

Info Note

Assessing the influence of CCAFS' climate data and tools

Findings from an Outcome Harvesting evaluation

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Key messages

- CCAFS' climate data and tools are effective in contributing to development outcomes.
- CGIAR and non-CGIAR entities use the tools for species/habitat modelling, climate change impact studies and identification of climate analogue sites.
- Outcomes are observed in many parts of the world and in a wide range of societal actors. They occur at different stages along impact pathways relevant to CCAFS' goals.
- The evaluation used an adapted Outcome Harvesting approach and highlighted useful lessons on how CCAFS may be able to focus their investments in tool development, facilitate uptake and sustainability, and capture change.

The CGIAR Research Program on Climate Change, Agriculture and Food Security ([CCAFS](#)) integrates climate change research across all CGIAR Research Centres and Research Programs. Some of CCAFS' work since 2010 has involved the development of high quality, accessible and easy-to-use climate data and tools. With an increased focus on achieving development outcomes influenced by such data and tools, a study was carried out starting in 2016 to evaluate the development effectiveness of some of CCAFS' climate products: the [GCM Climate Portal](#), [MarkSimGCM](#), and the [Climate Analogues tool](#) (Box 1). The study was designed to explore whether use of these three products has led to development outcomes, and if so, what type of changes have been observed and how exactly the products have contributed to such changes. Outcomes here are defined as behavioural changes in individuals, groups or institutions doing something differently with respect to climate-change-related knowledge, attitude, capacity, policy or practice.

Outcome Harvesting (Box 2) was used for the evaluation, along with some elements from Impact Pathways thinking (Douthwaite et al. 2008) and Contribution Analysis

(Mayne 2008). We started the harvest by collecting outcome leads from project documents and an online survey. These leads provided the basis for selecting those cases that appeared promising to be turned into SMART outcomes (Box 3). A majority (70%) of the 30 cases investigated that employed CCAFS' climate products were new in the sense that they were not directly related to the CCAFS program. Results from the survey indicated that the data and tools frequently were employed in countries not directly targeted by the CCAFS program and that users often discovered the tools via web search. These observations suggest strongly that CCAFS' climate data and tools are widely used even without specific promotion, which is consistent with CCAFS' mandate as a provider of international public goods (IPGs). After email exchanges and phone interviews, we identified a total of 14 cases with a plausible linkage to one of the tools and sufficiently detailed information to qualify as SMART outcomes (Box 4). Of these 14 SMART outcomes, eight related to the GCM Climate Portal and six to the use of the Climate Analogues tool. We found several MarkSimGCM leads, but no SMART outcomes at this stage. One SMART outcome was developed into an extended outcome story ("Farms of the Future, Africa", Box 5) and one ("Seeds for Needs, India", Box 6) was unpacked in considerable detail.

BOX 1. THE CLIMATE PRODUCTS EVALUATED

- The GCM Climate Portal houses global datasets of climate change projections for climate change impact assessment, downscaled using a range of different methodologies.
- MarkSimGCM is a tool for simulating daily weather data (rainfall, maximum and minimum temperatures and solar radiation) that are characteristic of current and future climatologies, for use in impact and adaptation studies.
- Climate Analogues is a tool that researchers can use to identify, connect and map sites with statistically similar climates across space and time.

Who has changed through the influence of CCAFS climate data and tools?

We detected changes influenced directly or indirectly by information from the climate products in a broad range of societal actors. These included next-users of CCAFS' research outputs such as funders investing in further research; NGOs, INGOs and government agencies changing their programming; and national governments changing their planning for climate change adaptation. Three outcomes involved end-users such as farmers and communities engaging in programs employing CCAFS' tools and subsequently adopting climate smart agricultural practices.

The 14 SMART outcomes were categorized as:

- **Immediate level outcomes:** stakeholders who became more aware of climate change issues; financially supported climate change research; increased institutional or personal capacity; and/or changed their advocacy strategy with respect to climate change themes.
- **Intermediate level outcomes:** stakeholders who changed their climate-related policies and/or invested resources in strategy development or implementation.
- **Ultimate level outcomes:** examples of how CCAFS' climate data and tools contributed to achieving results involving the end-users or beneficiaries of CCAFS' work, enhancing the adaptive capacity and resilience of farmers and communities to climate change and thus reducing potential adverse impacts on their food and livelihood security.

How do CCAFS' climate products contribute to development changes?

The GCM Climate Portal was used mostly for climate change impact studies and species/habitat distribution modelling. For example, researchers from the University of Western Australia used it for assessing the vulnerability of aquatic species to climate change effects and the findings were incorporated in the planning of Australian National Resource Management groups. Another study assessed the likely impacts of climate change on maize production in Timor-Leste. The analyses also provided information about a looming El Niño event and these results were used to convince relevant actors in government to set aside funds to prepare appropriately. This shows that CCAFS' tools can influence unintended results beyond the original purpose of the work undertaken.

The Climate Analogues tool was used to identify current or future climate analogue sites for various reasons: identification of sites for farm-to-farm exchange visits to enhance knowledge sharing and peer learning, as a learning resource to identify suitable agricultural

BOX 2. WHAT IS OUTCOME HARVESTING?

Inspired by Outcome Mapping, Outcome Harvesting (OH) is a utilization-focused and participatory step-by-step method for (developmental, formative, summative) outcomes evaluations (Wilson-Grau and Britt 2013).

OH looks at the process by which change occurs, instead of the end result or impact of the change. It collects evidence of who has changed what, where and when, and then, working backwards, determines whether and how an intervention contributed to these changes.

OH is particularly useful in complex programming contexts where relations of cause and effect are not fully understood. Elements of OH can also be used for monitoring purposes.

BOX 3. OUTCOMES NEED TO BE SMART

Outcomes are here defined as observable changes in the behaviour (actions, activities, relationships, policies or practices) of individuals, groups, organizations or institutions that are influenced in a small or large way, directly or indirectly, intentionally or not by actors producing or using research outputs generated at least partly with the help of CCAFS' climate products. To qualify as an outcome, the descriptions need to be SMART (Wilson-Grau and Britt 2013):

- **Specific** - formulated in sufficient detail
- **Measurable** - providing objective, verifiable quantitative and qualitative information
- **Achieved** - establishing a plausible relationship between the outcome and contribution
- **Relevant** - presenting a significant step towards the impact that is strived for
- **Timely** - emerging within the time period being evaluated

BOX 4. THE EVALUATION BY NUMBERS

The evaluation entailed the following:

- >100 outcome leads, details and tool usage often unclear
- 45 survey cases analysed in terms of usage of tools
- 30 cases researched further via Skype/email for which use of the tools was confirmed
- 14 of these developed into SMART outcomes with descriptions of outcome, contribution, significance of outcome, and importance of contribution
- 1 of the 14 cases extended into a comprehensive outcome story ('Farms of the Future, Africa')
- 1 outcome researched further through Impact Pathway-related Outcomes Harvesting resulting in an additional 18 SMART outcomes ('Seeds for Needs, India')

strategies and adaptation planning, and to identify climate-ready seed varieties and selecting sites for crop evaluation trials (Boxes 5 and 6).

Other cases not turned into SMART outcomes showed that the use of CCAFS' climate products was sometimes aimed at results beyond CCAFS' primary goals. For example, researchers in Canada assessed the influence of climate change on cultural ecosystem services, projecting a declining availability of outdoor ice skating.

Apart from the primary function of the tools (providing scientific, robust and credible climate information), there are also secondary functions that contributed to the achievement of outcomes, such as supporting visualization and communication about future climates, enhancing reflective and independent thinking, engaging partners and stakeholders in collaborations or projects, and increasing reputation and visibility. Finally, supporting strategies such as capacity building and advocacy also played a role in enabling research uptake.

Who is contributing to the outcomes?

A range of different organizations contributed to the 14 outcomes analysed, including universities, government institutions and civil society organizations, sometimes

working together to achieve change. Academic staff contributed to half of the SMART outcomes and in the survey represented the largest group of tool users (47%). Academics are an important actor group producing research outputs that can potentially lead to development outcomes. There was considerable involvement of national actors too, indicating that climate products can support part of CCAFS' partnership strategy focusing at the national level as a key route to impact. In eight of the 14 outcomes, the contributing organizations were either CGIAR Centres or CCAFS collaborating partners. The remaining six outcomes were influenced by organizations that had no formal connection to CGIAR/CCAFS and the researchers were independent in their use of the tools.

What did we learn from the evaluation?

One of the questions the evaluation findings highlighted was how to focus CCAFS' niche and comparative advantage as a provider and developer of climate data and tools. There are several dimensions to this:

- Promoting widespread use of climate products in line with CCAFS' IPG mandate, compared with strengthening their strategic and targeted use which will help to better assess their outcome effectiveness and validate and adapt program impact pathways.

BOX 5. FARMS OF THE FUTURE, AFRICA

Climate conditions are changing rapidly and communities, policy makers and scientists need to learn how to enhance their adaptive capacities to better respond. CCAFS' Farms of the Future approach addresses this by connecting farmers to their plausible future climates to stimulate uptake of new knowledge and technical and institutional innovations by communities. The approach revolves around learning workshops with agricultural stakeholders using the Climate Analogues tool to identify analogue locations. Local knowledge of socio-economic (market access, employment availability, political unrest) and biophysical factors (soil composition, structure and moisture content, topography, water available for irrigation) is used to contextualize results. Farmers then take part in learning journeys to selected farms to see how their farming systems might look in the future and how other farmers are already coping.

The approach has been tested and validated by CCAFS' regional teams in East and West Africa, with the participation of 60 farmers and other agricultural stakeholders from Tanzania and Kenya, and 200 from Burkina Faso, Ghana, Mali, Niger, and Senegal. The sharing of climate-smart agriculture knowledge and practice during the exchange visits has led to the emergence of development outcomes, changing farmer's attitudes (such as increasing women's self-confidence) and leading to the adoption of innovations that are expected to improve their current livelihoods and adaptive capacity.

BOX 6. SEEDS FOR NEEDS, INDIA

Farmers in India traditionally source and cultivate crop seeds from their local markets, where the variety of seed materials is limited. Yet, crop diversity is essential to respond to a changing climate. Bioversity International's Seeds for Needs program aims to expose farmers to more crops and varieties, increase their first-hand knowledge about different traits and options available, and strengthen their seed systems and seed-saving capacity so that they always have access to planting material that fits their changing needs.

In 2010, the Indian Council of Agricultural Research agreed to collaborate in the program. In 2011/12, several pilot trials were conducted with seed varieties carefully selected also on the basis of Climate Analogues analyses. The seeds performed so well that the farmers agreed to continue the trials in the next season. Further trials followed with additional seed varieties and at further sites in India, quickly building a farmer-based experimentation network where members were asked to act as 'citizen scientists' providing feedback on the seeds' performance. Today, over 15,000 farmers from more than 600 villages in 49 districts of seven Indian states participate in the program. Communities also engaged in establishing 14 community seed banks offering farmers an alternative source for obtaining seed varieties for the next season, seven of these under their direct supervision. These improved local seed system networks and agricultural systems facilitate the use of climate-adapted genetic materials enhancing climate change resilience.

- Engaging in grassroots programs and projects (learning what is needed on the ground with respect to climate information), compared with supporting processes at the policy level for scaling up and out various projects.
- Investing in tool dissemination and facilitation, compared with further tool and platform development that help to both mainstream and integrate climate change learning across CGIAR.

Deciding where CCAFS should be located in these dimensions is not straightforward, but there are several lessons that can help to sharpen its role in influencing research uptake and outcome delivery. The evaluation highlighted the benefits of:

- Developing explicit impact pathways for the climate products, describing their contribution towards CCAFS' overall theory of change and helping to define their added value and the niches they could occupy.
- Thinking harder about the strategic selection of partnerships that can strengthen CCAFS' climate product development, maintenance and support, as well as the uptake and implementation of research outputs.
- Putting together a strategic marketing mix to support the dissemination and communication of CCAFS' climate products, including an improved website with links to relevant use cases and some kind of forum functionality.
- Honing operationalization of CCAFS' outcome-focused, results-based monitoring, evaluation and learning, capturing in a more systematic way where and how CCAFS' climate products are contributing to outcomes, to improve project targeting and informing value for money discussions.

The results of the evaluation suggest that CCAFS' climate data and tools are effective in contributing to development outcomes. Mapping the outcomes assessed onto CCAFS' sub-Intermediate-Development-Outcomes showed that they are relevant to CCAFS' planned contribution to CGIAR's overall goals. The outcomes occurred at different stages of their respective impact pathways, and

at each level there were some indications of post-funding sustainability. Nevertheless, CCAFS may benefit from exploring how both research uptake and sustainability of changes can be increased through implementation of enhanced facilitative strategies by CCAFS and others.

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This brief summarizes findings of an evaluation of CCAFS' data and tools and their influence on outcomes achieved. The full report can be found using the link in the references.

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CCAFS and Info Notes

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT). CCAFS brings together some of the world's best researchers in agricultural science, development research, climate science and Earth System science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security.

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