

Summary

In the realm of climate adaptation, the relationship between climate services, the implementation of adaptation plans, and the roles of various stakeholders, particularly municipalities, is crucial. Climate services, which are typically provided by scientific organisations, research institutions, and specialised agencies, offer essential data and tools to support decision-making in the face of a changing climate. The successful implementation of adaptation strategies at the regional and municipal levels requires more than just the provision of data; it demands a careful balance between the expertise of climate service providers and the on-the-ground realities faced by municipalities. In other words, the demand driven approach of climate services is essential for a successful implementation of adaptation plans.

Municipalities, often the frontline actors in climate adaptation, are both the users and implementers of these services, and sometimes they are providers of climate knowledge, too. As intermediaries and knowledge brokers, they translate scientific insights into practical measures that protect communities, infrastructure, and ecosystems. The challenge lies in ensuring that the climate services provided are not only scientifically sound but also tailored to the specific needs and contexts of these local governments. This report explores this delicate balance, focusing on the interaction between climate services and their practical application in different regions, while emphasising the importance of local knowledge and stakeholder engagement in shaping effective and context-sensitive adaptation strategies.

By examining case studies from the European Union, Latin America, and the Caribbean, the report highlights that the success of climate adaptation efforts depends on integrating place-based knowledge and contextual narratives, which are essential for developing tailored climate services. These services should go beyond merely providing data; they must embrace a more inclusive approach that incorporates local knowledge and addresses the specific needs of communities.

The distinction between scientific facts and broader societal concerns is particularly relevant for climate adaptation. While scientific data often reduces complex situations to technical problems, it is crucial to consider the social, political, and ethical implications of adaptation, including non-climatic factors such as gender, environmental justice, and decolonisation.

Finally, ethnographic research is vital for understanding the local contexts and narratives essential for developing fit-for-purpose and effective climate services. Through qualitative methods, ethnography provides deep insights into the lived experiences, cultural practices, and social dynamics of communities. This knowledge is crucial for tailoring adaptation strategies to local needs and fostering trust and collaboration between climate service providers and local stakeholders. Ethnographic research uncovers the nuanced ways in which climate change and risks are perceived and experienced, enabling more responsive and contextually appropriate adaptation measures.

Standardisation is not a primary concern for the municipalities in this study; rather, they emphasise the importance of flexibility, situatedness, and open communication in their processes. Municipalities recognize that each community has unique needs and contexts, making rigid standards less effective in addressing local challenges. Instead, they value adaptable approaches that allow for tailored solutions and responsive interactions with stakeholders. However, there is potential for procedural standardisation in the future, particularly in establishing common frameworks or guidelines that ensure consistency in process management while still allowing room for customization. Such procedural standards could help streamline operations and facilitate collaboration across different municipalities, without undermining the essential need for localised and context-specific interventions.

Key findings

- 1. Importance of local knowledge:** The case studies underscore the critical role of place-based knowledge when developing climate services. Various approaches to incorporating local knowledge and concerns were observed, such as *MTAs (Mesas Técnicas Agroclimáticas or agroclimatic roundtables)* in Latin America, citizens' parliaments in Milan, holistic approaches led by citizens' initiatives in Ammerland and the West Indies, real-life experiments in Landshut, citizen science projects in Ghent, and the inclusion of migrant knowledge in Paris. These diverse methods highlight that without integrating local knowledge and narratives, climate services risk being perceived as top-down initiatives, disconnected from the lived realities and specific needs of the municipalities and communities most affected by a changing climate.
- 2. Role of local actors and narratives:** Local actors, including NGOs, citizen scientists, and other civic organisations, play a pivotal role in climate adaptation by ensuring that strategies are grounded in local realities and are more likely to gain community trust and support. Their engagement helps align adaptation plans with the specific needs and conditions of the communities they serve. Exploring local narratives of change, as discussed by Krauß and Bremer (2020), adds depth to place-based knowledge and provides critical context for linking adaptation plans and climate services with local experiences. These narratives not only enrich the understanding of local vulnerabilities and strengths, but also facilitate more effective and culturally relevant adaptation measures by connecting broader strategies with the lived experiences and values of the community.
- 3. Need for integrated approaches:** Effective and fit-for-purpose climate services necessitates integrated approaches that combine scientific data with local narratives and place-based knowledge. This integration not only enhances the relevance and credibility of climate services but also ensures they are both scientifically robust and contextually appropriate. By merging quantitative data with qualitative insights from local communities, climate services and adaptation plans can be tailored to address specific local needs, risks, and opportunities. For example, cities like Paris and Ghent, which face challenges such as heat waves, heavy rains, and flooding, benefit significantly from this approach. Integrating local experiences and scientific data allows these cities to develop more effective and responsive adaptation plans. This holistic method fosters more nuanced and actionable strategies, promotes community engagement and ownership, and ultimately improves the effectiveness and resilience of climate adaptation efforts. Additionally, it helps bridge gaps between different stakeholders, leading to more coordinated and comprehensive responses to climate challenges.
- 4. Democratising and decolonising climate adaptation:** Climate adaptation extends beyond technical processes and challenges traditional forms of governance. Non-governmental organisations, citizen science, and other civic activities play pivotal roles in driving adaptation efforts. The rise of new participatory models underscores that climate services are as much a matter of democratic engagement as they are technical challenges. This is particularly evident in non-European contexts, such as Latin America and the West Indies, where participation, self-empowerment, and decolonisation are integral to the adaptation process. However, these issues are also pertinent in cities and rural areas across the European Union, where there is often a dynamic interplay between government initiatives and local citizens' initiatives. The case studies presented here illustrate in various constellations how this tension can lead to productive co-production and outcomes, but there is also the urge from citizens' initiatives to remain independent, as the Ammerland case illustrates. Ultimately, climate service for adaptation is a highly political issue that continuously challenges the routines of democratic

decision-making.

5. **Opportunities and Limits of Standardization:** Standardization offers several benefits, including ensuring procedural consistency and facilitating the generation of comparable data. It can support the development of an equitable climate services ecosystem and enhance the uptake of quality-assured services to aid adaptation and mitigation efforts. However, its effectiveness is limited by the diverse and complex nature of local climates, socio-economic conditions, and cultural contexts. A one-size-fits-all approach often falls short of addressing these varied needs. For instance, interviewees from the Ghent case study emphasise the necessity of flexibility in adaptation strategies, noting that standards like ISO 14091:2021 may not adequately accommodate the specific needs and adaptive capacity required by local municipalities. Furthermore, such standards can add layers of complexity and administrative burden.

Despite these limitations, standardisation can still play a valuable role. In some cases, standardising processes within climate service development can facilitate the effective integration of local knowledge, address local needs, and support the scaling up and equitable development of climate services. The Latin American case study illustrates how the standardisation of agroclimatic round tables (MTAs) can achieve comparability, inclusivity, saliency, legitimacy, robustness, and fit-for-purpose outcomes, demonstrating the potential benefits of a balanced approach.

Thus, while standardised climate services can provide consistent data and information beneficial for specific adaptation measures and foster trust in climate services, standardisation must be approached with care. It requires a thorough analysis to determine which processes can be standardised without undermining local climate needs and knowledge, ensuring that local contexts are always respected and accommodated.

Recommendations

6. **Enhance Engagement with Local Communities:** Climate services should prioritise continuous engagement with local communities to understand their specific needs, senses of place, knowledge, and narratives. This engagement should extend beyond the duration of individual projects, ensuring that adaptation strategies evolve in response to ongoing local feedback. While the methods of engagement should remain flexible to cater to local contexts, establishing a standardised framework for how this feedback is collected and integrated could enhance the consistency and effectiveness of community interactions.
7. **Promote Flexibility in Standardization and Guidelines:** Standards and guidelines should be designed to allow for flexibility and adaptation to local contexts. Developing adaptable procedural guidelines can help bridge the gap between the need for standardisation and the importance of local relevance. Such guidelines could provide a consistent foundation for municipalities while allowing for necessary customization based on specific local conditions.
8. **Situating Climate Services:** Despite many European cities having established or planning to establish adaptation plans, the term "climate services" remains unfamiliar to many local authorities, often being linked primarily to climate managers, administrators, or technicians. In practice, climate services are commonly seen as climate data providers and evaluators of outcomes, but they rarely play a central role in the implementation of adaptation plans. To improve their effectiveness, climate services should focus less on data provision and more on meeting local needs for adaptation and mitigation purposes. This means integrating climate services into local decision-making frameworks in a way that amplifies public engagement and incorporates diverse community perspectives. Rather than positioning climate services as an isolated solution, they should be part of the democratisation of adaptation plans. To facilitate and enhance public participation, ensuring that local knowledge and democratic input drive the development of climate services and adaptation strategies. This shift would help climate services become more relevant and impactful by respecting and elevating the role of the community in shaping effective and context-sensitive adaptation efforts.
9. **Establish Systematic Feedback:** Systematic feedback loops between users, purveyors, and providers of climate services are necessary to develop climate services that are truly fit for purpose. While the specific approaches to gathering feedback (e.g., round tables, citizens' initiatives, or assemblies) should not be standardised to allow for the necessary flexibility, the process of establishing these feedback systems and the continuous monitoring and evaluation strategies of climate services should be standardised. The evaluation process needs to be based on the goals set by the communities and not alone by technical standards. This would ensure a consistent and reliable process across municipalities, facilitating shared learning and improving the responsiveness of climate services.
10. **Encourage Interdisciplinary Approaches:** Combining insights from social sciences, humanities, and natural sciences can lead to more holistic and effective adaptation strategies. To support this, interdisciplinary research and practice should be encouraged and supported. While the specific interdisciplinary methods should remain flexible, establishing standard guidelines for fostering interdisciplinary collaboration could help ensure that such approaches are consistently integrated into climate service development and implementation. There is an urgent need for a "cultural turn" (Krauß 2023) in climate services.

