SDC Observatory Brief:

Bringing climate services to policy makers and affected people

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Lead

Although the provision and quality of climate information is improving, this is not yet being matched by its inclusion in decision-making to support climate resilient development and adaptation planning. This is largely due to a supply-driven model, which does not place enough emphasis on the necessity to understand user needs. Climate services aim to address this by bridging the gap between climate information providers and users. Focusing on the user interface this brief introduces the diverse sector of climate services, and notes three important cross-sector challenges and opportunities moving forward.

The need for climate services

As the world increasingly feels the effects of climate change the demand for climate information is increasing. Access to such information has the power to enhance resilience and adaptation to climate change impacts, whilst at the same time making progress towards development trajectories. However, information provision and access alone is not sufficient to ensure that this information is used effectively.

In recognition of the need to improve the use of climate information in decision-making the past four years have seen an increasing number of global, European and national efforts to spur the development of climate services. Examples are the Global Framework for Climate Services (GFCS)[1] of the World Meteorological Organization (WMO), the US government-led Climate Services for Resilient Development[2], the Climate Services Partnership (CSP)[3] and the JPI European Research Area for Climate Services (ERA4CS)[4].

Climate services go beyond the basic provision of climate information to supporting the use of that information in decision-making based on the needs of the users. They involve the collection, generation and, importantly, the *transformation* of high-quality past, present and future scientific information about the climate system into tailored “products” and guidance that support the needs of specific individuals and organisations to make informed, ‘climate-smart’ decisions (Street, 2016). These services aim to reach a wide variety of users, each of which have different information needs and capacities to use that information. Detailed examples of users at the community and municipal level are provided in Box 1. For examples of climate services users, intermediaries and providers see Table 1.

[1] http://www.gfcs-climate.org/
[2] http://www.cs4rd.org/
[3] http://www.climate-services.org/
[4] http://www.jpi-climate.eu/ERA4CS

Box 1: Examples of the need for climate services

Smallholder farmers: In developing nations subsistence and smallholder farmers used to be able to rely on traditional knowledge and environmental indicators to decide how to manage their crops. However, increased variability in rainfall in recent years has in many places disturbed these cycles, contributing to local food insecurity and increasing the vulnerability of these communities. In order to plan which crops to grow, the right timing for planting, and to make the most of any opportunities such changes may bring, they need access to *reliable* weekly to seasonal information on *relevant* variables such as rainfall and soil moisture that they can readily understand and act upon. To support the uptake and use of this information, it needs to be highly contextualised in that it captures *local* climate trends and its interaction with other variables such as socio-economic trends, local knowledge etc, and provided in a format that is *accessible* to people (including those of low literacy) and is *useable* in that it fits with current knowledge systems (combined with traditional knowledge, for example).

Urban planners: To take an example at the municipal level, an urban planner for a fast-growing city needs to plan for big changes in development pathways and climate trends on timescales of 5-40 years. They need to know how climate is expected to change, how this will affect their infrastructure, who and what will be impacted now and in the future given current rates of growth and development, and whether planned infrastructure developments will withstand future climate change. They need access to information that they trust, that is *relevant* to their needs, and that is available in an accessible format. They may also need support to understand the *uncertainty* associated with the information, and what this means for their decision-making systems (combined with traditional knowledge, for example).

Table 1: Examples of users and providers of climate information

Users	**Intermediaries**	**Producers/Providers**
National Government (e.g. for National Adaptation Planning, sector development planning, infrastructure planning, civil protection, predicting and addressing migration).	International and Non-Government Organisations	National Hydrological and Meteorological Services (NMHSs)
Municipal Government (e.g. for water resources management, urban planning, disaster risk reduction).	Private sector consultants	Government ministries other than NHMSs
Private sector (e.g. in risk analysis of supply chains, adaptation planning).	Academic and research institutes	Academic and research institutes
Farmers/Agriculture sector (e.g. for crop planning, land management, choice of agricultural techniques).	Community-based organisations and extension services	
Communities (e.g. for disaster preparation, protecting productive assets, improving local enterprises).		

Climate services: A growing sector

To meet these challenges and the diverse needs of climate information users an array of activities are developing under the label of 'climate services'.
At the user interface these actions broadly consist of activities that focus on (i) the discovery of user's needs to inform climate services design; (ii) provision of tailored climate information, (iii) capacity building for the understanding and use of climate information; (iv) greater user-provider interaction, both to enhance mutual understanding and trust-building, and for the joint or 'co-production' of climate information that meets the user's needs; and (v) institutional strengthening for the sustained provision of quality climate services.

These activities aim to 'bridge the gap' between climate information users, such as the farmers and urban planner described in Box 1, and climate information providers. They also form part of a value chain that links climate modellers, analysts and forecasters, with intermediaries who 'transform' this climate information into knowledge for end users, with value measured in the usage of the climate information by the user (Figure 1; World Bank, 2016).

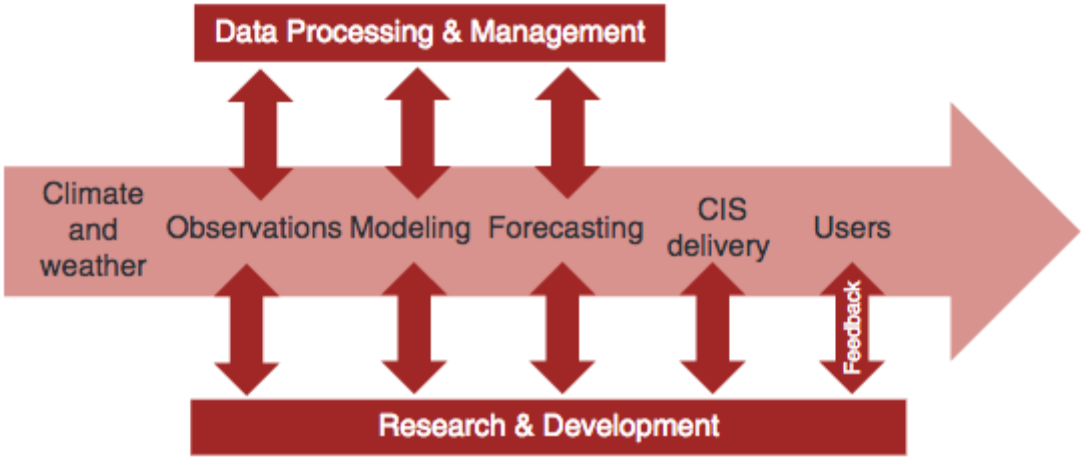

Figure 1: An overview of the climate services value chain from the World Bank Group Report on Climate Information Services (CIS) in Kenya (2016). Activities at the user interface, such as those described above and illustrated in Figure 2, enable improved delivery of climate services and feedback from users, and are thus key for the uptake and use of climate services at the end of the value chain.

NGOs and development organisations are increasingly playing a role in the delivery of climate services, acting as intermediaries between climate information providers and users facilitating an improved understanding of user needs to inform the design of climate services (Figure 2).

At the local level ongoing resilience- and capacity-building initiatives with smallholder and subsistence farmers include the use of Participatory Scenario Planning in CARE International's Adaptation Learning Programme[5] for Africa, and the Participatory Integrated Climate Services for Agriculture (PICSA) approach[6] that couples climate, crop, livestock and

[5] http://careclimatechange.org/our-work/alp/

[6] PICSA was co-developed by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and the Walker Institute at the University of Reading: http://www.walker.ac.uk/projects/participatory-integrated-climate-services-for-agriculture-picsa/

livelihood information with tools that farmers can use to decide the best options for them. In the PICSA approach, long-term historical climate data in combination with seasonal forecasting models is used to provide farmers with seasonal forecasts and warnings. Both of these examples use a participatory framework that captures user needs and tailors locally relevant climate information combined with local knowledge, agricultural services and participatory decision-making to support small-scale farmers to plan for the future. Initiatives such as these are building mechanisms to disseminate this knowledge through training local intermediaries (namely NGOs and local government officers) to train others in the use of climate information, particularly those already involved in local extension services. PICSA attempts to integrate such training into the curriculum for agricultural extension officers through "Training for Trainers" workshops[7], for example.

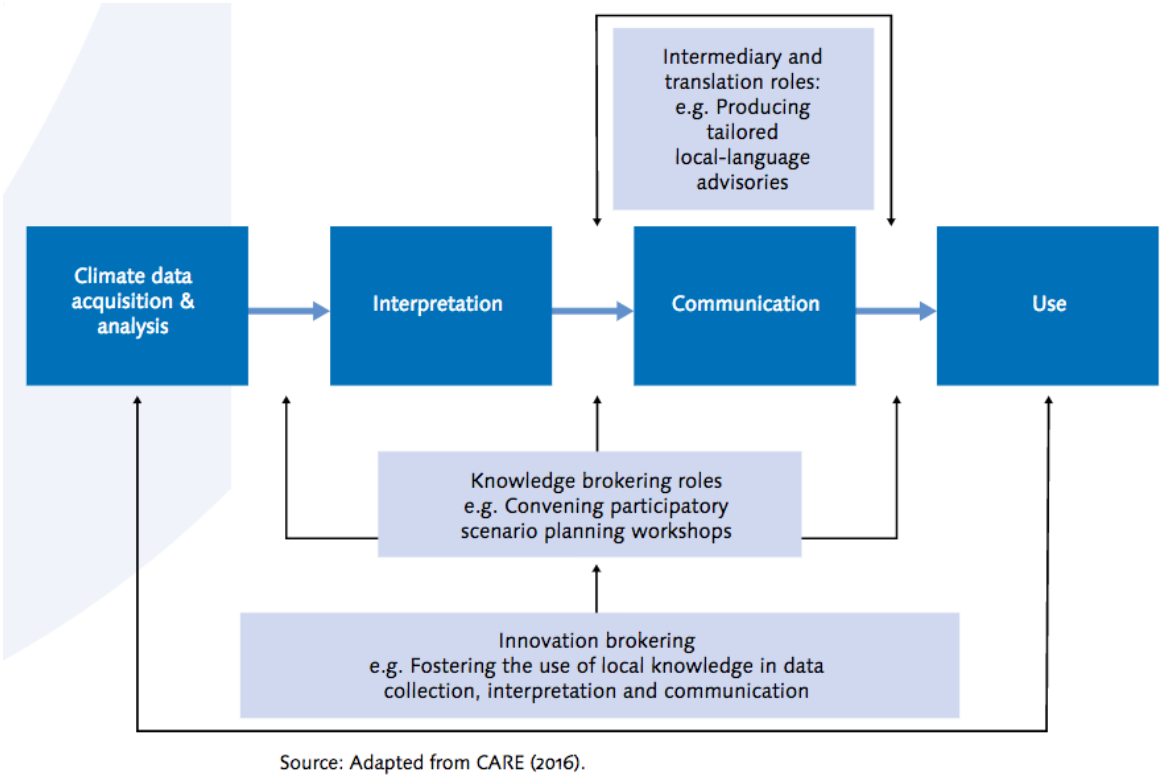

Figure 2: The role of NGOs in delivering climate services, from Jones et al. (2016). This figure highlights activities by provider-user intermediaries in enhancing the delivery of climate services and in obtaining and utilising feedback from users both to inform the acquisition and analysis of climate data (for example, which meteorological factors are most useful, and over what timescales), and the design of the delivery of climate services (for example, what platforms are most used by users).

At the municipal to national level NGO-convened stakeholder workshops are increasingly being used to facilitate communication between information providers and users, supporting interaction that allows users to ask what particular climate trends and uncertainties mean for their decision-making, and enables providers to explain the constraints on the information they can provide (Steynor et al., 2016). These workshops support the 'co-exploration' and

[7] Several such "Training of Trainers" workshops were undertaken last year, organised jointly by CCAFS and the WFP as part of the Global Framework for Climate Services (GFCS) Adaptation Program in Africa: https://ccafs.cgiar.org/blog/how-training-trainers-helps-reach-farmers-participatory-climate-information-services#.WDWL96KLS9

'co-production'[8] of climate services to collectively meet users needs and identify opportunities for improvement in information provision. This can be a powerful mechanism for generating trust and a foundation for long-term communication between decision-makers and information providers. Examples of this co-exploration/co-production approach include workshops convened for the Future Climate For Africa[9] programme, where a mix of academics, government officials, disaster risk reduction practitioners, climate impact modellers and climate scientists were brought together and collectively worked through a place-based, multi-stressor vulnerability analysis onto which layers of climate data were integrated to inform decision-making (further details of this approach can be found in Steynor et al., 2016).

Pressing challenges and opportunities

Innovative participatory activities at the user interface such as those described above aim to transform decision-making processes and increase resilience across levels. But to be effective they require credible climate information that caters to user needs. In developing countries many National Hydro-Meteorological Services (NHMSs) are struggling to meet current demand for climate and weather data, with many installed air and surface weather stations failing to report data (Snow et al., 2016). In many instances, these activities are also stretching these institutions to and beyond their capacity in terms of both human and technical resources (Jones et al., 2016).

In addition to exposing the need to build the capacity of NHMSs this disconnect between information requirements on the ground and the capacity of providers to meet them highlights the need for both **institutional strengthening and coordination of all activities in the climate services value chain**. Effective coordination of efforts is also necessary for delivering climate services at scale without duplicating efforts, which is particularly important given the restricted financial and human resources and weak institutional mechanisms/governance structures of developing countries. Such coordination requires an active dialogue and sharing of information on activities relating to climate services, increased scrutiny and planning of future project proposals, and clear strategies for the development of regional and national climate services, including the roles played by NHMSs, NGOs, government and funders in their delivery (Jones et al., 2016).

Central to institutional strengthening is the need for **investment in and sustained funding of NHMSs** in order to gain the credible climate information required by users. The European Roadmap for Climate Services and UNDP's Climate Information for Resilient Development in Africa (CIRDA)[10] programme, which focuses on strengthening climate information and early-warning system services in developing countries in Africa, both advocate and have laid out plans for enhanced engagement with the private sector to drive investment and innovation in NHMSs (Street, 2016; Snow et al., 2016). For Africa in particular this could be transformative, but "will require buy-in, leadership and persistence from Africa's leaders,

[8] The co-production process is a collaborative knowledge production process that results in social learning, and is therefore a shift away from more traditional knowledge production where experts create knowledge for 'users'.
[9] http://www.futureclimateafrica.org/
[10] CIRDA is four-year programme supporting work in 11 African least developed countries: http://adaptation-undp.org/projects/cirda

continued discussion by thought leaders and knowledge brokers, and flexibility, adaptability and humanity" (Snow et al., 2016).

The **scaling-up of climate services and capacity building** at the local level presents a particularly difficult challenge, but if addressed could see significantly improved climate-resilient development, adaptation planning and wellbeing. In developing nations, where many rural communities are geographically isolated, providing equitable access to information alone remains an issue. However, where they can be supported, information and communication technologies (ICTs) hold huge potential for the scaling-up of climate services interventions. A significant and growing percentage of farmers own mobile phones, providing them with access to ICT-based agricultural services such as WeFarm's[11] SMS-based peer-to-peer question and answer system and the Haller Farmers App[12], which are empowering individual farmers to increase their own resilience through access to tailored information and guidance. Such systems can complement and expand on more traditional extension services, the use of radio and structured decision-making approaches such as PICSA. Furthermore, platforms which crowd-source information such as WeFarm allow two-way interaction, enabling users to ask questions and provide feedback on their services, further elucidating user needs. Realising this potential requires significant investment in and expansion of communications infrastructure, though this comes with additional benefits that can enhance resilience, such as access to microfinance initiatives. This new source of information on user needs also requires further analysis, where farmers are not just users of climate information, but are also providers. Insights from such analysis would provide much added value to the any feedback channels developed between users and providers, potentially influencing the type and format of information produced. However, the future provision and continued operation of such services also hinges on funding, further highlighting the need for sustainable financial flows for the implementing organization(s).

Concluding remarks

The integration or mainstreaming of climate information into decision-making is crucial to reduce climate risk and inform climate-resilient development. To be effective, this information must be timely, credible and trustworthy, and must be responsive to user's needs in terms of scale, legitimacy, saliency and usability i.e. through a holistic and integrated approach, it must take into account the context in which the user makes decisions.

Climate services is a fast-growing sector and a multitude of activity is underway to achieve the above. However, in order to deliver effective climate services as broadly and efficiently as possible the activities of funders, NHMSs, governments and implementing organisations need to be coordinated. The development and integration of activities into plans for the development of national services is thus key, and presents an opportunity for development organisations to engage at the national level. To sustain the provision of climate services these plans need to additionally consider and lay the groundwork for future funding mechanisms, particularly the opportunities presented by private sector investment.

[11] http://wefarm.org/
[12] http://www.hallerfarmers.org/

The future development of mobile technology in combination with on-the-ground partnerships offers great potential for capturing user needs and delivering climate services at scale, and could be used to support and increase the reach of 'traditional' knowledge and approaches. However, a lack of communications infrastructure means that many of the most vulnerable populations do not yet have access to ICTs. And, whilst investment in this sector could be transformative in aiding the delivery of climate services and other services that enhance the resilience of individuals other methods of communication and up-scaling also need further research.

Further Reading

Street, R. B. (2016) Towards a leading role on climate services in Europe: A research and innovation roadmap. Climate Services 1, p. 2–5.

Steynor, A, Padgham, J., Jack, C., Hewitson, B. and Lennard, C. (2016) Co-exploratory climate risk workshops: Experiences from urban Africa. Climate Risk Management Volume 13, 2016, p. 95–102.

World Bank (2016) Climate Information Services Providers in Kenya. Agriculture Global Practice Technical Assistance Paper. World Bank Group Report Number 103186-KE. The World Bank: Washington, USA.
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http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2016/02/23/090224b0841a389f/1_0/Rendered/PDF/Climate0inform0s0providers0in0Kenya.pdf

Snow, J. T., Biagini, B., Benchwick, G., George, G., Hoedjes, J., Miller, A. and Usher, J. (2016) 'A New Vision for Weather and Climate Services in Africa'. UNDP: New York, USA.
Sourced from:
http://www.undp.org/content/dam/undp/library/Climate%20and%20Disaster%20Resilience/WeatherAndClimateServicesAfrica.pdf?download

Jones, L., Harvey, B. and Godfrey-Wood, R. (2016) The changing role of NGOs in supporting climate services. BRACED Resilience Intel. Issue no. 4. BRACED Knowledge Manager, Overseas Development Institute: London, UK
Sourced from:
https://www.odi.org/publications/10560-changing-role-ngos-supporting-climate-services

Additional Resources

Taylor, A. (2013) Using climate information to support adaptation planning and policy-making: A step-by-step guide. On weADAPT, the Collaborative Platform on Climate Adaptation.
Sourced from: https://www.weadapt.org/knowledge-base/using-climate-information/guide-to-using-climate-information

The guidance is accompanied by 2 case studies:

Taylor, A. (2013) Using climate information to support adaptation planning and policy-making: A case study in Cape Town, South Africa.
Sourced from: https://www.weadapt.org/knowledge-base/using-climate-information/using-climate-information-case-study

Taylor, A. (2013) Using climate information to support adaptation planning and policy-making: A practical case study in Bagamoyo District, coastal Tanzania.
Sourced from: https://www.weadapt.org/knowledge-base/using-climate-information/tanzania-using-climate-information-case-study

Taylor, A. (2012) Developing regional climate change messages using multiple lines of evidence. On weADAPT, the Collaborative Platform on Climate Adaptation.
Sourced from: https://www.weadapt.org/knowledge-base/using-climate-information/regional-climate-change-messages

The Climate Knowledge Brokers (CKB) Group "is an emerging alliance of leading global, regional and national knowledge brokers specialising in climate and development information… Its goal is to improve access to climate information by coordinating and orchestrating the efforts of climate knowledge brokers." CKB are currently developing online modules to develop the capacity of climate knowledge brokers and intermediaries. These will be published on the website in due course.
Website: http://www.climateknowledgebrokers.net/

The Using Climate Information theme on weADAPT provides a resource base for topics related to climate services, including some basic climate science background, guidance for understanding and using climate data, insights for effectively communicating climate change, research and examples of how climate information can be integrated into decision-making across levels, and knowledge for the design, implementation and evaluation of effective climate services.
Website: https://www.weadapt.org/knowledge-base/using-climate-information

Annex: Examples of climate services

Contextualised information	**Related services**
● Immediate and short-term weather forecasts ● Seasonal forecasts ● Longer-term climate projections ● Early warning systems ● Information on past, current and future climate trends	● Advisory services (e.g. economic analyses, seed and technology developments, disaster preparation) ● Training on best practices (e.g. land preparation, crop selection, the timing of fertilizer application) ● Climate impact analysis (e.g. climate impact on agricultural productivity) ● Projections of impacts (e.g. disaster risk assessment, future water resources) ● Financial services (e.g. insurance and pre-disaster funds to support preparation)