



AMMA-2050: Combining Scenario Games, Participatory Modelling and Theatre Forums to Co-produce Climate Information for Medium-term Planning



Authors

Emma Visman, VNG Consulting
(emma@vngconsulting.org.uk);

Dominic Kniveton, University of Sussex;

François Affholder, **Françoise Gérard**,
Frédérique Jankowski,

Centre de Coopération Internationale
en Recherche Agronomique pour le
Développement (CIRAD);

Laure Tall, Institut Sénégalaise de
Recherches Agricoles (ISRA); **Fowe Tazen**,
(Institut International d'Ingénierie
de l'Eau et de l'Environnement (2iE);

Tanya Warnaars, Centre for Ecology
and Hydrology (CEH); **Adeline Barnaud**,
Cécile Berthouly, Institut de Recherche
pour le Développement (IRD).



Aim of the project

The African Monsoon Multidisciplinary Analysis 2050

(AMMA-2050) project aims to improve understanding of how the West African monsoon will be affected by climate change in the coming decades and to facilitate the use of this information to inform preparedness and adaptation decision-making on the 5–40 year timescale. The project's pilot studies focus on urban flooding in Ouagadougou, Burkina Faso, and climate-smart agricultural practices in Senegal.



Dates

June 2015–November 2019



Countries

West Africa, with pilots in
Senegal and Burkina Faso



Theatre Forum organised in Senegal with Kaddu Yaraax group.
(Source: A. Barnaud, IRD, 2018)

Aim of co-production:

Enabling medium-term decision-making to be supported by emerging understanding of climate-related risks requires bringing together expertise from across sectors, disciplines and decision-making levels. Co-production required establishing common understanding of the decision-making contexts, key climate science concepts and scientific understanding of the region's future climate. A range of approaches was employed to bring together knowledge and data from across disciplines (climate science, hydrology, agriculture), and particular groups of decision-makers, to explore context-specific issues and options. Sustainability was sought by working through existing mechanisms and strengthening the knowledge exchange capacities of partnering researchers within the region.

Context:

AMMA-2050 has worked across decision-making levels. At sub-national scale the project supported planning on urban flood risk in Ouagadougou, Burkina Faso. In Senegal, AMMA-2050 has supported national and decentralised adaptation and agricultural planning processes, engaging with *Comité Régionale du Changement Climatique* (Regional Committee on Climate Change) in Fatick. The project has contributed to the development of the National Adaptation Plans of Senegal and Burkina Faso, and the knowledge and practices of regional institutions, engaging with the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL).

Who was involved and what were their roles?

An adapted Participatory Impact Pathways Analysis (PIPA) process, developed by the University of Sussex, provided a 'road map' for supporting a range of co-production processes led by different AMMA-2050 partners. Researchers from *Centre de Coopération Internationale en Recherche Agronomique pour le Développement* (CIRAD) have employed the Plateau Game to share information about climate change, evaluate changes in farmers' strategies and identify adaptation options, debate policies and validate modelling. Subsequent participatory modelling enabled (sub-state) regional decision-makers and agricultural professionals to review and inform the pilot's bio-economic model of farming systems. CIRAD, *Institut de Recherche pour le Développement* (IRD) and *Institut Sénégalaise de Recherches Agricoles* (ISRA) have developed a Theatre Forum, a form of participatory theatre employed to support collective analysis and explore alternatives between different stakeholders (Boal, 1979), enabling exchanges between researchers and civil society actors (Heras and Tàbara, 2014). To strengthen facilitation skills, the Centre for Ecology and Hydrology (CEH) provided researchers with stakeholder engagement training and coordinated a workshop to share co-production approaches with WASCAL.

How was co-production done?

Build common ground

An adapted **Participatory Impact Pathways Analysis** (PIPA) process has provided an overall framework for project engagement. The pathways approach recognised the need to: (i) listen to people's different framings of the risks that climate change poses; (ii) encourage different people's participation in decision-making; and (iii) co-develop pathways to achieve 'climate-proofed' development. The resultant 'road map' supports a range of co-production processes led by different AMMA-2050 partners.

Co-explore need; co-develop solutions

The Plateau Game enables participants and researchers to share knowledge and explore practical and policy options. Each plateau – or board – represents several farmers' fields, adapted

What was co-produced?



- **An assessment of the impacts of climate change on agriculture in Senegal:** Information on the genomes of pearl millet varieties is being linked to climate metrics to identify the traits most likely to be needed in a future climate. The resilience of agronomic practices and soil ecosystem services is also evaluated under High Impact Weather events (including rainfall, length of growing season, dry spell and high temperature).
- **A bio-economic model of farming systems in the Peanut Basin:** This explored the influence of changes in climate, crop varieties and farming systems – such as intensification of agriculture – and interventions – such as insurance.
- **Tailored climate information that can support flood-risk management:** Policy options are explored through high-resolution model hydrological simulations of the extent and impact of future flooding in Ouagadougou. Intensity Duration Frequency (IDF) curves – a standard tool used in hydrological engineering – are developed to meet requirements for informing infrastructural development in Senegal and Ouagadougou.
- **A Theatre Forum piece designed to promote multi-actor discussion on climate change impacts on agriculture and adaptive strategies:** The piece highlights the importance of all actors being aware of the interconnected, long-term implications of their current decisions and actions.



Benefits of the co-production approach

- Decision-makers have identified variables of interest which modellers had previously not thought relevant. In Burkina Faso and Senegal, in addition to temperature and rainfall, decision-makers requested medium- and long-term information on strong winds, as they are a source of erosion in agriculture and structural damage (ZiE, 2018).
- The co-production approaches have enabled researchers to review the assumptions underlying the framing of their models.
- Iterative discussions have enabled researchers and decision-makers to jointly explore the relevance of different adaptation policy options in the context of a changing climate.
- Researchers have had the opportunity to undertake research with colleagues from across disciplines within which they have not worked before. They have also developed a better understanding of decision-makers' needs.

to reflect farmers' perceptions of space, soil type, equipment and other factors (D'Aquino, 2016). Farmers choose their activities (cropping system and livestock) and allocate their resources (labour and cash) to activities. Their output depends on the resource they use and on the climate – represented by a 'climate card' – which gives rain distribution across the board's cells. After the harvest, farmers have to feed their family, reimburse credit and so on. If the output is insufficient, they can sell animals, ask for help from other players or propose other options. The process is interspersed with discussion as participants reflect on what is happening in the game. All discussions are recorded, transcribed and analysed.

Participatory modelling affords an exploratory space for decision-makers to test the impacts of different policies and for researchers to better appreciate decision-making contexts. In Senegal, workshops between (sub-state) regional decision-makers and representatives of the agricultural profession supported a review of the bio-economic model and Plateau Game, enabling researchers to learn about issues that needed to be considered in modelling.

Theatre Forum promotes dialogue between actors on an equal basis, as well as encouraging actors to reflect on their own behaviour. A performance is characterised by three main stages: (i) Actors play a story inspired by real facts and existing tensions; (ii) A moderator then invites debate to bring out feelings, interpretations and proposals to resolve tensions; (iii) Spectators then come to replace one or more of the characters to test possible solutions and collectively discuss them. The other actors remain in character, improvising their responses. To promote discussion, the Senegalese Theatre Forum group, Kaddu Yaraax, have added a 'trial' after the first showing of the piece, where the spectators judge whether the behaviour of each character is good, neutral or bad.

Co-deliver solutions

AMMA-2050 has sought to strengthen the knowledge exchange capacities of existing scientific and decision-making bodies rather than creating new mechanisms or intermediary actors. AMMA-2050 shared its co-production approaches within a collaborative workshop with WASCAL to inform the development of the WASCAL Competence Centre and jointly develop a road map on how to strengthen linkages between researchers and policy-makers in West Africa (WASCAL/CEH, 2018).

Lessons to learn from:

- **Use a range of approaches:** AMMA-2050 employed a range of approaches that has increased decision-makers' appreciation of how specific types of climate change information, such as IDF curves, can inform long-term investments. These approaches have also increased partnering researchers' understanding about the vital importance of engaging decision-makers throughout the process of developing climate information so that these resources are adopted to strengthen climate-resilient development.
 - **Ensure transferrable approaches:** Project approaches have been employed to support decision-making processes across a wide range of contexts and are therefore transferrable.
 - **Tailor approach to the context:** While there is emerging learning about the potential benefits of co-production, there is no 'one size fits all' formula. The contextualisation and framing of approaches is essential to ensure they are tailored to support specific decision-making processes. Each step in the process of co-producing climate services requires different types of approaches, and varying levels of engagement between different groups of actors.
 - **Agree on the principles, sustainability and benefits:** Recognising that co-production requires the bringing together of expertise and knowledge from across diverse groups of actors, it is essential to:
 - at the outset, reach agreement on the principles that will underpin collaborative work;
 - ensure the facilitation required to support effective interaction between researchers and decision-makers, build trust and promote networks that can be sustained beyond the lifetime of the project; and
 - explicitly recognise the differing impacts that each partner seeks, ensuring that everyone gets some benefit from the co-production process.
- It is equally important that expectations are realistic, acknowledging that the time needed to deliver scientific results may not match decision-making time frames.

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