WISER

Weather and Climate Information Services for Africa

# Guidance on Equitable and Inclusive co-production for Weather and Climate Services

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## List of acronyms

| | |
|---|---|
| ALP | Adaptation Learning Programme |
| CARIAA | Collaborative Adaptation Research in Africa and Asia |
| CCAFS | Climate Change, Agriculture and Food Security |
| DANIDA | Danish International Development Agency |
| DFID | Department for International Development |
| EU | European Union |
| EUPORIAS | European Provision Of Regional Impacts Assessments on Seasonal and Decadal Timescales |
| FRACTAL | Future Resilience for African Cities and Lands |
| GIZ | Gesellschaft für Internationale Zusammenarbeit |
| MEL | Monitoring, Evaluation and Learning |
| NGO | Non-Government Organisation |
| NORAD | Norwegian Agency for Development Cooperation |
| PICSA | Participatory integrated Climate Services for Africa |
| PSP | Participatory Scenario Planning |
| SIDA | Swedish International Development Cooperation Agency |
| UMFULA | Uncertainty reduction in models for development applications |
| UNDP | United Nations Development Programme |
| USAID | United States Agency for International Development |
| WISER | Weather and Climate Information Services for Africa |

## 1. Introduction

Weather and climate services are concerned with providing weather and climate information at a variety of timescales that is tailored, targeted and communicated meaningfully to users. The intention is that it effectively enables decision-making for adaptation to the adverse impacts of climate variability and change. Weather and climate "services" differ from weather and climate information in that they are directly responsive to the needs of users of the services. For weather and climate services to be usable, they must be credible, legitimate and salient for a range of stakeholders. This requires service producers to take an inclusive approach to the construction of usable weather and climate information, in which users play an active role in helping to define, develop, and refine the services.

The outcome of the Weather and Climate Information Services for Africa (WISER) programme is to increase the use of weather and climate services to inform regional, national, sub-national and community level policy, planning and decision making in Africa. To achieve this it is essential that weather and climate services are developed through processes of co-production to ensure their usability. Co-production is one approach that can promote collaborative approaches for the development of weather and climate services so that they meet standards of scientific credibility, while also being considered trustworthy, relevant, and legitimate among users. WISER is committed to the inclusion of co-production processes within its programme and defines it as "the bringing together of different knowledge sources and experiences to jointly develop new and combined knowledge which is better able to support specific decision making contexts." However, despite growing commitment to co-production of weather and climate services, there is little documented information on how it should be done.

Co-production is variously defined but a review of the literature highlights key elements (Vincent et al, 2017a). Importantly, these findings illustrate that the *process* of co-production is equally as important as the *product* that results. Good practice in co-production requires that the weather and climate service itself exhibits several characteristics, and the process of developing that service is based on certain principles (Figure 1). An effectively co-produced weather and climate service should be decision-driven, process-based, and time-managed. In order to achieve this, the team involved should be aware that the process of co-production needs to be inclusive, collaborative and flexible.

The aim of this guidance is to provide suggestions on how to undertake equitable and inclusive co-production, aimed initially at projects under the second phase of the WISER programme, but in future for wider application. As such, it is largely targeted at researchers and the producers of weather and climate services, although it will also be of interest to certain user or intermediary groups looking to incorporate weather and climate information into their decision making. It has been organised to link to the project cycle with which researchers and climate service producers will be familiar. The guidance is based on documented evidence of good practice with regards to inclusive and participatory processes, illustrated with some examples of how these have been applied in the co-production of weather and climate services.

This guidance is organised in three parts: characteristics of a co-produced climate service (section two), principles for co-production processes (section three), and steps involved in co-production of weather and climate services (section four). It is important to remember that, while these are depicted as separate component for each of conceptualisation and interpretation, these three components are interrelated and overlap within practice. Process principles for co-production (inclusive, collaborative, and flexible) should

inform every stage of the co-production process to produce weather and climate service products that are decision-driven, process-based, and time-managed. Drawing on learning gained through continuous monitoring and knowledge exchange during the co-production process, both the process and weather and climate information products should be reflexively reviewed at various points throughout the project to enable iterative refinement of both (Figure 1).

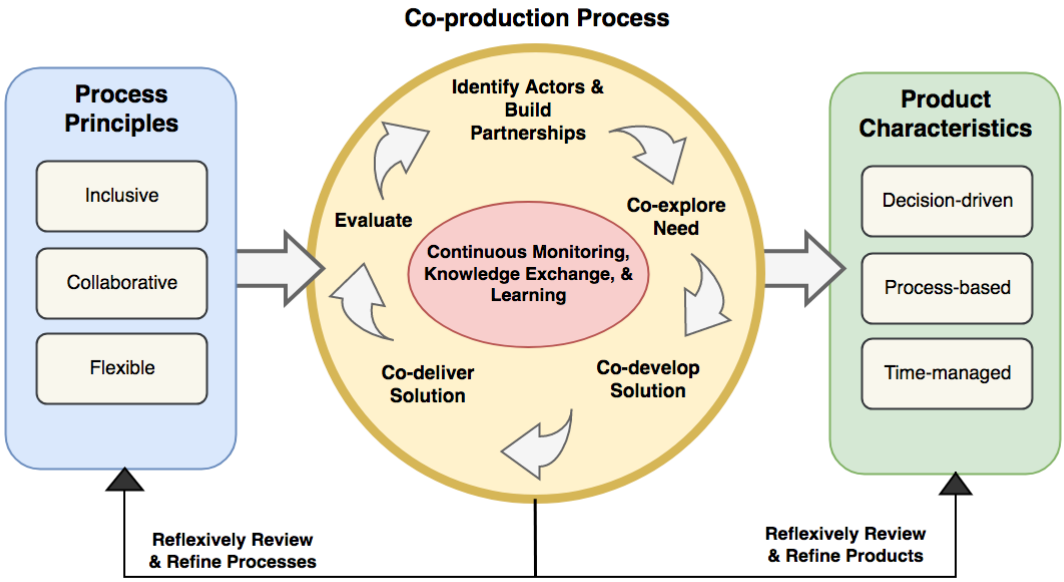



*Figure 1: Overview of the components of the WISER co-production guidance*

## 2. Product characteristics of a co-produced weather or climate service

| Decision-driven | Process-based | Time-managed |
|---|---|---|
| •Co–exploration<br>•Understand the problem<br>•Identify need, taking into account differences within and between different social groups<br>•Interrogate decision process<br>•Determine actions needed to work toward desired outputs and outcomes | •Flexible<br>•Scope of users<br>•Build relationships based on trust and joint ownership<br>•Define expectations, benefits & goals<br>•Define roles & responsibilities<br>•Facilitate continuous knowledge exchange<br>•Put in place MEL to support adaptive programming | •Iterative<br>•Maintain targeted and appropriate levels of engagement throughout the design, development, and refinement of weather and climate services<br>•Recognise that time requirements from and types of engagement may vary throughout the co-production process<br>•Develop appropriate incentives and articulate mutual benefits / rewards of collaboration |

### *2.1 Decision-driven*

Much attention has been paid to the legitimacy, credibility and salience that is required to put information into practice (Cash et al, 2003). When a weather or climate service is developed in response to the decision

needs of users, this can also strengthen perceptions of the credibility and legitimacy of the service provided, as it is more apparent how and why the services were developed and who they are intended to benefit. This is often a fundamentally different *modus operandi* from the traditional approach, where there was a focus on supply of weather and climate products without interrogating the demand (Box 1). To identify the need for a weather or climate service, it is necessary to understand what decisions are sensitive to weather and climate, and the relative impacts of weather and climate, in order to identify the problem that the service can address. The decision context can have a large influence on what is determined to be the most important problem (Steynor et al, 2016).

**Case study-How developing a co-production proposal is different**

During the WISER Knowledge Management Workshop (organised and hosted by the Africa Climate Policy Centre (ACPC) in Addis Ababa, 24 – 26 May 2017) workshop participants were asked to work in groups to develop their own 'mock' project proposals for a co-produced climate service.

Several key challenges emerged across the groups when developing proposals:

1.Most of the proposals were very attuned to weather and climate risks, while less attention was paid to defining how the weather or climate services would address users' needs, especially those of marginalised groups *i.e. they were not demand-driven*

2. Many of the proposals included an initial 'consultation' with users at the outset, but did not plan for the need to iteratively refine the service during the course of the project *i.e. they were not process-based*

3. Nearly all of the proposals included very short timelines for anticipated completion of the projects, allowing very little time for developing and maintaining relationships among project partners *i.e. they were not time-managed*

The experiences in these sessions illustrate that while awareness of the concept of co-production is increasingly widespread, challenges remain to translating ideas about co-production into practice. The guidance in this document is intended to address some of the stumbling blocks that are frequently encountered.

*Box 1: Case study on how developing a co-production proposal is different*

The climate service also needs to reflect the gendered nature of decisions, meaning that a decision-driven climate service may look different for different groups of people (Carr et al, 2016). The types of information required by women reflects decisions linked to socially defined roles and responsibilities. For example, among farming communities in Senegal, both men and women requested information on seasonal onset, length of rainy season, distribution of rainfall within the season and warnings on the arrival of rainfall events and hazards (e.g., storms, strong rains, and strong winds). However, in addition to this general list, female farmers specifically requested information on dry spells (which they defined as no rain for a period of 20 consecutive days), as well as information on the likely seasonal rainfall cessation date (Tall et al, 2014). In this area of Kaffrine, the means of production (cart and donkey) to farm plots are largely controlled by men, who plant and farm their own plots first. Planting of maize and millet thus typically takes place on women's plots a month later than men's, when they have finished with the cart and donkey. As a result, women farmers are ready for harvest later into the rainy season (in September). A dry spell or early seasonal rainfall cessation during this key period of crop blooming is devastating for most women in Kaffrine. Men, on the other hand,

are more concerned with the start of the rains (Tall et al, 2014). Awareness of differences in the types of preferred information, relating to the gendered nature of decisions, was important for climate scientists in the process, since they had primarily been focusing on the onset of the rains, believing that to be the most important metric for users. Note that there are not only differences in decisions due to gender, but also due to other social identifiers, and disability, and socio-economic status (Box 2). Understanding the nature of decisions of different groups of people can be enabled through co-exploration.

Co-exploration is likely to take place through a series of facilitated dialogues, whether in a collective workshop format, or through individual interviews. Such processes generally do not form part of the standard model of scientific project development, whereby climate products are generated based on theory or empirical evidence-derived questions, as opposed to the decisions which they will inform. Current models for funding scientific projects are also rarely conducive to the effort-intensive deliberations that are required to develop decision-driven weather and climate services. Flexibility and appropriate time and financial resources should be built into project proposals in order to develop weather and climate services that are decision-driven.

Box 3 outlines some questions to frame decision-driven services.

**Intersectionality**

As well as gender, there are other social identifiers, for example ethnicity, caste and religion. In a similar way to gender, these are socially constructed and comprise sets of expected norms and behaviours. In addition to being men and women, people's identities are constructed around alignment with a number of these different groups associated with these groups. Moreover, individuals may vary their self-identity depending on the circumstances and the perceived power that belonging to particular social groups may afford them. For example, aside from being female, a woman may have multiple identities depending on her ethnicity, religion and socio-economic background. This concept is known as intersectionality (McCall, 2005).

Intersectionality has been defined as 'the interaction between gender, race and other categories of difference in individual lives, social practices, institutional arrangements, and cultural ideologies and the outcomes of these interactions in terms of power' (Davis, 2008: 68). Intersectionality highlights multiple dimensions of power relations that are embodied in different people. Intersectionality has important implications for how individuals may relate to climate change. To take an example, an elderly woman of low socio-economic status and low caste will have multiple dimensions of power deficit compared to a working age man of high socio-economic status and high caste. It also acts as reminder that "women" and "men" do not form homogeneous groups because their gender interacts with other social identifiers to create unique circumstances. Instead we need to move from identity categories to situated knowledges (Kaijser and Kronsell, 2014).

*Box 2: Intersectionality*

**Questions to frame decision-driven services**

- What problem or decision are we trying to address with this climate service?
- Do we know enough about user needs, taking into account the needs of women, the disabled, and the poorest of the poor?
- Do we know enough about the context in which the weather and climate service will be used? How are the target decisions in the relevant sector made, and how will the weather and climate service inform that?
- If not, do we have the time and resources – both financial and human – needed to undertake co-exploration?

*Box 3: Questions to frame decision-driven services*

### *2.2 Process-based*

Studies of good practice in co-production have highlighted the importance of focusing on process over product. A co-developed weather and climate service can aim to develop a usable product, but should equally focus on the process through which the service is developed. Being attentive to the process is essential to building relationships of mutual respect and trust between stakeholders. Furthermore, a flexible and iterative process-based approach can enable the refinement of the weather and climate services to ensure that they are relevant and reliable enough to inform decision-making. Ensuring that the climate service is process-based is essential to support an effective service. A process-based weather and climate service often requires considerable deviation from the normal *modus operandi* of both climate product development and funding mechanisms (Box 1).

Typically funding proposals are contingent on identification of a climate product and the outline of a process to achieve that product. In effective co-production, it is very difficult to define the ultimate climate product at the outset, as the process allows scope for inclusion of a wide range of users, co-exploration of the issue of concern, and then engagement and dialogue around how to develop a climate service that best meets user needs. Part of this process involves an extensive exploratory period. This has to include full scoping of relevant users, including active attempts to secure inclusion of marginalised groups, as well as time to jointly define goals and build relationships (Box 6). The exploratory period should also explore other elements related to the process of engagement – for example the perceived benefits of engagement, respective expectations and responsibilities, and mutually-beneficial goals. The most appropriate mechanisms and modalities for communication should also be determined.

Being gender-sensitive and socially-inclusive requires particular attention to be paid to the process-based elements of the weather or climate service. Concerted efforts are needed to effectively reach women, the disabled and the poorest of the poor. Since there will be differences in education levels and literacy, sensitivity is required to ensure that these groups are able to understand the information, which may mean ensuring availability in local languages and non-written form (Tall et al, 2014; UNECA/ACPC, 2011; Roncoli et al, 2009). There may also be differences in preferred media and mechanisms for receiving information, which need to be taken into account to ensure equitable inclusion. In investigating gender differences in preferred channels for receiving weather and climate information, women in Kenya prefer to hear over the radio, whilst in South Africa the radio was preferred by men, but face-to-face briefings from an extension officer was preferred by women (Cherotich et al, 2012; Archer, 2003). Face-to-face method was also preferred in Senegal, where women preferred to receive early warning at the borehole, where they spend time fulfilling the gendered role

of water collection (Tall et al, 2014). In Malawi, women cited particular levels of trust in NGO workers, and in Tanzania more women are targeted when there are female extension agents (Coulibaly et al, 2015; Tall et al 2014; Doss, 2001).

Doing things differently is essential to process-based co-production. Since the process is typically very fluid with objectives that are periodically and reflexively revisited and refined, there is the need to be very flexible and dynamic to manage this. Similarly, because of the often unpredictable nature and ongoing evolution of the process, there needs to be time and space for regular and interactive reflections and learning within the monitoring and evaluation framework. Ideally there will be a dedicated person to ensure that this happens and does not slip through the cracks (Visman et al, 2016). Monitoring and learning can reflect on how the process can be better managed, for example through different forms of engagement, more regular contact, or alternative ways of sharing information and enabling participation. This is particularly important to be inclusive and may require flexibility in the timings and locations of activities. Box 4 outlines questions to ensure a service is process-based.

**Questions to ensure a service is process-based**

Have sufficient time and resources been allocated to enable effective and inclusive co-production throughout the project lifecycle?

- Is there evidence of appropriate incentives and recognition for active participation in the co-production *process* (as opposed to just outputs or products)?
- Are clearly defined and jointly agreed upon goals in place?
- Has someone been allocated responsibility for oversight of the process (e.g. a knowledge broker or embedded researcher) and are the roles and responsibilities of all participants mutually understood and agreed upon?
- Is there an active procedure of monitoring, evaluation, and learning to enable reflection on the process and opportunities for modification of the service?

*Box 4: Questions to ensure a service is process-based*

### *2.3 Time-managed*

Ensuring appropriate allocation of time, and then managing this time, is essential to effective co-production of a weather and climate service. In comparison to more traditional development of climate products, equitable and inclusive weather and climate services require extensive time for engagement between producers and users (Box 1). The service itself incorporates the notion of exploring the need for climate information, defining the product, developing the product, using the product, and then evaluating and refining, possibly even redefining (Box 5). This requires ensuring that time is available to ensure inclusion (taking into account potential differences between men and women, the disabled and the poorest of the poor in participating in the process), enable collaboration, and account for the need for flexibility.

The time required for effective co-production of a climate service differs throughout the lifespan of a project (Figure 2). In particular time should be allocated at the very start of the process in order to identify stakeholder and then co-explore and the problem(s) that a new weather and climate services may address. The importance of this stage cannot be overestimated. Once a need has been identified, time is required for a facilitated process of inclusive engagement between producers and users, as well as other relevant

stakeholders (e.g. intermediaries, knowledge brokers, researchers) to discuss and establish shared goals and a roadmap for service development, which takes into account expectations of all parties to the process, and outlining of respective commitments. This process cannot be rushed as it is likely that relationships will need to be established and trust built (Vogel et al, 2016). As well as being time-intensive, co-production is often easier when people are physically proximate – particularly at the early stages - due to the time and effort required for the process (Porter and Dessai, 2017).

Allowing sufficient time for co-production continues after the initial high input. The ongoing nature of inclusive collaboration requires regular contact and maintenance of relationships. However, the nature of interaction will depend on the particular group of stakeholders involved. The frequency and format of interaction should be mutually defined and agreed upon at the earliest phase of the project cycle, with opportunities to revisit whether this should be adjusted at later stages. In addition a constant awareness of monitoring and evaluation and learning in order to enable flexibility and iteration requires that all parties enable appropriate time and commitment. It will be important to consider the incentive structures that exist for participating in co-production, as this may differ significantly among participants. Where possible, it is important to align incentives with the time and resource demands involved in co-production; however, this can often fall outside of the scope of individual projects. Output-oriented incentive structures are typically in place both at a project level and an individual level. In co-production of equitable and inclusive weather and climate services, the attainment of a high quality output, in terms of a climate product, is contingent on the process that enables it, and this process is typically a time-intensive sustained engagement between producer and user. Box 5 outlines questions to ensure a service is time-managed.

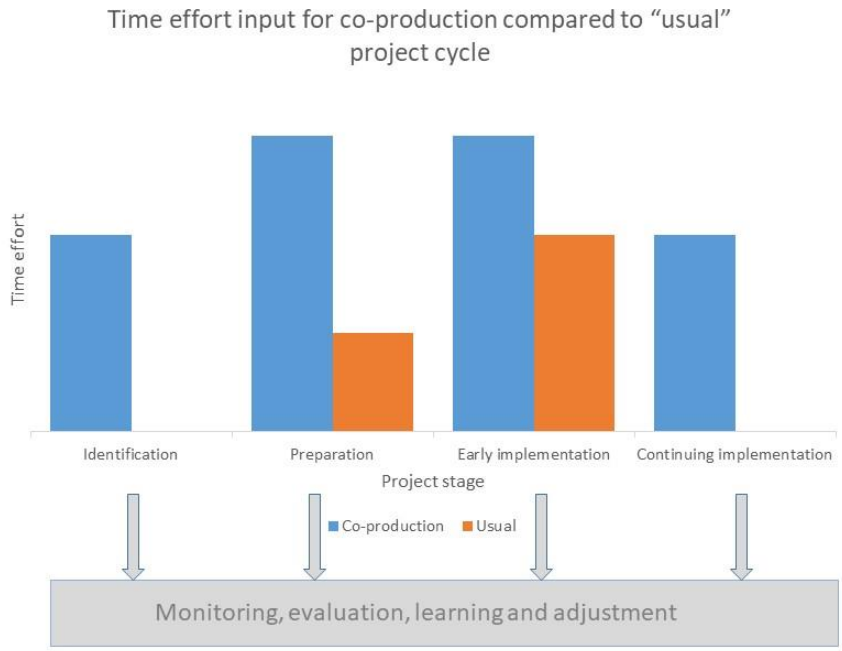



*Figure 2: Time effort input for co-production compared to the "usual" project cycle*

**Questions to ensure a service is time-managed**

- Has sufficient time been allocated for engagement processes throughout the lifespan of the project?
- Has the frequency and format of interaction between stakeholders been defined at the outset, with explicit opportunities to review and revise modes of engagement at later stages?
- Has sufficient time been allocated to ensure identification of users, including explicit consideration of frequently marginalised groups – including women, disabled and the poorest of the poor?
- Has additional time been allocated at the start of the project for co-exploration and the development of mutually-beneficial relationships between producers and users?
- Are adequate time and resources included to manage and sustain collaborative relationships?
- Are incentive and reward structures in place to reflect the time-intensive nature of co-production on participants in the process?

*Box 5: Questions to ensure a service is time-managed*

**Case study-Philippines Resilience Project following typhoon Haiyan**

In the wake of typhoon Haiyan, the Met Office has been partnering with Local Government Units (Baranguy) in Passig, Marikina and San Juan cities in greater metropolitan Manila and two municipalities in Salcedo, Eastern Visayasas. This forms part of an intensive effort by government to integrate climate information into local planning and business continuity following increasing vulnerability to typhoons. The co-production process was very time-intensive, requiring significant staff and participant time, and staff travel. This was to variously facilitate surveys and interviews with a range of stakeholders, meetings with the government department, introductory workshops with representations, training and focus workshops for the duration of the pilot, and face to face meeting with local representatives (personal communication from Met Office project staff). Despite the large time commitments, local government officials were motivated to be involved with the process because the service was answering their specific decision-making context.

*Box 6: Case study on Philippines Resilience Project following typhoon Haiyan*

## 3. Process principles for co-production

| Inclusive | Collaborative | Flexible |
|---|---|---|
| • Inclusion of people, paying particular attention to women, the disabled, and the poorest of the poor<br>• Inclusion of knowledge | • Identifying actors<br>• Building relationships & partnerships<br>• The "co's"<br>  • co-exploration<br>  • co-design<br>  • co-develop | • Adaptive process<br>• Flexibility in design, priorities & outputs<br>• Flexibility between actors |

### *3.1 Inclusive*

Development of effective decision-driven weather and climate services is contingent upon an inclusive process. Inclusion can refer to the two inter-related components: inclusion of people and inclusion of knowledge and experience. Box 7 outlines some questions to ask to ensure an inclusive process.

Normally, the idea to generate a weather and climate service originates from producers, or at least parties who have familiarity with meteorology and climate science and weather and climate product development. This means that there are often implicit assumptions about users who have a decision that could be informed by climate information. Although substantial literature exists on how to best engage stakeholders in co-produced processes, there is much less attention paid to how to identify those stakeholders in the first place, and the assumptions embodied in that identification (Colvin et al, 2016). An uncritical analysis of potential stakeholders, or users, within climate service production can lead to subtle reinforcement of existing power structures, and systematic exclusion of groups that are typically marginalised and socially excluded. This finding is highlighted in a study in Europe, that found that identification of users typically reflects assumptions of what information they need and what their capacities are to interpret and apply that information (Porter and Dessai, 2017). Furthermore, it is recognised that those who are already well off and powerful (e.g. male, educated, able bodied, wealthy) are often better able to take advantage of co-production processes to meet their needs, thereby excluding other groups from benefitting equitably. The privileged position of deciding who is awarded stakeholder status, and therefore included in the process, should be accepted with due responsibility to fully consider the widest potential range of users in an open and transparent way. This may require specific targeted efforts, for example duplicating meetings so that men and women can be separated (to create conditions conducive to participation) and ensuring communication formats enable accessibility to different levels of literacy, language ability, and disabilities (e.g. non-visual, sign language) (Smith et al, 2017). Whilst it is not a solution since it does nothing to address the underlying causes of inequality, quotas for participation can support the positive discrimination that is often required to be inclusive.

Science has typically prioritised scientific knowledge based on theory construction, testing of hypotheses and refinement of conceptual models based on defensible methodological processes. We are accustomed to circumstances where we assume a knowledge deficit, and look to science to fill a 'knowledge gap.' Knowledge generation by scientists is then imparted to potential end-users in a linear and unidirectional model (Stocklmayer, 2013). However, other knowledge systems exist.

Local knowledge often provides contextual nuances (Naess, 2013). The Climate Change, Agriculture and Food Security (CCAFS) programme investigated the existence of indigenous knowledge systems for weather forecasting in Lushoto district in northern Tanzania (Mahoo et al, 2015). Indigenous knowledge was based on the behaviour of large animals, birds, plants, insects, and astrological indicators. The study emphasised that indigenous predictions are often considered more credible and salient than scientific climate forecasts, highlighting a need to recognise the value of different knowledge systems and to consider how these can inform decision-making respectively. As well as recognising indigenous knowledge in its own right, there is the scope to bridge knowledge systems. The process of negotiating knowledge generated from scientific and traditional systems is contingent on equal consideration of, and mutual respect among, various parties. If the process is conducted well and sensitively negotiates these power issues, there is the potential for experiential knowledge to be created and this, in turn, builds legitimacy and appropriateness of information for decision-making (Fazey et al, 2014).

**Questions to ensure an inclusive process**

*People:*

- Who does this problem affect (both now and in the future) and how?
- What are the roles of these people in their society?
- Are there key people outside these groups who may have a valuable role to play going forward?
- Is this service targeted at a specific group? Why/why not?
- Are we including/planning to include all potential users and decision-makers, including marginalised groups such as women, the disabled, and the poorest of the poor?
- How will inclusion be achieved? (i.e., workshops, meetings, interviews)
- Are we prepared to be flexible in our process to enable inclusion of all groups?
- Has there been sufficient time and resource included in the project plan to engage with different groups of society?

*Knowledge:*

- What knowledge and experiences do different actors bring?
- What knowledge is already being used and how can weather and climate services build on this?
- What role do these different knowledge types play?
- What are their strengths and weaknesses in terms of enabling effective decision-making?
- Is the service utilising the existing knowledge and expertise of all the actors?
- Is there a historical/political element to the knowledge?
- Are the actors willing to share their respective knowledge openly and freely?

*Box 7: Questions to ensure an inclusive process*

### *3.2 Collaborative*

Collaboration underpins the process of co-production and its related "co" terms (e.g., co-exploration, co-design etc.) that refer to the importance of the process as an end as opposed to a means to an end. Effective co-production of equitable and inclusive weather and climate services is based on producers and users working together. This requires an open mind and a willingness to consider new forms of knowledge, experiences, and perspectives from different actors, as outlined in section 3.1. Ideally it should also build relationships and partnerships to increase the likelihood of sustainability of the weather and climate service beyond the lifetime of any funded project.

Effective collaboration also requires empathy from producers and users to consider the respective decision-making environments. Users are typically driven by a range of political, economic and social drivers that

reflect, and in turn inform, societal development (e.g. Policansky, 1998). This may mean that their capacity to actively engage in the co-production process necessarily waxes and wanes depending on demands which would vary depending on their decision-making context. A policy-maker, for example, may encounter an unexpected policy issue or be subject to the demands of changing political interests that determine their focus of activities. At the grassroots level, a farmer's capacity to engage could be affected by changing seasons or the occurrence of livelihood shocks, such as extreme events. National Meteorological and Hydrological Service staff in many African countries are overstretched with increasing demands being placed on their time to not just produce predictions and projections, but also interpretations. Scientists also have competing demands on their time and attention reflecting teaching commitments, pressure to publish and seek funding. Accepting and being sensitive to the differing pressures and time constraints on all parties can enable effective collaboration, whilst recognising that the development of a climate service will be subject to ebbs and flows. Considering a role for formalising the collaboration, for example through Memoranda of Understanding that detail the respective commitments of relevant parties, can help to build ethical partnerships that cement collaboration. Box 8 outlines questions to ensure a collaborative process.

**Questions to ensure a collaborative process**

- Have all the relevant actors been scoped and given the opportunity to participate in the development of the climate service, including marginalised groups such as women, the disabled and the poorest of the poor?
- Does the project team have the right mix of individuals across disciplines and with the needed experience, expertise, and skills to develop a usable climate service?
- Are adequate resources earmarked to enable collaboration (e.g. for engagement activities, such as meetings, workshops, as well as programme management)?
- Are mechanisms in place to ensure effective inclusion (e.g. translation/language, support for those with disabilities (e.g. non-visual materials, sign language) transport availability, ensuring time of meetings that fits with gender roles)?
- Do the various parties feel joint ownerships of the process?
- Is the process putting in place/developing the networks and capacity necessary to ensure sustainability of collaboration post-project?

*Box 8: Questions to ensure a collaborative process*

### *3.3 Flexible*

It is important to devise a clear conceptualisation of how co-production contributes to the broader theory of change for a project or programme, and this is often contingent upon inclusion of a degree of flexibility in all aspects of the process. This includes flexibility around the design of the programme itself, as well as the organisational, institutional, and individual flexibility that can enable adjustment to the shifting needs and priorities that may arise throughout processes of co-production.

Flexibility is a key aspect to enabling iterative processes of frequent and sustained interaction between producers and users of climate information to develop usable weather and climate services (Dilling and Lemos, 2011). This involves a cyclical process of developing, testing, and refining the weather and climate services in response to potential users' needs and feedback. However, iterative processes of developing equitable and inclusive weather and climate services can result in unanticipated or surprising results that were not necessarily factored into the programme at the outset. For example, users may make requests for additional services that were not envisioned within initial project planning. Meteorologists and climate scientists responsible for developing the technical components of the services may need to creatively rethink product

development strategies to meet specific user demands. These kinds of situations require the ability to respond, adjust, and adapt in real time. This means that all partners must approach the process of co-production with an open mind, whilst also taking steps to foster flexibility within the programme.

To do so, there is first a need to build in flexibility within the design of a programme or project. This requires identifying key decision-making points within the programme at the outset. Such decision points represent an opportunity to review progress and to make adjustments or course corrections. At these points, it is necessary to assess whether the programme is performing as expected or, if not, to understand what must be adjusted. It is also important to assess whether the needs and priorities of stakeholders have evolved since the beginning of the programme and to take this into account within future activities. In this sense, programmes that incorporate co-production must employ a learning-by-doing approach. This is increasingly recognised in development programmes, which have shifted toward 'adaptive programming' that incorporates learning into activities in real time.

In addition to building flexibility at the programmatic level, there is also a need to enhance flexibility among organisations, institutions, and individuals who are involved in the co-production process. Co-production necessarily involves developing new relationships and ways of working. This can sometimes put a strain on organisations and individuals, who have different mandates and modalities for carrying out their work. In this sense, co-production processes are not uniform, even within a single project. It can take significant time to explore and reconcile these different ways of working. Additionally, relationships between programme partners evolve over time, as do their respective knowledge, capacities, and needs. This can result in additional and new requests for weather and climate products. For example, as the capacity of users to understand and interpret climate information increases during a project, their requests for different kinds of services may become more specific and sophisticated. Therefore, it is crucial to allocate time within the project development to address these issues. Developing a centralised project administration or coordination mechanism is essential to bridging among different stakeholder groups to enable more agile programming.

It is important to acknowledge, however, that there are limits to the amount of flexibility that can be built into programmes. Often times, the learning and experience required to inform understandings of course corrections may be needed can come too late in a programme, especially within projects with short time horizons. Therefore, it is important to build opportunities for reflection and monitoring into the programme from the outset, while also setting realistic expectations among all partners about what can and cannot be changed within the programme – as well as when, why, and how these limitations will come into play. Box 9 outlines questions to ensure a process is flexible.

**Questions to ensure a process is flexible**

- Have periodic opportunities to revisit the goals, activities, and timelines been built in to the programme?
- Is there scope for adjustment and flexibility based on ongoing monitoring, evaluation and learning?
- Have key decision points been identified within the programme at the outset, where course corrections or adjustments could be made?
- Has an ethic of 'learning-by-doing' been fostered among all actors to better incorporate evolving priorities and interests?
- Has ongoing monitoring, evaluation, and learning been build included in the design to inform programming, both at the beginning and throughout the project?
- Have opportunities for joint reflection and dialogue among partners been built in to the programme?

*Box 9: Questions to ensure a process is flexible*

### *3.4 Monitoring and Evaluation and Learning*

Continually monitoring, evaluating and learning (MEL) during the course of a co-productive process is essential in determining if the project is going in the right direction and, following its completion, if it was it successful in achieving its goals. It can inform ongoing and future activities, helping to fine tune or reorient (when required) the process as it evolves. The UNDP handbook (2009) states that without effective planning, monitoring and evaluation, it would be impossible to judge if work is going in the right direction, whether progress and success can be claimed, and how future efforts might be improved. WISER places importance on MEL and has produced guidance on the process (WISER, n.d.). The suggestions here are to emphasise the importance of the MEL process for the development of an effective and sustainable climate service, and can all be undertaken within the WISER MEL framework.

MEL for a co-productive process requires two layers: taking place continually during the process itself and upon completion. MEL during the process can include the process of evaluating progress and often includes evaluation of progress towards the outcomes, assessment of the quality of relationships, evidence of mutuality and reciprocity and a review of the learning (NIDOS, n.d.). As outlined above, active monitoring and learning is particularly important with co-production of equitable and inclusive weather and climate services, as there is much to be learned on the process as well as the outputs. It is important to build in opportunities for learning acquired through monitoring to inform the co-production process in an ongoing and iterative fashion. On completion of the process MEL helps to determine the effectiveness and impact service developed but can also include a critical analysis of the co-productive process itself.

A key component of any monitoring and evaluation of a service and process is a need to measure the impact of the service against the priorities that were set during the initial "exploration" or design phase. It is therefore essential that goals, and corresponding measurement criteria, should be jointly defined and agreed upon by all actors from the project onset and integrated into work programme and results-based framework.

**Case study - Barriers and enablers to successful co-production from six case studies in climate and development**

In order to better understand how co-production processes are applied in climate and development, Harvey et al (2017) took six examples that were self-identified as successful:
1. Climate Knowledge Brokers Group – Climate Knowledge Brokers Manifesto
2. Red Cross Climate Centre Writeshop Process
3. Climate and Development Knowledge Network and *Fundacion Futuro Latinamericano* – Latin American and Caribbean Knowledge Exchange Workshops
4. Global Forum on Food Security and Nutrition - Climate Change and Food Security and Nutrition Dialogue
5. Climate Change Agriculture and Food Security programme – Climate Change and Social Learning Sandbox
6 .International Potato Center Quechua-Aymara Association for Sustainable Communities (ANDES) and the Potato Park – Agreement for the Repatriation of Native Potatoes in Peru

The table summarises some of the enablers and barriers to the success of co-production processes based on these six examples. These learnings resonate with the principles of producing a co-produced climate service, and are applied within the guidance here.

| Enablers | Barriers |
|---|---|
| ***Relevance/resonance*** *– ensure the topic reflects the active interest of the group* | ***Focus*** *– balancing specificity and accessibility in exchanges* |
| ***Participation and ownership*** *– active involvement of people with interest and motivation* | ***Time*** *– not making time available for strategic conversations and partnership* |
| ***Facilitation*** *– goal-oriented processes that enable time for discussion whilst staying on track* | ***Participation*** *– not always having the right people in the room and lack of trust to share information* |
| ***Design*** *– constructive approaches based on social learning and incorporation of different disciplines* | ***Language*** *– only producing materials in one language/the time and cost barriers of translation* |
| ***Incentives and investment*** *– to enable the process of working together* | ***Keeping the momentum*** *– difficult to continue connections between events (e.g. workshops)* |

Source: adapted from Harvey et al (2017)

*Box 10: Case study on barriers and enablers to successful co-production from six case studies in climate and development*

## 4. The co-production cycle

As a complement to the characteristics of a co-produced weather and climate service, and principles of co-production processes outlined in sections 2 and 3, here we provide specific guidance on steps that could be undertaken at different stages within the co-production life cycle (Figure 3; see also Box 10). This cycle is based on sound principles of co-production and (limited) experience of co-production in practice, and is the basis for further testing and refinement. The first step is to put together an appropriate team.

### *4.1 Compile an appropriate team*

Project teams committing to co-production of weather and climate services typically should be transdisciplinary and contain a broad range of expertise. This is because scientists are typically accustomed to producing weather and climate products through processes that can be undertaken within their own community of experts and using tools with which they are familiar. Weather and climate services are fundamentally different in that their generation inherently requires working with users and other partners, both to understand information requirements, as well as to test and apply the resulting products. As well as weather and climate scientists and users, this may comprise social scientists who are expert in investigating decision-making contexts and, in particular, using qualitative methods to do this with users (Box 11).

**Building a weather and climate services 'team'**

Experience under the EU-funded European Provision Of Regional Impacts Assessments on Seasonal and Decadal Timescales (EUPORIAS) programme has illustrated the importance of diversification among actors working together to co-produce weather and climate services (Jiménez, 2016). To effectively respond to the multiple dimensions of users' needs, it is often necessary to form a multi-disciplinary team. It can often be useful to have an 'outsider' within your team, who can bring new ideas and innovations to the climate service development process. Collaborations can include actors such as students, programme managers and administrators, social science researchers, non-climate technical experts, and communications and visualisation specialists. Importantly, the makeup of a weather and climate services team may vary throughout the co-production process; while scientific inputs may be most important during the early and middle phases, greater reliance on communications and design expertise may be required at later stages. It is important to consider what combinations of actors will be needed, and at what point, within the co-production process and to build this into planning.

*Box 11: Building a weather and climate services team*

The team should also consider the need for someone to manage the co-production process throughout the lifecycle. Having a dedicated team member (or members) with this mandate is essential to proactively build and manage relationships between the various parties. This person can also ensure ongoing monitoring of the evolution of the process and the needs and expectation of both users and producers to ensure mutually beneficial development of the service. Different modalities may be employed for this – for example embedded researchers or knowledge brokers (Box 15). Whilst one person may be nominated for management and coordination, all team members need to be on-board with, and committed to, the co-production of the climate service; and both aware of, and willing to participate in the various requirements of this new way of working. Box 12 outlines some questions that should be asked of the team before committing to co-produce a weather or climate service.

**Questions to ask the team before developing a co-produced weather or climate service**

- What are the embedded assumptions and motivations of initiating the co-production process?
- Are we including/planning to include all potential users and decision-makers, including marginalised groups such as women, the disabled and the poorest of the poor?
- Will the climate service provide equitable benefits, taking into account the needs of marginalised groups such as women, the disabled and the poorest of the poor?
- Are all parties willing to work in a collaborative manner?
- How do we see the process of co-producing our climate service?
- What other actions do we need to take to continue a process of co-design of our climate service?
-

*Box 12: Questions to ask the research team before developing a co-produced weather or climate service*

Figure 3 outlines the steps of a co-production process as linked to the project lifecycle. Each of these elements will now be outlined in turn, highlighting what they involve, who should participate, and suggestions on how they can be undertaken. Given that co-production should be flexible, reflection and reflexivity and the opportunity to learn and modify, are important throughout.

Note here we are making the assumption that identification has already taken place of the problem that the service is seeking address, and the sector and scale at which it is relevant – e.g. improving water resources management.

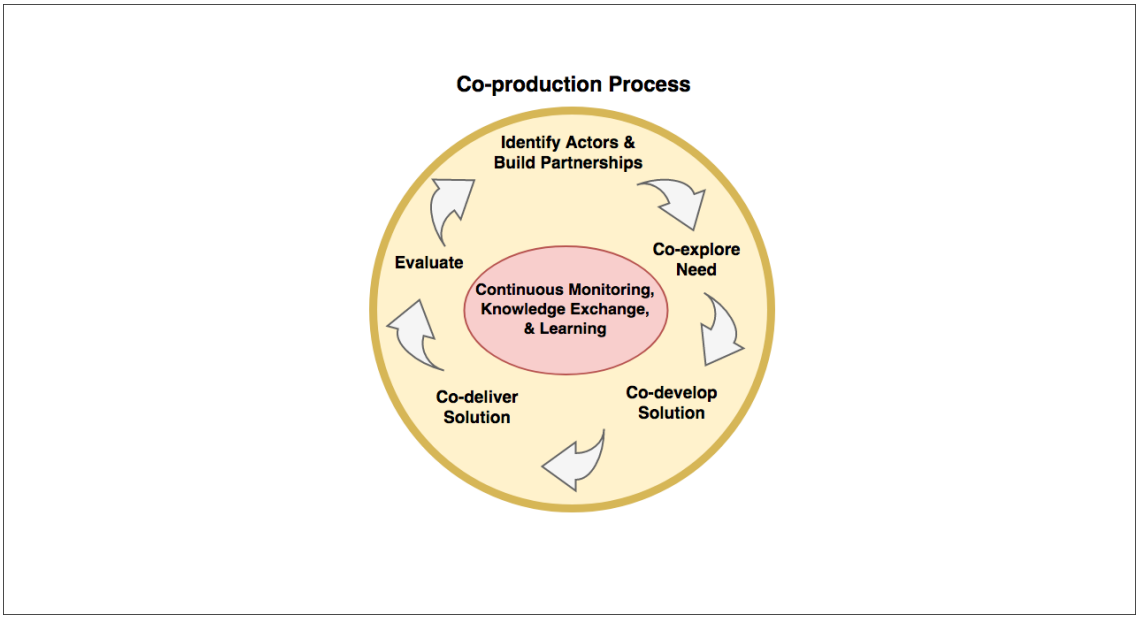



*Figure 3: The steps of the co-production process*

## *4.2 Identify actors and build partnerships*

**Key questions to inform the stage: identify actors and build partnerships**

- Who makes decisions that are influenced by climate?
- Who can provide information?
- Who do we include to ensure that all decision-makers, including marginalised groups such as women, the disabled and the poorest of the poor are represented?

| | |
|---|---|
| How much time should we allow? | For a two year project, it is possible that the first three months or so may be necessary for identifying actors, and building partnerships can take longer than that. |
| Who should be involved? | All team members will likely have insights, for example producers will likely have recommendations for counterparts in the focal country. Social science team members will be best placed to undertake stakeholder analysis of users. |
| Ensure inclusion of women, the disabled, and the poorest of the poor | Make specific efforts to seek out representation from a variety of groups, recognising that this may require sensitivity of methods of engagement. |

### 4.2.1 Identify stakeholders

Some pre-existing relationships are likely to have been capitalised upon in a consortium gathered for the concept note/proposal, and these can form the initial stages of scoping from which snowball sampling will identify other potential actors with whom to consult. Box 13 also outlines broad categories of stakeholders. Actors that are identified at this stage for partnerships could be "next-users," i.e. those that "receive" the information products directly, for example government departments, or "end-users," i.e. those that are intended to benefit from the development of a climate service at the grassroots level, for example farmers or water boards. Intermediary actors, or knowledge brokers, should also be identified and scoped for interest in

developing partnerships. These could include NGOs or networks that could coordinate and communicate with users. This is particularly important to ensure representation of the interests of women, the disabled and the poorest of the poor, who may not be able to participate directly. The process of identifying actors can likely be done remotely based on internet searches and taking leads from relevant contacts, but may often require some preliminary scoping through site visits and informational interviews. Stakeholder analysis is also a core component of WISER's MEL guidance.

**Broad categories of stakeholders with potential interest in co-production of weather and climate services**

- Government staff
    - National and local
    - Different ministries and departments
- Non-government organisations/civil society organisations, e.g.
    - International (Oxfam, CARE, Save the Children, Red Cross/Red Crescent)
    - National/local
- Multilateral agencies, e.g.
    - UN agencies (including the WMO and Global Framework for Climate Services)
    - Multilateral development banks, e.g. African Development Bank, World Bank
- Donors, e.g.
    - DFID, GIZ (German), USAID, SIDA (Swedish), DANIDA (Danish), NORAD (Norwegian)
- Academia and research partners
- Final users of information, e.g. farmers

*Box 13: Broad categories of stakeholders with potential interest in co-production of weather and climate services*

### 4.2.2 Determine level of interest of stakeholders

Initial meetings with these actors are important to outline the producer ideas for the generation of climate information products, and to scope whether these actors would be interested as potential partners. It is recommended that the initial process of meeting actors takes place face-to-face. Face-to-face meetings are also an important prerequisite to building trust, instilling confidence in the commitment of the team to the process, and offering the opportunity for an engaging dialogue in which questions and concerns can be explored. Such face-to-face meetings can take place individually, or in group settings through workshops. Trust cannot be built overnight and sustained engagement through electronic and (ideally) face-to-face means should be planned to take place throughout the project lifespan. Sufficient financial resources and time should be budgeted to enable this. Box 14 outlines some questions to ask stakeholders to determine interest.

**Questions to ask stakeholders to determine interest**

- To what extent does the climate affect their planning and decisions?
- What interest do they have in weather and climate services?
- What information do they want from you?
- Who else might be influenced by their opinions?
- Who else do they think should be play a role in co-producing weather and climate services?

*Box 14: Questions to ask stakeholders to determine interest*

### 4.2.3 Building relationships

A prerequisite for building relationships is identification of stakeholders and determining the nature of their interest in weather and climate services. As outlined above, the process of building - and then maintaining – relationships is essential to successful co-production. Based on a review of six co-production processes in the

climate and development field, Box 10 highlights several key enablers that depend on the existence of good relationships, namely: participation and ownership; facilitation; design; and incentives and investment (Harvey et al, 2017). Adequate time and resources should be made available for building and maintaining relationships, with face-to-face contact being very important. Box 15 outlines how having embedded researchers and knowledge brokers can build and maintain relationships, as well as providing other benefits.

**Case study – embedded researchers and knowledge brokers**

Truly understanding the needs of users is easier when there is a good understanding of decision-making contexts. This can be enabled by having embedded researchers in user environments, or using knowledge brokers (Cvitanovic et al, 2015). Embedding researchers in decision-making environments creates improved understanding and empathy, as well as facilitating knowledge exchange (Cook et al, 2013). It thus also facilitates process-based co-production, and ensures ongoing knowledge exchange that can rapidly identify when there is the need to employ flexibility in service development.

The Future Climate for Africa project FRACTAL has embedded researchers within its focal cities across southern Africa in order to gain insights into how decisions relating to water, energy and food are made. Ethnographic research, or participatory action research, in which researchers are embedded within their research context – for example within a rural community - are other examples. For true co-production the length of this embedding ideally needs to be longer than just the stage of needs assessment, to include the process development whereby the service is tried and tested by users.

Knowledge brokers are typically embedded within research teams and act as intermediaries to develop and manage relationships and networks among and between producers and users (Michaels, 2009). The Future Climate for Africa project Uncertainty reduction in models for understanding development applications (UMFULA) project has attempted to follow the knowledge broker model in delivering climate information to inform medium-term (5-40 year) planning decisions in Malawi and Tanzania. There is a knowledge broker for each country. In Malawi, Kulima Integrated Development Solutions has been involved in the process of stakeholder identification and needs assessment. They are in charge of managing relationships with partners in country, which includes the Department of Climate Change and Meteorological Services and the Ministry of Agriculture, Irrigation and Water Development, and facilitating dialogue between users and researchers. As part of this process so far, they identified misunderstandings in interpretation of climate model outputs, and have worked with the rest of the research team to produce user-oriented guides – so far one on "What climate models show us and how they can be used in development planning[1]" and another on "How to interpret global climate model results".

Note: Even with embedded researchers and knowledge brokers is important to manage the process of co-production, it does not negate the need for all participants to be open-minded and willing to do things differently.

*Box 15: Case study on embedded researchers and knowledge brokers*

[1] http://www.futureclimateafrica.org/resource/climate-models-what-they-show-us-and-how-they-can-be-used-in-planning/

*4.3 Co-explore need*

**Key questions to inform the stage: co-explore need**

- What weather or climate service is needed?
- Are we ensuring that the needs of include all potential users and decision-makers, including marginalised groups such as women, the disabled and the poorest of the poor are represented?

| | |
|---|---|
| How much time should we allow? | For a two year project this would ideally be complete within the first 4 months. |
| Who should be involved? | All team members should be involved to understand the decision context and needs. |
| Ensure inclusion of women, disabled and the poorest of the poor | Make specific efforts to seek out representation from a variety of groups, recognising that this may require sensitivity of methods of engagement |

Having identified stakeholders who are interested in the design of a climate service, the next stage is to investigate a specific decision that requires weather or climate information, and what type of information might be required, in order to arrive at a particular aim for the weather or climate service.

There are various options for this stage. It is possible to used closed answer or open ended questions, and this can be conducted remotely (for example an online survey, or email questionnaire) or in person. Box 18 outlines some indicative questions/themes to explore to identify needs. Face-to-face is recommended as it increases response rate, and provides the opportunity for dialogue and further probing that may be required. This may take place through individual interview or workshops with stakeholders identified in stage one. Particular care must be taken to ensure inclusion of women, the disabled and the poorest of the poor where appropriate, or their representatives (e.g. NGOs who can speak on their behalf). This may require flexibility and adaptation of the ways in which interviews and workshops are conducted – for example in terms of language used (or availability of interpretation), timing and location. If workshops are used which bring together different stakeholders with different levels of power, e.g. government staff and community members, sensitive facilitation is required to ensure that everyone feels able to speak and voice their opinion (Box 16, Box 17).

**Case study - Ensuring inclusion of women**

Recognising that women are often disproportionately affected by climate change, when designing climate change preparedness workshops to take place in the semi-arid Suid Bokkeveld, the facilitators planned carefully to ensure spaces to allow both women and men full participation in the workshops. However, including women in a meaningful way was not easy. Women tend to provide the continuity in society; they stay at home to attend to children, and elderly and ill relatives. There may be livestock to attend to and food to prepare. For these reasons, only a few women attended the first workshop and several brought their children with them. The children's needs took the women's focus off the workshop content, as did their attention to catering. At the women's suggestion, the children were invited to engage in their own activities, run by two facilitators. The children enjoyed this and it has become a regular feature. Catering is now provided by community members not engaged in farming. Furthermore, because women tend to have limited access to their own transport, a bus collects all participants at convenient pick-up points, so everyone is equally mobile.

The workshops provide an invaluable opportunity to understand the perspectives of women farmers in the area. They create a space for joint learning and reflection in the community, where men and women can share their experiences, collect information from small-scale experiments and climate monitoring, and plan strategies in anticipation of climate variability. Men and women propose small adaptation projects on their farms at workshops as well. This is a great confidence booster for some women, who report back on successes and challenges encountered. The equal access of men and women to funding for adaptation projects is important and supports an approach that includes the entire community and draws on the strengths of its members.

These changes to the workshops have had several positive impacts:

- The children's workshops and catering provided allow both female and male farmers to focus on the workshop content while having their needs, such as food and child care, attended to.
- The workshops perform an important social function and provide a safe space for interaction and sharing among women, who are often isolated on their farms.
- Women who want to play a larger role and be involved in the farmers' co-operative have been able to establish themselves as voices of authority.
- Women can enjoy the process of building self-confidence and having their contributions taken seriously in an engaging and enthusiastic environment (Annecke and Koelle, 2011).

*Box 16: Case study on ensuring inclusion of women*

**Case study – ensuring inclusion of the disabled**

A project in the Pacific region to raise awareness of climate change made specific efforts to ensure inclusion of the disabled, which may hold some lessons for inclusion of the disabled in the co-production of weather and climate services (Harris, 2014). Although scientific evidence is growing, awareness and education – particularly among vulnerable communities – is often lacking due to cultural and language barriers. The impact is that vulnerable people may not respond to or be aware of policies aimed to build their resilience.

In the Pacific, different means of communication are used to improve the accessibility of climate change education and awareness. This includes participatory media – including community radio, participatory video, digital storytelling, entertainment education and dramas, animation, theatre, music and information and communication technologies, which have had the effect of empowering marginalised groups, including people with disabilities, women and youth. Creating content through these media in a participatory way ensures the perspectives of people with disabilities and other marginalised groups can be brought into the public sphere, and contribute to understanding of climate risk more broadly. They can also offer a powerful, empowering form of storytelling for potentially isolated groups. Community networks and support for using different media are required for this kind of intervention to be a success, so there is potential for linking such interventions with people with disabilities and disabled people's organisations and networks. Targeting these groups as stakeholders for inclusion will improve the likelihood of developing weather and climate services that meet the needs of the disabled.

*Box 17: Case study on ensuring inclusion of the disabled*

Box 18 outlines indicative questions/themes to explore to identify needs. Box 19 describes an approach taken to investigate actual and potential weather and climate information needs for development planning in Malawi.

**Indicative questions/themes to explore to identify needs**

- What are the biggest challenges that you face? What role does the weather and/or climate play in that?
- How does/has weather and/or climate affect(ed) your activities (in the past)?
- What weather and/or climate information do you use, and from where? (including indigenous knowledge)
- For what purpose do you use this weather and/or climate information? What decisions does it inform?
- Are there limitations to the weather and/or climate information that you use? (i.e. is it available for the appropriate time and spatial scale; is it available in a timely fashion; do you understand it fully; does it provide the information that you need to make decisions?)
- What weather and/or climate information would you like to be available? How would you use it?

*Box 18: Indicative questions/themes to explore to identify needs*

**Case study - Investigating actual and potential weather and climate information needs for development planning in Malawi**

Needs identification was based on three stages: policy analysis, exploratory interviews with government staff, and then a workshop. In order to take account of differing decision priorities between government departments, the workshop used a role play scenario that was unfamiliar to all the participants, but had close parallels with their daily jobs, and had a similar decision-making process. The intention here was to encourage participants to consider the potential risks of climate change to different sectors, and to raise their awareness of the potential use of weather and climate information through prompts, but also to encourage them to consider additional information that would also be useful in planning decisions. After this activity, participants reflected on their own decision-making processes and procedures using the insights they had gathered in order to determine what weather and climate information may assist them, and thereby generate the list of needs.

*Box 19: Investigating actual and potential weather and climate information needs for development planning in Malawi (Vincent et al, 2014)*

### *4.4 Co-design solution*

**Key questions to inform the stage: co-design solution**

- How do we see the process of co-producing our climate service?
- What will be the respective roles and responsibilities of actors within the process?
- What other actions do we need to take to continue a process of co-design of our climate service?

| | |
|---|---|
| How much time should we allow? | For a two year project a first attempt at a solution would ideally be complete by the end of the first year. |
| Who should be involved? | Weather and climate scientists and co-production facilitators |
| Ensure inclusion of women, disabled and the poorest of the poor | Be sensitive to the particular needs of different groups, which may require multiple meetings at different times and in different locations, translated materials and interpretation capacity to ensure accessibility. |

Having obtained information on needs, the research team likely needs to consider what is and is not feasible, and whether proxies are available that would meet the information needs. When some ideas have been generated, further dialogue and engagement needs to take place with stakeholders to ensure that this meets their needs. The next stage is co-delivering the solution, and so vital activities at this stage are putting in place partnership arrangements that reflect the shared understanding of the intended weather or climate service, and outline the respective commitments and responsibilities of various actors in the process of producing that service. A Memorandum of Understanding, or similar, that codifies these may be useful for transparency and accountability.

### *4.5 Co-deliver solution*

**Key questions to inform the stage: co-deliver solution**

- Are all partners ready, willing and able to play their respective roles in the process?
- Is a learning framework in place in order to monitor the rollout of the service?
- Is flexibility in-built into the process in order to enable course correction, if required?

| | |
|---|---|
| How much time should we allow? | For a two year project the beginning of the delivery of a solution, bearing in mind that it is likely to require several iterations, should ideally have started by the beginning of the second year |
| Who should be involved? | All team members and partner actors |
| Ensure inclusion of women, disabled and the poorest of the poor | Be sensitive to the particular needs of different groups, which may delivery through different mechanisms, and translated materials. Be especially proactive in monitoring and reflecting on success |

One of the characteristics of a co-produced climate service is that the service only results when it is co-delivered. Weather and climate scientists may produce information products, for example, but it is the interpretation and use of these products that makes them a service.

The process of co-delivering a solution is likely to involve several actors working together for the first time. It is also likely to be an iterative process based on trial-and-improvement, and thus a learning mechanism is essential to identify successes and challenges, and implement course correction if necessary. In particular there may be need for training – for weather and climate scientists to understand how information is put to use, and for partners to understand the generation and limitations of weather and climate products. Box 20 outlines the Participatory Integrated Climate Services for Agriculture (PICSA) approach, in which training of extension workers is a vital component to deliver interpreted seasonal forecast advisories to farmers at the grassroots level. Box 21 outlines the process of co-delivering interpreted seasonal forecast information through participatory scenario planning, an approach that has been scaled up in Kenya to cover all counties, and is also being replicated throughout Africa (CARE, n.d.).

**Case study-Participatory Integrated Climate Services for Agriculture (PICSA) Intermediary Training in Tanzania and Malawi**

Under the Global Framework for Climate Services (GFCS) Adaptation Programme in Africa, the World Food Programme, CGIAR, and the Tanzanian and Malawian national meteorological services have been hosting trainings of extension workers – or, Intermediaries – to improve understanding, communication, and use of climate services in select districts in Tanzania and Malawi. The PICSA approach involves a 5-day training-of-trainers to enable district- and ward-level district to guide pastoralists and farmers through a set of participatory activities aimed at providing locally relevant climate information to inform livelihood decisions.

To enable monitoring and effective learning, a variety of monitoring and evaluation approaches were employed by implementers, including: case study visits, post season discussion and feedback, quantitative surveys, and qualitative follow up. During the training, participants developed work plans and shared these with the training facilitators to enable assessment of progress and follow up later on. Additionally, the trainees also received forms to distribute to pastoralists and farmers to gather feedback at the end of the season about the usability of the climate information provided. Finally, the PICSA facilitators returned approximately 6 weeks after the training to conduct "Learning and Review Days" to receive feedback from the intermediaries about their experiences using the training curriculum in the field and to provide a supplementary refresher training. Finally, the training facilitators conducted an evaluation at the end of the season to assess whether and how people at the local level had used the information they had received from the intermediaries.

Building in monitoring, evaluation, and learning from the outset has enabled the PICSA approach to adapt to the real-time needs of the intermediaries and the users of the climate information. Establishing mechanisms for monitoring and evaluation at the beginning of the process is crucial.

*Box 20: Case study on Participatory Integrated Climate Services for Agriculture (PICSA) Intermediary Training in Tanzania and Malawi (based on CCAFS, 2016)*

## *4.6 Evaluation*

### 4.6.1 Designing a Monitoring, Evaluation and Learning (MEL) framework for the project

**Key questions to inform the stage: evaluation**

- Are sufficient time and resources being allocated to the project to enable effective co-production?
- Are all project team members accountable for the co-production of the climate service?
- Is there are learning framework in place to make the most of opportunities to reflect and improve?
- Have measurement criteria been clearly defined and agreed between all actors?
- Are sufficient time and resources allocated for ongoing monitoring and post-project evaluation?

As outlined above, the process of co-producing a weather or climate service needs to be flexible and iterative. In order to do this, and ultimately to create a more useful and usable service, there needs to be proactive monitoring and learning throughout the service development lifecycle, as well as a terminal evaluation (see section 4.6.2). It is important to be systematic to not replicate mistakes and to build on successes. Learning reflections should be recorded so as not to lose them, for example in the case of staff turnover. Ways to do this could be individual submissions, e.g. through email or an online form, or a workshop evaluation; an in-person (minuted) staff meeting; or a purposive engagement/follow-up, for example a phone conversation with workshop participants. Table 1 outlines some possible themes for reflection on the co-production process.

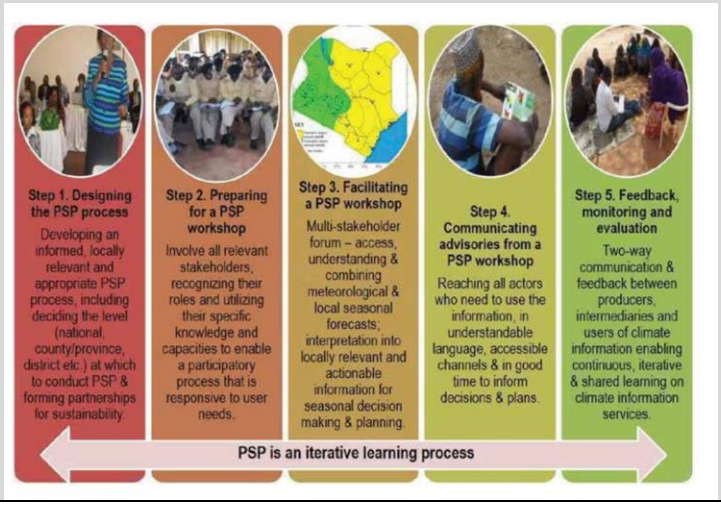
*Table 1: Possible themes for reflection on the co-production process (source: based on CARIAA, 2017)*

| Timing | Participants | Possible themes for reflection |
|---|---|---|
| Quarterly | All project members (including research team and partners) | • Has the process been proceeding as anticipated? If not, why not?<br>• Have all the intended partners been engaging? If not, why not?<br>• Am I participating actively in the co-production process?<br>• Which tools, approaches or activities are proving less effective than expected? Why?<br>• Are we on schedule to produce a timely service? If not, why not?<br>• What are we learning about what works and does not work in co-producing a weather or climate service? |
| Event-by-event (e.g. field visits, meetings, workshops) | All relevant participants (including research team and partners | • Did we achieve our intended goal from this interaction? If not, why not?<br>• Did we engage the people we had aimed to engage? If not, why not?<br>• What worked well? What worked less well?<br>• What should we do differently next time?<br>• What is our biggest lesson learned from this event? |

**Case study: Participatory Scenario Planning for co-producing user-informed climate services**

Participatory Scenario Planning (PSP) is based on the principles of co-producing an effective weather and climate service. Based around 5 steps (see below) PSP takes place in a forum that brings together different actors with different knowledges and enables them to interpret weather and climate information (typically seasonal forecasts) to provide context-appropriate sectoral advisories for use at local level, for example by local government staff, and by farmers and agro-pastoralists. PSP has been successful in bringing weather and climate scientists into closer contact with users, enabling them to gain better appreciation of weather and climate information needs. On the other hand, the dialogue has helped users to understand the uncertainties of weather and climate information, and they ways in which it can usefully inform their decisions.

As part of decentralisation, Kenya Meteorological Department now has representatives in all 47 counties, and they have joined with the Agriculture Sector Development Support Programme in the Ministry of Agriculture, Livestock and Fisheries, with the support of CARE's Adaptation Learning Programme (ALP), to adopt this as a mechanism to ensure environmental resilience of agricultural value chains.



*Box 21: Participatory Scenario Planning for co-producing user-informed climate services (based on CARE, n.d.)*

### 4.6.2 Terminal evaluation of projects by WISER

Evaluation of co-production efforts under WISER should focus on two aspects: 1) the quality and benefits of the co-production process itself and 2) whether the co-production process produces better climate services (and how much better). Given that co-production is time and resource intensive, it is important to understand when co-production is needed and where it may not provide as much return on investment. Co-production may not be necessary in all situations.

With regard to the first aspect, there has been a large amount of research conducted on assessing the quality and benefits of co-production processes themselves (e.g. Brugnach et al., 2015; Hegger et al., 2014). It is widely shown that a key benefit of co-production processes are that they foster enhanced communication, build networks, and strengthen trust among partners. However, even when these benefits are realised, this does not always translate into the production of usable scientific knowledge (see, for example, Lövbrand, 2011). Generally, evaluation of co-production processes relies on gathering the perspectives of the various actors involved, either through structured interviews, focus group discussions, or a combination of these, to determine whether and how the collaborative process has been beneficial to them. This is generally in qualitative, not quantitative terms.

With regard to the second aspect, there are significant questions about how to determine whether co-production produces better climate services and how this value can be effectively measured. A key difficulty is that there is currently lack of agreement on the best way to evaluate climate services more generally (Vaughan & Dessai, 2014). While there have been quantification of the benefits of weather services for several decades, the same approaches for measuring the value of weather services do not necessarily apply to climate services, such as seasonal forecasts or decadal predictions. Therefore, there is not always a good baseline for comparison to assess the relative benefit of co-production of climate services.

There is an increase in the use of "co-evaluation" approaches to assess the benefits of climate services. Similar approaches have been used in the fields of risk, vulnerability, and resilience assessments, where the baseline indicators against which interventions are assess are developed jointly with the intended beneficiaries (Dow et al., 2007; Jones & Tanner, 2015; Steinemann & Cavalcanti, 2006). This is still a relatively new area and will require further exploration to determine robust methodologies for assessing the value of co-production. Box 22 outlines questions to address at a terminal evaluation.

**Questions to address at a terminal evaluation**

- How well did scientists and other stakeholders specify the problem statement at the outset of the project or programme?
- In retrospect, would different scientific information and processes have been more useful? What steps could have better set up the project at the outset?
- Did the project give appropriate priority to process and products?
- Was the process inclusive, collaborative, communicative, and positive for both scientists and stakeholders, including women, the disabled, and the poorest of the poor?
- Was the role of researchers and stakeholders, and their respective knowledges, clear and adhered to?
- Were there appropriate incentives and rewards structures in place for scientists and stakeholders to participate in co-production, and by the satisfaction of contributing to better decisions?

- Did the scientific information and process lead to better decisions (or was it capable of doing so, even if constraints precluded a better decision)? How should future projects be managed to better meet this goal?
- What obstacles to collaboration were encountered in shaping the goals and final results?
- Are the knowledge and / or associated products being used by the target groups and in the desired way? If not, why not?
- Was a mechanism created to insert new scientific results and learning that occurred by observing the outcomes of decisions made using the products?

*Box 22: Questions to address at a terminal evaluation (source: adapted from Hegger et al, 2012 and Beier et al, 2016)*

### *4.7 A note on co-production and the project life cycle.*

In its purest form, in which it leads to new ways of thinking and "transformation", co-production should start from a "blank page" (Harvey et al, 2017). In practice, this is very difficult. It is rare that users and producers happen to come together in circumstances in which they may be able to identify overlapping interests in the respective need for, and opportunity to provide, a climate service. In reality there will always be at least some degree of implicit intention. The mere arranging of a forum for discussion between users and producers is contingent on the belief that there is an opportunity to collaborate for mutual benefit. More often than not, such fora will be arranged with explicit intentions to address a particular issue which has been predefined as one of concern.

The realities of the project life cycle also act to contain the opportunities for co-production. In ideal circumstances, identifying actors and co-exploring the need should take place prior to proposal development, as it is only after this has taken place that the broad nature of an intended climate service can be outlined. However, in most cases, calls for proposals typically predefine, to various degrees, the types of projects that can be supported. As a result the potential for development of a service is already delimited by the nature of the funding call which, in turn, distils a short-list of potential users who may be interested in a service of that nature. It is, therefore, necessary to be clear about the starting assumptions that are driving the development of the co-production process in the first place, as well as the intended outcomes and impacts, to set realistic expectations among all stakeholders about what is possible. Within the necessary constraints of knowing firstly that you want to produce a climate service and secondly some criteria of what that may incorporate, it is still possible to undertake instrumental co-production that creates usable knowledge (Harvey et al, 2017). The guidance provided here aims to support the process of instrumental co-production. However, it is important to be transparent and reflexive about the motivations for initiating a pre-defined co-production process and to discuss with stakeholders what implications this will have.

### *4.8 Summary and next steps*

This guidance has outlined the process and principles that are necessary to produce a decision-driven, process-based and time-managed weather and climate service. Ensuring inclusion, collaboration and flexibility are necessary to the process. The process itself can be broadly divided into five steps: identify actors and build partnerships; co-explore need; co-design solution; co-deliver solution; and evaluate. The entire process is underpinned by learning gained through continuous monitoring and knowledge exchange during the co-production process, which should enable iteration as required.

Producing the guidance has relied on somewhat limited documented experience of co-production of weather and climate services. Whilst there is some evidence on gender differences in weather and climate services, there is limited evidence on how to effectively include women, the disabled, and the poorest of the poor in co-production of climate services. Since co-production is process-based, it is important to document learning and the evolving roadmap of the process, as opposed to a traditional way of working where the output itself is the focus of attention. It is hoped that, in applying this guidance, forthcoming weather and climate services will be able to document their own experiences to inform the wider community, and also provide insights to further refine and elaborate the guidance.

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