Guidelines for User Interface Platforms (UIPs) for effective user engagement

WORLD METEOROLOGICAL ORGANIZATION

ClimSA

INTRA-ACP CLIMATE SERVICES AND RELATED APPLICATIONS PROGRAMME

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WEATHER CLIMATE WATER

Contents

Executive Summary – Principles and Guidelines

User Interface Platforms (UIPs) facilitate interactions to enable users, researchers, and climate service providers in the climate services value chain to come together to develop, deliver and use climate information in support of robust climate-sensitive decision-making. The interactions and engagement that the UIPs facilitate improve communication, coordination, and collaboration, and help build trust amongst participants. The engagement helps identify and align user needs and provider capabilities, improves climate literacy through communication and capacity building, and can gather and act on knowledge exchanged to improve climate service development, delivery and use. Engagement can promote mainstreaming of climate information in the decision-making process and guide scientific research and developments (including products and services based on science) through better understanding of society's (users) needs for climate information.

UIPs have been developed and implemented worldwide using various methods and approaches. In 2017 an international WMO Expert Team compiled and analysed differing examples of UIPs for user engagement. The Expert Team identified three broad categories of engagement ranging from relatively passive engagement through websites and web-based tools, to more active engagement through interactive activities such as workshops and interactive seminars, to highly active engagement through focussed relationships, with the level of passive versus active engagement being guided by needs, capacity and available resources. As more examples of user engagement through UIPs have appeared, some spanning several of the three categories, considering a range of engagement modes would allow for a better focus on outcomes, such as improved decision-making, improved trust, collaboration, relationship building and networking. Modes of engagement could include passive and structured through to active and relationship focused. UIP activities could include one or more such modes, or varying levels of such modes, depending on the UIP.

The number of organisations and individuals who might use climate information for their decision-making far outnumbers the climate experts and service providers, and different approaches to UIPs offer the opportunity to reach few or many organisations, depending on the need, context and available resources and capacity. The methods for engaging (i.e., what is needed for developing and operating the UIPs) should be determined on a case-by-case basis depending on what is appropriate, and the available technologies and capabilities. UIPs should be implemented flexibly to meet the diverse range of interests and requirements, which will also evolve over time as technologies and science progress and as new environmental and societal challenges arise.

Principles for UIPs for effective user engagement

1. **Tailor** to context and decision, considering the broader landscape and socio-cultural values.
2. Enable **affordable, manageable, timely and sustainable** engagement.
3. Build required **capacities** among actors.
4. Build **trust** among actors through carefully facilitated processes and **equitable** engagement, recognising the knowledge that all actors bring to the process.
5. Embrace **diversity** and respect differences.
6. Enhance **inclusivity** and **collaboration**, including building **networks** and **relationships**.
7. Keep **flexible** and allow for **innovation.**
8. **Communicate** in engaging and accessible ways and be mindful of technical language. Make things **tangible and relevant** to everyone.
9. Ensure **value-add** for all involved.

Steps for the development and operation of UIPs for effective user engagement

1. **Step 1: Ensure ownership and leadership** from an individual or organisation with the resources to make sure the development and operation take place. Tools like RACI (Responsible, Accountable, Consulted, Informed) Charts can be used to document who is responsible, accountable, or should be informed or consulted for different aspects of operating the UIP.
2. **Step 2: Identify the intended participants**. Consider the context, the broader landscape, practicalities such as institutional arrangements (including organisational support), affordability, diversity, inclusivity, collaboration, and value-add. Using stakeholder analysis and mapping methods like Influence-Interest matrices can aid to identify which stakeholders to involve, what level of involvement is needed and how to involve them.
3. Step 3: Engage with participants to **collectively develop and agree on the UIP's aims and purpose**. This could include the development of terms of reference for the UIP that has been agreed on (e.g., TORs for a technical working group on climate).
4. **Step 4: Assess capacity gaps** and implement responsive capacity building based on these gaps. This can be done as part of the process of identification of the intended participants of the UIP but can also be a continual process done as part of the regular UIP activities. Standalone targeted capacity assessments and capacity building exercises can also be conducted.
5. **Step 5: Make arrangements for how the UIP will be operated and agree on those arrangements** with participants, including the format of and approach to engagement. These aspects can be further integrated into the terms of reference started in Step 3.
6. **Step 6**: Operate / undertake the user engagement (the UIP).
7. **Step 7: Conduct ongoing monitoring, evaluation and review** of the UIP to take on board suggestions and evolving needs for future operation and improvements.

Other considerations

- The rise in the use of virtual engagements that emerged as a result of travel restrictions during the COVID-19, compounded by both a growing awareness and unease at the environmental impact of travel and issues around inclusivity from certain sociodemographic groups, have created a huge growth in replacing in-person engagement with **virtual/online/remote engagement**. Such remote engagement has the potential to improve diversity, equity, and inclusion in some forms of UIPs. Further considerations around remote engagements are provided in this document, however, people's access to appropriate resources (such as stable internet) needs to be carefully considered to avoid excluding those who would have problems with remote engagement.
- **Networking** between participants is important in many user engagement activities, and should be considered for incorporation into the UIP.
- **Multiple and varying communication and engagement approaches** within a UIP can be useful. For example, UIPs in the form of meetings can be usefully supported by websites/web-based tools and social media, for example to improve the reach, inclusivity, and impact. The prioritisation of one type of platform for user engagement does not exclude use of others in a complimentary manner.
- For some UIPs (for example at National Climate Outlook Forums (NCOFs) and Regional Climate Outlook Forums (RCOFs)) **continuity, in terms of institutional memory and engagement,** is

highly beneficial and therefore it is worth considering establishing designated focal points or champions amongst some key stakeholders who will provide continuous and regular interaction and engagement in the UIP. Also ensure the different stakeholders find value in the interactions to ensure they are sustainable.

- Consider holding **sector-specific sessions** alongside generic / multi-sectoral UIPs to allow focus on sectoral needs. The sectors to be targeted will depend on the national context.
- In many cases, **it might be efficient to evolve and improve an existing UIP** to better meet users' needs. For example, expanding the scope of existing climate outlook forums (RCOFs and NCOFs focusing on the upcoming season) to broader climate forums covering timescales of relevance to the users rather than being limited to the seasonal outlook timescale.
- **The timing and frequency of user engagement can be crucial** (as highlighted by several NCOFs), in which cases the needs of the users should drive the timing and frequency, for example regularly preceding a wet or a dry season.

In-person engagement versus virtual, online or remote engagement

There is a wealth of literature discussing the advantages and challenges of remote engagement compared to in-person engagement (Moss et al. 2020, 2021; Tao et al. 2021; Skiles et al. 2021). Advantages of remote user engagement include less time, carbon and money spent travelling; greater inclusivity as often certain groups are less likely to attend in-person, such as women with caring responsibilities, people with disabilities or the elderly; provision of options creativity, for example through use of real time surveys or interactive online work boards; and enabling sometimes weaker voices to be heard which would often be muted by the presence of strong personalities in an in-person environment. However, such UIPs need to be facilitated carefully since there are also disadvantages, including challenges around limited networking, low attentiveness as participants are not getting away from the desk and 'being in the room', lack of spontaneous 'coffee break' interactions, language challenges that can be more difficult to handle remotely, hampered creativity if suitable technologies are not available, and challenges with strong and reliable internet.

For UIPs that have traditionally been conducted as in-person meetings, perhaps a first question should be 'does the UIP definitely still need to be entirely an in-person meeting?' If the answer is not a strong yes, then could the UIP be conducted either entirely online/remotely, or could it perhaps be conducted as a 'hybrid' meeting with some elements and/or participants online/remote and some in-person? The hybrid meeting approach might mean having some user engagements conducted entirely online/remotely (for example pre-COF training to reduce costs) or having some of the participants online/remote and some in-person.

If an existing in-person UIP is going to be changed to either hybrid or entirely online/remote, then the format needs to be carefully reconsidered. In the case of UIPs with a mix of participants joining remotely and in-person then it is important to consider the requirements of **all** participants to strive for inclusivity and avoid creating two different groups and a 'them' and 'us' environment. For hybrid and fully remote/online events, the consideration of engaging professional online event hosting companies and platforms should also be considered, ensuring availability of online options like live surveys, interactive workboards, breakout rooms, Q & A section and translation among others.

Hypothetical case study – a regional UIP for Antarctica

This hypothetical case is included to help illustrate the Principles and Guidelines described in this document. Antarctica is home to about 5,000 people, mostly researchers. The main economic activities include fishing and tourism, both of which rely on climate information for planning. In addition, the region is highly affected by climate change which is causing the melting of ice sheets. Antarctica currently does not have a regional forum for bringing users, researchers and climate service providers together to facilitate the development, delivery and use of climate information for decision-making. There is lack of a platform or stage for communication, coordination and collaboration amongst climate service actors.

Using the proposed step-by-step guidelines, how might we establish a UIP for Antarctica to help? decision-makers better manage the climate-related risks in and around Antarctica?

1) Ownership and leadership:

Someone needs to take ownership. Antarctica has no NMHS or RCC and it is not part of a WMO Regional Association, so at least one of the stakeholders involved in the UIP development needs to take on this role, supported by others if necessary. For the sake of the illustration, let's pretend that the WMO takes ownership of this hypothetical UIP supported by the seven WMO Members with Antarctic territorial claims. WMO appoints a focal person to manage the regular engagements with the relevant WMO members and stakeholders.

2) Proposed purpose and participants:

The overall aim and purpose of the UIP could be to provide a platform or stage for regular and sustained dialogue, communication, interaction, and coordination amongst stakeholders considering consistent information on past and future climate conditions for Antarctica and the Southern Ocean.

Participants could include WMO and other UN Agencies; international experts on climate observations, climate research, climate projections, climate impacts and adaptation; Members of the Antarctic Treaty; user representatives from sectors such as fisheries, DRR, ecosystems.

3) Engage and develop an agreed aim and purpose. WMO could organise online meetings and communications between the participants to develop and agree the aim and purpose. Aims and purposes could include:

a. Identify key regional and international climate experts and user sector representative/experts. Develop a shared vision and common purpose. Develop agreed principles and ways of working together.
b. Meeting of regional and international climate experts and user sector representative/experts to co-explore and share knowledge (including discussing climate change and climate impacts over Antarctica and the Southern Ocean) while jointly identifying issues that require climate information.
c. Identify climate products and services which will assist stakeholders in their planning and decision-making. Promote integration of climate information, along with the uncertainties and limitations, into decision-making processes.
d. Provide ongoing assistance to better understand the needs from climate information, and support the use of climate information for decision-making, for example through sustained interactions, training workshops on climate change and climate impacts, outreach sessions involving media experts to develop effective communications strategies.
e. Create a network and community of climate stakeholders for Antarctica and strengthen the sustained collaboration between the stakeholders.
f. Gather and act on feedback from all participants and improve subsequent meetings.

4) Assessing capacity gaps and capacity building would occur as part of the above aims, particularly bullet points (d) and (e) above.

5) The arrangements for operation of a UIP for Antarctica could be based on annual meetings held remotely using an online video-conferencing platform supported by documentation on websites. This type of interaction would highly suit the decentralised nature of participants in a UIP for such a location and context.

6) With regard to the principles: being flexible could be key since such a UIP or activity for this region is a new endeavour, and important learning will be needed, including regular evaluation and review of the UIP. Antarctica might have a unique context and decision-making landscape, and the actors in the process might have varying socio-cultural values. The UIP should embrace the diversity the participants bring, should be inclusive and collaborative, and should respect any differences. Organising the UIP as online meetings would help make the cost manageable and would be sustainable if the participants wish to hold regular meetings but bear in mind potential accessibility issues. A regular series of meetings would help build relationships and establish a network to tackle climate-related challenges in and around Antarctica. Knowledge sharing and capacity building are possible and having open and honest interactions and discussions should build trust among actors.

7) Evaluate the UIP after each meeting by seeking feedback from all participants and review this feedback to improve subsequent meetings as the needs of the participants evolve and based on what was useful and what was not useful in the operation of the UIP.

Background

Priority sectors for adaptation identified by many countries in their Nationally Determined Contributions (NDCs) to the Paris Agreement include water, agriculture, health, energy, and disaster risk management, as well as other climate sensitive sectors. In some countries, such priorities are also identified in National Adaptation Plans (NAPs), and most countries also address climate-related risks in national development and sector-specific plans. WMO is supporting structured interactions among users, researchers, and climate services providers by contributing to the development of User Interface Platforms (UIPs) that allow providers and users of climate services to come together to co-design tailored sectoral climate services. WMO is leading the coordination of the conception and development of UIPs; supporting regional partners in establishing/strengthening the use of regional[1] UIPs for selected priority sectors.

Within the Global Framework for Climate Services (GFCS) and under the provisions of technical support to the ClimSA programme (https://www.climsa.org/) this document provides guidance for the development and operation of UIPs. Such guidance is intended to be used to promote structured interactions among climate service providers, users, and researchers, to allow providers and users of climate services to co-design tailored general and sectoral climate services. The guidance is being developed in association with the WMO, Regional Climate Centres (RCCs) and NMHSs.

The following sub-sections summarise the Global Framework for Climate Services as the major driving force for climate service development, delivery and use around the world; the importance of user engagement, through UIPs; and the value chain for climate services to illustrate the key activities and key actors in climate service development, delivery, and use.

The Global Framework for Climate Services

Knowledge of the past, present and future climate is important for decision-makers and policy-makers to better manage the risks and opportunities related to climatic conditions (Hewitt and Stone 2021). There are a growing number of actors involved in the development, delivery, and use of climate services. The importance of this was recognized at World Climate Conference 3 in 2009, which led to the establishment of the Global Framework for Climate Services (GFCS, Hewitt et al. 2012; WMO 2014), a UN-led initiative in which WMO Members, UN Agencies, inter-governmental organisations, non-governmental organisations (NGOs), regional, national and local stakeholders work in partnership to develop and use targeted climate services via an international partnership.

The GFCS identifies five key components for climate services (Figure 1). Observations, monitoring, research, modelling and predictions of the climate provide the data, information and knowledge that underpin climate services, made accessible through climate service information systems, and supported by capacity development. However, the critical component to link societal use and societal needs to the underpinning capability is the interface and engagement between the users of the climate services and the providers of the climate services. This engagement is through so-called User Interface Platforms (UIPs) in the GFCS (Hewitt et al. 2017; WMO 2018a) to help ensure that climate services reach the people who need to make decisions, and that the services are of use and value to the decision-makers, as far as is scientifically credible and possible.

[1] Note that regional is meant to relate to multi-national areas and not regions within a nation.

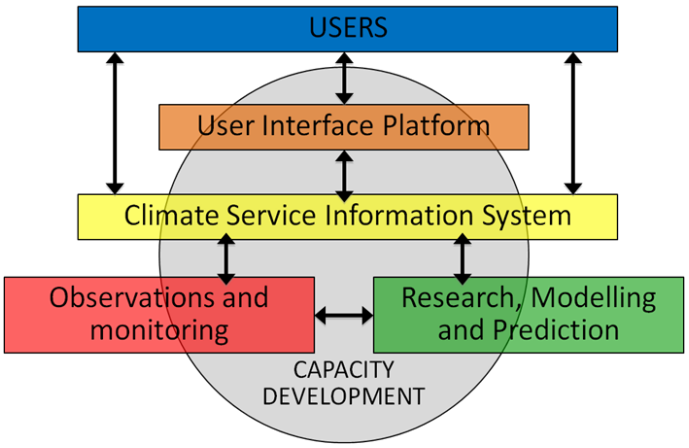

Figure 1: Schematic of key components of the GFCS. Adapted from the GFCS Implementation Plan (Hewitt et al. 2012; WMO 2014)

User engagement and User Interface Platforms

The UIP concept in the GFCS is described as a structured means for users, researchers, and climate service providers to come together to design, or co-design, tailored climate services. UIPs are not institutions or stand-alone entities necessarily, but function as go-betweens for the other components of the GFCS (which themselves are important components of the climate service value chain described in the next section), helping ensure the generation and delivery of what is needed for climate-sensitive decision-making. UIPs can also facilitate coordination and collaboration.

The interactions and engagement undertaken in UIPs improves communication, coordination, collaboration and helps build trust amongst participants. The engagement helps identify and align user needs and provider capabilities, improves climate literacy through communication activities and capacity building, and can gather and act on knowledge exchanged to improve climate service development, delivery, and use. The engagement can also promote mainstreaming of climate information in the decision-making process, and guide future scientific research and developments (and the products and services based on that science) through better understanding of society's needs for climate information. Managing climate-related risks, including adaptation options, requires a faster, more fluid relationship between various stakeholders involved, from science to humanitarian use, and from data to decisions, and engagement between all actors is essential.

The methods for engaging (i.e., the UIPs) are determined on a case-by-case basis depending on what is appropriate and using available technologies and capabilities (Figure 2). The number of organisations and individuals who could receive climate information for their decision-making far outnumbers the climate experts and service providers, and different approaches to UIPs offer the opportunity to reach few or many organisations, depending on the need and context. UIPs should be implemented flexibly to meet the diverse range of interests and requirements, which will also evolve over time as technologies and science progress and as new environmental and societal challenges arise.

UIPs have been developed and implemented worldwide using a wide range of methods, a subset of which are discussed in the next section. The wider range of methods include committees, working groups, focus groups, workshops, interagency task teams, internship programmes, one-on-one discussions, media broadcasts, social media, training, web portals, mobile apps, podcasts, webinars, structured decision tools, and graphical information systems. In many cases there will be opportunities to build upon well-established dialogues such as the Regional Climate Outlook Forums discussed in the next sub-section.

The GFCS described four main aims for UIPs (WMO 2014), which are simplified as follows:

- **Dialogue**: enable communication between the providers and users of the climate services.
- **Outreach**: improve climate literacy through communication activities and capacity building.
- **Feedback**: gather and analyse feedback from user communities.
- **Monitoring and evaluation**: measure progress made in improving climate services according to agreements between users and providers.

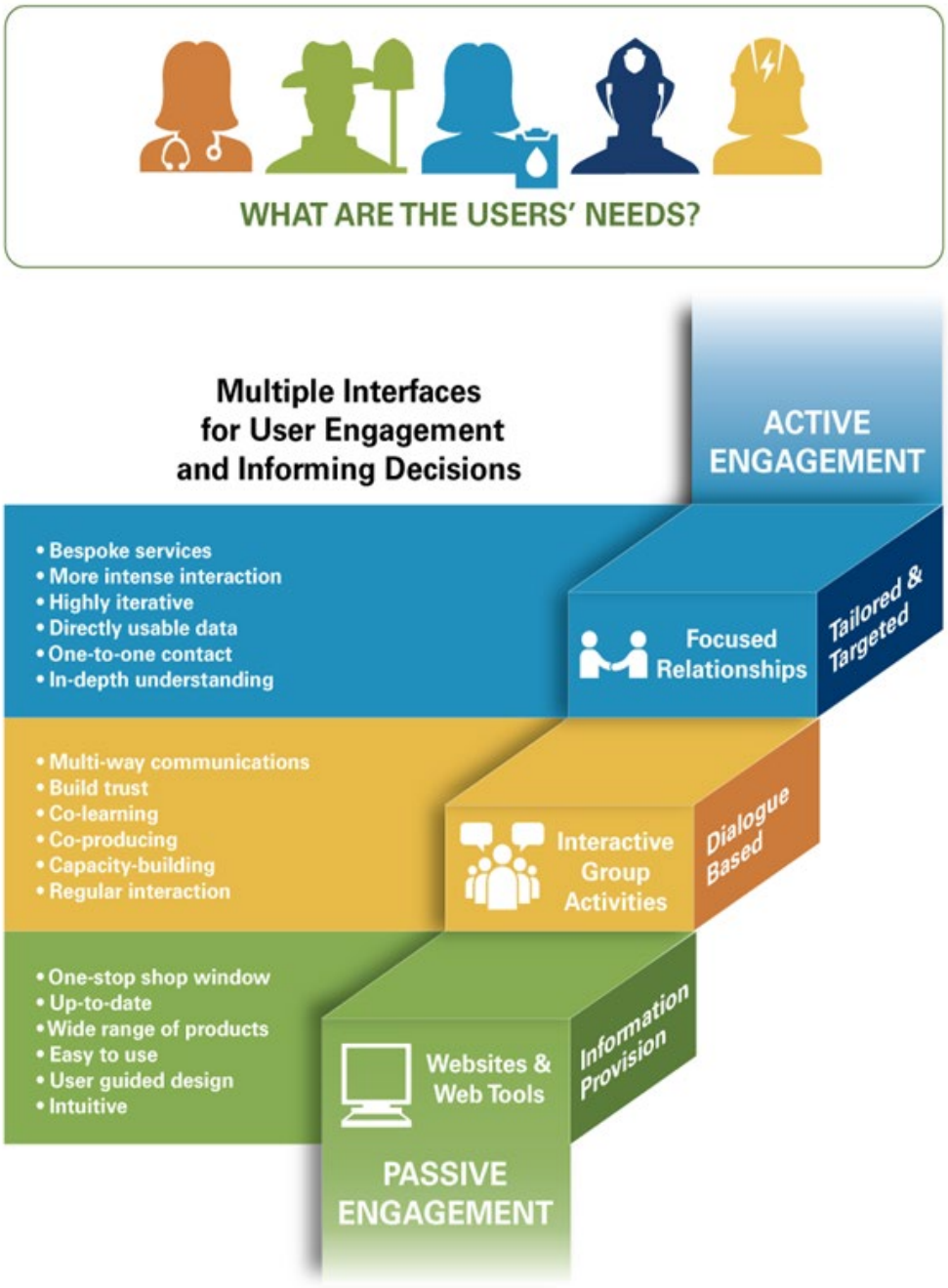

Figure 2: Schematic of three broad categories of engagement between users and providers of climate services. Figure from Hewitt et al. 2017; WMO 2018.

Value chain for climate services

No matter how accurate, skilful or detailed the climate information is that underpins the climate service, the service has no intrinsic value unless it can be used to make decisions that bring benefit to the decision contexts (Mylne 2002) and so the ultimate goal of any climate service should be to bring value to the decision context. The development, delivery and use of climate information needs to be done by building relationships between and amongst the producers and users of climate information with the objective of any user engagement being to understand what constitutes useful information for specific decision-making contexts. With such a goal and objective in mind, climate service providers need to understand the climate service landscape and stakeholders, identifying key actors to engage with or collaborate with to (co-)develop services of value to the market and/or society. One way of viewing and understanding this landscape is to consider the value chain for climate services (as illustrated in Figure 3, taken from Hewitt and Stone 2021).

The value chain is context-dependent and represents the range of activities needed to research, develop, produce, and deliver the product or service to all users (Porter, 1985). The visualisation of a chain is not intended here to represent a linear flow from one end to the other. Indeed, it is critical that there are iterations and cycles between different parts of the chain (Vogel et al. 2019; Hewitt et al. 2020). In particular, the premise behind user engagement is that information flows many ways in the chain. Therefore, some contexts may be better visualised by a "value web" representing something more complex with more connections than a chain affords. Figure 3 shows a simplified visualisation of some of the key activities, and examples of the types of actors typically, but not exclusively, involved in different parts of the value chain. The climate service activities are illustrative, and some are inter-related and could map to more than one part of the value chain. The examples of actors for user decisions are not necessarily meant to align with the actors listed in the same row. NMHS in the figure refers to National Meteorological and Hydrological Services.

While it is essential that the providers of climate services understand the landscape and the stakeholders, it is also the case that all the actors across the value chain would benefit from better understanding all the links in the value chain, an important consideration when designing user engagement activities/UIPs.

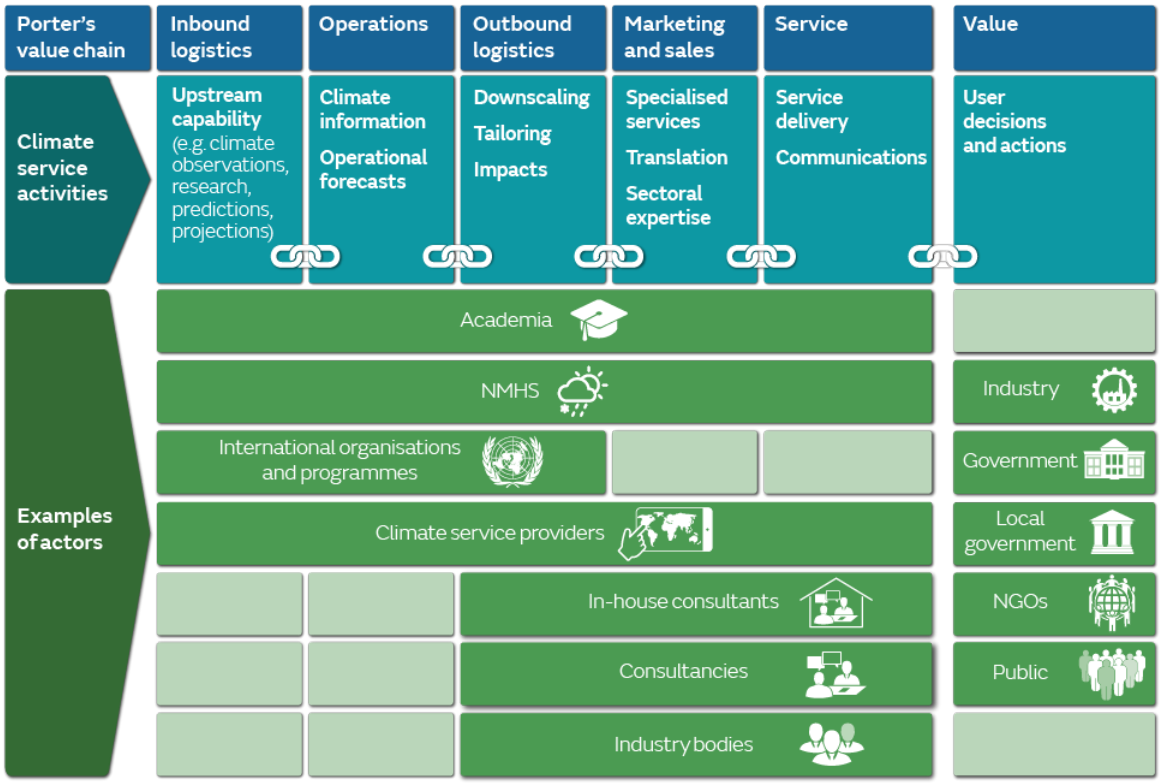

Figure 3: Schematic of the climate services value chain structured around Porter's value chain (Porter, 1985). Figure from Hewitt and Stone 2021.

Overview of existing UIPs at regional and national levels

There are numerous examples of UIPs that are either well-established or starting to become established, both at the regional and national scale. Examples include (but are not limited to):

- A compilation and analysis of real applications undertaken by an international WMO Expert Team of user engagement (summarised by Hewitt et al. 2017; full list in WMO 2018). The Expert Team came up with three broad categories of user engagement, ranging from relatively passive engagement through websites and web-based tools, to more active engagement through interactive activities, to highly active engagement through focussed relationships, with the level of engagement being dependent on the user's needs (Figure 2). As more examples of UIPs have appeared, some spanning several of these three categories, focussing on the range of engagement modes might be more insightful because it allows for a better focus on outcomes, such as improved decision-making, improved trust, collaboration, relationship building and networking. Modes of engagement could include passive and structured through to active and relationship focussed. UIP activities could include one or more such modes, or varying levels of such modes, depending on the UIP.
- Regional Climate Outlook Forums (RCOF), discussed in the following section. Note that some regions are exploring the development of Regional Climate Forums (RCFs) not limited to the seasonal outlook timescale, which could also be linked to National Climate Forums (NCFs) at the national scale.
- Climate service user forums focussing on specific sectors (typically agriculture, health, water resources) have started to be organised at the regional scale attached to some RCOF meetings (as well as at the national scale in some countries).
- Regional Climate Centres are key actors in the climate service value chain at the regional scale, providing regional-scale products to support NMHSs through websites and web-based tools, reaching a large number of users relatively easily, and supporting RCOFs.
- National Climate Outlook Forums, discussed in the following section, are taking place in a growing number of countries around the world.
- There are numerous other examples at the national scale, and/or are sector-focussed, that align to the three broad categories shown in Figure 2: very widespread use of web-sites and web-based tools; interactive group activities through workshops, summer schools, roving seminars, working groups, monsoon forums (mainly in S Asia to date, coordinated by RIMES), Climate Field Schools (for example, https://www.climatelinks.org/blog/climate-field-schools-transforming-agricultural-risk-resilience), Participatory Integrated Climate Services for Agriculture developed by the University of Reading and extensively used by WFP https://ccafs.cgiar.org/index.php/resources/tools/participatory-integrated-climate-services-agriculture-picsa; and focussed relationships such as bespoke services co-developed, consultancy services.
- A book produced in 2012 by the WMO of over 70 examples of real-world climate services (WMO 2012) including examples of UIPs, to illustrate the benefits of, and promote good practices in, climate services as part of the initial implementation of the GFCS.
- The World Climate Research Programme (WCRP) has regional fora with users, to introduce feedback from users into the research agenda.

Some illustrative examples of effective engagement between climate service providers and users with good uptake and use are provided in the following table from the WMO Expert Team on user engagement. More detail on each of these examples are included in the WMO Technical Report "Good practices for climate services user engagement" (Hewitt et al. 2018). Note that the table is not intended to be a comprehensive list.

Engagement	Category	Main objectives
Seasonal forecast fora: National Climate Outlook Fora and Regional Climate Outlook Fora	Interactive group activities	Establish regular dialogue and strengthen networking between providers and users at the national or regional scale, collect feedback to improve products and services, strengthen climate risk management through seasonal forecast services, build awareness and capacity in climate-sensitive sectors
Climate and disaster resilience planning workshops in Tuvalu	Interactive group activities	Improve the communication of climate information to villagers, seek feedback and improve climate bulletins, produce a community climate and disaster resilience plan
Roving seminars for farmers in West Africa	Interactive group activities	Enhance farmers' capacities for decision-making by involving them in training and knowledge transfer, and improve the climate service providers' products through user feedback
Climate and health working group in Madagascar	Interactive group activities	Identify the climate information and service needs of the health sector, help the sector use climate information for the prevention of epidemics and to guide responses for climate sensitive diseases (malaria, plague and Rift Valley fever)
The UK's climate programme and climate forum	Interactive group activities, focussed relationship	Identify user needs, co-develop products and services, provide up-to-date information on climate predictions and projections to support decision-making, use feedback to continually develop the underpinning capability and products and services
International and national coffee production, trading issues and seasonal forecasting	Focussed relationship	Identify key management decisions associated with climate risk on seasonal timescales, improve understanding of, and trust in, seasonal forecasts, co-develop a climate service that fits within the company's management decision framework
Climate information for a Canadian energy company	Focussed relationship	Assess and demonstrate the value of using tailored climate forecasts and climate change projections for hydroelectric power management
Climate service for the Australian sugar industry	Focussed relationship	Identify key management decisions associated with climate risk on seasonal timescales, improve understanding of, and trust in, seasonal forecasts, co-develop a climate service that fits within the company's management decision framework
Climatological information services website of the Hong Kong Observatory	Website	Provide online access to climate data, statistics, products, latest climate news and educational resources
"Our Future Climate New Zealand" web tool	Web-based tool	Easy-to-use interface for selecting and downloading maps and plots of climate projections for New Zealand, designed through user feedback

How UIPs have been established and operated

The UIP Annex of the GFCS Implementation Plan describes the stakeholders, at different spatial scales from global to national. At the global scale, the scope of UIPs includes all nations. Globally, the United Nations system is a critical international stakeholder, with specialized agencies and programmes whose mandates are to coordinate the international co-production, dissemination and use of climate services in all regions and countries.

Regionally, implementation of UIPs in some ways mirrors the global level, albeit in conjunction with stakeholders from governments, regional organizations, non-governmental organizations, scientific institutions and the private sector with a regional scope.

At the national level, implementation is a matter for individual governments and other national stakeholders. It is expected that governments will identify centres and agencies that will coordinate national interactions with the regional and global mechanisms, and that they will assess requirements at the sub-national level, deciding how services are implemented at the community level within their nation.

Finally, the private sector is an important part of UIPs, and private sector organisations will be both providers and users of climate services. For example, health interests in the private sector include private pharmacies, pharmaceutical production enterprises, medical equipment manufacturers, and private practising doctors.

Regional Climate Outlook Forums

RCOFs have been described as “one of the most effective mechanisms for developing user-driven products and services and communicating those to users at regional and national scale” by P. Taalas, Secretary-General of the WMO (WMO 2016).

An RCOF is a platform that brings together climate experts and sector representatives from countries in a climatologically homogenous region to provide consensus-based climate prediction and information, with input from global and regional producing centres and NMHSs, with the aim of gaining substantial socio-economic benefits in climate sensitive sectors. The RCOF approach was initiated in the late 1990s in several different regions of the world (Buizer et al. 2000; Ogallo et al. 2008; Mahon et al. 2019). The early RCOFS were primarily focused on seasonal timescales as modulated by El Nino-Southern Oscillation events and were not focused on longer-term climatic variations and changes. Through interaction with users in the key economic sectors of each region, extension agencies and policymakers, the RCOFs support access to credible climate information, and assess the likely implications of the climate outlooks on key sectors in the given region and explore the ways the outlooks could be used by the regional stakeholders. The process typically includes the following components:

1. Meetings of regional and international climate experts to develop a consensus-based regional climate outlook for the coming season, typically in a probabilistic form based on a range of credible climate predictions.
2. Interactive sessions involving climate scientists and user sector representatives, for the identification of impacts and implications and for the formulation of response strategies.
3. A training workshop on seasonal climate prediction to strengthen the capacity of the national and regional operational climate experts.
4. Outreach sessions, involving media experts, to develop effective communication strategies.

In support of the RCOFs are the WMO-accredited Regional Climate Centres (RCCs). The RCCs leverage data, information, products and engagement across countries within their respective

domains of responsibility and provide examples of success and standards of good practice for climate service engagement, development, and delivery.

In 2017, the WMO undertook a review of the RCOF process (WMO 2017). The review examined the interpretation, creation and dissemination of regional climate outlooks. The review also considered the high expectations and requirements of stakeholders for more actionable climate information tailored to their needs. The review provided recommendations towards a new generation of RCOFs characterized by a transition to objective forecasting approaches to regional climate outlooks, identification of end-use priorities, co-design and operationalization of tailored products, user feedback, systematic evaluation of socio-economic benefits, and the introduction of training workshops that address specific competencies across regions.

National Climate Outlook Forums

NCOFs have been described as “an essential mechanism for promoting inter-agency coordination and regular multi-stakeholder dialogue between information providers and users at the national level.” (taken for example from the Fiji NCOF report).

With so many nations holding NCOFs, there are invariably different needs and objectives from one nation to another, but NCOFs typically include the following objectives (taken from NCOF reports and concept notes for Fiji, Kiribati, Bhutan, Guyana, Papua New Guinea):

- To provide a national platform for regular and sustained dialogue, communication, interaction and coordination amongst stakeholders considering consistent information on past and future climate conditions, including information from the RCOF for that region.
- To identify specific climate products and services which may assist national stakeholders in their planning and decision-making.
- To promote integration of climate information, along with the associated uncertainties and limitations, into decision-making processes, and where necessary provide ongoing capacity building to help better understand and use climate information for decision-making.
- To discuss user views and obtain feedback for improvement of climate products, including their accessibility, applicability, value and usability.
- To strengthen collaboration between the NMHS with national stakeholders and communities.

Reports from NCOFs have highlighted successes, such as:

- Helping the NMHS/climate service provider to package climate information to the needs of stakeholders and communicate uncertainties in weather and climate information.
- Enabling participants to know how to use existing climate information provided by the NMHS/ climate service provider.
- Increasing the confidence of NMHS staff in answering technical questions on weather and climate.
- A participant from a government ministry who participated in an NCOF described the NCOF as "eye opening", they were not aware of the weather and climate services, and they now understand the ENSO, and how it could arrive at certain times of the year and influence the rainfall and temperature.

User fora

Several workshops and forums have been planned or conducted immediately after an RCOF for specific sectors. For example, a water users' workshop has been proposed following immediately after the South Asia RCOF (SASCOF) with the following objectives:

- To introduce the seasonal climate information and seasonal hydrological prediction.
- To introduce the climate information available at the regional level.
- To make use of the climate information in managing irrigation water.

Similarly, a health users' workshop has been proposed following SASCOF to:

- Facilitate greater interaction between climate and health sectors at the national and regional level.
- Provide an overview of climate risks to health in South Asia.
- Identify climate and weather knowledge and decision needs to manage extreme heat events.
- Inform the development of health tailored climate applications.
- Establish a network of partners and projects to reduce the impact of extreme heat in S. Asia.

Challenges for the effectiveness of UIPs

The existing regional and national UIPs have highlighted several challenges and shortcomings. Common ones include the following:

- The cost versus benefit of a UIP and the impact of climate information on decision-making all need to be monitored collaboratively, assessed and demonstrated to assess levels of satisfaction and meeting the needs of the participants in the UIP.
- The duration of the engagement, and suitable venue or environment for the engagement are essential. Also, face-to-face engagement can incur relatively high costs, including costs of the meeting venue, the time and expense incurred for participants to travel, and the associated carbon footprint. Travel restrictions during the COVID-19 pandemic necessitated many face-to-face UIPs being replaced by engagement online through a range of web-based tools. While there are challenges associated with web-based approaches, their use should be explored further and offer many advantages (Moss et al. 2020, 2021; Tao et al. 2021) but being mindful that the reliance on online tools during the COVID-19 pandemic has affected stakeholder engagement and collaboration.
- Building collaboration and engagement of key organisations, such as NMHSs and other government Agencies can be problematic. In particular, it is important to provide authoritative and consistent information, and different sources of climate information can be used in different climate services causing confusion amongst the users, and so consolidated or consistent messaging is needed. Developing the capacities and capabilities of all actors involved in the UIP will strengthen the engagement.
- UIPs need sustained funding otherwise the collaboration and engagement may end.
- RCOFs are proving successful as existing forms of UIPs, but they are typically held only once or twice a year and such a schedule might not be compatible with some users' needs and with the overall aims of UIPs under the GFCS, namely dialogue, feedback, outreach, and monitoring and

evaluation. Identifying user needs, co-designing and co-producing climate services might not be sufficiently served at occasional RCOFs, and not all RCOFs currently fully embrace the approach of ensuring that climate service development is user-driven.

- Sharing climate information successfully is not always easy. Alternative means of dissemination should be co-explored between the providers and users of climate services. Climate information is often difficult to obtain, understand and use. UIPs are often too technical for sector representatives. Need to consider language, culture, communication style and communication channels.
- UIPs conducted at the regional level need to feed into national UIPs wherever possible to enhance climate service delivery and use at the actual level of decision-making. The concept of a National Framework for Climate Services (WMO 2018b) can provide the environment to enable UIPs at the national level.
- Inadequate human resource at the RCCs can affect the establishment of regional UIPs.
- Co-production, sector coverage, involvement of relevant stakeholders and disciplines, and insufficient dialogue, outreach, feedback and monitoring and evaluation. Some regions are considering improving and expanding the RCOFs to address these shortcomings.

Principles for UIPs

There is a wealth of literature on co-production of climate services (see for example Lemos and Morehouse 2005; Steynor et al. 2016; Vincent et al. 2018; Golding et al. 2019; Hewitt et al. 2020; Steynor et al. 2020; Hewitt et al. 2021). Co-development is an approach and concept which is closely aligned to user engagement since the co-production depends on engagement between the providers and users of the services. The Weather and Climate Services for Africa (WISER) programme has been active in co-production and user engagement and provides a useful and accessible source and resource for practical experience of user engagement. WISER has six building blocks of co-production (Figure 4).

Figure 4: the building blocks of co-production. Figure from Carter et al. 2019 https://futureclimateafrica.org/coproduction-manual/index.html

The WISER programme developed ten overarching principles for good co-production (see https://futureclimateafrica.org/coproduction-manual/book/text/02.html#23-overarching-principles-of-good-co-production) which have the potential to form the basis for guiding high-level recommendations or principles for UIPs. In addition, the Future Resilience for African Cities and Lands (FRACTAL https://futureclimateafrica.org/wp-content/uploads/2021/09/Principles-Brief.pdf) project developed 12 overarching principles that underpin climate resilience work. A journal article (Otte 2021) reviewed key stages that influence people's decisions about climate action, and makes recommendations which are also useful to consider for user engagement for climate services, since the purpose of the climate service is to influence a decision, i.e. take some form of action.

As an initial idea, the following principles could be useful for UIPs, based on the WISER and FRACTAL principles, and other ideas in the afore-mentioned peer-reviewed publications:

1. Tailor to context and decision, considering the broader landscape and socio-cultural values.
2. Enable affordable, manageable, timely and sustainable engagement.
3. Build required capacities among actors.
4. Build trust among actors through carefully facilitated processes and equitable engagement, recognising the knowledge that all actors bring to the process.
5. Embrace diversity and respect differences.
6. Enhance inclusivity and collaboration, including building networks and relationships.
7. Keep flexible and allow for innovation.
8. Communicate in engaging and accessible ways and be mindful of technical language. Make things tangible and relevant to everyone.
9. Ensure value-add for all involved.

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