

Developing decision-relevant climate information and supporting its appropriate application:

Learning from the Zaman Lebidi BRACED consortium in Burkina Faso and collaboration with AMMA2050



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Before the storm in the outskirts of Ouagadougou, April 2017 Photo: Camilla Audia

Introduction

In the Sahel thousands of farmers and pastoralists suffer from poor advisory services, including access to climate information to effectively support livelihood decision-making. Strengthening resilience to climate extremes and disasters through improving the reliability, relevance and communication of climate information is one of the four core aims of the BRACED consortium project, Zaman Lebidi (See Box 2).

Burkina Faso regularly experiences natural disasters, the most frequent of which are floods, high winds, locust attacks and droughts. These disasters are increasing the population's vulnerabilities, depleting them of the resources to invest in preparing for and coping with ongoing and potential future shocks. Thousands of farmers and pastoralists have poor access to climate information that could effectively support livelihood decision-making. To address this gap, a key aim of the BRACED consortium project, Zaman Lebidi, is to strengthen the provision of reliable, timely, relevant climate information for

the more than two million people in the Northern, Central North, Central Plateau and Eastern regions of Burkina Faso.

This policy brief synthesises consortium learning about the processes and partnerships required to develop climate services which can best support those people whose lives and livelihoods are directly impacted by climate risks. It outlines how a collaborative workshop between Zaman Lebidi and the climate science research project AMMA2050 provided a shared learning experience for both researchers and decision makers, considering how climate information can concretely support local decision-making processes in both urban and rural contexts. This collaboration not only strengthened decision makers' awareness about currently available and proposed future sources of climate information, it also heightened climate researchers' awareness of the issues involved in providing climate information which can effectively support decision makers.

Box 1: Definitions

Climate information is here used to encompass weather and climate, considering information over both short- and long-time frames.

Climate Information Services (CIS) are the development and delivery, with key stakeholders, of accessible, timely and relevant weather and climate-related information that can support decision making across timeframes, sectors and livelihoods (Kniveton et al (2016)).

Co-production is the bringing together of different knowledge sources and experiences from across different disciplines, sectors and actors to jointly develop new and combined knowledge. (KCL policy brief 1, 2, 3)

Downscaling are scientific techniques for translating climate information provided at one scale (such as national or regional) to smaller, more local scales. (Kniveton et al (2015)).

Climate information intermediaries are those individuals and organisations who are prepared to receive weather and climate information to (a) inform planning within their own organisations, (b) share this through their existing networks and partners, and (c) collate feedback on how climate information has been used and the ways in which it can be improved to better support the climate information requirements of specific user groups. (Kenya Meteorological Department (2014)). To ensure sustainability and support integration within ongoing planning, efforts are focused on strengthening the capacities and networks of existing intermediaries rather than creating new 'boundary organisations'. (World Bank GFDRR (2016), Graham et al (2016)).

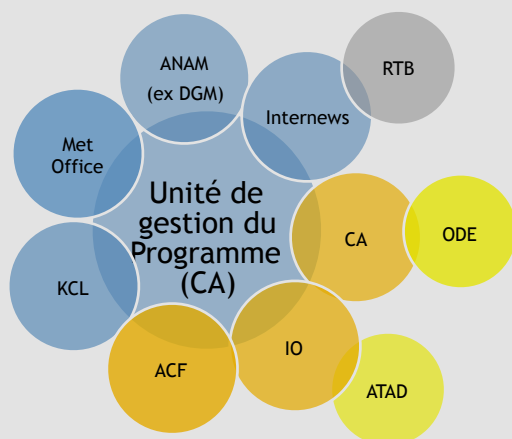


Diagram 1: Partners in Zaman Lebidi include Christian Aid (CA), which coordinates the consortium, and Action Contre la Faim (ACF), Alliance Technique au Développement (ATAD), Oxfam Intermon (IO), Office de Développement des Églises Évangéliques (ODE), Agence Nationale de la Météorologie (ANAM formerly known as Direction Générale de la Météorologie (DGM)), the Met Office, King's College London (KCL), InterNews and Radio Télévision du Burkina (RTB).

Box 2: The Zaman Lebidi project

The BRACED Consortium project in Burkina Faso, Zaman Lebidi - a term combining the country's principal languages and which means the 'changing world' - aims to benefit 1.3 million people in the four provinces of Sanmatenga, Passoré, Gnagna and Namentenga. It is coordinated by Christian Aid and engages the Burkina and UK Met agencies, national and international development and media partners and research institutions (see Diagram 1). The project seeks to strengthen resilience to climate extremes and disasters through (1) improving the reliability, relevance and communication of climate information, (2) strengthening livelihood options, (3) building the capacity of local actors and (4) informing policies through research, training and advocacy.

Zaman Lebidi's strategy for communicating climate information and supporting its effective application within decision making to support vulnerable communities

Co-producing and supporting appropriate use of decision-relevant climate information is a process involving a wide range of actors and relationships. The approach adopted by Zaman Lebidi includes:

- a) strengthening the technical and communication capacities of the national meteorological agency, Agence Nationale de la Météorologie (ANAM);
- b) developing the technical and journalistic capacities of local community radios to address climate risks within regular programming;
- c) building common ground and supporting opportunities for ongoing learning between the providers and users of climate information; and
- d) reinforcing the integration of climate information within local early warning decision making bodies and processes.

This approach highlights the value of ensuring channels for ongoing dialogue between the providers and users of climate information, enabling regular review to assess how climate information is supporting those people most directly affected by climate risks and what improvements can be made to enable the information to better support specific



ANAM-led training on using manual rain gauges (Passoré, 2017). Photo: Frédéric Tankoano

decision making processes.

The key steps undertaken to carry out this strategy are elaborated below.

a) Strengthening the provision of decision-relevant climate information

Historically, communication of weather and climate information in Burkina Faso has been difficult. While the ANAM provides short-term forecasts, the 'current station network, data management, human capacity and IT-infrastructure are not sufficient to acquire satisfactory and precise data for medium and long term forecasting and planning'. While ANAM directly engages with local users via their roving seminars, which encompass training on interpreting probabilistic seasonal forecasts, staffing requirements make it hard to scale up this approach. Lack of community engagement, institutional instability, insufficient national funding and reliance on external funding have been identified as amongst the factors contributing to low integration of climate information within decision making.

- The UK Met Office has been undertaking a number of activities to strengthen the provision of national climate services, while ensuring that the workload for ANAM remains realistic and that the services developed are sustainable. Activities undertaken or proposed include:
- Providing ANAM with guidance on how to

develop post-event analysis reports. These examine the conditions which led to damaging weather or climate events, assess impacts, and evaluate actions taken by institutions and communities before, during and after the event. These reports help to improve understanding of how such events affect communities, inform responses to future events and, over time, assess if national met services and other actors' interventions are having their intended impact on improving responses and reducing losses. This guidance will help ANAM develop improved post-event analyses for the 2017 rainy season. These could provide the Burkinabe government with an evidence base illustrating the socio-economic benefit of ANAM's work.

- Recognising that routine verification of forecasts is crucial to assess their reliability, improve accuracy and build trust with users, the UK Met Office has provided verification training to ANAM. This involves checking if a forecasted event has indeed happened against both the observations of local weather stations or rain gauges and satellite data. It also encompasses mathematically verifying the accuracy of externally generated models such as weather outputs from the UK Met Office or Météo France.
- Further training being provided in 2017 includes on-the-job **forecaster training** on how to make best use of the weather observations and model data routinely available to ANAM. In order to

link climate model outputs to more user-relevant local variables, such as crop yields or water levels, additional **climate change training** will encompass advanced use of the Climate Predictability Tool (CPT), a software package for constructing seasonal climate forecasts, and provide an introduction to the Providing Regional Climates for Impact Studies (PRECIS) tool, which enables downscaling (see Box 1, Definitions) of global climate change scenarios to geographic scales more relevant to national or provincial decision making. Due to UK Met travel restrictions, climate scientists from ANAM will undertake training at the UK Met Office in Exeter and UK Met scientists may also deliver training in a neighbouring country, such as Senegal.

To improve futures services, ANAM and the UK Met Office have analysed the climate information needs of a range of users and intermediary organisations via a workshop and a survey (see definition of Climate Information Intermediaries in Box 1). A UK Met Office consultant will, in 2017, be supporting ANAM to undertake guided user interviews designed to strengthen ANAM's understanding of users' decision-making processes and their associated timescales through detailed requirement gathering.

UK Met Office consultants are also working to assess and improve ANAM's communication channels (notably via work with local radios) and trial a radio programme, containing user-relevant climate information in a compelling story-telling form, to test if this potentially scalable format improves ANAM forecast accessibility.

A jointly-developed pilot forecast product has been adapted for the agro-pastoral sector. User trials will be carried out and feedback integrated into the finalisation of the product in order to ensure that it can be easily interpreted and used to by agro-pastoralists, when making decisions about farming.

b) Enabling access to relevant climate services for those people whose lives and livelihoods are most impacted by climate-related risks

Recognising the significant use of community radios by rural populations, Internews is using a decentralised approach to engage local radios to broadcast climate information combined with local knowledge and livelihood advisories. Work with local radios has included undertaking technical and institutional assessments of the journalistic capacities of community radio staff and programme

content and coaching and accompaniment of staff to strengthen the approach to climate-related risks to local livelihoods.

Internews has been working with local radio stations, helping them to produce quality programs that are directly linked to local needs and that recognise the value of local knowledge and expertise. Introducing the concept of resilience to climate risks in the community radio programs was accompanied by a technical reinforcement of the radio stations' capacities to reach the project's target audience of farmers, livestock owners and community-based organisations. Steps were also taken to highlight the need to focus on reaching female audiences, given women's greater vulnerability to climate extremes and their current and future role in enhancing resilience (See Learning Papers 4 & 5).

Ultimately, project implementation has demonstrated that it is possible to establish partnerships for the production of climate programmes with community radio stations without imposing excessive burdens on the stations.



A member of the Souré village Early Warning Committee reading the manual rain gauge (Passoré, 2017). Photo: Frédéric Tankoano

Box 3: Zaman Lebidi Climate Information strategy

Project implementation has highlighted the necessity of developing a climate information communication strategy that enables all actors involved in the process of production, communication and use of climate information in connection with agro-pastoral resilience activities to better coordinate and harmonises actions to achieve a real change in living conditions and behaviour. The project has sought to employ approaches that result in sustainable climate services provision and are able to support decision making processes at both local and national levels.

The objectives of the BRACED climate information communication strategy are to:

- Harmonise communication of climate information among the various BRACED partners;
- Identify the best conventional and innovative channels for communicating climate information;
- Define the roles and responsibilities of the actors involved in the communication of climate information; and
- Define an operational plan and identify the mechanisms to ensure the sustainability of the system.

The communication of climate information is articulated around four main axes, namely:

1. Production of climate information by ANAM;
2. Transformation of the content of ANAM forecasts messages into national languages employing non-technical terminology. It is in this context that Internews has developed the Lexicon of Words and Weather Terms which includes a repository of SMS abbreviations (see further section c below);
3. Communication of climate information via conventional media (radio, TV and print) and innovative media (SMS / IVR and web social platform);
4. Developing a monitoring and evaluation mechanism which supports the sustainability of the climate information communication system.

c) Building common ground and supporting opportunities for ongoing learning between the providers and users of climate information

As part of the learning agenda, in 2016 KCL and Zaman Lebidi partners coordinated a workshop on communicating climate information. For many operational partners, the workshop provided a first opportunity for direct interaction with ANAM. Participants found the workshop useful in contributing to:

- Developing a shared understanding of the process of developing and communicating decision-relevant climate information. Prior to the workshop, most participants understood communication as the one-way transmission of information but identified it as a two-directional exchange process after the workshop.
- Clarifying the respective roles of project partners in developing decision-relevant climate information. It heightened recognition of the importance of engaging extension services to work with forecasts to develop locally-relevant agricultural and livestock advisories; and
- Strengthening partners' understanding of ANAM climate information products as well as their capacities to appropriate employ and communicate the probabilistic nature of climate information.

Internews lexicon provides 517 words and weather terms in non-technical French, Moore, Gulimancéma, Fulani and English (<http://internews.org/resource/lexicon-weather-terms-burkina-faso>). The first of its kind in the Sahel region, this resource aims to make meteorological information more understandable so that farmers, livestock owners and other decision makers can make appropriate decisions to strengthen their resilience to the effects of climate variability, extremes and change. The lexicon is a result of collaboration with Welt Hunger Hilfe/Self Help Africa (which lead the other BRACED consortium in Burkina Faso), ANAM, the National Centre for Scientific and Technological Research/ Centre National de la Recherche Scientifique et Technologique (CNRST) and the National Council for Emergency Assistance and Rehabilitation/ Conseil National de Secours d'Urgence et de Rehabilitation (CONASUR). The UK Met Office's incorporation of terms in English also enables the lexicon to be used in English-speaking countries. This output is the result of cross-project, cross-sectoral BRACED programme collaboration, engaging partners from local, national and international research centres, technical services and partnering development agencies.

Proposed plans for strengthening access to climate information include the development of an SMS/ Interaction Voice Response (IVR) platform (See Box 4). To support communication through this type of platform, the lexicon contains SMS abbreviations

of key terms, as well as reference information on regional temperatures and Sahelian seasons.

The resource has been well-received by a range of 'intermediary' organisations, including journalists, decentralised government services and local leaders (see Box 1, Definitions). The next step is to strengthen capacities to use this resource to support effective communication and promote understanding about the ways in which climate information can enable decision makers at all levels to better manage climate risks.

d) Supporting appropriate application: integrating climate information within local decision making

Burkina Faso has had a national multi-hazard disaster preparedness and response plan in place for since 2009. This recognises the importance of developing regional and communal contingency plans. Yet, disaster risk agencies currently 'do not have the capacity to interpret, simplify and relay technical, meteorological and climatological information and alerts'.

Zaman Lebidi has been undertaking efforts to strengthen integration of climate risks within decision making at both national and local levels. At national level, the consortium has been undertaking advocacy with the Ministries of Finance and Development, as well as working with other ministries, to integrate contingency planning within communal development plans and ensure budgetary allocations to enable their implementation. At a local level, Zaman Lebidi has been working in collaboration with CONASUR (National Council for Emergency Relief and Rehabilitation) to support communes in the areas of project focus to develop communal contingency plans which enable a co-ordinated response. This collaboration supports the whole process of developing the plans, including: the development of tools, training of enumerators, data collation, and drafting and communal validation of the plans.

Recognising the benefits of learning from complementary approaches and areas of expertise, in February 2017, Zaman Lebidi and AMMA2050 (see Box 5) held a collaborative workshop in Ouagadougou, designed to create a shared learning experience for researchers and decision makers to

Box 4: Communication of climate information via the SMS/IVR platform EcoData

The communication of ANAM's meteorological information is carried out through ESOKO's EcoData platform, which has signed a service contract with the consortia Zaman Lebidi / CA and Welthungerhilfe / Self Help Africa. A total of 1,200 climate information intermediaries (including but not limited to farmers and agropastoralists, journalists, State technical service agents, community leaders and craftsmen) in 43 districts of the geographic areas in which BRACED-activities are being undertaken receive ANAM daily forecasts and weather hazard alerts. Prior to the release of these forecasts by EcoData, Internews transforms the content and validates the messages. Internews trained the 1,200 weather intermediaries who receive daily forecasts in the encoding, decoding and use of the Lexicon of Weather Words and Terms. In order to measure the impact of the messages broadcast, EcoData and Internews will conduct monthly beneficiary feedback surveys. ANAM and EcoData have committed to ensuring long-term continuation of the System beyond the duration of the BRACED project.

Box 5: The AMMA2050 project

AMMA-2050 is a collaborative international project investigating how the West African monsoon is responding to the drivers of climate change and how this emerging scientific understanding can support decision making on the 5- to 40-year timescale. Bringing together scientists and policy makers from across West Africa and Europe, the consortium aims to increase understanding of the regional climate and how it will change, and apply that knowledge to practical development questions. The project is particularly focused on high impact weather events that significantly affect livelihoods (for example, flood-producing storms, crop-damaging dry spells) and using an expert judgement approach to evaluate the trustworthiness of projections of future change. While focused on the Sahel region, they have two pilot studies: one is supporting climate-smart agriculture in Senegal and the other addresses urban flooding in Ouagadougou. AMMA-2050 seeks to build ties between researchers and decision makers to strengthen the use of climate information. It recognises that to achieve this an understanding of the decision-making process is key to ensuring that relevant information in useable formats reaches the right people in a timely manner.

explore how weather and climate information can better support local government decision making. For participating early career climate scientists, the workshop provided a first experience to consider how their research could practically support decision makers' concerns (see Box 8).

The workshop brought together the approaches of Zaman Lebidi, focused on practical actions to build resilience in rural areas in the immediate future, with the research consortium AMMA2050's address of climate risks within medium-term decision making, which, in Burkina Faso, is focussed on addressing urban flood risks. The forum thus provided an important opportunity to draw together



Sand storm before the rain in Ouagadougou, 2014 Photo: Frederic Cazenave

expertise and understanding on opportunities for developing more integrated approaches to strengthening resilience across timeframes, sectors, contexts, decision making levels and livelihood groups in relation to differing weather-related hazards. It also afforded an opportunity to support inter-regional learning, with valuable participation from the AMMA2050 partners, the Senegalese Institute for Agricultural Research/ Institut Sénégalais de Recherches Agricoles), 2iE (International Institute for Water and Environmental Engineering) as well as the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL).

The forum was attended by more than 50 participants from across rural and urban communes, key ministries and technical services, research institutes and humanitarian and development agencies. The workshop employed the highly interactive Participatory Impact Pathways Analysis (PIPA) methodology (see Box 6) and was designed to support in-depth discussions on the structures, policies and processes of commune decision making, available sources of weather and climate information and the uncertainties inherent in future projections, and how this information can best support specific local decision-making processes. Workshop participants developed concrete plans for integrating weather and climate information in commune level decision making, aligned with the two ongoing projects (see Section e below) and, in evaluation feedback, participants reported that the forum was effective in improving their abilities to strengthen address of climate risks within their future work (see Box 7).

Box 6 - Participatory Impact Pathways Analysis (PIPA)

PIPA is an adaptable planning and monitoring and evaluation tool designed to help project partners make explicit their Theories of Change (ToC), in other words how they see themselves achieving their goals and having impact. The AMMA2050 project is using the PIPA approach as a tool for engagement, to explore the views of stakeholders and to identify other partners who could support the aims of the project. The approach involves bringing together several stakeholders, influencers and those that could support or be impacted by the project, through a workshop. Through the forum, participants are asked to share their vision for the project and collectively identify the key problems that it faces. In addition, participants develop a network map of actors who could influence its outcome by helping to overcome the focus problem, or determinant, which the project seeks to address.

The February 2017 workshop employed three inter-linked exercises from PIPA, namely problem tree analysis, output planning and stakeholder mapping (as illustrated in Figure 1). Through this process participants noted that the key problem for AMMA2050's pilot in Ouagadougou is low-level usage of climate information by policy-makers to inform development activities at a local level. From these discussion a collectively agreed 'action plan' was developed. This was then used to develop an Output Logic Model (OLM). This OLM is a description of the project's impact pathways, and a way to realise the project's ToC. Simply put: Who will be contributing to change? Why? And how will it be done?

e) Joint BRACED Zaman Lebidi – AMMA 2050 workshop outcomes: action plans and follow-up

Zaman Lebidi action plan

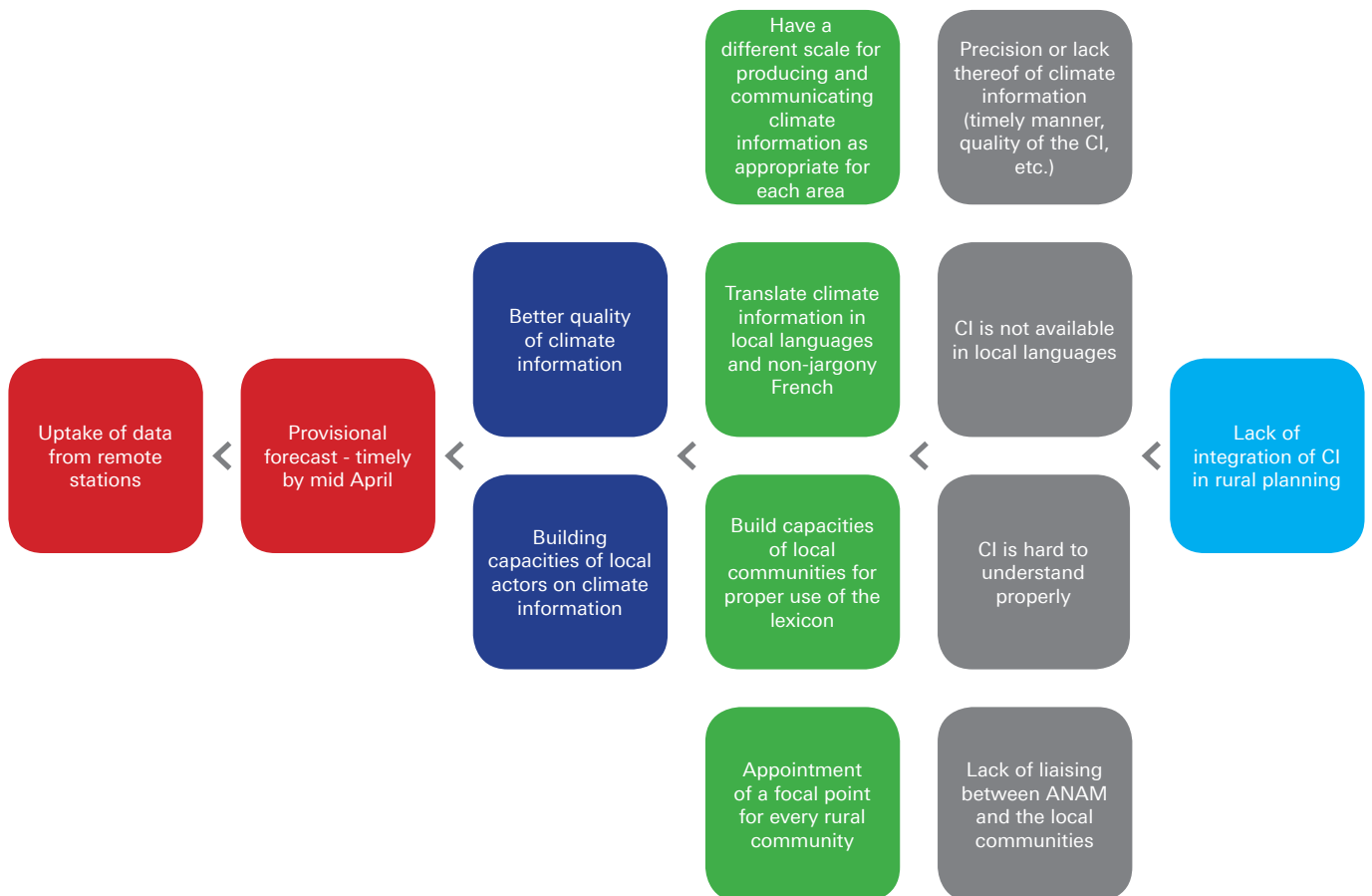
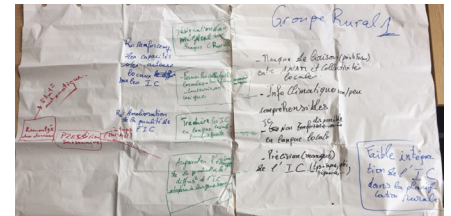
Zaman Lebidi partners are undertaking a sensitization on climate risks with municipal councilors and the Village Councils for Development, seeking to promote integration of climate risks within municipal consultation frameworks. Efforts are also being made to strengthen linkages between commune and village decision making processes with regard to both early warning systems and contingency plans,

as well as to ensure the allocation of resources to enable implementation of these systems and plans. In advance of the 2017 rainy season, partners have also been undertaking training on climate information for the village Early Warning Committees.

The action plan initiated in the workshop led to some important Zaman Lebidi activities. The rural commune mayors' involvement in the workshop enabled acquired knowledge and information to support EWC and DRR planning. For example, in the Gnagna province, ACF (Action against Hunger) was able to use CONASUR led workshops on DRR to communicate the action plans to all the province's mayors. In the Passoré province, ODE (Office des Eglises Evangéliques) relayed the

Figure 1

Problem Tree exercise from rural group 1 (BRACED Zaman Lebidi). It reads from right to left, the final determinant problem being "Remontée des données par station automatique", Uptake of data from remote stations



information to the Haut Commissaire (the highest provincial authority) so that he could diffuse it to the mayors through official channels. ATAD (Alliance Technique Au Développement), working in Sanmatenga and Namentenga provinces, had the opportunity to share the workshops action plan and agenda with the Head of State, President of Burkina Faso, Mr Roch Marc Christian Kaboré, during the Journée National du Paysan/National Farmer's Day celebrations held in Kaya, Sanmatenga 11-13 March 2017. It was an opportunity to highlight BRACED Zaman Lebidi achievements in the area and put forward the project's advocacy strategy together with the outputs of its leaning events.

AMMA 2050 plans for addressing flood risk in Ouagadougou urban planning

The initial AMMA2050 stakeholder workshop, held in Ouagadougou 2016, made clear that the 2008 "Grand Ouaga" plan (designed to inform planning for Ouagadougou up to 2025) had not been fully informed by emerging scientific understanding of future climate extremes, variability and change. Following this workshop, the Ministry of Urbanisation and Housing (MUH) requested 2iE through the AMMA-2050 project to join a high-level consultation platform designed to inform future urban planning on climate and flood risks. This platform, called "the Development and Technical Evaluation Committee for developing studies of Town Planning and Urbanisation", awaits implementation resources.

To support development decision-making in the context of climate change, AMMA-2050 project partners for Burkina Faso have been worked with key stakeholders during and following the 2017 collaborative workshop to develop an action plan, employing the PIPA methodology. This plan aims to strengthen decision makers' capacities to take into account climate risk in urban planning at medium-term (5 – 40 year) timeframes.

Initial steps in framing the action plan include an in-depth review of key policies and programmes related to flood risk in Ouagadougou to ensure appropriate timing and targeting of project activities. Recognising the value of ensuring sustained engagement with local and national decision makers, 2iE plan to appoint a focal point to ensure a channel for ongoing interaction with key stakeholders.

AMMA2050 partners propose presenting to key

stakeholders the current scientific understanding of future flooding in Ouagadougou alongside a case study of the causes and impacts of the 2009 flooding event, including the cascading effects with regard to health and sanitation. Drawing learning from the policy actions undertaken within complementary initiatives to address urban flood risks, and through reviewing currently available scientific modelling, the research team will, together with stakeholders, identify the policy actions which can be simulated and which may best support planning to address future flood risk in Ouagadougou.

Over 2017-2019 AMMA2050 plans to undertake a range of activities to support the integration of climate information in development planning, including training and experience-sharing sessions for decision makers and awareness-raising via regular broadcasts on radio and TV as well as short information films. To ensure sustainable legacy, the AMMA2050 will seek to actively engage key stakeholders in the development and implementation of these actions.

Box 7: Key findings from the workshop evaluation questionnaire

Over 80% of participants found the workshop to be 'very useful' or 'useful', and its content 'very relevant' or 'relevant'. Over 70% indicated that the event was 'effective' or 'very effective' in improving their ability to integrate climate information in decision-making. The majority of participants reported that working in groups was by far the most useful aspect of the workshop. Group work improved understanding of decision-making processes and also allowed sharing of personal experiences and expertise regarding meteorological information and climate change adaptation. Many participants also found the development of action plans a very useful aspect of the workshop. Almost every participant reported that they were likely to use the knowledge acquired at this event in their future work.

Box 8: Learning from engagement: perspectives

Dr Rory Fitzpatrick, University of Leeds



The joint BRACED/AMMA2050 workshop in Ouagadougou gave me my first experience talking to forecast users and decision-makers first-hand about the challenges they face integrating climate information into their adaptation plans. This opportunity was invaluable to my research.

The most important individual learning experience was the ability to better understand how decision makers view climate information. Current meteorological advice can be hard to interpret, not relevant to decision makers or not available with sufficient lead time. Multiple sources providing potentially conflicting information also leads to forecast users receiving mixed messages. Forecast users require consistent, accurate weather advice with acceptable, but unambiguous, qualifiers regarding the limitations of the advice. Ultimately, climate science cannot be precise, but efforts can be made to properly quantify the level of certainty such information can provide.

As climate scientists, we need to work more closely with impact scientists and decision makers to ensure that potentially important meteorological findings can be communicated easily and precisely. Improving resilience to climate change is a multi-faceted problem. Whilst meteorological science is a very important part of this process, it cannot exist separate to other research areas or dedicated actors in West Africa. Integrating climate with information on vulnerabilities and other risks can provide long term improvements for people across West Africa whose lives and livelihoods are directly impact by climate. The personal relationships fostered by the BRACED/AMMA2050 workshop will contribute to this lasting legacy.

Dr Conni Klein, Centre for Ecology and Hydrology



In my work as a scientist with a focus on the West African climate, I often refer to the vulnerability of West African populations to drought, floods and other climate extremes. Unfortunately, most scientists prefer to remain among themselves and that is exactly why the joint AMMA2050/BRACED workshop was an excellent opportunity for me to step out into the real world and engage with the people who might one day practically apply the research I am working on.

The interaction with stakeholders and decision makers adds another dimension to how research should be undertaken. Research questions are often selected based on the likelihood of them receiving funding, the availability of data and methods, as well as personal interest. However, confronted with people who are struggling with very concrete problems in their everyday life and with uncertainties in their future, the most pressing research questions arise out of necessity. I never used to think about how research results can be shared in a format to be of actual use to local communities. For example, why not contextualise a scientific study on changes in future extreme rainfall frequency by relating it to the strength of devastating storms that people have already directly experienced? The referencing to past events in order to illustrate future changes was an important learning for my own work. Workshop discussions made me realise that my and others' research is largely useless if our insights cannot lead to positive change for local communities. For research to be successful, it is not enough to publish in high impact journals. It also involves being aware of the fixed deadlines of decision makers and the conflicting needs of the population. It requires daring to talk to people outside of the scientific sphere and trying hard to communicate complex scientific topics in an understandable way, even when struggling with the language. The workshop afforded me an important opportunity to take a glimpse of the world where theory is transformed into practice.

Conclusion

There remain significant obstacles for enabling climate information to effectively support local and national decision-making in Burkina Faso. These obstacles include limitations in terms of human resources and operational capacities to provide an effective public weather service. While Government ministries and agencies at national, regional and commune levels are keen to receive climate information, capacities to enable effective integration of climate risks varies widely across sectors and decision making bodies.

Recognising the process of co-producing decision-relevant climate information, Zaman Lebidi has invested in activities related to each step in this process. The project has sought to work through existing channels and networks, as well as exploring the potential for employing new forms of communication, to establish systems of collaboration that can support post-project continuation and expansion of climate services. The project has pioneered an approach that seeks to support and monitor product relevance alongside

impacts on decision making at local and national levels. Project learning demonstrates that, while channels for the concerns of those most directly impacted by climate risks to inform the research agenda are emerging, these are not yet systematic.

Learning across both the Zaman Lebidi and AMMA2050 projects has highlighted the vital importance of developing integrated approaches to resilience building, where climate is addressed as one of the risks facing those living in multi-hazard environments. The consortium approach and collaborative workshop have demonstrated the value of drawing together expertise from across decision making levels, sectors and disciplines to identify how climate information can strengthen resilience across timeframes, sectors, contexts and livelihood groups. Enabling spaces for sharing learning within and across projects, programmes and regions offers vital opportunities to identify the approaches which are proving most effective in supporting those people most at risk of climate variability, extremes and change.

Early Warning Committee members in Bagaré with the solar powered radios (Passoré, 2017). Photo: Issaka Tiendrébeogo.



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Authors: Emma Visman (King's College London, VNG Consulting), Camilla Audia (King's College London), Frances Crowley (King's College London), Justin Ilboudo (Christian AID), Patricia Sanou (Christian AID), Edmund Henley (UK Meteorological Office), Malick Victor (Internews), Alexander Ritchie (King's College London), Gino Fox (University of Sussex) Maimouna Bologo Traoré, Fowe Tazen, Aboulaye Diarra (Institut International d'Ingénierie de l'Eau et de l'Environnement – 2iE), Tanya Warnaars and Conni Klein (Centre for Ecology and Hydrology), Rory Fitzpatrick (University of Leeds), Mark Pelling (King's College London) and Chesney McOmber (University of Florida).