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BASQUE CENTRE
FOR CLIMATE CHANGE
Klima Aldaketa Ikergai

EVALUATING ADAPTATION: AN ANALYSIS OF POLICY PROGRESS IN COASTAL CITIES AND REGIONS

Authors: *Marta Olazabal [a,b], William Lewis [a], Kayin Venner [a,c], María Ruiz de Gopegui Aramburu [a,c], Elisa Sainz de Murieta [a,d], Sascha Mahawelatanne Goonesekera [e], Ibon Galarraga [a,f]*

a Basque Centre for Climate Change (BC3)
b Ikerbasque
c Institute for Environmental Science and Technology (ICTA), Universitat Autònoma de Barcelona (UAB)
d Department of Applied Economics, University of the Basque Country (UPV/EHU)
e Metroeconomica, S.L.
f Department of Economic Analysis, University of the Basque Country (UPV/EHU)

HIGHLIGHTS

- Although larger cities seem to be hotspots for adaptation action, more than 50% of larger coastal cities worldwide do not have plans in place (only 59 cities out of the sample of the 136 largest coastal cities worldwide).

- There is a need to align adaptation policies with climate risks, this can be informed through two assessment frameworks: the Adaptation-Risk Policy Alignment (ARPA) framework and the Adaptation Policy Credibility (APC) framework.

- The ARPA framework was tested in four early adapter cities. The pilot showed that the gap between adaptation planning and actual implementation still remains.

- The APC framework was applied in 59 cities worldwide with adaptation policies and was shown to be useful in providing an overall idea of the likelihood of adaptation policies being delivered and sustained in the future.

- When looking in detail into M&E frameworks of city plans, only 11 of the 59 cities listed adaptation indicators and metrics and the majority focused on outputs (95%), i.e. what is implemented, rather than outcomes - the objectives to be achieved.

- Although cities are finding new innovative ways to integrate learning and reflect on outcomes, there remains a persistent disconnect between the production of climate science and the implementation of practical and context-specific adaptation actions.

- Our new project 'IMAGINE adaptation' (2023-2027) addresses the urgent need to evaluate adaptation in urban areas and understand progress across governance levels. Analysis of policy progress can be a useful first step, but it is not indicative of effective adaptation.

Rising sea levels and extreme weather events threaten extensive areas of the planet, with nearly 11% of the global population, or 896 million people, living in low-lying coastal areas. A study in 136 coastal megacities found that coastal flooding under a high-emission sea-level rise scenario could cause annual expected damages of US$1,600 billion in 2050. The danger looming over them has been and remains a constant source of concern. An endless stream of measures of every sort have been applied since 1997, motivated by international commitments and conventions such as the Paris Agreement of 2015. In this line of action, thousands of governments worldwide at different scales have committed to adaptation and are working on strategies and plans to prepare for climate change impacts. For example, there are now over 12767 signatories of the Global Covenant of Mayors which represents a long-term commitment by cities and regions to adapt to climate change. Despite this policy context, progress to date is poorly understood and tracked. As yet, there is insufficient qualified information and agreement on methods and metrics to evaluate the local and global impact of adaptation initiatives.

The evaluation of progress on adaptation to climate change, that is, how well we are prepared for the impacts of climate change, has been debated for years across scientific and policy arenas, sectors, and at multiple levels of governance. Measuring adaptation to climate change is highly challenging: first, because there is no single understanding or definition of adaptation. Second, because measuring adaptation effectiveness or success given the inherent uncertainty is highly complex, and third, due to the lack of agreed goals, objectives, metrics and indicators. The Paris Agreement (Article 7) in 2015 established the need to measure adaptation progress and define a Global Goal on Adaptation (GGA) of "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change" while contributing to sustainable development, and meeting

Donostia-San Sebastian (Spain), 2014. (Source: Asier Aranzadi)

the temperature goal of 1.5°C. However, many questions emerge when designing the GGA such as means of assessment, sources of information and aggregation, and how to make a common global goal on adaptation locally relevant.

When it comes to large comparative assessments of adaptation progress across nations, regions, or cities and despite a large consensus on its limitations, the focus on adaptation planning and policy outputs as a measure of progress has been the dominant assessment approach. The attention to (and use of) other means to measure progress beyond adaptation outputs, has been largely theoretical and case-study-focused. However, adaptation assessments require approaches that can cover different spatial and temporal scales including policy design processes, implementation, and impacts in the medium and long term.

The project CLIC was set-up to explore this question "Are cities properly preparing for climate change after "this question"?". Focusing on planning and policy outputs, it aimed to design, develop, and coordinate an experiment on an international scale to assess the quality and effectiveness of public adaptation

policies made by cities, specifically in the areas most affected by sea-level rise and under greater pressure from extreme climate phenomena: **the largest 136 coastal port-cities over 1M inhabitants.**

CLIC "Are cities properly preparing for climate change?" ran between 2018 and 2021 and was funded by AXA research Fund (Grant agreement No. 4771) and the Spanish Ministry of Economy and Competitiveness (MINECO) (Grant Agreement No. IJCI-2016-28835). It gathered a team of around 10 research collaborators mainly based at the Basque Centre for Climate Change – BC3 (a non-for-profit international research institution located in Northern Spain) and a network local, regional and national adaptation policy experts that contributed knowledge regarding the state of adaptation policies in their respective regions.

The state of adaptation policy

The first stage involved the identification and characterisation of climate change adaptation initiatives across the 136 coastal cities worldwide (Olazabal et al 2019b). Policy documents were retrieved on a city-by-city basis including 68 countries using an Internet search engine. Local experts (policy officers, policy consultants, researchers) were surveyed to confirm the findings i.e. existing adaptation policies across all governmental levels. 226 adaptation policy documents were found in 20 different languages that were translated and their content analysed: 88 at national level, 57 at regional/state level and 81 at city/metropolitan level. This set of adaptation policies was considered the latest, most up-to-date database of governmental adaptations in early 2019.

Our analyses showed that (1) in 50% of cases, there was no evidence of policy implementation, (2) in almost 85% of cases, planned adaptation actions were not driven by present or future climatic impacts or risks, i.e. measures were proposed without justification of risks reductions, and, finally, that (3) formal adaptation planning was relatively recent and concentrated in more developed areas and countries (see Figure 1). All this posed serious concerns about institutional capacity to translate risk knowledge into practical action and raised important questions regarding the effectiveness of planned actions or the capacity to identify useful metrics and assessment tools to evaluate them.

Development of policy assessment methodologies.

Based on these results, an important question arose: how to assess the alignment of climate adaptation policies with risk-based approaches and how to assess if they will be effective in the long term? The CLIC project developed two assessment frameworks: the Adaptation-Risk Policy Alignment (ARPA) framework and the Adaptation Policy Credibility (APC) framework.

Many cities around the world are undertaking adaptation planning processes in contexts of considerable uncertainty due to climate risks. However, our evidence suggests that current adaptation policies are failing to fully incorporate risk-related information and knowledge. Understanding how policies account for current and future risks is crucial in order to assess whether they will effectively contribute to reduce vulnerability and increase resilience. Exploiting the synergies between the well-established discipline of disaster risk reduction and climate adaptation, ARPA assesses whether (and how) climate change adaptation policies integrate risk knowledge and information (Sainz de Murieta et al 2020). ARPA displays a set of risk-based metrics that look at risk knowledge and understanding; governance; risk reduction and resilience; and planning for preparedness, response and recovery. We tested this framework in four early adapter cities: Copenhagen, Durban, Quito and Vancouver. These cities are considered pioneer cities in the design and implementation of adaptation plans and were used to show the full applicability of ARPA. Despite its potential, the pilot testing exercise showed that assessing the progress of these early adapter cities planning is still difficult through secondary sources. Most of the key risk issues in ARPA are promisingly incorporated in the planning processes, but the gap between planning and actual implementation still remains.

Through a pilot in the same four early adapter cities (Copenhagen, Durban, Quito and Vancouver), the CLIC project explored the concept of credibility as a critical issue in climate policy and developed a conceptual and operational assessment framework for helping to allocate public funding and private investments, and for implementing and catalysing climate policy (Olazabal et al 2019a). The APC Framework is organised into three main categories - policy and economic credibility, scientific and technical credibility, and legitimacy - and contains 17 indicators and 53 metrics. These indicators and metrics, which focus on both policy process and content, provide an overall idea of the probability of adaptation policies being successfully implemented and sustained in the future. As such, the APC can serve as a valuable tool for cities and policymakers seeking to assess and enhance their adaptation planning and policy-making processes.
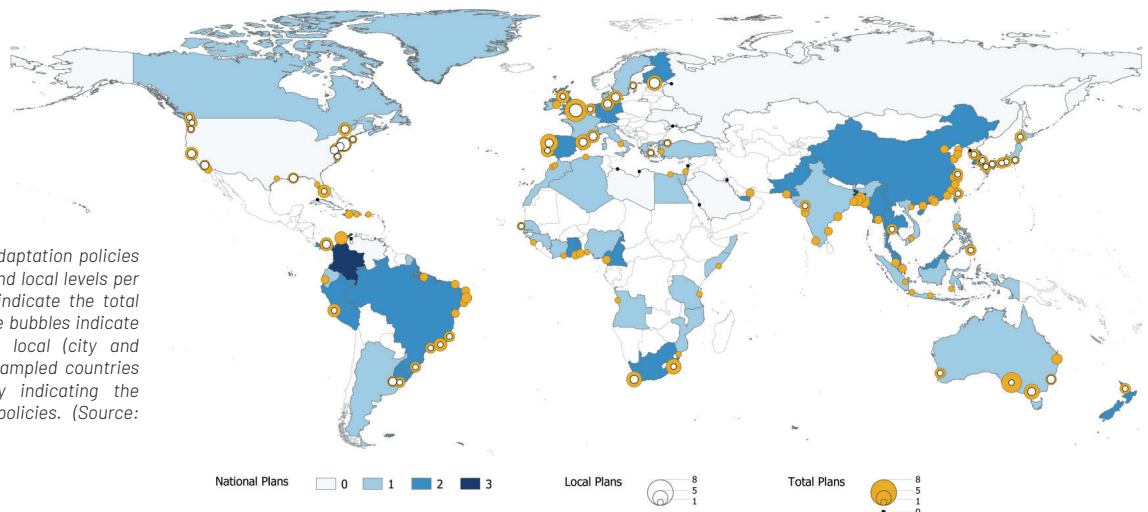

Figure 1. Number of adaptation policies at national, regional and local levels per city. Orange bubbles indicate the total number of plans; white bubbles indicate the total number of local (city and metropolitan) plans. Sampled countries are shaded gradually indicating the number of national policies. (Source: Olazabal et al 2019b)

National Plans 0 1 2 3   Local Plans 8 5 1   Total Plans 8 5 1 0

Global large-scale assessment of credibility of urban adaptation policies

Once the methodology was established, the APC was applied in 59 cities with adaptation policies in place (Olazabal and Ruiz De Gopegui 2021). This global assessment revealed that current adaptation planning in large global cities has significant room for improvement and is, overall, unlikely to be effective unless greater emphasis is placed on financing, regulatory context, monitoring and evaluation, and legitimacy aspects (the extent to which decisions are acceptable to participants and nonparticipants that are affected by those decisions).

The global results (see Figure 2) show that adaptation finance frameworks are lacking, and adaptation decisions pay insufficient attention to the needs of vulnerable groups. This inhibits the potential for far-reaching adaptation action. Additionally, there is a lack of actual data on implementation and effectiveness. We presume that current approaches to adaptation monitoring, evaluation, reporting and learning (MERL) are not yet sufficiently mature for use in urban planning practice and, similarly, existing MERL frameworks (used in environment or sustainability evaluations) are not usable or compatible with adaptation governance needs.

Moving forwards, adaptation needs to be integrated in current institutional and regulatory frameworks in order to guarantee sustainable adaptation action in the long-term. To achieve this, methodologies for understanding and examining the adaptation solution space in cities should be developed and used in practice. Finally, monitoring and evaluation will enable an improved understanding on how policy processes connect to adaptation success, and inform the revision of evaluative proposals such as the one used here.
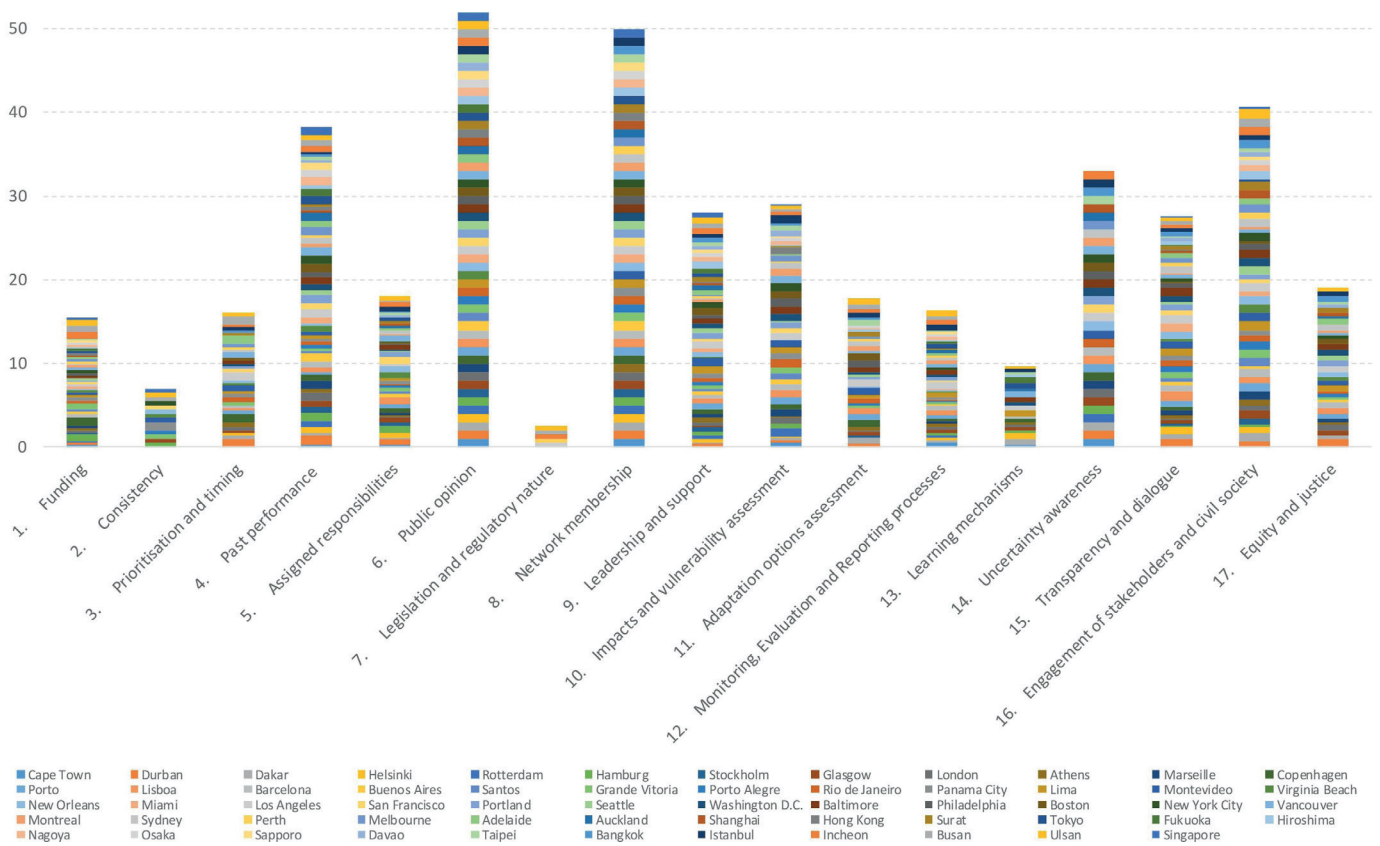

Figure 2. Aggregated scores per indicator. Each column represents the aggregate score for each of the 17 indicators, considering all individual city scores. (Source: Olazabal and Ruiz De Gopegui 2021)

Understanding local policy practice on monitoring and evaluation of adaptation.

The global assessment of credibility of urban adaptation policies showed that, overall, and across governance levels and sectors, climate change adaptation MERL systems are rarely developed and implemented. As a result, there is a generalised lack of knowledge and practice regarding the definition and use of adaptation indicators and metrics from which to effectively learn. One of the outputs of the CLIC project focused on understanding the emergent state of practice regarding adaptation indicators and metrics in local adaptation planning (Goonesekera and Olazabal 2022). The study focused on what indicators and metrics are used, what aspects of the adaptation process are measured, and the processes through which adaptation is monitored, evaluated, and reported.

Out of the sample of the largest 136 coastal cities worldwide, only 59 cities had adaptation-related plans (Olazabal and Ruiz De Gopegui 2021) and only 11 (Athens, Auckland, Barcelona, Glasgow, Lima, Montreal, Nagoya, New York City, Portland, Tokyo, and Vancouver) listed indicators and metrics. Sourced from these documents, we compiled and coded a total of 1971 indicators, of which 1841 focus fully or partially on adaptation-related aspects. We studied the level of detail (objective, indicator, metric), type (target, input, output, outcome, or impact), scale, dimension, units of measurement, target, and proposed monitoring time frame, among other aspects.

Data showed that a majority of adaptation indicators and metrics only measure outputs (95%), (i.e. what is implemented) and fail to consider the outcomes (e.g. users or beneficiaries of adaptation measures) or broader impacts (e.g. number of hospitalizations) of adaptation initiatives. Additionally, targets and monitoring timeframes, as well as data sources, are rarely defined. We consider this to be due to a lack of defined local adaptation goals and a poor understanding of how specific adaptation actions lead to vulnerability reductions and resilience increases.

Based on the identified gaps, this article proposed a metric development guiding framework (see Figure 3) that policy-makers can use to stimulate discussion around effective and feasible approaches to measure adaptation progress based on improved adaptation decision-making.

This framework and these findings underline the need for the revision of current adaptation planning practices that might ultimately facilitate processes of learning, experimentation and innovation in this growing field. An understanding of the wider benefits of adaptation actions is crucial for learning and it is clear that reflective learning processes are needed within organisations to ensure investment is actually reducing vulnerability. As a number of cities move into the second generation of climate change adaptation plans they are finding new innovative ways to integrate learning and reflect on outcomes (Lewis and Olazabal 2021). Cities are finding organic ways to learn and understand the wider impacts of their climate adaptation plans. From the experience of six global cities, we found that learning starts with a strong focus on vulnerability and traditional indicator systems can be supplemented through participatory approaches.

Our recommendation is for further efforts to be directed towards understanding how informative participatory processes and repeated vulnerability assessments can be used for learning. We find that following up the adaptation implementation journeys in cities will be key to develop reference frameworks for context-specific sustainable and transformative long-term climate adaptation strategies.
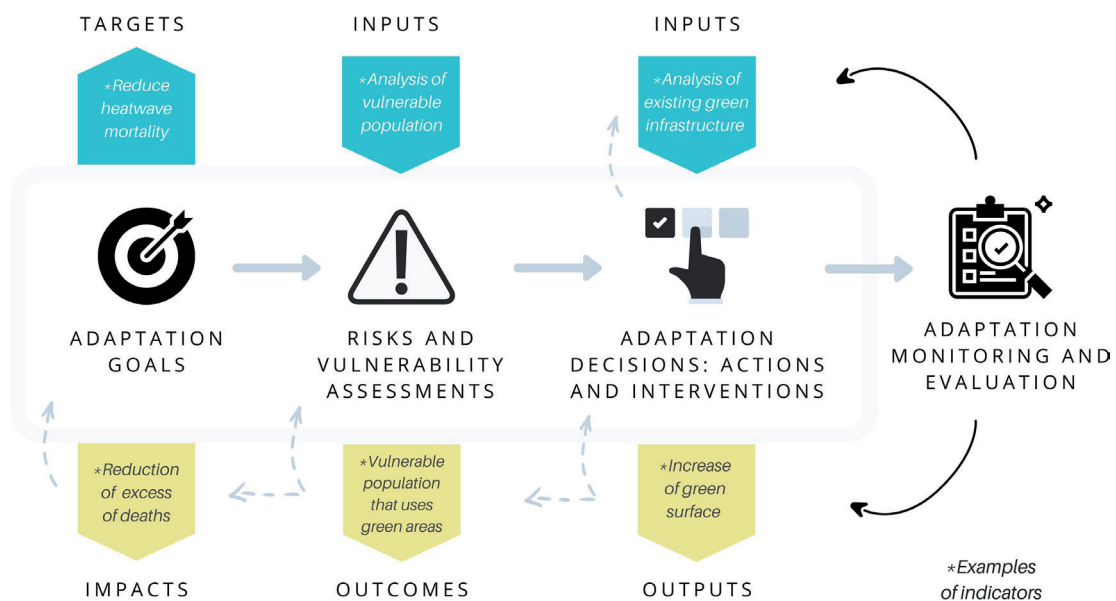

Figure 3. Adaptation indicators and metrics (measuring inputs, outputs, outcomes, and impacts) should be connected to adaptation decision-making criteria, processes, and stages. (Source: Goonesekera and Olazabal, 2022)

The importance of multiple forms of knowledge in adaptation planning and policy practice

Evidence from the CLIC project showed that current adaptation planning approaches are not always successful in generating actionable knowledge to guide implementation on the ground. There remains a persistent disconnect between the production of climate science and the implementation of practical, local, and context-specific adaptation actions. Because of this reason and informed by theory, the CLIC project argues for a need to incorporate "subaltern" knowledge (typically labelled local, traditional, or indigenous knowledge) in climate adaptation science and practice (Olazabal et al 2021). In this article, building on recent comparative assessment studies, we identify limitations of current approaches and illustrate key pathways through which subaltern knowledge can be integrated to better inform current approaches.

We assert that multiple forms of knowledge and particularly, the subaltern, are a critical source of innovation and should be included throughout the policy development process from the definition of adaptation success, to the development of goals, actions, and assessment metrics. This participation during plan creation can help to broaden the adaptation solution space by enhancing both the effectiveness and the social legitimacy of actions and is crucial for integrating equity and justice aspects into adaptation decision making (see Figure 4).
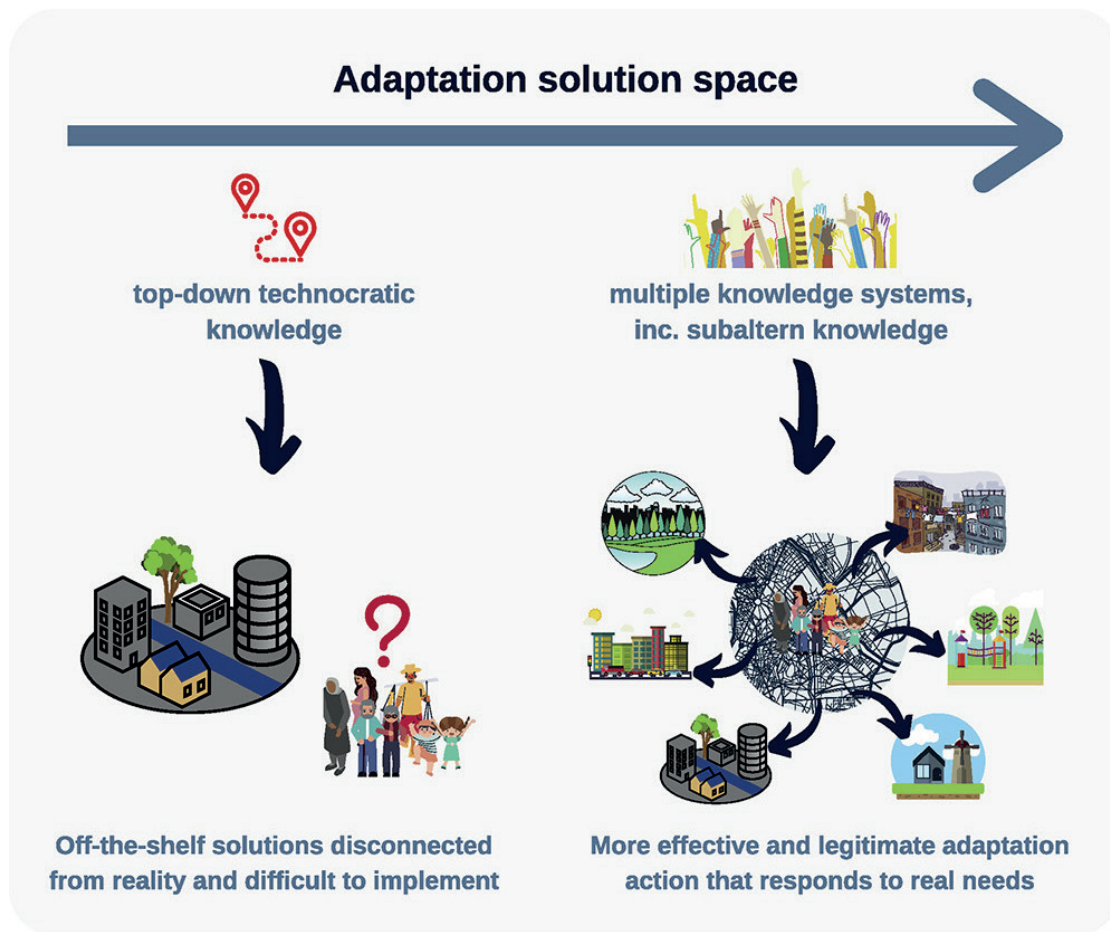

Figure 4. Broadening the adaptation solution space through the integration of multiple knowledge systems. (Source: Olazabal et al 2021).

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Future research

Impacts of climate change are happening as a result of extreme temperatures, sea-level rise, storm surges or droughts. Communities and governments across the globe are preparing through actions to reduce its impacts and increase climate resilience. However, progress made to date to adapt is still poorly understood and tracked due to a lack of a means to evaluate how well the world is adapting. Further barriers include unclear goals and metrics for adaptation and the absence of a shared definition of successful adaptation. Finding a response to this question is at the core of the international climate debate and has particular significance at the local level where assets and lives of millions of people, especially poor and marginalised groups, are at risk.

Our new project 'IMAGINE adaptation' addresses the urgent need to evaluate adaptation in urban areas and understand progress across governance levels . It argues that the current focus on policy progress can be a useful first step, but it is not indicative of effective adaptation. A broader understanding of success is required, one that goes beyond technical definitions and considers equity, justice, and maladaptive issues. It departs from the assumption that a paradigm shift regarding how we understand success in adaptation is required in order to move from a potential lock in of urban risks to transformative urban adaptation (see figure 5).

To enable evaluation and learning from diverse understandings of adaptation, 'IMAGINE adaptation' will gather expert and local views to reformulate the concept of adaptation success. The project will then explore the trends and needs regarding monitoring and evaluation and how these may enable or hinder adaptation. The findings will be used to inform the development of a comparative case study research across 12 urban areas worldwide. Finally, the project will explore how the evaluation of local progress can be integrated into global goals for adaptation. The outputs of the project aim to be a reference for future adaptation assessment studies and will pioneer the understanding of the ways to enable far-reaching transformative urban adaptation through processes of evaluation and learning.
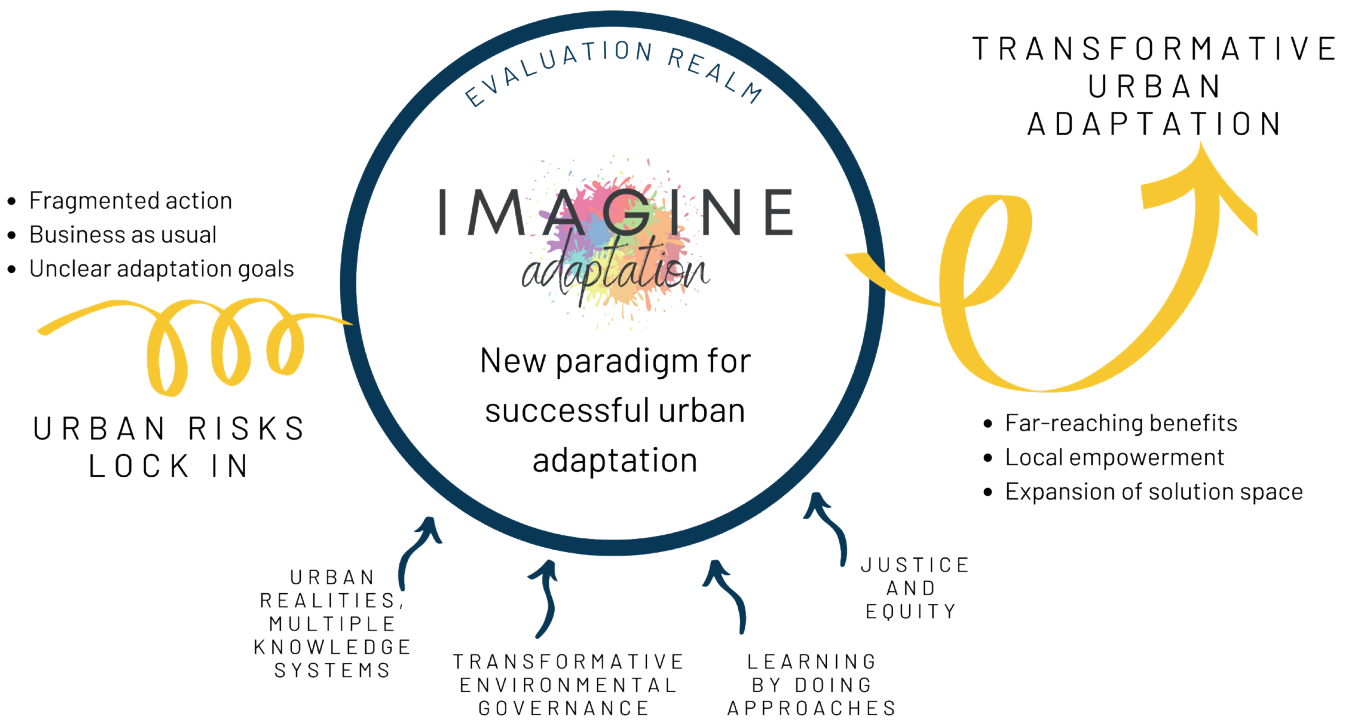
Principal Investigator: Marta Olazabal

Figure 5. Conceptual framework for the project IMAGINE Adaptation: From the lock in of urban risks to transformative urban adaptation through a paradigm shift in how we conceive adaptation and its evaluation.

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BASQUE CENTRE FOR CLIMATE CHANGE
Klima Aldaketa Ikergai

EUSKO JAURLARITZA
GOBIERNO VASCO
HEZKUNTZA SAILA
DEPARTAMENTO DE EDUCACIÓN

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