishbone Analysis

"Fishbone" Analysis/Ishikawa Diagrammes are another technique from management and process studies that are utilised in a number of fields, including within analysis of climate adaptation (Dimitrov, 2019; Yücer et al., 2020; Seidu et al., 2025). Fishbone diagrammes allow users to visualise how multiple, categorisable, types of cause feed into a network that link together to cause a problem. These can allow planners to move through a network of causality to identify deeper causal relationships and places where interventions could be effective.

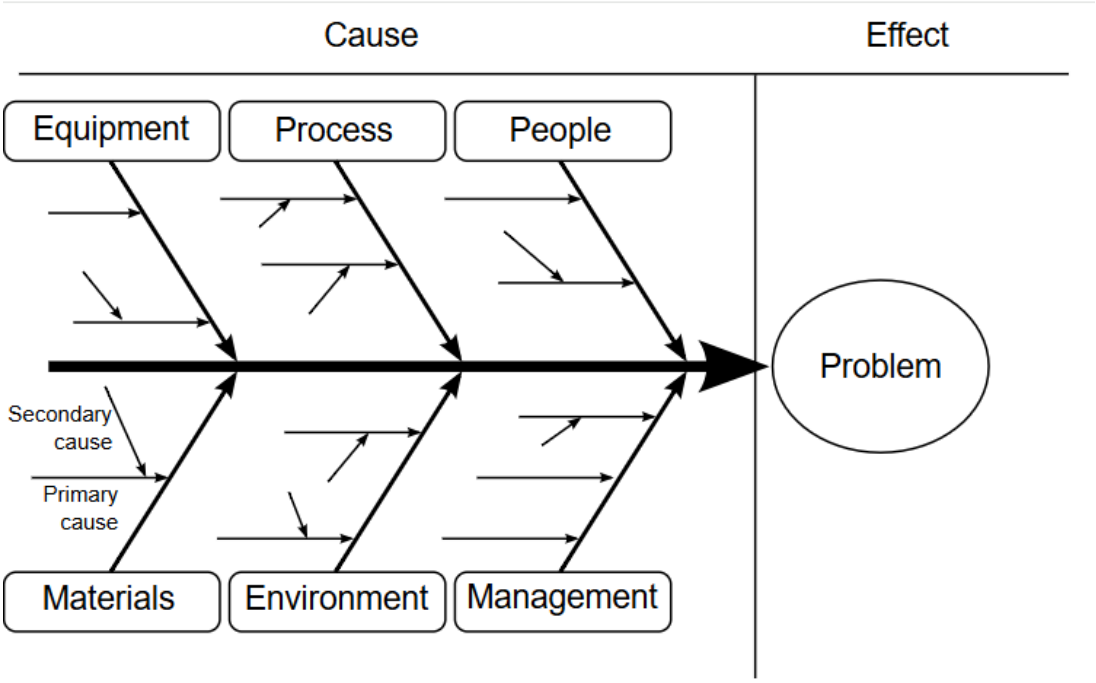

Figure 14 Example of a fishbone/Ishikawa diagramme for identifying the causes of problems. Note that the factors at the edges of the fishbones are arbitrary and different factors can be used in your analysis

Fishbone analysis may improve on the 5 Whys method by allow analysis of more complex causal relationships; but does not appear to prompt for "depth" of cause in the same way that "5 whys" does (albeit arbitrarily). In combination these two techniques may provide a useful tool to be deployed in a workshop with participants to gain a deeper understanding of why hazard occur, how risks develop, or why an adaptation measure became maladaptive. But there remain limitations to how likely it is to uncover truly "root" causes of problems, or of the underlying causes of vulnerabilities.

4.3 Social Vulnerability Assessment

Social Vulnerability Assessments (SVA) refer to a variety of techniques for identifying common causes of vulnerability (separate from exposure to bio-physical hazard effects of climate change). Different tools and techniques for SVA exist, but typically collate data on common vulnerability drivers, such as housing quality, age, income, health, immigration status, membership in a group facing discrimination, and others (McCullagh et al., 2025; Spielman, 2020; Cutter et al., 2009). SVA has been identified as a valuable tool for CCA decision making by providing the kind of information needed to make distributively just decisions (Kinsky and Mavrogianni, 2020; McCullagh et al., 2025, Juhola et al., 2022). SVA can allow CCA planners to reach a deeper level of analysis that simply identifying hazard exposure and building a CCA strategy around effective prediction of and reaction to hazard. But simply identifying existing vulnerabilities does not necessarily allow planners to reach the *root causes* of a problem, because vulnerability is not an inherent condition of certain groups, people, or places, but is created and maintained by networks of power relationships which determine why some areas or groups of people are historically or presently under-resourced in a way which leaves them vulnerable or unable to adapt to climate change without assistance (Schipper, 2020). Likewise social vulnerability indices and studies is that they are driven by the availability of data that cities and administrations have on hand, which may often be incomplete or biased on what it was deemed to be worth measuring. There is a risk that this is seen as a substitute for actively seeking the data on the most important drivers of vulnerability (Stolte et al, 2024). A database on key drivers of vulnerability was produced by the VulneraCity project.

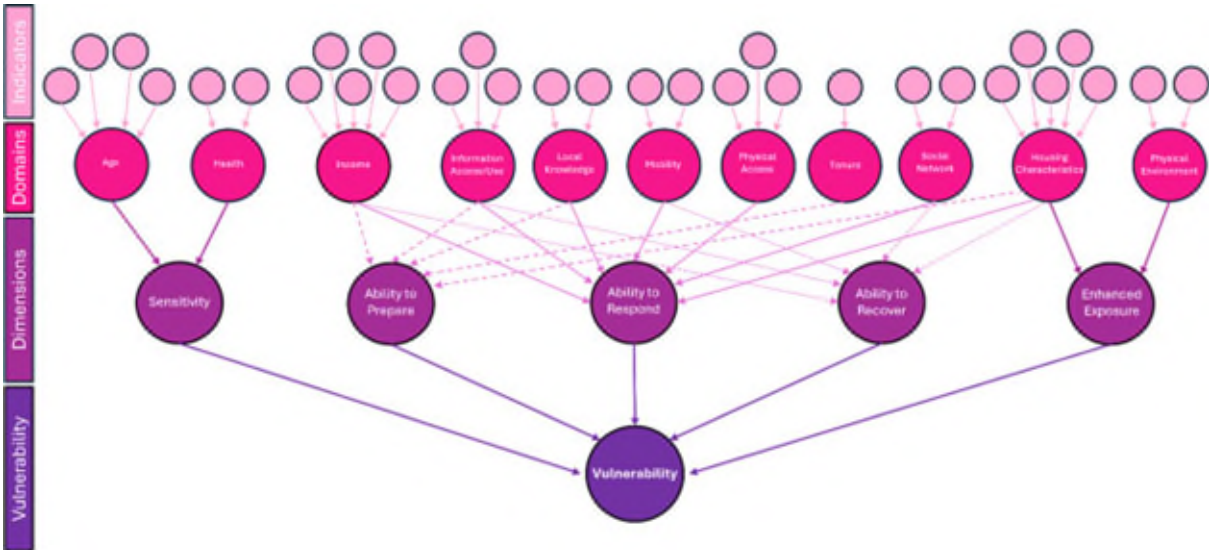

Figure 15 Structure of a Social Vulnerability Assessment. Source: McCullagh et al. (2025)

Nonetheless, Social Vulnerability Assessments are a valuable tool in ensuring that both transformative and incremental adaptations are distributively just, as they allow us to identify who vulnerable groups in our research/implementation context are and ensure that resources are prioritised to meeting these needs. Climate-Adapt have developed a toolkit for performing Social Vulnerability Assessments, which may be found here.

4.4 Systems Mapping

(Participatory) Systems Mapping/Causal Loop Diagrammes can allow administrations to understand how the components of a system interact with each other, and can reveal otherwise hidden relations, causes, and dependencies between entities and features of systems, and to visualise the connections (Bui and Papi-Thornton, 2024; Barbrook-Johnson and Penn, 2022; Lemke et al., 2024). In particular system maps that visualise causal relationships between factors are championed for their ability to depict and identify "vicious cycles" of barriers/problems that can occur in climate adaptation planning (Meadows, 2008; Zea-Reye et al., 2021; Dorst et al., 2022; Hanf et al.; 2025) which may reflect root causes of issues; and point to solutions or leverage points for interventions at deeper parts of the system that simply responding to hazards. Scolobig et al., (2023) also point to the use of visioning exercises with stakeholders that use systems maps as one of a selection of methods of understanding the systems they are part of as a way of inducing stakeholders to reveal root causes of issues that would have been obscured had they not been involved.

The process of creating systems maps and visualising causality within a system through cyclic graphing can be both an expert-led exercise, but *participatory* systems mapping involves stakeholders and members of these systems in the creation of the maps. This can allow stakeholders to identify connections that may not be evident to those without a "ground level" vision of the systems, and can provide qualitative evidence and "lived experience" that might be missed from a top-down approach – such as perceptions of influence over different elements of the system that different groups have. Systems mapping may also be a valuable and procedurally just way of identifying which stakeholders to invite to consultation processes, by both providing a systematic approach to identifying who the stakeholders in a problem are and allowing planners to go beyond the "usual suspects" they have engaged before (Haddaway et al., 2017; Lemke et al., 2024).

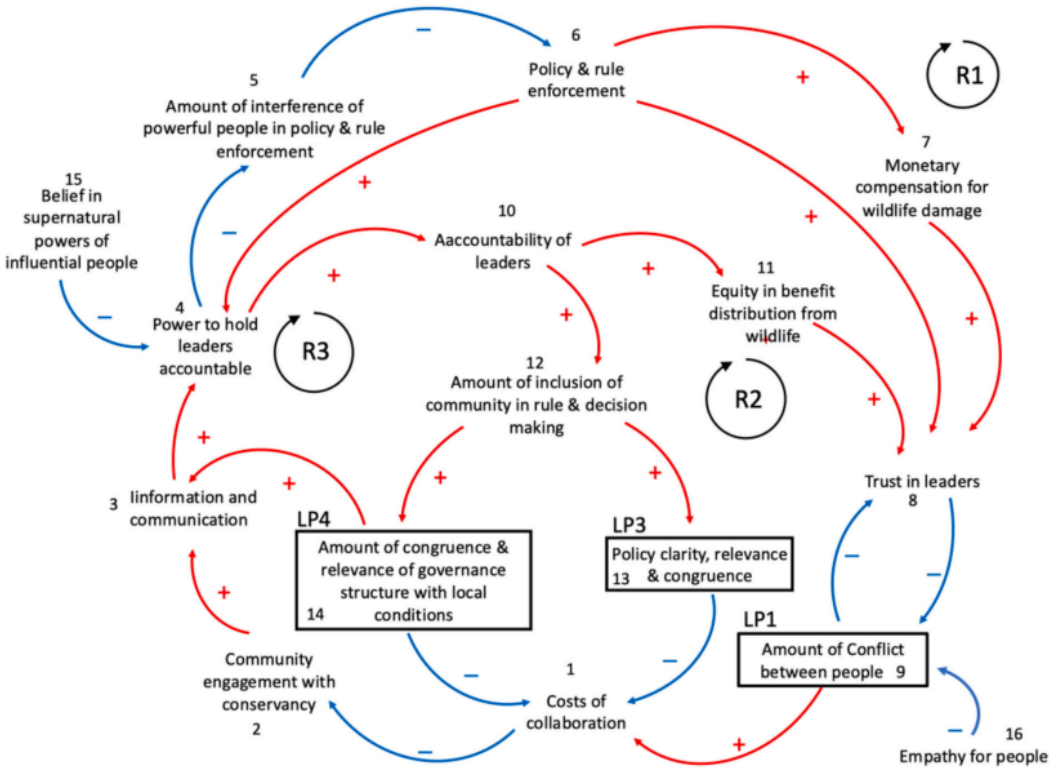

Figure 16 Example Segment of a Causal loop diagramme of the "governance" sub system showing leverage points in boxes (LP) and reinforcing feedback loops (R) (Kansky et al., 2025).

4.5 Leverage Points Analysis

Leverage Points Analysis is a way of thinking about how to make effective changes within a system. Developed originally by Donella Meadows (2008) leverage points analysis has typically classified 12 types of intervention, which operate on sequentially "deeper" components of systems to make more effective and durable changes. These "deeper" interventions may reasonably be understood as impacting the "root causes" of problems, located in the values and objectives of the entire system, its goals, and organisational logics.

- **12. Constants, parameters, numbers (e.g., taxes, subsidies, standards)** These are the easiest to change but usually have the least impact on the overall system.
- **11. Sizes of buffers and stabilizing stocks** How much "slack" or reserve exists in a system (like inventory or savings).
- **10. Structure of material stocks and flows.** Physical setup—like infrastructure, supply chains, or networks.
- **9. Length of delays** Timing mismatches between actions and their effects (e.g., policy vs. results).
- **8. Strength of negative feedback loops** Mechanisms that stabilize a system (like thermostats or regulations).
- **7. Gain around positive feedback loops** Processes that amplify change (e.g., compounding growth, viral spread).
- **6. Structure of information flows** Who does (or doesn't) have access to information
- **5. Rules of the system** Incentives, punishments, laws, constraints
- **4. Power to add, change, evolve, or self-organize system structure** A system's ability to adapt or restructure itself.
- **3. Goals of the system** What the system is trying to achieve (profit, growth, wellbeing, etc.).
- **2. Mindset or paradigm** The underlying beliefs or assumptions that shape the system.

- **1. Power to transcend paradigms** The ability to step outside any one worldview and flexibly adopt others—this is the most powerful leverage point.

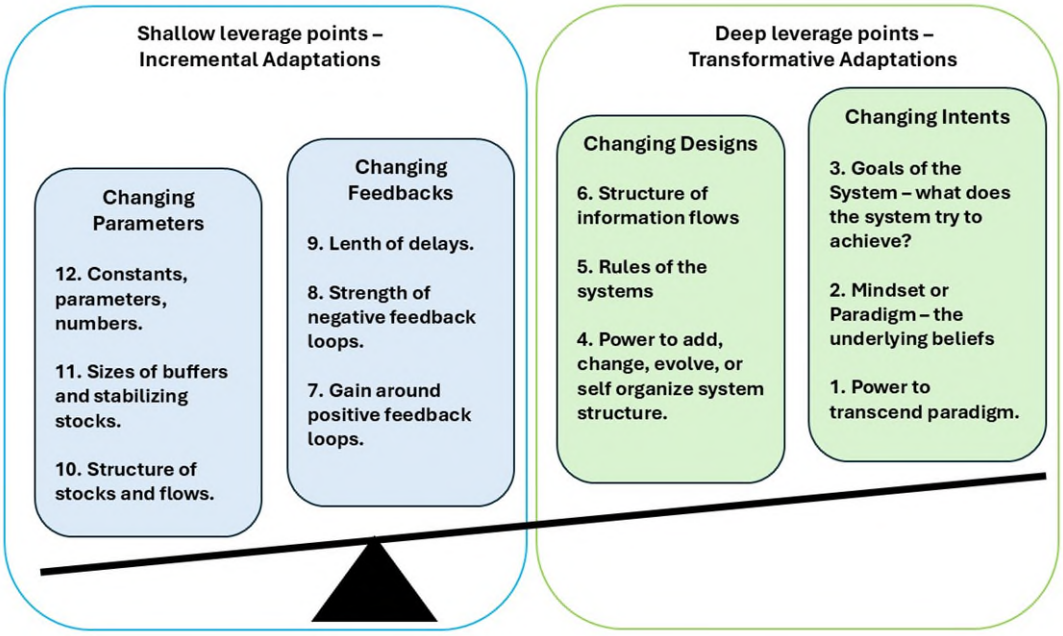

Figure 17 Visualisation of the Shallow and Deep Leverage points

The 12 leverage points provide a heuristic tool for considering where the root causes of problems may emerge from and what planners could consider targeting if they want to make deep transformations to the system they interact with. For instance, in a climate adaptation context – a change in how much of a scarce stock of water is allocated to local communities rather than agricultural exports would be an example of a parameter change – a relatively easy to make but "shallow" intervention. A deeper, transformative, innovation may be to shift the process that prioritises water to cash-crops rather than local needs.

4.6 FORIN: Disaster Root Cause Analysis

Forensic Investigations of Disasters (FORIN) Root Cause Analysis was developed by the Integrated Research on Disaster Risk (IRDR) program of International Council for Science (ICSU), International Social Science Council (ISSC) and United Nations International Strategy for Disaster Reduction (UNISDR) as a framework for analysing how a disaster event (e.g., a flood, fire, or storm) emerged from a succession of immediate causes, vulnerability drivers, risk factors, to the eventual root causes of the problem (Oliver-Smith et al., 2016).

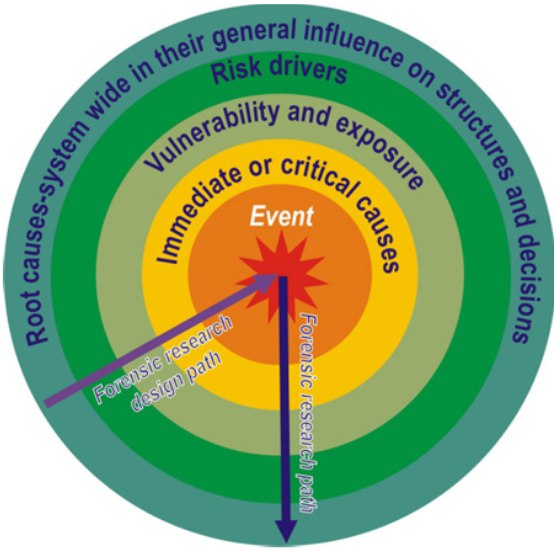

Figure 18: Framework for a FORIN analysis, showing how the output of the research (left hand arrow) will provide an explanation of why a disaster event occurred by tracing its origin in the root causes; and how the research proceeds (right hand arrow) by successively deepening its search for causal factors beginning with the event itself.

Four methods are identified as appropriate to conducting a FORIN study (Oliver-Smith et al., 2016):

1) **Retrospective longitudinal analysis (RLA**), concerned with the temporal development of the processes that have produced disasters in the past.
2) **FORIN disaster scenario building (FDSB)**, selected on the basis of a known hazard that preludes a possibly inevitable future event that is considered a factor in future disaster.
3) **Comparative case analysis**, an event-based analysis that seeks to identify underlying causes of disasters by comparing disaster impacts or contexts in different social contexts.
4) **Meta-analysis**, an event- or system-based review of the available literature carried out to identify and assess consistent and contrasting findings across diverse studies.

The FORIN framework provides an overarching framework for structuring a study into the root causes of disaster events. However, its utility is likely to be more appropriate for structuring scientific research and be beyond the capacities/resources of local governments. Likewise, it is structured towards analysing specific events/disaster – and while disaster response is a component of climate adaptation, climate adaptation also encompasses broad and longer term shifts in how a social-system alters its activity in response to climate change that cannot be pinned down to temporally brief or sudden “events” (for instance, changing the business model of regional scale agriculture in response to middle to long term shifts in growing season).

4.7 PEARL: Disaster Risk Root Cause Analysis

Positioned as an improvement on the FORIN framework The PEARL Risk Root Cause Analysis framework is both a conceptual framework for identifying root causes in disaster causation and a set of methodological guidelines (Fraser et al., 2016; Fraser et al., 2014). In particular, the PEARL approach shifts the focus away from singular, large scale, high impact disasters, to smaller scale and recurrent disasters – which may make it a more appropriate framework for analysing the kinds of events that adaptation actions will focus on (annual heatwaves, fires, floods), and at the kind of scale that city and regional governments will address.

PEARL uses the IPCC conceptualisation of “risk” of disaster as a factor of A) the drivers of the hazard (e.g., rainfall patterns in the case of a flood), B) Exposure to the hazard when it occurs (e.g., the number of people within the flood risk area, and impacted by its effects), and C) the

vulnerability of those impacted to the effects. The framework is focussed on explaining the risk in terms of root causes, broken down into four thematic areas:

1. Physical Factors
2. Socio-Economic Factors
3. Governance
4. Perceptions

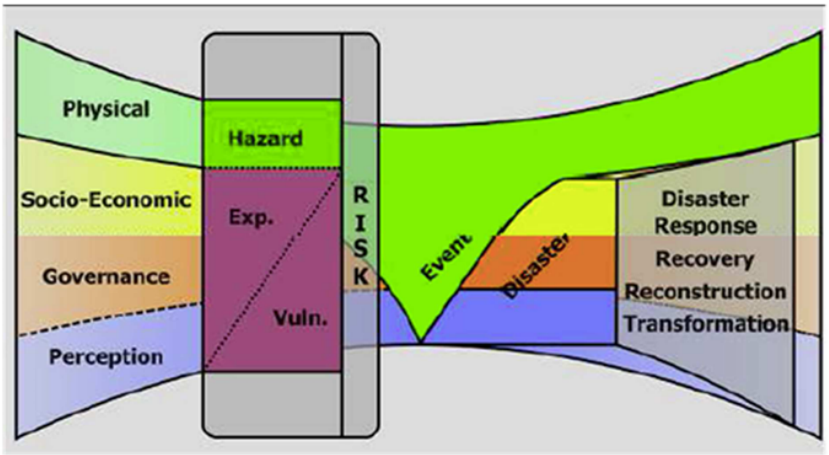

Figure 19 PEARL Root Cause Analysis Framework

Methodologically, as with FORIN, the framework's developers recommend similar qualitative investigations to identify and classify root causes within the framework above (Fraser, 2016; Mavrogenis, 2016; Scolobig, 2017). A source book of three case studies that applied the PEARL approach is available as Deliverable 1.2 of the PEARL project. The authors emphasise a number of features for effective root cause analysis:

- That the organisation undertaking the analysis should be able to access many different stakeholders within the case study area; that it is seen as credible and unbiased; with knowledge of the context and ideally with relationships to the stakeholders. Academic and research organisations are preferable.
- Qualitative methods be used to capture depth, context, and meaning; but can be used alongside quantitative methods to understand the strengths of causals factors or to model actor relationships.
- When conducting interviews and qualitative measures, diversity of stakeholders from different points of the system are needed to get a proper view on the issue.
- Following the identification of a range of factors, stakeholders could be brought in to weight the factors for their causal attributes/importance. There is a risk of bias here, but there is a potential to validate weighting against typical vulnerability factors used in social vulnerability assessments.

Additionally, the project created a template for conducting interviews to identify root causes of disasters using the PEARL framework, reproduced on page 91.

Nonetheless, while the PEARL model is valuable for its structured approach to exploring a variety of risk factors, and prompting deeper investigations into how risks are produced, it does not provide clear advice for practitioners for evaluating whether their investigations have penetrated suitably deep to identify true "root" causes of issues. Additionally the authors acknowledge that there are risks that stakeholders may themselves not have a clear sense of what the root causes of risks and vulnerabilities are for themselves, or the processes which caused them to be – and what they identify as the causes of problems may be shaped by the values, biases, and perceptions of justice and fairness.

4.8 TransformAR Scorecard

Developed as part of the EU Mission Adaptation project TransformAR, the TransformAR scorecard is a tool used to self-assess whether an adaptation project is transformative or not (Fabri and Cools, 2025; Fabri et al., 2025). The scorecard builds on the five-point definition of transformative adaptation from Cools et al. (2024) detailed in section 2.3; and develops three indicators for each of the five components of transformative adaptation which can be assessed with a score of 1–4.

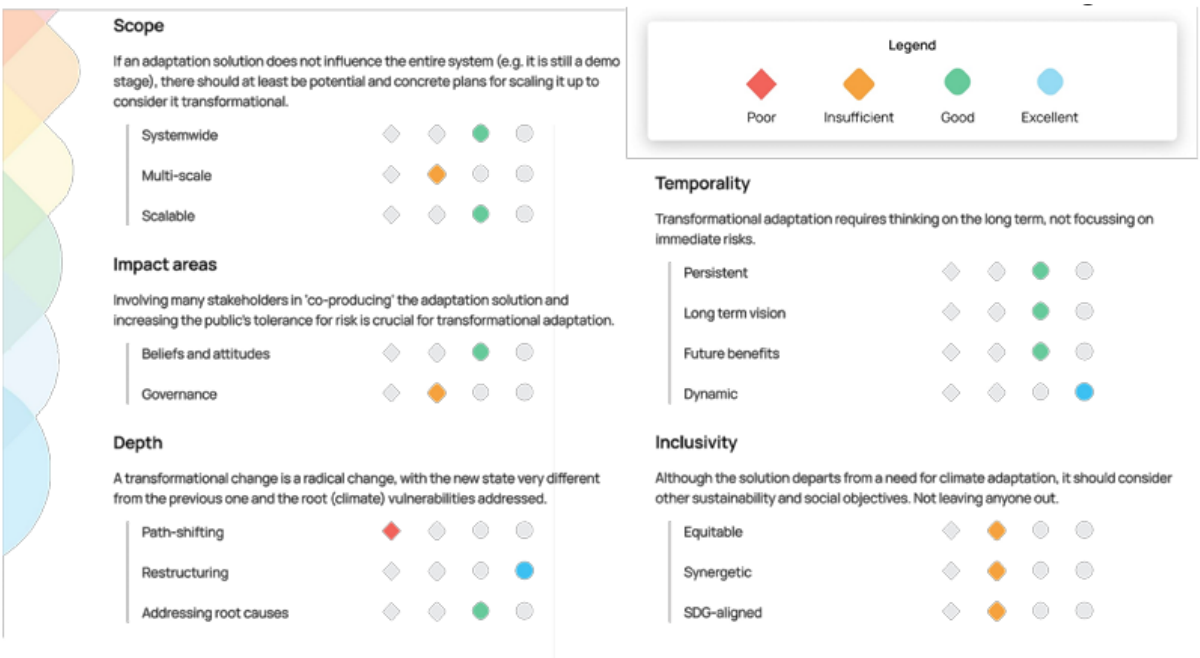

Figure 20 The TransformAR Scorecard – showing the assessment indicators for the five components of transformative adaptation

While the TransformAR Scorecard is of broad relevance as a tool for assessing the transformative potential of adaptation measures, two indicators of broader relevance to this review: the indicator of "Addresses Root Causes" and "Equitable".

For "Addresses Root Causes" the authors structure the indicator along three points:

Addresses Root Causes	**Example:** *in Austria, flooding was a severe issue for households living along the Danube river, the root cause being that this area is not suitable for urbanisation. 500+ buildings have been relocated with the help of subsidies.*	It is clear which climate risk(s) is being addressed with the adaptation project
		It is known why the system was/is vulnerable to this climate risk
		The cause of this vulnerability is being addressed with the adaptation project

The authors note that "addressing the root causes also requires an a priori assessment of vulnerabilities and how they can be addressed holistically" – however there is no methodological guidance provided for identifying root causes or means of assessing them. There is therefore a potential risk with the second indicator for root causes: "It is known why the system was/is vulnerable to this climate risk" as this presumes a knowledge of the root causes that the tool is designed to identify.

For "equitable" the authors include four components for the indicator:

Equitable	**Example:**	Vulnerable groups are considered during the design and implementation of the adaptation project.

	an urban greening project near a social housing complex, benefitting the people living there.	Vulnerable groups are involved during the design and implementation of the adaptation project.
		The adaptation project benefits vulnerable groups more than non-vulnerable groups
		The project will compensate losses for groups that are disadvantaged by the adaptation project

These loosely align with recognitional, procedural, distributive, and restorative forms of justice from the AJI in turn. The Adaptation Justice Explorer would therefore be a complementary tool for deepening the assessment of justice. The scorecard is a valuable and straightforward tool to use for quick assessments of the transformative potential of proposed adaptation measures aligned to the IPCC and Mission Adaptation definitions of Transformation.

4.9 Future Directions for Root Cause Analysis in Climate Change Adaptation

That adaptation measures address the root cause of vulnerability remains central to how the demands of transformative adaptation are understood. However there has not been a commensurate development of tools for governments and administrations charged with implementing transformative adaptation to identify what the root causes of their climate risks are. The tools reviewed in brief above may all have utility for planners at the early stages of their climate adaptation planning processes (e.g., the analyse phase of the USM Model).
Nevertheless, there are several outstanding methodological questions that future research should seek to address in order to mainstream the use of root cause analysis in planning for just and transformative adaptation:

- Further methodological and conceptual work should be provided on how to identify whether any cause is truly a “root” cause rather than simply a “deep” one. A clear methodological limitation of some of the techniques outlined above (e.g., the five why’s framework) is that they arbitrarily delimit when a root cause is reached. This may risk some forms of root cause analysis failing to properly identify truly “root causes” of social vulnerability and therefore leaving supposedly transformative adaptation measures insufficiently ambitious to meet requirements of justice.

- Many methods of root cause analysis detailed above lack internal principles for ensuring that their results are *correct*. It is plausible that a team of adaptation planners conduct a “five why’s” analysis (for instance) but owing to a lack of information, biases within the team, or simple faulty reasoning reach a false conclusion about the root cause of an event.

- A related concern is that sophisticated methods of root cause analysis rely heavily on qualitative methods such as interviews with stakeholders and those affected by the disaster. An acknowledged problem is that these stakeholders may themselves only have a limited view of the system in question and may fail to identify the root causes themselves. A potential option is to combine qualitative approaches with a theory-based account of root causes of vulnerability which could provide some external validation of the answers identified from stakeholders.

- There are questions about the appropriateness of root cause analysis as a tool for different kinds of entities involved in transformative adaptation planning. Many root causes of vulnerability (e.g., historic injustices, social prejudices, systematic socio-economic factors) may be outside of the scope of local, city, regional, governments to address. This may reflect a broader challenge for subnational entities to enact truly transformative adaptation options.

5 Synthesis of Guidance for Engaging Vulnerable Groups in CCA Policymaking

In this synthesis, we digest information on engaging vulnerable groups and summarise practical steps for fairer and more inclusive CCA. The practical guide (4.3) is complementary to distributional, recognitional, and especially procedural justice indicators in the Adaptation Justice Explorer described in 2.6.

“Citizen-led recommendations for the Horizon Europe Missions on sustainability” highlight that vulnerable groups should not be disproportionately burdened or left behind (Malaize et al., 2025). Without explicit targeting, vulnerable groups are frequently excluded from planning and implementation, leading to increased risk of marginalisation. Prioritizing vulnerable groups is a justice imperative, which has been increasingly emphasized in EU policymaking over the past decade. With the Just Transition as a cornerstone to the European Green Deal, Just Transition Platform (JTP) Working Groups (WGs) were formed in 2021 aiming to ensure a fair and socially equitable transition with a focus on public participation and inclusion of vulnerable groups (European Commission, 2023).

Actively including and empowering them in decision- and policymaking processes is important to achieve transformational adaptation, where adaptation is seen as a socio-political and empowering learning process (Loroño-Leturiondo et al., 2025, Cools et al., 2024). Indeed, vulnerable groups are also knowledge holders, “experts by experience” (Verweij et al., 2026), who are often underrepresented and seen as passive receivers. Their lived realities and experiences are valuable inputs needed to tackle the root causes of vulnerability instead of treating the symptoms (Taylor et al., 2022).

Our synthesis of tools and methods for engaging citizens focuses on how to engage vulnerable groups and is based on most recent EU-funded outputs. In EU practical guidance for policymakers, various EU projects have been dedicated to exploring frameworks and developing methods and tools to include vulnerable groups in CCA (e.g., **Adaptation AGORA**, **LOCALISED**, **REGILIENCE**, **SOLARIS**, to name a few). We further put an emphasis on case studies and publications relevant for the TICCA4Danu city-regions and provide a comparison of their focus, definitions of ‘vulnerable groups’, and participation approaches indicating the depth of participation.

5.1 Collaborative Processes engaging Vulnerable Groups from the Literature

Derived from the ‘Ladder of Citizen Participation’ (Arnstein, 1969) the ‘Ladder of Empowerment’ (Rocha 1997) is one of the first models conceptualizing individual and collective forms of empowerment, highlighting the needs of marginalised people and communities. Participation and empowerment can have different understandings and expectations among authorities, administrators and citizens, and this framework challenges underlying assumptions by highlighting the importance of listening to the needs, concerns and priorities of vulnerable groups. While the ‘ladder’ framework helps in defining and evaluating the level of participation, it does not address how participatory processes span over the life cycle of a project or how stakeholders influence participant engagement, such as power dynamics, especially when involving vulnerable groups (Hodson et al., 2023).

Collaboration processes where diverse actors collaborate in designing solutions to complex societal problems usually consist of four stages: 1) Initiation, 2) Design, 3) Implementation and 4) Evaluation (Verweij et al., 2026). Targeting and engaging vulnerable groups require more resources and considerations than general public participation. The main differences are the need for more financial resources and compensations in different forms to lower barriers to participation from the beginning. Vulnerable groups are more difficult to reach, encounter more accessibility challenges and barriers, and tend to have a lack of trust and need more time to foster connections (Verweij et al., 2026).

Verweij et al. (2026) distilled ten guidelines for engaging vulnerable groups in the initiation and design stages from a comprehensive literature review (Table 11). They highlight that more research is needed for the implementation and evaluation stages, where the exclusion of vulnerable groups leads to limited knowledge of how policies and interventions are perceived and how effective they are.

Table 12 Initiation and design stages in engaging vulnerable groups (Verweij et al. 2026)

Stage	Key Elements	"Ten Commandments"
Initiation	• Recruitment • Resources • Trust • Reciprocity	• Use gatekeepers (e.g., community leaders) to recruit vulnerable citizens • Reduce initial knowledge inequalities • Secure necessary financial resources upfront • Ensure institutional support
Design	• Design environment - Physically safe (e.g., community venues, online) - Psychologically safe (Balance power relations, ensure transparency, teambuilding exercises) • Design activities - Diverse interaction formats and group sizes - Interactive tools - Neutral, supportive, easily accessible language - External facilitator	• Convene in a safe space • Give vulnerable citizens a directing role • Tailor activities to their skills • Have support available • Use a facilitator (external and non-partial) • Use respectful, lay communication

5.2 Existing approaches to involve Vulnerable Groups

5.2.1 Selecting approaches

In addition to the justice tools presented at the Synergy Workshop in November 2025, we have selected approaches for involving vulnerable groups after conducting desk research and through cross-references within the publications, based on the following criteria:

- ☑ City/regional scale
- ☑ European/EU context
- ☑ Focus on the engagement of vulnerable groups in decision-making and climate actions
- ☑ Integration of justice aspects

☑ Targeting local and public authorities

Additionally, we included publications with a connection to TICCA4Danu project partner regions (either as a case study or region of interest).

Table 13 CCA Approaches that enable justice integration and inclusive processes

Name	Project	Focus	Approach	'Vulnerable groups'	Regions
[1] Citizen Engager Citizen Engagement Manual for Climate Action and a Just Transition	LOCALISED (H2020) Products and services for local and regional administration and citizens for climate change mitigation and adaptation	How to engage vulnerable groups: - Detailed methods for the different phases of the engagement process	Co-participation Co-creation	- people with lower income, women, people with migration background, and LGBTQI - groups that may be negatively impacted by potentially regressive effects of climate policies, such as higher fuel or housing prices	Austria, Poland, Spain
[2] Maladaptation Self-assessment checklist	REGILIENCE (H2020) Regional Climate Resilient Development Pathways Identification and upscaling of resilience solutions	- Checklist (16 Qs) on risks factors and vulnerabilities, CCA strategy development, and expected impacts to identify the potential of and prevent maladaptation	Consultation	- Social groups more likely to experience negative impacts or reduced wellbeing	Available in: English, Portuguese; Spanish; French; German; Italian; Greek; Croatian; **Bulgarian**; Dutch.
[3] Practitioners' Guide towards Solidarity in Climate Change Adaptation Policies	SOLARIS (JPI Climate) Justice dimensions in CCA policies and the instruments used for risk reduction of extreme events (focus on floods)	- Implementations of 'justice' in CCA - Dominant technocratic perspectives - Power imbalances,	Consultation	- "left behind" people - marginalised groups - mainly local inhabitants - lack resources or knowledge to participate	Belgium, England, Finland, France

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Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

		participation and recognition - Justice issues in investment allocation - Distribution of responsibility and implications for justice			
[4] **Toolkit for local governments and community led-initiatives** Collaborative governance for just sustainability transitions	**COM4LGD** **Communities for Local Green Deals** (Citizens, Equality, Rights and Values (CERV) programme) Empower communities to drive just transformations	- Collaborative and participatory sustainability transitions for local governments - It also refers to [5] regarding co-creation	Co-creation Collaborative design	- People in vulnerable socio-economic situations and minority groups - most affected by the negative impacts of climate change - face the greatest challenges in implementing climate-friendly measures	Refers to a booklet with initiatives in Germany, Ireland, Spain
[5] **The Power of Many** How city officials can use co-creation for Just and Sustainable Cities	**Fair Local Green Deal** (Porticus Foundation) Support local development using tailored approaches for involving local actors and stakeholders	- Practical guides and lessons learned from different cities on how to best elevate collective intelligence through co-creation process that ensures that no one is left behind in climate action	Co-creation	- Minorities and marginalised groups - underrepresented communities - struggle to show up - perceive themselves as lacking the technical expertise to contribute effectively	Belgium, Poland, Spain,
[6] **Upscaling citizen engagement for climate resilience**	**Adaptation AGORA** (HEU) Foster collaborative and community-based	- Four pillars (institutionalize engagement, strengthen local capacity, empower	Co-production Co-creation Co-design	- often face a combination of practical challenges to engage (literacy, financial, digital, language...) associated with deeper systemic barriers including	Germany, Italy, Spain, Sweden

	adaptation with co-designed solutions Promote citizen engagement and empowerment	citizens and stakeholders and exchange knowledge) - 16 policy and governance recommendations		power imbalances, historical distrust of authorities, and the priority of immediate daily-life struggles over climate concerns - include younger generations - disproportionately affected by climate risks and/or excluded from decision-making	
[7] **Mapping new forms of civic engagement in Europe**	**CitizensLAB** (MitOst, Stiftung Mercator, Robert Bosch Stiftung and European Cultural Foundation (ECF)) A participatory European network of local, cross-sectoral actors	- New and innovative civic engagement forms - Contemporary views on experimental participation - Show diversity of initiatives, movements, projects and platforms - Links to multipliers	Co-creation	- homeless people, persons with disabilities, the unemployed, war veterans - excluded groups including Roma - refugees - living in rural, distant and inaccessible areas - impoverished and young people	Croatia, France, Greece, **Hungary**, Poland, Portugal, Spain, Sweden, United Kingdom
[8] **Citizen Engagement** A Policy Brief from the Policy Learning Platform for better Governance	**Interreg Europe Policy Learning Platform** (Interreg Europe Programme) Policy learning based on good practices in regional development	Five recommendations for better policymaking - foster inclusivity and diversity - build trust between citizens and governments	Consultation Co-creation Co-design	- marginalized groups - face barriers to participation (language, digital divides, logistical constraints)	Belgium, **Bulgaria**, Finland, Germany, Netherlands
[9] **Common strategy for engagement of vulnerable and**	**Danube GeoTour Plus** (Interreg Danube Transnational Programme)	Core objectives - Clearly mapped vulnerable Groups,	Consultations	- including economically disadvantaged individuals, ethnic minorities, people with disabilities, isolated seniors, youth at risk of	**Project partners:** Austria, Bosnia and

disadvantaged groups in Danube geoparks	Actively include all community members in initiatives to ensure that all benefit from geoparks - geological heritage with sustainable development, education, and community involvement	- Well understood vulnerable Groups, - Inclusive planning and policy development - Monitoring and Evaluation to ensure actively engaging vulnerable groups in geopark initiatives		“brain drain” and women in rural areas - face significant barriers to participating in community development initiatives	Herzegovina, Croatia, **Czech Republic**, Germany, **Hungary**, **Romania**, Serbia, Slovakia, **Slovenia**
[10] Just Transition Platform Working Groups. Action 7: Guidelines to engage with people living in vulnerable situations	**Just Transformation Platform** (JTP) Working Groups (WGs) (European Commission - Regional and Urban Policy) Bring together stakeholders across Europe concerned with the people and places affected by the transition to a climate-neutral economy; shared Implementation Plan that specifies 17 actions - Action 7 being engaging vulnerable people.	- Reaching, inclusion and engagement of the hard-to-reach groups within the context of energy justice and transition process. - Examples of methods applied in case studies within the EU.	Co-design Consultation	- living in vulnerable situations - the least able to adapt and cope - expected to be impacted the most - hard-to-reach groups - stand the farthest from the arena where decisions are made - rural communities, youth, ethnic minorities, people living in poverty or unfit housing, people with mental health challenges or physical disabilities - who might not engage with conventional services (e.g., mobile services, street outreach or online engagement) - marginalized groups	Belgium, Croatia, Denmark, Finland, France, Italy, Netherlands, **Poland**, Portugal, **Slovenia**, Spain, UK

Engagement cultures and perceptions vary across regions and within countries, shaped by political histories, social norms, levels of trust between civil society and public authorities, and familiarity with community organising and development. Therefore, participatory methods that work in one place may not succeed elsewhere [7]. Local resource constraints (limited budgets, human resources and administrative capacities) also limit the kinds of participatory processes that can be carried out meaningfully [6]. Against this background, we also looked for guides that include case studies and regions overlapping or relevant to the TICCA4Danu partner regions [7-10]. In general, there is an abundance of literature on citizen engagement and public participation, but little practical guidance on how to involve vulnerable groups specifically, and even less so in the Southeastern European context.

Barriers to meaningful citizen engagement have been identified as low awareness and understanding of the decision-making process and participation tools, and lack of trust among the stakeholders, which makes it difficult to establish constructive dialogues. In Hungary, for example, community projects are starting to gain traction whereas the environment for civil society and public participation is less supportive. A lack of understanding and greater mistrust and prejudices among public administration and NGOs hinder cooperation. Thus, working with intermediaries/multipliers becomes even more valuable. Mutual-interest partnerships have produced urban community projects, but rural areas, which are more affected by poverty, long-term unemployment and discrimination, are lagging [7].

Feedback from participants of a photovoice research event by DemNet based in Hungary further highlight enablers and barriers to citizen participation. Enabling factors include emotional motivators (helpfulness, enthusiasm, positive emotional feedback) and social and structural support (collective action, community building, organisational support, family and friends). Barriers can be emotion-based (fear, laziness, bad experiences with previous involvement, over-politicisation, lack of solidarity), due to lack of information, poor communication and lack of good examples, and structural (corruption, outdated legislation and bureaucratic apathy). To address these, fostering a partnership with local citizens (as equal partners) has been raised as one of the most important steps in better citizen engagement.

Citizen engagement workshops in 2024, as part of the Ready4Heat project, worked on adaptation to heat in several cities, including Hajdúböszörmény (Hungary) and Maribor (Slovenia). Awareness raising (information) and collecting ideas and suggestions (consultations) were the main aims of the workshops. In Hungary and Slovenia, the attendees were mainly representatives of vulnerable groups, consisting of professionals working in kindergarten, at schools, in nursing homes etc. It was most challenging to involve health workers due to the Hungarian health system being heavily overloaded and time constraints. The report offers insights into the set quantitative and qualitative key performance indicators (KPIs) that were evaluated.

In the case of Ukraine, the Academy of Civic Participation Handbook (2019) created within the Council of Europe Project Promoting civil participation in democratic decision-making in Ukraine emphasises that all voices should be heard and considered through non-discrimination and inclusiveness, and public authorities should consider the widest possible range of contributions, including from marginalised, disadvantaged and vulnerable groups. It

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stresses preventing monopolisation by ‘elite’ groups and acknowledges that public expert examinations and e-consultations can exclude those with less access or capacity. However, detailed alternatives for engagement design tailored to vulnerable groups, especially going beyond consultation, are lacking. In summary, the literature and project reports make clear why inclusion matters and what the barriers are, but there remains a practical gap: few resources synthesize concrete, contextual methods that local authorities can apply when working with vulnerable people, especially in rural, post-conflict and low-resource settings.

5.2.2 Methods

In a systematic review of participation strategies of engaging vulnerable groups, Tollmann et al. (2025) highlight that commonly used methods include workshops, co-creation and photovoice. In this section, we highlight three methods that are especially suitable for involving and engaging with vulnerable groups due to their flexibility and easy accessibility. They can be combined according to the engagement goals and desired effects and outcomes.

Active recruitment
Passive recruitment includes open calls, which usually lead to overrepresenting certain groups. Moving beyond them by predefining groups and criteria and communicating them clearly will encourage a wider reach. Direct outreach and (informal) conversations have proven to be most effective when reaching out to vulnerable groups. Other active methods include Citizen Lottery – randomly select participants depending on predefined variables – and work with community representatives and existing networks (representatives of local institutions, initiatives, welfare organisations) to involve marginalised people [1].

Co-creation
Co-creation comprises the involvement of relevant stakeholders in a collaborative approach to tailor solutions to the needs and challenges of the target groups. It has gained considerable attention in recent years to encourage a bottom-up approach of governance. Often associated with co-producing knowledge, co-designing solutions and co-deciding actions, one of the goals is also to enhance policy uptake and on-the-ground implementation, alongside acknowledging diverse knowledge systems. The open format of co-creation makes it versatile for application in various contexts to improve and public engagement and foster collaboration.

Co-creation allows participants to actively propose ideas and work collaboratively on the development of solutions. This method also introduces learning pathways and capacity building for citizens who may not have the means for specialized education but are able increase their knowledge and skills through collaborative design processes. Among the tools, co-creation has been introduced and described in detail with examples, challenges and best practices [1, 5].

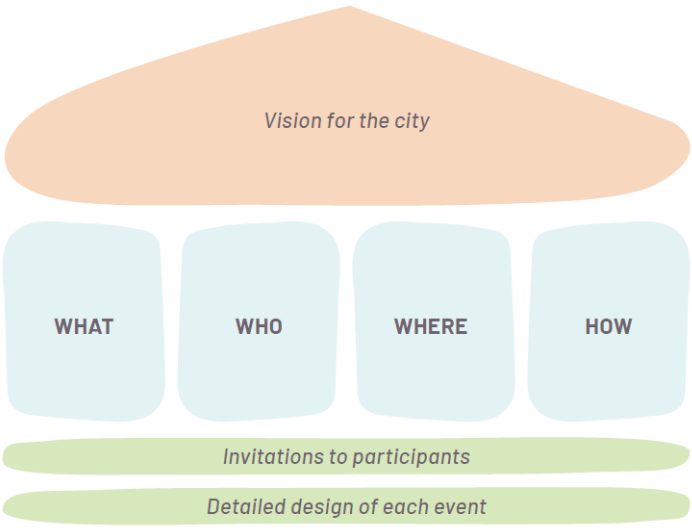

Figure 21 Core elements of a co-creation process [5, p.16]

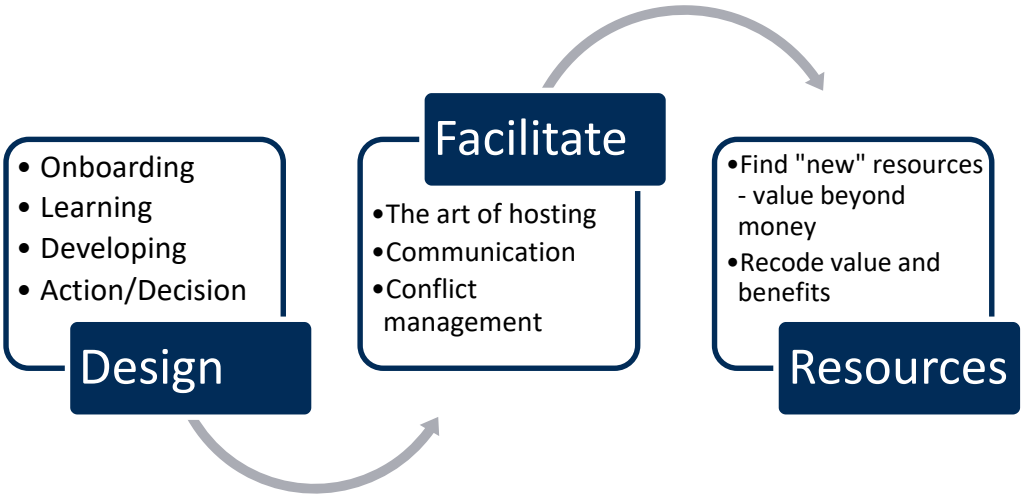

Figure 22 Common steps in designing a co-creation process based on [5, p.19-51]

Storytelling and visual depictions

While co-creation focuses on how to involve vulnerable groups in decision-making, storytelling, especially with visual elements, addresses need to communicate climate change and adaptation issues in ways that resonate on a personal level and helps citizens to express their views. Climate change can feel too abstract and distant for some audiences, making it difficult to establish direct connections. Storytelling in science communication has been increasingly prominent, such as 'climate stories' where experiences are shared instead of complex results and information. This approach can raise awareness and spark motivation for further action (Anker et al., 2024).

"How to build a climate story – A practical guide (Anker et al., 2024) proposes three development cycles:

1. Plan: set the goal, main message and target audience of the story, interact with stakeholders as soon as possible
2. Design: create a storyboard including the storyline, visual style and mood of the story
3. Create: translate the content into products (media, graphics…)

To build a shared understanding among stakeholders regarding climate-related opportunities and risks, storymaps or climate impact diagrams are also helpful. Visual elements such as illustrations or photos can lower participation barriers, encourage meaningful conversations, and integrate diverse knowledge forms (Loroño-Leturiondo et al., 2025).

Examples: "Photovoice" research combines photography and focus group discussions to investigate participants' experiences, feelings and the visual representations. The method has been applied in participatory research with the aim to elicit actionable knowledge from photos and narratives provided by participants (Tollman et al., 2025).

While art can raise interest and facilitate the engagement with citizens, accessibility (e.g., language) still needs to be considered [3].

Q Methodology

Going beyond individual narratives, Q methodology offers a systematic way to explore different views on subjective topics across groups and cluster opinions (van Dijk et al., 2022). As a participatory approach, this method has been applied in environmental planning and management (Seghezzo et al., 2024) risk communication (Attems et al., 2020) flood risk management (Rittelmeyer, 2020) and practitioners' perspectives on project collaborations

(Suprapto et al., 2014), to name a few. It enables participants to express and negotiate their priorities and opinions, capturing the nuances of decision-making.

Q fosters engagement and is a more organic process where instead of abstract ratings, e.g., in questionnaires, participants can compare and contemplate the statements systematically. This way, decision-making processes can be analysed more coherently and accurately (Gao and Soranzo, 2020). Studies can be conducted in low-resource settings and in flexible ways, adjusting to the local contexts, requirements and specific needs of the participants, e.g., using pictures, symbols or even real objects. This approach counters the standardization of stakeholder groups with imposed labels and oversimplified categorization of complex lived realities (van Dijk et al., 2022). Marginal voices are given space, revealing underrepresented narratives and enabling dialogue (given that diverse opinions are represented through suitable participants) (Seghezzo et al., 2024).

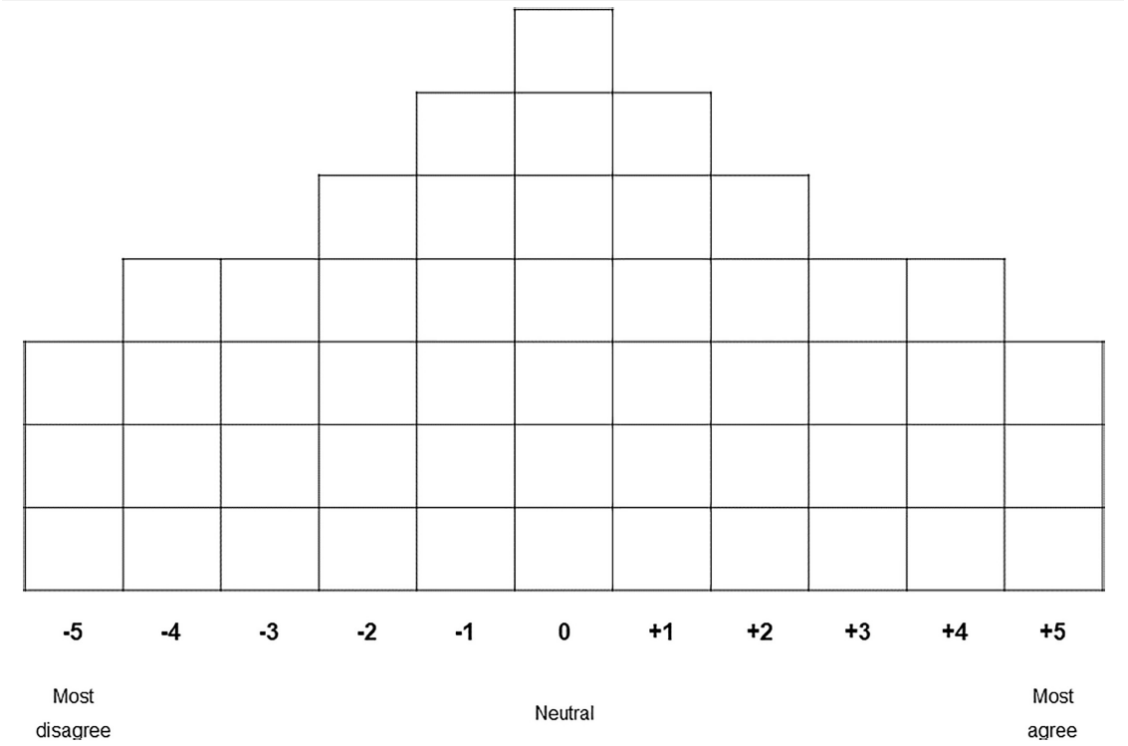

Figure 23 Q-grid with 51 boxes for the participants to place the statements (Attems et al. 2020)

An addition, 'Living Q' has been developed by Ripken et al. (2018) that is based on controversial statements derived from a preceding Q study, and adding interactive elements in a group setting. Instead of contemplating and sorting on their own, a group of people engage and discuss their views and opinions and come to joint conclusions. The outcomes are immediately evaluated, making the priorities' negotiation process transparent.

5.3 Practical Step-by-Step Guide from the Synthesis

Drawing on state-of-the-art of engaging vulnerable groups and our review of the tools listed in Chapter 5.2.1 (Table 2), we summarised the knowledge and insights into a step-by-step guide. The main stages consist of 'Initiation' (recruitment, resources, trust and reciprocity), 'Design' (design environment and design activities), 'Implementation' and 'Evaluation' consistent with Verweij et al. (2026). The goals and key questions in the second column set the tone for the concrete actionable steps in each stage. In total, we distil 40 concrete steps for the engagement process from beginning to end, with references to more specific resources.

Table 14 Step-by-Step Guide for Engaging Vulnerable Groups

Stages	Goals and Key Questions	Key Steps
Initiation	• **Define the engagement scope** What is the possible level of participation based on the legal and contextual framework? What challenges can be realistically solved within the timeframe? • **Review and self-assess** What local strategies already exist? What maladaptation potentials are there? What are potential negative effects or spillover (on other sectors or geographical areas)?	1. Map the goal on a spectrum from concrete (a specific climate action) to systemic (develop climate strategies) 2. Map the engagement stages in the policy cycle 3. Collect local data and verify its relevance (if possible) 4. Vision of the city about the challenge(s) citizens face 5. Ensure political alignment to obtain approval 6. Identify key barriers and opportunities with other municipal departments 7. Identify local leaders for implementation 8. Self-assessment of maladaptation potentials [2]
Recruitment	• **Identify target groups and stakeholders** Who are currently involved in decision-making? Who are excluded? • **Target and reach out** What are the needs of the target group? What are the feasible recruitment options? How can inclusivity be ensured?	9. Collaborate with gatekeepers/multipliers/mediators (e.g., community leaders, local representatives, welfare organisations) to identify and recruit vulnerable people 10. Define outreach methods and communicate goals, expectations and roles and responsibilities clearly 11. Arrange logistics (venue, catering, moderation, materials, registration…) 12. Reduce initial knowledge inequalities by providing training

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Resources	• **Ensure financial and institutional support** How can barriers be lowered and participation made accessible? What resources (human and social) and community initiatives already exist?	13. Devote extra resources, e.g., using Social Impact Assessments [1] or social indicators [3] and secure necessary financial resources upfront 14. Provide compensation for their time and other support (e.g., transport, childcare, missed wages) 15. Provide tools, resources and guidance for citizens to take action on key challenges (e.g., Small-scale pilot actions or funding) 16. Allocate enough financial and human resources for the implementation of engagement outcomes
Trust	• **Transparent communication** • **Focus on discussing *their* needs** What is the state of mind of the target group?	17. Collaborate with well-known community members 18. Participatory budgeting allows participants to influence the distribution of public resources toward local priorities [8] 19. Use active listening and open discussion
Reciprocity	• **Foster grassroots participation and citizen-led initiatives** How can a sense of responsibility among participants be established?	20. Start as soon as possible and show immediate impact in public events, however small 21. Acknowledge contributions (e.g., nominate local heroes) to promote community ownership
Design	• **Design, facilitate and (re-)discover resources**	22. Hire External facilitator (non-partial) 23. Document results and make decisions together
Design Environment	• **Ensure a safe participation environment** Where to hold the events? How to ensure participants feel physically and psychologically safe? How to balance power relations?	24. Convene in a safe space - Physically safe (e.g., communal spaces, parks, neighbourhood areas, online so that they can be in their homes) - Psychologically safe (transparency, teambuilding exercises) - Have support available and ensure enough time and space (some topics may have strong emotional components)

Design Activities	• **Ensure inclusive and meaningful participation** What are the skills of the participants? What are the practical and economic barriers to participation? (e.g., income, time, accessibility and functional needs)	25. Give vulnerable citizens a directing role, as co-experts 26. Tailor activities to their skills 27. Reframe group identities from “vulnerable” to “valuable” 28. Diverse interaction formats and group sizes 29. Use respectful, lay language for communication 30. Allow them to have a say in when, where and how the activities occur
Implementation	• **Turn results into action** How to apply the tailored CCA actions? • **Raise awareness** • **Official handover to signal responsibility** • **Monitoring and reporting** How to integrate data from public involvement into official monitoring and reporting?	31. Establish a coordination and management team, ideally with people leading the participatory process 32. Public education and awareness campaigns using diverse media and channels, tailoring messages to local concerns 33. Recognize and reward good citizen actions 34. Official handover to local decision maker (ideally with local media) 35. Define monitoring indicators and report on how vulnerable groups were involved and their influence on decisions and communicate the outcome
Evaluation	• **Evaluate impacts** Are there potentials for maladaptation? How many people participated? What impacts did the activities have? • **Follow-up and feedback mechanisms** • **Encourage long-term engagement** How can a network be established to stay connected beyond the engagement process?	36. Thorough evaluation of the impacts and side effects (positive and negative) to identify and mitigate potential maladaptation 37. Collect feedback (e.g., surveys and questionnaires), with intermediate evaluation if needed in a longer period 38. Make community engagement a properly resourced job (not tied to specific projects) 39. Provide involved citizens a platform to speak publicly (e.g., online forums, living document) 40. Inform the public about the outcomes and promotes further discussion

5.4 Engaging Vulnerable Groups: Challenges and Best Practices

Addressing the need for identifying and tackling the root causes of vulnerability in adaptation planning and strategies, this section highlights the importance of involving vulnerable groups. Engaging vulnerable groups can bring multiple benefits and is crucial for transformative adaptation. However, if poorly resourced or implemented, it can result in harmful outcomes. The following best practices drawn from European case studies and guides encompass the entire engagement process.

- **Build trust early and continuously**

A lack of trust as a barrier for engaging vulnerable groups has been identified repeatedly, e.g., due to lacking representation in governmental institutions, social exclusion and isolation. Working together with intermediaries and associations (‘gatekeepers’/‘multipliers’/ ‘mediators’), and transparency are important steps. Start from their realities, interests and needs, not from assumptions. Build and foster trust through tangible impact and continued involvement while recognizing their contributions fosters a sense of ownership and pride [8]. Engaging citizens early in the process is ideal to gain trust and maximize opportunities. Draw on existing knowledge, networks and strengths and include vulnerable groups in the assessment process.

- **Value lived experience equally with technical expertise**

Value different knowledge systems (everyone is a knowledge holder). Technocratic expertise often dominates and widens the gap between authorities and citizens, and valuable contextual knowledge is not being recognised, limiting a holistic approach to vulnerability. Bringing groups from diverse backgrounds and sectors together to raise complementary issues and collaborate on solutions to concrete place-based social challenges contribute to transformative changes with challenge-based policies.

- **Use diverse, accessible and creative methods and formats**

Using diverse methods during the different phases, especially facilitation methods during workshops (see, e.g., [1, p.52-62]). Diversifying participation formats also helps to collect and work with different knowledge systems. Furthermore, using diverse communication methods and leveraging hybrid methods can foster wider participation. Creative solutions to invite participants and maintain their motivation to continue are important for success, and social media has a positive effect. Ideas for climate action group activities: Quick-start tools.

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This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

6 Conclusion and Next Steps

6.1 Key Findings

This report has provided guidance on just and transformative adaptation aimed at both the broader community of practitioners, researchers, and policy makers who engage with the concept, but also specific guidance for city/regional scale administrations looking for methodological guidance for ensuring their adaptation project progress towards justice and transformative change. Key findings of the report are as follows.

- Conceptual linkages between Just Adaptation to Transformative Adaptation include showing how transformative adaptation may be a demand of four “forms” of justice.
- There are risks in presuming a link between transformative and just adaptation. Transformations may be a requirement of many forms of justice, but transformative change on its own may still leave vulnerabilities intact or create new ones if justice is not actively considered. Caution should be used with definitions of transformation that make justice a necessary requirement.
- CCA planners should take a pluralistic account of justice, that is open to how local communities within a specific social context understand and perceive justice. Many core theories of distributive justice will demand transformative changes.
- Identifying and addressing root causes of vulnerability remains central to definitions of transformative adaptation, but further methodological guidance should be developed and tested within CCA projects. Several methods of identifying root causes were identified and reviewed.
- Indicators for multiple forms of justice are relevant across CCA planning cycles. However, some indicators for restorative justice may be more appropriate for a national level administration with greater legislative power to make deep changes to socio-economic organisation.
- While there is an abundance of publications on public civic engagement, less can be found on how to involve vulnerable groups, especially going beyond the consultation level. This highlights a practical gap where concrete steps that can be adapted to local contexts for authorities are needed.
- In the Southeastern European context, reaching and engaging vulnerable groups may encounter significant barriers such as lack of trust among different stakeholder groups, varied understanding and expectations of citizen engagement and low capacity and resources.
- Working with multipliers/intermediaries is even more important in this context, and more time and resources will be needed to initiate and activate public engagement involving vulnerable groups.

6.2 Next Steps

The report forms a part of the TiCCA4Danu project and further work on the topics included in this report are anticipated as the project develops. In particular several areas are identified for further development both within and beyond the TiCCA4Danu project.

Firstly, this report has introduced and detailed the process of developing the *Adaptation Justice Explorer* as a tool for identifying climate adaptation justice considerations within city/regional planning workflows – through a mapping of the Adaptation Justice Index to the Urban Sustainability Management Model. The AJE remains a "live" tool which will continue to develop and be iterated upon, reflecting feedback from testing within the TiCCA4Danu project. It is anticipated that the final version of the tool will map and link relevant tools for achieving each of the indicators, allowing for a fully integrated tool that allows for users of the USM to identify relevant justice consideration at each phase of the process, and be linked to relevant methods to employ to achieve the indicator.

Secondly, the methods of root cause analysis detailed and reviewed in section 4 will be further assessed for their relevance and usefulness for developing transformative adaptation through testing with the TiCCA4Danu partner city and regional governments within an online coaching session. Insights gained from this coaching session will be incorporated into a Working Paper intended to prompt further methodological assessment of how climate adaptation planners should work to identify root causes.

Third, policy briefing versions of important sections of this report will be developed and disseminated to partner administrations, particularly the synthesis of guidance on vulnerable group engagement. A version of this briefing is included in Annex 8.3. This guidance is intended to form the basis of an invited workshop at the EUSDR Annual Forum in November 2026.

Finally, further conceptual work on the linkage between justice and transformative adaptation should be developed, and a clear framework for understanding these links might be developed to give structure to work on this topic both within allied EU project and beyond.

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8 Annexes

8.1 Adaptation Justice Index: Indices, Scale, Sources.

The table below contains the assessment criteria of the Adaptation Justice Index, originally developed by Juhola et al. (2022). Full details of the development of the index and examples of its use are available in the original paper here.

#	Indicator	Scale	Value	Source
D1	A risk mapping/assessment has been conducted.	No assessment has been conducted.	0	Tonnoy et al. (2014); Chu & Cannon (2021); Fiack et al. (2021)
		Risk assessment is mentioned but not used.	1	
		Risk assessment is conducted, and measures have been identified for some risks.	2	
		Risk assessment is conducted, and measures are identified for all risks.	3	
D2	There is a process for identifying vulnerable groups.	No process.	0	Chu & Cannon (2021); Fiack et al. (2021)
		Vulnerable groups are identified.	1	
		There is a vulnerability assessment that will be updated.	2	
		Vulnerability assessment is connected to adaptation planning and monitoring.	3	
D3	There is a process that assesses the distribution of benefits.	No process.	0	Anguelovski et al. (2016); Chu & Cannon (2021); Colenbrander et al. (2018); Fiack et al. (2021); Ponce Olivia et al. (2021) Nthambi et al. (2021)
		The strategy identifies the distribution of benefits of adaptation in general.	1	
		Distribution of benefits is assessed as part of the strategy process.	2	
		Distribution of benefits is monitored continuously.	3	
D4	There is a process that assesses the distribution of costs.	No process.	0	Colenbrader et al. (2018); Neumann et al. (2021); Rolfe et al. (2021)
		The strategy identifies the distribution of cost of adaptation in general.	1	
		Distribution of costs is assessed as part of the strategy process.	2	

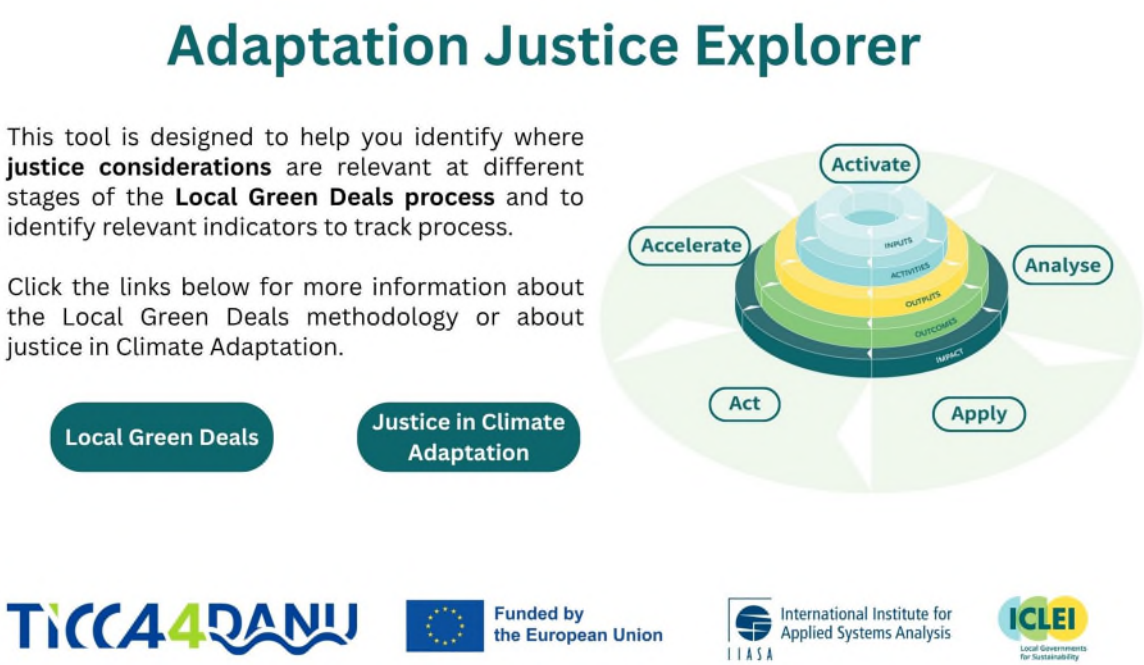
		Distribution of costs is monitored continuously.	3	
D5	The strategy identifies the possibility of a distribution of negative impacts (e.g., maladaptation)	No identification	0	Juhola et al. (2016); Tubi & Williams (2021)
		The strategy (at least implicitly) identifies the possibility of the negative impacts of adaptation measures in general.	1	
		Distribution of negative impacts of some adaptation measures are identified.	2	
		Distribution of negative impacts of all adaptation measures are identified.	3	
#	Indicator	Scale	Value	Source
P1	Adaptation strategy details who participates in the strategy process	No participation outside of public sector.	0	Innes & Booher (2004); O'Brien & Selboe (2015); Anguelovski et al. (2016); Chu & Michael (2019); van den Berg & Keenan (2019); Chu & Cannon (2021)
		Participation through invitation of experts, private sector	1	
		Participation of experts and citizens through open invitation	2	
		Participation and measures to enable participation of vulnerable groups	3	
P2	The adaptation strategy has involved participation during different phases of the process	No participation	0	Innes & Booher (2004); O'Brien & Selboe (2015); Anguelovski et al. (2016); Wenta et al. (2018); Chu & Cannon (2021); IPCC (2022)
		The strategy process has involved information provision about adaptation (at least once during the process before the final output publication)	1	
		The strategy process has involved consultation	2	
		The participation in the strategy process has been collaborative and continuous	3	
P3	The strategy allocates responsibility to adaptation	No allocation	0	Buckeley et al. (214); Juhola (2019)
		Responsibilities are mentioned	1	
		Responsibilities for some adaptation measures are allocated	2	
		Responsibilities for all adaptation measures are allocated	3	
P4	The adaptation strategy has a	No participation in adaptation plan	0	Innes & Booher (2004); van den

	structured plan for implementation	The implementation plan involves informing different stakeholders	1	Berg & Keenan (2019)
		The implementation plan involves stakeholder consultation	2	
		The implementation plan involves stakeholder participation in a collaborative and continuous manner	3	
P5	The adaptation strategy has a plan for updating and evaluating the strategy	No plan	0	Jurgilevich et al. (2017); van den Berg & Keenan (2019)
		The strategy involves a plan for updating, but evaluation is not described	1	
		The strategy involves a plan for updating and describes how progress will be evaluated	2	
		The strategy involves an update and evaluation plan that includes stakeholder participation.	3	
#	Indicator	Scale	Value	Source
R1	The strategy acknowledges that adaptation needs are different across groups in society	No acknowledgement	0	Shaw (2015), Chu & Michael (2019), Chu & Cannon (2021); Fitzgibbons & Mitchell (2021)
		The strategy states that adaptation needs are different	1	
		The strategy takes into account different adaptation needs based on expert review	2	
		The strategy is built on different groups identifying their adaptation needs	3	
R2	The strategy acknowledges the impact of existing societal structures on vulnerable groups in adapting to the impacts of climate change	No acknowledgement	0	Shi et al. (2016), Chu & Cannon (2021)
		The existence of structures is mentioned in a general manner	1	
		There are measures to decrease the impact of structures	2	
		There is a structured plan to assess the impact of societal structures on vulnerability	3	
R3	The strategy acknowledges adaptation as a way to secure basic human rights	No acknowledgement	0	Bulkeley et al. (2014); Peel & Osofsky (2018)
		Adaptation as a way to secure basic rights is mentioned	1	

		The strategy describes how adaptation can secure basic rights in general	2	
		The strategy has measures to secure basic rights.	3	
#	Indicator	Scale	Value	Source
C1	The strategy acknowledges the need to compensate for the diverging impacts of climate change	No acknowledgement	0	Huggel et al. (2013); Thompson & Otto (2015); Robinson & Carlson (2021)
		The strategy acknowledges the need to compensate	1	
		The strategy has compensation measures for some impacts of climate change	2	
		The strategy has compensation measures for all relevant impacts of climate change	3	
C2	The strategy has compensation measures to deal with maladaptation	No mention of the need to compensate	0	Eriksen et al. (2021)
		The need to compensate is mentioned	1	
		There are compensation measures for some maladaptation	2	
		There are measures to compensate for all groups	3	
C3	The unequal distribution of resources for adaptation is compensated for by redistribution	No mention of unequal distribution.	0	Robinson & Carlson (2021)
		The need for reallocation of resources for adaptation is acknowledged (at least partially).	1	
		There are measures for application of adaptation resources.	2	
		There are measures for reallocation of adaptation resources to develop adaptive capacity.	3	

8.2 Adaptation Justice Explorer

Double-click on the image to visit the *Adaptation Justice Explorer.* Using your mouse and the embedded hyperlinks, you can navigate the explorer. Some hyperlinks contain external links which will open your web browser. These are links to relevant tools and methods created elsewhere.



8.3 Practical Guide for Policymakers and Planners

From this deliverable, we will extract the praxis-oriented components such as the Adaptation Justice Explorer and Step-by-step guide for engaging vulnerable groups to create a shortened version. The practical guide will be presented during the IIASA online coaching session for regional partners on July 2, 2026. The hand-out will be further discussed during a workshop at the Annual Forum of the EUSDR in Bulgaria, November 2026 to collect feedback.

The section below will be updated to integrate the feedback from potential users after the coaching session and workshop.

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

Swiss Confederation

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Briefing

Justice in Climate Change Adaptation Planning

Why should climate adaptation planners consider justice?

Public administrations should actively think about justice when planning for transformative climate change adaptation due to several reasons.

Firstly, because promoting justice is right to do!

Failing to actively consider justice in climate adaptation planning or any other area of public planning risks failing to fulfil moral obligations/duties which a public authority may have to those that it governs. It is for justice's sake that administrations should consider justice in their works.

Secondly, because making just policy is linked to making publicly acceptable climate policy.

There is now a growing body of evidence that suggests that *public perceptions* that a policy is fair or just is the main determinant in whether the public accepts climate policy (Berquist et al, 2022; Thaller et al, 2023). Policymakers therefore are incentivised to understand what drives public perceptions of fairness within the social context they operate in, in order to design policy that meets expectations of fairness.

Thirdly, because just adaptation policy may improve the effectiveness of adaptation policy.

Many actions that are associated with making just adaptation policy may also support making more effective adaptation policy overall (Schipper, 2020; Shah et al., 2025, Briel et al, 2021; IPCC, 2022). There are several possible mechanisms for this:

Table 15 Pathways/Mechanisms for more effective climate adaptation through justice. Drawing from examples of challenges to adaptation from Schipper et al, 2020

Adaptation Challenge	Possible Solution	Link to Justice
Poorly planned adaptation projects exacerbate or introduce new drivers of vulnerability (maladaptation), due to lack of understanding of vulnerability	Adaptation actions based on a thorough analysis of the root causes of vulnerability; Adaptation measures that tackle these root causes rather than the symptoms of the problems	**Distributive & Procedural Justice** Tackling the root causes of vulnerability requires thinking about how the current system distributes resources in a way that leaves some groups more vulnerable to climate change than others; and altering governance processes in a way which allows them to make their needs known to planners and able to effectively use local government to advocate for their interests.

Adaptation projects fail to deliver benefits to those they were designed to support, leading to intended beneficiaries becoming more vulnerable.	Ensure that planning and project development processes include vulnerable groups; and ensure that they are structured to prevent powerful actors from influencing the process and further marginalising the vulnerable intended beneficiaries.	**Procedural & Recognitional justice** The specific needs of the most vulnerable have to be *recognised* within the planning and development process and not assumed to be the same as the needs of those who are usually consulted; There is a reform of planning processes that enable participatory involvement of citizens and vulnerable groups may also be a requirement of theories of procedural justice. Likewise, vulnerable groups may have specific "expertise" of CCA through their lived experience of the problem that is valuable for making informed and evidence-based decisions.
Locking in development pathways that prevent future adaptation, remove access to resources, provide temporary solutions or create a false sense of security, or incentivise individuals to make adaptation decisions for short term benefit (e.g., migration or sale of assets)	Linking adaptation policy to targeting poverty and meeting developmental objectives. Carefully assessing the system-wide impacts of adaptation measures.	**Distributive justice** Many theories of distributive justice will call for measures to reduce wealth disparities (egalitarian theories) or otherwise target poverty (sufficientarian and utilitarian theories). Adaptation policies that link adaptation to tackling inequality or the root causes of vulnerability may also satisfy broader demands for greater distributive justice.

Finally, because there may be legal or statutory requirements for administrations to consider justice.

In an EU context, member states have legal obligations to ensure non-discrimination based on any ground (Article 21) and to guarantee social protection (Article 34), health care (Article 35) and equal access to services (Article 36) as included in the Charter for Fundamental Rights which is part of the Treaty on the Functioning of the EU (FRA, 2025). Member States have also committed to the Aarhus Convention which requires them to comply with procedural justice in any type of environment-related decision making (EEA, 2025).

Linking Transformative Adaptation to Justice

Conceptual Overview of the Transformative/Just relationship.

Transformative Adaptation intersects with ideas of Just Adaptation and the shared vision for EU. Cools et al's (2024) definition adds "equity" (a synonym for justice) as a defining feature of what makes a transformative adaptation transformative. They write that:

> *"Socially, [transformative adaptation] can lead to more inclusive and equitable societies, empowering communities to make decisions about their futures in the face of climate change" (Cools et al, 2024).*

Transformative Adaptation by definition "prioritizes distributive justice" (Briesbock et al, 2026). Procedural justice, however, failed to meet the threshold for inclusion among expert participants, implying that transformative adaption is seen as how costs and benefits are shared within a society rather than as systemic transformation addressing root causes by involving the public in adaptation decision-making and planning. The table below offers

explanations of why four forms of justice imply the necessity of transformative approaches to adaptation.

Table 16 Overview of why transformative adaptation is linked to four forms of justice.

Form of Justice	Link to Transformative Adaptation
Distributive Justice	Transformative adaptations may focus on interventions designed to tackle the system that produces vulnerability (Carr, 2019; Vogel & O'Brien, 2022). In many cases, this will involve making changes to the way our economic systems distribute costs and benefits and could align with the recommendations of many theories of distributive justice that often call for more egalitarian distributions of resources across scales.
Recognitional	Transformative adaptation may require transformations in the working practices of those who plan and implement adaptation actions (Taylor et al, 2025), including reflections on core assumptions, beliefs, and values. This can involve changes to the processes used to make adaptation decisions and improve the recognition of different actors within administrative and governance processes (Shi & Moser, 2021)
Procedural	Transformative adaptation, in order to succeed at challenging systems, which produce uneven vulnerability, needs to "open space" in governance processes to allow vulnerable people to use new levers of power to advocate for their needs (Erikson et al, 2015; Colloff et al, 2021; Schipper et al, 2022). This may align with demands of procedural and recognitional justice which call for increased participation of people in the decisions which affect their lives.
Transitional	Transformative adaptation prompts consideration of what the purpose of a system is and what other goals it might be designed to promote. Conversely incremental adaptation measures may focus on treating the symptoms of climate change while leaving the current social-system/business-as-usual processes intact (Kates et al., 2012; Park et al., 2012). While incremental solutions are not necessarily unjust, (and may be necessary) they may miss an opportunity to address an unjust system. Adaptation does not always reduce vulnerability (Schipper, 2020; Shah et al., 2025) when justice is not considered.

Practical Step-by-Step Guide from the Synthesis

Drawing on state-of-the-art of engaging vulnerable groups and our review of the tools listed in Chapter 5.2.1 (Table 2), we summarised the knowledge and insights into a step-by-step guide. The main stages consist of 'Initiation' (recruitment, resources, trust and reciprocity), 'Design' (design environment and design activities), 'Implementation' and 'Evaluation' consistent with Verweij et al. (2026). The goals and key questions in the second column set the tone for the concrete actionable steps in each stage. In total, we distill 40 concrete steps for the engagement process from beginning to end, with references to more specific resources.

Table 17 Step-by-Step Guide for Engaging Vulnerable Groups

Stages	Goals and Key Questions	Key Steps
Initiation	• **Define the engagement scope** What is the possible level of participation based on the legal and contextual framework? What challenges can be realistically solved within the timeframe? • **Review and self-assess** What local strategies already exist? What maladaptation potentials are there? What are potential negative effects or spillover (on other sectors or geographical areas)?	1. Map the goal on a spectrum from concrete (a specific climate action) to systemic (develop climate strategies) 2. Map the engagement stages in the policy cycle 3. Collect local data and verify its relevance (if possible) 4. Vision of the city about the challenge(s) citizens face 5. Ensure political alignment to obtain approval 6. Identify key barriers and opportunities with other municipal departments 7. Identify local leaders for implementation 8. Self-assessment of maladaptation potentials [2]
Recruitment	• **Identify target groups and stakeholders** Who are currently involved in decision-making? Who are excluded? • **Target and reach out** What are the needs of the target group? What are the feasible recruitment options? How can inclusivity be ensured?	9. Collaborate with gatekeepers/multipliers/mediators (e.g., community leaders, local representatives, welfare organisations) to identify and recruit vulnerable people 10. Define outreach methods and communicate goals, expectations and roles and responsibilities clearly 11. Arrange logistics (venue, catering, moderation, materials, registration etc.) 12. Reduce initial knowledge inequalities by providing training
Resources	• **Ensure financial and institutional support** How can barriers be lowered and participation made accessible?	13. Devote extra resources, e.g., using Social Impact Assessments [1] or social indicators [3] and secure necessary financial resources upfront 14. Provide compensation for their time and other support (e.g., transport, childcare, missed wages)

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	What resources (human and social) and community initiatives already exist?	15. Provide tools, resources and guidance for citizens to take action on key challenges (e.g., Small-scale pilot actions or funding) 16. Allocate enough financial and human resources for the implementation of engagement outcomes
Trust	• **Transparent communication** • **Focus on discussing *their* needs** What is the state of mind of the target group?	17. Collaborate with well-known community members 18. Participatory budgeting allows participants to influence the distribution of public resources toward local priorities [8] 19. Use active listening and open discussion
Reciprocity	• **Foster grassroots participation and citizen-led initiatives** How can a sense of responsibility among participants be established?	20. Start as soon as possible and show immediate impact in public events, however small 21. Acknowledge contributions (e.g., nominate local heroes) to promote community ownership
Design	• **Design, facilitate and (re-)discover resources**	22. Hire External facilitator (non-partial) 23. Document results and make decisions together
Design Environment	• **Ensure a safe participation environment** Where to hold the events? How to ensure participants feel physically and psychologically safe? How to balance power relations?	24. Convene in a safe space - Physically safe (e.g., communal spaces, parks, neighbourhood areas, online so that they can be in their homes) - Psychologically safe (transparency, teambuilding exercises) - Have support available and ensure enough time and space (some topics may have strong emotional components)
Design Activities	• **Ensure inclusive and meaningful participation** What are the skills of the participants?	25. Give vulnerable citizens a directing role, as co-experts 26. Tailor activities to their skills 27. Reframe group identities from “vulnerable” to “valuable” 28. Diverse interaction formats and group sizes 29. Use respectful, lay language for communication

	What are the practical and economic barriers to participation? (e.g., income, time, accessibility and functional needs)	30. Allow them to have a say in when, where and how the activities occur
Implementation	**• Turn results into action** How to apply the tailored CCA actions? **• Raise awareness** **• Official handover to signal responsibility** **• Monitoring and reporting** How to integrate data from public involvement into official monitoring and reporting?	31. Establish a coordination and management team, ideally with people leading the participatory process 32. Public education and awareness campaigns using diverse media and channels, tailoring messages to local concerns 33. Recognize and reward good citizen actions 34. Official handover to local decision maker (ideally with local media present) 35. Define monitoring indicators and report on how vulnerable groups were involved and their influence on decisions and communicate the outcome
Evaluation	**• Evaluate impacts** Are there potentials for maladaptation? How many people participated? What impacts did the activities have? **• Follow-up and feedback mechanisms** **• Encourage long-term engagement** How can a network be established to stay connected beyond the engagement process?	36. Thorough evaluation of the impacts and side effects (positive and negative) to identify and mitigate potential maladaptation 37. Collect feedback (e.g., surveys and questionnaires), with intermediate evaluation if needed in a longer period 38. Make community engagement a properly resourced job (not tied to specific projects) 39. Provide involved citizens a platform to speak publicly (e.g., online forums, living document) 40. Inform the public about the outcomes and promotes further discussion

Engaging Vulnerable Groups: Challenges and Best Practices

Engaging vulnerable groups can bring multiple benefits and is crucial for transformative adaptation. However, if poorly resourced or implemented, it can result in harmful outcomes. The following best practices drawn from European case studies and guides encompass the entire engagement process.

- **Build trust early and continuously**

A lack of trust as a barrier for engaging vulnerable groups has been identified repeatedly, e.g., due to lacking representation in governmental institutions, social exclusion and isolation. Working together with intermediaries and associations (‘gatekeepers’/‘multipliers’/ ‘mediators’), and transparency are important steps. Start from their realities, interests and needs, not from assumptions. Build and foster trust through tangible impact and continued involvement while recognizing their contributions fosters a sense of ownership and pride. Engaging citizens early in the process is ideal to gain trust and maximize opportunities. Draw on existing knowledge, networks and strengths and include vulnerable groups in the assessment process.

- **Value lived experience equally with technical expertise**

Value different knowledge systems (everyone is a knowledge holder). Technocratic expertise often dominates and widens the gap between authorities and citizens, and valuable contextual knowledge is not being recognised, limiting a holistic approach to vulnerability. Bringing groups from diverse backgrounds and sectors together to raise complementary issues and collaborate on solutions to concrete place-based social challenges contribute to transformative changes with challenge-based policies.

- **Use diverse, accessible and creative methods and formats**

Using diverse methods during the different phases, especially facilitation methods during workshops. Diversifying participation formats also helps to collect and work with different knowledge systems. Furthermore, using diverse communication methods and leveraging hybrid methods can foster wider participation. Creative solutions to invite participants and maintain their motivation to continue are important for success, and social media has a positive effect. Ideas for climate action group activities: Quick-start tools.

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8.4 PEARL Root Cause Analysis Interview Guide

The table presented below shows a simple interview template created as part of the PEARL project to accompany their Root Cause Analysis Framework, and adapted for this deliverable with example answers based on analysis of flood risk vulnerabilty. It allows investigators conducting stakeholder interviews to assess for the three component drivers of climate risk (Hazards, Exposure, Vulnerability) across four different classifications of root causes of an event; and explore details of how each root cause of the risk is express across three time-horizons. Full details of its development and case studies of application are available online here.

Root Cause of Climate Risk	Root Cause Pathway	Temporality	Example Answer
Drivers of Hazard	Physical	Historic	Geographic location of city/region, inherent vulnerability to flooding.
		Contemporary	Increasing rainfall from climate change
		Future	Projected worsening or rainfall in future
	Socio-Economic	Historic	Rapid urbanisation, canalisation of rivers
		Contemporary	Deferred maintenance of drainage systems
		Future	Continued urban expansion increasing runoff
	Governance	Historic	Flood defence planning did not cover all neighbourhoods equally
		Contemporary	Weak enforcement of zoning and building regulations
		Future	Insufficient long-term climate adaptation planning
	Perception	Historic	Underestimation of flood risk in planning decisions
		Contemporary	Scepticism towards green drainage solutions, preferences for paved streets
		Future	Lack of trust in local government leads to low engagement with hazard prevention measures in upper catchments. Knowledge of traditional forestry practices in upper catchments being lost
Drivers of Exposure	Physical	Historic	Settlements located in flood-prone areas. Lack of investment in flood defences.
		Contemporary	Uneven maintenance of existing defences, investment prioritised into protecting tourist resorts

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		Future	Continued urbanisation increasing pressure for housing on floodplain
	Socio-Economic	Historic	Local economic interest groups lead to infrastructure siting decisions in hazard prone areas
		Contemporary	Low tax revenue in deprived areas leave local authorities unable to invest in defences
		Future	Austerity policies limit new infrastructure plans
	Governance	Historic	Land-use policy allowed development in flood prone zones, developers over-represented in government processes were able to halt legislation that prevented them from being regulated.
		Contemporary	Fragmented bureaucracy, austerity policies from national government limit ability to make new investments.
		Future	Poor economic prospects at home mean educated young people are not making careers in local government
	Perception	Historic	Discriminatory zoning practices left minority communities forced to settle on marginal flood prone land.
		Contemporary	Low trust in government means hazard warning are ignored
		Future	New population moving from mountainous countryside areas are less aware of flood risks.
Drivers of Vulnerability	Physical	Historic	Social housing was built to low quality standards and has not been well maintained. Building standards did not take account of climate change and changing nature of flood hazards.
		Contemporary	Poor evacuation routes, uneven application of maintenance of flood defences.
		Future	Housing stock continues to degrade.
	Socio-Economic	Historic	Poor and working class neighbourhoods generate less tax revenue and their administrations lack the funds needed to make flood prevention investments.
		Contemporary	Poor communities are less likely to have flood risk insurance. Private landlords have few

			incentives to make productive investments in improving quality of existing properties.
		Future	Falling revenue of farmers owing to less predictable climate and flooding patterns. Poor communities in hazard exposed zones risk becoming "uninsurable" trapping them in unsellable properties.
	Governance	Historic	Decisions to prioritise flood defences in wealthy/touristic neighbourhoods, which formed electoral base of governing party.
		Contemporary	Lack of data on mobility impaired population, no channels or resources to reach out to these groups and involve them in flood risk planning.
		Future	National government priority to promote economic growth will create pressure to prioritise flood defences in economically prosperous parts of the city.
	Perception	Historic	Perception amongst government planners and parties that climate adaptation was a not a government responsibility, that concerned citizens should take out insurance policies, or move to less hazard prone areas.
		Contemporary	Flood warnings are not translated into the local ethnic minority language. Perception that local communities are not interested in being involved in adaptation planning prevents local hazards from being known to planners.
		Future	Belief that new technologies for water management are a substitute for making changes to how the administration makes adaptation decisions.