World Resources Report

What Types of Information Are Needed for Adaptation Decision Making?

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Question Six: What types of information are needed for adaptation decision making?

This paper describes the conditions for information to be useful in decision making about climate change adaptation. The author argues that decision-relevant information should match the geographical scale and time frame of the decision-making process, should be tailored to the specific decision-making community in question, and needs to evolve to remain informative and relevant. The paper explores different information needs for identifying risks and vulnerabilities, setting priorities, coping, and adapting. The author ends by suggesting that engagement by both information providers and information users is essential to delivering decision-relevant information.

As individuals, communities, organisations and governments move to making decisions and developing policies related to adaptation, the demands are increasing for information to inform these processes. There is recognition that 'perfect' information does not exist and there is the need to derive the required evidence from the 'best available' information. These considerations represent significant challenges to those that are already, and see themselves in future, developing and supplying information. What are climate information demands and

what determines them? How are these demands changing and how do these changes affect that which is provided? How should suppliers of information respond to these demands? How best to inform what is provided? This paper reflects on these questions based on experiences and lessons being learned within the UK Climate Impacts Programme (https://www.ukcip.org.uk).

What are climate information demands and what determines them?

Individuals, communities, organisations and governments at all levels are considering and in some cases developing and implementing measures targeted to address the implications of a variable and changing climate. As such, they are wrestling with, and often challenged by, the information that is available. These challenges include finding available and relevant information and being able to use what is offered.

Required is information that can inform decisions and policies that are being developed, implemented and evaluated. These necessitate that the information can be integrated, along with other sources of information and factors (e.g., economic, social, environmental, cultural, political, operational, technical and scientific information and judgements) that are required by the decision or policy making processes.

These demands are for decision-relevant information (and data). These include information that is consistent with the spatial and temporal scales of the decision making processes and more specifically with the nature of the climate change related risks and adaptation measures being considered. The demand for spatially relevant information is determined by the scales at which decisions need to be affected, as well as the scales at which the decisions processes (e.g., frameworks and models) operate. In terms of temporal resolution, decisions and policies are needed that are consistent with such timeframes as investment and policy making schedules, including lead times for implementation; investment, maintenance and replacement schedules; and policy renewal schedules. At the same time, however, these demands for information at specific spatial and temporal resolutions need to be balanced with what information is, and should be, available based on the need for sound scientific credibility. This balance will often mean that specific demands cannot be met by what is available. It means that alternative information and decision processes will need to be introduced. Required are innovations intended to deliver information that can inform decisions based on credible and sound information.

In addition, the demands relative to temporal scales reflect the fact that in many instances decisions and policies are seen as ongoing continuous improvement processes. They are reflective of the recognition that there will continue to be social, environmental and economic changes and that improvement is likely and must be integrated. Adaptation is similar and must be undertaken as a continuous learning process. The information required is that which supports these types of process.

The information required also varies depending on the intended purpose for which the information is to be used – vulnerability, risks and adaptation assessments and/or monitoring and evaluation. Information required to support identifying vulnerabilities, risks and adaptation options, can be quite different than that required to appraise identified options and to establish priorities for implementation. The latter are informed by established criteria that can be quite specific to the risks considered, assessment and the desired outcomes. There are also questions as to the nature of the information needed to evaluate adaptation options post implementation – informed through identified objectives, and related to triggers and indicators that would signal the need to change. These information needs are also dependent on the scope of the adaptation measures being considered. These measures can range from strategic and policy, technical and structural, to non-technical and non-structural (e.g., building capacity to identify, implement and evaluate). Understanding the nature of, and delivering, the information required to support these different strategies is important.

The need to have decision-relevant information is most obvious when considering the evidential requirements associated with assessing the different types of climate risks and required adaptation measures. Response measures targeted to enhance coping capacities and that are introduced following the occurrence of an extreme event (e.g., flooding, wind events and heat waves) or failure of existing capacities, are traditionally focused on understanding the particular event, focusing on a limited area (potentially with broader implications), associated consequences and the required capacities, all in light of risk tolerances. By contrast, response measures targeted at enhancing capacities to deal with projected future risks often consider changes over a longer period of time. The information needs, reflecting the complexity of the decisions required, can be quite complex. Information on long-term changes and variability (including extremes) all need to be considered. The intention is not only to cope, but to adapt.

Further pushing the need for more decision-relevant information is the nature of adaptation measures that are being considered. Adaptation to extremes and long-

term changes may require looking beyond coping and introducing transformation and transition adaptation measures. In addition, where uncertainties and vulnerabilities are high, decisions may require the introduction of incremental (i.e. adaptive management) and /or robust adaptation measures. In all these cases, the information required is that to support the decisions to be made and their implementation. In the cases where uncertainties, vulnerabilities and the potential for conflicts related to the proposed options are high, the information (evidence) must be specifically decision-relevant. This means being tailored and constructed, including in breadth, and spatial and temporal resolution, so as to inform and support the related decisions and their implementation.

These demands for information are being made by people; communities and private, public and third sector organisations and agencies with wide spectra of perspectives, processes and goals. In addition, existing capacities and the ability to build the required capacities vary considerably across and within the different decision and policy making communities. These spectra are reflected in the demands and therefore should be included in considering what information and data is supplied.

To be decision-relevant also means that there is a need to understand the nature of the available information (assumptions and limitations) and how it can (and should not) be used. As demands become more sophisticated, the requirements for supportive information become more critical. These requirements are particularly acute considering the nature and scope of those seeking to use the information, differing capacities and perspectives, and different decision and policy making processes.

There will always be the demand for accurate information, but suggesting that adaptation decisions require accurate information and data is a misnomer. Decision relevance and an understanding of the nature (assumptions and limitations) and confidence in what is available are critical measures of the quality of the information. But quality information alone will not necessarily result in appropriate adaptation decisions. Processes that recognise that there are uncertainties and that integrate those uncertainties into decision making processes are the real needs. As such, the demand is for a clear and decision-relevant interpretation of the uncertainties in the information and data available, along with clear and transparent statements regarding assumptions and limitations and what these mean in terms of use. It is argued by both decision makers and adaptation practitioners that these interpretations and statements do not exist and represent

an urgent research requirement involving providers and users of information, as well as decision-making experts.

How are these demands changing and how do these changes affect that which is provided?

The changing scope and nature of adaptation measures and strategies that are being considered and that will be considered are (or should be) changing the demands for supportive information and data. The fact that adaptation, for many, is seen as a continuous learning / improvement process also suggests that these demands will continue to evolve.

As such, with the goal of informing decision and policy processes, demands for information are varied and, based on experiences, they are also changing / evolving as experience with adaptation evolves, the purposes for which the information are required evolves and the scope of those requiring information broadens. In the first instance, adaptation has moved from primarily identifying adaptation options that address a specific risk or pressure to identifying and appraising adaptation options that involve the potential for synergies and conflicts across dependent systems and communities. These are increasingly complex systems with multiple dependencies and interactions. These changes in scope with time are evident in many of the studies included within the IPCC (from the FAR to the AR4) and in most of the studies presented on the UKCIP website (earlier scoping studies to more recent case studies).

To be supportive within such a changing decision-making environment, the nature and scope of the information provided cannot be static, but must continue to evolve to remain informative and relevant.

How should suppliers respond to these demands?

Offering information that both responds to the demands and maintains scientific credibility is challenging. It requires extracting value from the information and data that is available to inform the required decisions and their implementation. It often means innovations both in terms of the information offered and in the decision and policy making processes which that the information supports. In the context of climate information, it means that descriptions of the climate, although necessary, are often insufficient to meet the requirements. The supply should not solely determine the demand for information nor should the supply solely determine decision and policy making processes.

More information is not necessarily better (more informative) information. More information and particularly data can actually confuse and act as a barrier to

decision making. In addition, those requiring access to information can become mesmerised by the numbers and abundance of information. Like those supplying, they can end up focusing on understanding the climate rather than focusing on extracting, from what is available, that information needed to inform, deliver and support decisions.

This potential for confusion would suggest that there is a need to understand what and how information can contribute to decisions and policy making, and to be able to clearly articulate that understanding. Does this capacity exist and if so, is it supported? Considering what is at risk with the existing adaptation deficit and as a result of projected climate changes, supporting effective use of information requires some attention.

This also suggests that the information provided should be informed by an understanding of the decision and policy making processes, what they are affecting (or trying to affect) and the desired outcomes (i.e. informed by the demand). With this goal in mind, the responsibility for provision of decision-relevant information is a joint responsibility involving both the providers and users of that information. This includes users (those requiring information) needing to have and being able to articulate a clear understanding of: the different means of affecting the desired outcomes (the processes and the different approaches therein); who is making and implementing the decisions; the evidence that is needed to support the decisions; and their implementations and the desired outcomes. It also includes those supplying the information to be able to listen to, and interpret, these requirements; to be able to look beyond traditional information and data presentations; and to have the capacity to deliver alternative and innovative information solutions.

How best to inform what is provided?

Experience within the UK Climate Impacts Programme is that sustained and informed engagement of users and providers can go a long way towards delivering decision-relevant information. The requirement is more than consultations and providing opportunities for feedback. These are part of what is required, but by themselves will have limited benefit if the goal is provision of decision-relevant information. This is particularly the case when the supply and demands for that information are rapidly changing or suddenly change (new projections) and when we need to learn by doing (supplying and using information to support decisions and their implementation).

At what point is the information provided acceptable / not acceptable and what determines that point? Informed and sustained engagement can help in defining

acceptability and identify what characteristics of the information (e.g., hierarchical or tiered information) are desirable. An example of where these benefits have been realised is the engagement associated with the development of the UK Climate Projections 2009 (see https://ukclimateprojections.defra.gov.uk) in which a number of mechanisms have been used to engage users and providers in the development of the information provided, its dissemination and its continued evolution.

Making information available / accessible is necessary, but is insufficient if the goal is to continue to supply decision-relevant information to support adaptation. There is a growing recognition that supported mechanisms and capacities that can facilitate the necessary engagement, promote the required understanding, and develop and support the provision of decision-relevant information are essential.

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