KE4CAP VKE3: Ensuring Platforms' Agility in Order to Meet Evolving User Needs

11 November 2020

Summary

This event focussed on sharing approaches being used and challenges being experienced by CAPs as they work to meet rapidly evolving user needs within an ever-changing world in terms of technology, data availability, policy requirements and knowledge provision. Discussions focussed on processes and mechanisms that have been established to tailor information and tools, approaches that have been adopted to help update resources and content, and innovations and improvements that have been introduced to facilitate the provision of new data and information.

Participants represented the full range of platforms, from those still in development to well-established platforms with many years of experience. It was encouraging to note that many of the newer platforms are facing similar issues and challenges to those already being addressed by more mature platforms and can learn from this experience while bringing fresh new perspectives and innovative ideas to on-going issues.

People want to trust and have confidence in using CAPs and, for these and other reasons, platform teams must be able to demonstrate to users that they offer credible and up-to-date data and information and that the platforms are evolving as user needs change. There are many approaches being adopted with discussions highlighting a move by some platforms towards a more service-oriented approach to better meet the increasing diversity of users, the greater use of integrated links to other sources of specialist information, and also the value of the flow of information as a means of helping users understand its development, limitations and potential applications.

There is also much that can be learnt from other projects particularly those related to curating climate data where international initiatives are leading the way in making high-quality data available to all via easy-to-use interfaces.

Introduction

An introductory presentation by Climate Ireland is at: https://www.weadapt.org/knowledge-base/climate-change-adaptation-knowledge-platforms/vke3-maintaining-relevance

Retaining relevance in a fast-moving world is a key task for all CAPs as they work to meet increasing and evolving user needs. CAPs must be sufficiently agile to be able to evolve in line with the needs of both existing and new users and in the context of:

- Evolving user capacity.
- Increasing amounts of climate and adaptation information and data available.
- Advances in technology.

Users need to be inspired and can be demanding. As such, the content and functionality of any CAP must to be regularly reviewed and appropriately renewed if it is to meet their requirements as they move from initiating to planning to managing adaptation actions. Yet resources available within CAPs are often limited and there remains a tension between the increasing pace of information

generation and the need to engage more widely with users, and the ability of platforms, within the available financial and human resources, to provide content that remains up-to-date and relevant.

The agenda is at Appendix 1.

Participants

Over 30 participants working on adaptation platforms in 19 countries and regions (Alps, Asia-Pacific, Austria, Canada, Europe, Finland, Germany, Greece, Ireland, Japan, Mexico, Netherlands, Philippines, South Africa, Slovenia, Spain, Sweden, Taiwan, UK) joined the discussions.

A full list of participants and platform links is included in Appendix 2.

Breakout sessions

Based on their choices during registration, participants were allocated to one of three parallel breakout sessions. Details of discussions are given in Appendix 3.

1. **Adapting to current and rapidly evolving user needs, science, policy and practice (led by Ireland, Spain and ClimateADAPT**)

Countries (Canada, ClimateADAPT, Germany, Ireland, Mexico, South Africa, Slovenia, Spain, Taiwan) shared examples of how CAPs are increasingly addressing the wide range of user needs spanning all stages of the adaptation decision-making cycle.

Given the diversity of both the information available and the potential users, it is important to ensure consistency of information across a platform. This can be particularly tricky as the majority of CAPs are working with a range of different users with widely differing levels of capacity. To address this challenge, some CAPs are adopting a service-orientated approach with for example one platform addressing more general awareness issues and a separate climate data portal providing a more detailed service for experienced users.

To understand user needs, CAPs are engaging with user groups on an ongoing basis through surveys, workshops and conferences. CAPs also work directly with their users through the provision of training workshops to increase users' capacity to employ the specific information and tools made available on platforms. Some countries also have funds for dedicated projects working directly with users to support the co-development of tools and platforms.

Whereas most CAPs already provide climate change information which addresses user requirements in understanding the levels of hazards posed by climate change, users are increasingly looking for additional information to support risk assessments, for example, the social, environmental and economic consequences of climate change. To overcome this challenge, CAPs can potentially link to additional sources of information, but this also raises the more general issue of clarifying the specific scope of a platform and the boundaries to information provision.

Many users tend to want simple interactive approaches which effectively communicate both the potential use and the limitations of the information being provided. However, they also need to be supported in employing the information and tools (through capacity building) and encouraged to supplement this with their own expertise to inform specific decision-making cycles.

2. **Reviewing to identify and prioritise the updating of functionality and content (led by SEI, ClimateADAPT and Finland)**

This group looked at approaches being used to review and then prioritise the updating of functionality and content in CAPs (Canada, ClimateADAPT, Finland, Japan, Mexico, Philippines, Sweden, Taiwan, UK). Up-to-date information and efficient user interfaces are key to maintaining users' trust and their ability to use a platform effectively.

Many CAPs are adopting systematic approaches to reviewing content based on current validity e.g. new policy or new research results, often using expert evaluation panels and user feedback processes to decide on whether information should be archived, renewed or maintained. Updating functionality is equally as important as users are increasingly expecting the use of latest industry-standard IT and interfaces to ensure they can find and access information easily.

Funding is often an issue and resources are usually limited, so there is a need to both prioritise the process of updating and to integrate this into the short- and long-term timetables for platform development. This approach may also help inform and identify what developments with respect to curating the current information might enable other actions going forward.

In general, maintaining the flow of information was considered to be important; deleting information can sever links and risk losing the story behind the development. This then links with the issue of transparency and the need to communicate to users details of the updates being planned and completed, how and why. There is also value in sharing lessons with platforms working in different areas e.g. disaster risk reduction, and drawing on their expertise and innovations where appropriate.

3. **Tailoring and updating existing information in a way that appeals to differing and changing user requirements and capacities (led by Netherlands, Austria, Canada and Copernicus).**

A common challenge among the platforms represented (Canada, Greece, Japan, Asia region, Philippines, Austria, Alps, Netherlands, C3S) was how best to disaggregate and manage the wide range of user requirements in a way that allows platforms to understand, address and update the information required.

Many platforms use sector and/or target groups to keep in contact with users and to co-develop new information. Nearly all have targeted newsletters and help desks to maintain links with users whilst others have developed different entry points or linked platforms to help meet the specific needs of users at different stages of the adaptation cycle and with differing capabilities.

When discussing possible future innovations to tailoring information such as adopting interactive approaches (e.g. online editing tools, which will also enhance the ownership and usability of platforms), the issue of quality control was raised. There is a need to define and adopt criteria to maintain the quality of information available on a platform, and to seek a balance between allowing many users to contribute whilst ensuring an appropriate level of quality is achieved. Lessons can be learnt from the work of data portals which tend to be more advanced with respect to formal quality control procedures.

As users need to know what is available and when, updating and tailoring of information links to the value of investing in appropriate and timely communications with users with a focus on appropriate (plain) language and including explanations of how and why any changes are being implemented.

Plenary

Demonstrating and promoting the benefits and relevance of your platform to stimulate and enhance users' interests.

To build trust and to maintain users' willingness to engage, all CAP operators must strive to understand and demonstrate the value of their platforms in meeting current and evolving needs of users. This can be equally important when working with funding agencies who needs to be assured of high-quality outputs and value for money.

Continuing with some of the themes raised in the breakout sessions, the plenary session broadened the discussions and focussed on issues such as:

1. Using quality control to demonstrate the value of the information offered.
2. Updating to help maintain relevance and usability
3. Demonstrating the benefit and value of platforms to different types of users?
4. What level of detail is needed to ensure relevance?
5. Others ways of making information relevant to users to enhance their experience?

Detailed discussions also reflected on the role platforms can play in working with users to champion the value of CAPs, and how platforms can leverage and build on other's work to introduce improvements and innovations.

All details are given in Appendix 4.

Overall, the discussions provided a means for rapidly sharing information and lessons learnt with operators from a broad range of platforms. All participants are encouraged to use the KE4CAP community to establish greater connections and to continue these discussions, including outside of the VKE events.

Appendix 1. Agenda

Chairs: Barry O'Dwyer and Jeremy Gault, University College Cork, Ireland

14:00	Welcome. Reflections on VKE1 and 2. Introduction to VKE3 and expected outcomes
14.15	Exchange 1. Breakout groups: • Group 1: Adapting to current and evolving user needs (keeping up to speed and maintaining relevance – evolving practice, policy and science) • Group 2: Reviewing to identify and prioritise the updating of functionality and content. • Group 3: Tailoring and updating existing information in a way that appeals to differing and changing user requirements and capacities.
15:15	Coffee break
15:30	Exchange 2. Feedback on breakout sessions
15:45	Exchange 3. Plenary: Demonstrating and promoting the benefits and relevance of your platform to stimulate and enhance users' interests.
16:30	Next Steps. VKE 4 (January) and VKE 5 (February/March)
16.45	Close

Appendix 2. Participants

Jan-Wilhelm	Anker	Netherlands	https://ruimtelijkeadaptatie.nl/
Julia	Barrott	UK	https://www.weadapt.org/
Carlo	Buontempo	Copernicus	https://climate.copernicus.eu/
Tanja	Cegnar	Slovenia	
Joyce	Chang	Taiwan	https://tccip.ncdr.nat.gov.tw/index_eng.aspx
Lo	Cheng	Canada	https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services.html
Valerie	Cote	Canada	https://climatedata.ca
Aram	Rodríguez de los Santos	Mexico	platform in development
Mariana	Echaniz	Mexico	platform in development
Jeremy	Gault	Ireland	http://www.climateireland.ie
Valentina	Giannini	Europe	https://climate-adapt.eea.europa.eu/
Ingrid	Gudmundsson	Sweden	http://www.klimatanpassning.se/en
Catherine	Hartigan-Go	Philippines	platform in development
Victoria	Hayman	UK	
Dimitra	Konsta	Greece	https://www.adaptivegreece.gr/en-us/
Wolfgang	Lexer	Austria, Alps	https://www.klimawandelanpassung.at https://www.capa-eusalp.eu
Cheng-Ting	Lin	Taiwan	https://tccip.ncdr.nat.gov.tw
Kate	Lonsdale	UK	www.ukclimateresilience.org
Sanna	Luhta	Finland	https://ilmasto-opas.fi/en/
Tsepang	Makholela	South Africa	https://ccis.environment.gov.za/
Erika	Marcé	Mexico	
Yoshifumi	Masago	Japan	National, https://adaptation-platform.nies.go.jp/ Asia-Pacific, https://ap-plat.nies.go.jp/
Yuji	Masutomi	Japan	National, https://adaptation-platform.nies.go.jp/ Asia-Pacific, https://ap-plat.nies.go.jp/
Kati	Mattern	Climate-ADAPT	https://climate-adapt.eea.europa.eu/
Lindsay	Matthews	Canada	https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services.html
Barry	O'Dwyer	Ireland	http://www.climateireland.ie
Gesa	Petin	Germany	www.anpassung.net/tatenbank
Bernadette	Roxas	Philippines	platform in development
Jose Ramon	Picatoste	Spain	https://www.adaptecca.es/
Per	Stenholm	Sweden	http://www.klimatanpassning.se/
Roger	Street	UK	
Kim	van Nieuwaal	Netherlands	https://ruimtelijkeadaptatie.nl/

Appendix 3. Breakout Sessions

Breakout session 1. Adapting to current and rapidly evolving user needs, science, policy and practice (led by Ireland, Spain and ClimateADAPT)

(Canada, ClimateADAPT, Germany, Ireland, Mexico, South Africa, Slovenia, Spain, Taiwan)

Looking to identify:

- Specific user groups being targeted by platform
- Their stage in relation to the overall adaptation decision making cycle (Understanding/Planning/Monitoring and Evaluation of combinations);
- The expectations/needs these users have of the platform (technical, information, tools);
- The ability of the platform to meet these (evaluated through a traffic light system).

In terms of user needs and expectations, these range from a 'one solution fits all/single projection'-type approach through to the full range of qualitative and quantitative information for e.g. adaptations options, risk (exposure and vulnerability) maps, and information beyond climate change aspects e.g. related socio-economic and environmental projections. Users want interactive approaches, tools that allow them to tailor data to their specific needs, and easy-to-navigate interfaces.

Given this diversity of users and their needs, consistency across all aspects of the platform is important, but can be difficult to maintain as platforms evolve and different elements are updated/renewed at different times etc. (links to breakout 2)

In working to meet these challenges, platforms are prioritising engagement with users and investment in training and capacity building; helping users to understand and employ the information and tools available on the platform to meet their own specific requirements.

Some countries also have funds for dedicated projects working directly with users to support the co-development of tools and platforms.

Many users are looking for information beyond just that necessary to understand the hazards of climate change e.g. information to support risk assessments such as social, environmental and economic consequences of climate change. Interdisciplinary information across sectors is also needed. To help meet this need CAPs are increasingly linking to additional sources of specialist information – but how far can platforms expand to meet the increasing need for information? What is their scope? Where should the boundaries be?

In many cases, simple interactive approaches which effectively communicate both the potential use and the limitations of the information being provided work well for early-stage users. However, independent of the stage in the adaptation cycle a user may be in, they need to be supported in using the information and tools provided (through capacity building) and encouraged to supplement this with their own expertise to inform specific decision-making cycles.

Breakout session 2. Reviewing to identify and prioritise the updating of functionality and content (led by SEI, ClimateADAPT and Finland)

(Canada, ClimateADAPT, Finland, Japan, Mexico, Philippines, Sweden, Taiwan, UK).

Looking at:
- How do platforms track content relevance/age?
- When is content too old?
- How do we prioritise the updating of functionality and content?
- How do platforms manage updating content with partners/contributors?
- How can the review of existing/older content be funded?

Finland: national CAP was established in 2011. To date, the Finnish Meteorological Institute (FMI) has maintained the portal jointly with the Finnish Environment Institute (SYKE) but the whole portal is currently being renewed and more partners are expected to join. Examples of how Finland decides which updates regarding functionality and content need to be done and when:

1. SYKE has systematically evaluated and divided the content they are responsible for into two categories:
- Content is relevant but needs to be updated.
- Content is outdated the article needs to be (totally) rewritten or deleted.

The evaluation is based on expert (researcher) assessment on whether the topic covered by the article has advanced to the point where new information is missing. The most important criteria being used are the references:
- If the text article is based on e.g. policy documents that have been updated or superseded then there is a more urgent need to update it.
- If the text article is based on research results which are still valid then there is a less urgent need to update it as ore research becomes available.

2. Finland has gathered feedback from both users and providers of climate information via online user surveys, user workshops and direct e-mail contacts (the latter allows for quick responses to small issues). All the feedback has been added to a mind-map and divided into categories to inform the current redevelopment of the platform, e.g. technical functionality, website structure and target groups, form of information (text, tools, numbers/statistics, visualizations), style of expression (neutral but positive), content requests etc.

The first step is the technical renewal process (i.e. change of platforms) which takes place in autumn 2020. In this regard, the user feedback on technical functionality, website structure and target groups has guided the process to allow:
- Better responsiveness, i.e. to be used effectively on mobile phones etc.
- Clearer structure: to help a wider range of users.
- Accessibility for all users, e.g. for people who are visually impaired (EU Directive).
- Relevant information is easier to find: better search function (with filters), tags, etc.

This process of using the feedback is ongoing. The mind-map will be continually expanded to help evaluate and prioritize actions and also to help identify what developments might enable and support other improvements.

Overall, it is hoped that the platform will be more flexible and easily adapted to meet future needs, the content production will be more de-centralized/more dispersed, and the portal can be maintained more easily (technically).

Climate-ADAPT: existing content is reviewed as follows:
- A team of experts has been established for each of 14 policy sectors on the platform, and 3 cross-sector coordinators. Updates are submitted by experts and reviewed by coordinators.
- For the database, items are updated either on an ad hoc basis, e.g. when a new version of a report is published, or through the implementation of a specifically designed procedure which identifies all items published during a defined period (e.g. 10 years ago or earlier)
- Experts evaluate whether an item should be kept or archived. Do not delete to avoid broken links elsewhere but add banner to indicate to users where content is not being updated.
- Web-content is updated whenever a relevant document becomes available according to a set frequency of updating (e.g. yearly for the policy web-pages).
- Regular review by the platform team
- Specific content templates are used to help ensure relevance for users and dates of publication are included so users can assess value.

The platform is prioritizing new developments based on the recent evaluation of the platform:

- The platform is managed and steered jointly by DG Clima and the EEA
- Strategic decisions are discussed and taken by the Advisory Group, led by the EEA and DG Clima, and made of all relevant DGs of the European Commission.
- Each year DG Clima and the EEA set priorities, which guide the development of an action plan (AP)
- The ETC/CCA supports the EEA and is in charge of the implementation of the AP.
- The result of the evaluation has been integrated in the above processes: the platform has been restructured to enable and improve access to content addressing target audience needs, IT developments have been deployed through a dedicated service contract, and further developments are included in the yearly APs.

Taiwan: the national platform is monitoring user uptake of content and how it is being used to prioritise what content to share and how, and how much international content to include. To avoid spending too much time reviewing, they indicate how old the content is. They also have a 'wishing well' that allows users to indicate their on-going and likely future needs – this approach has enabled the platform to gather some really innovative ideas and thoughts to guide development. But it is also important to develop criteria to help prioritise updating actions as resources are often limited: does it align with the platform goals? What is a suitable timescale? Where is user need the greatest?

More generally, it is important to communicate to users what updates happening when and why these priorities have been set. Being transparent can also have advantages as groups may come forward to work with platform teams to support the delivery of updates and new content.

There are also advantages to working more closely with researchers. For example, one research project in Sweden is looking at the information, services and tools being delivered by platforms in other sectors to help identifying potential approaches for prioritising and meeting user needs and via the Swedish platform.

Breakout session 3. How to tailor (and update existing) information in a way that appeals to differing user requirements and capacities (led by Netherlands, Austria, Canada and Copernicus)

(Alps, Asia region, Austria, Canada, Copernicus Climate Change Service, Greece, Japan, Netherlands, Philippines)

Tailoring information is at the core of what many CAPs seek to deliver; but it is difficult to meet rapidly-evolving user expectations and needs especially when users span the full range of interest, understanding and capacity to use climate information.

In response, Canada has:

- Developed a continuum of data portals on climate information to address varying user needs: a beginner one, which is simple and includes lots of story-telling, an intermediate one (climatedata.ca) for users who understand the climate information but require more detailed and customisable information, and an advanced one where the focus is on sharing scripts and data. Easy-to-use user interfaces are particularly important for the first two platforms.
- Developed sector modules for climatedata.ca that are created to reflect the language decision- and making contexts for that sector. At the outset, stakeholders in each sector are surveyed and this group continues to advise the development of that module.
- Taken advantage of all opportunities to engage stakeholders at related workshops, conferences, training sessions ('focus group light') using a polling tool so they can get rapid feedback on user requirements.
- Established a support desk where the team will help individuals find the information and data they need, i.e. to empower users to do it themselves. Run by 3 people supported by a network of experts they can call on.

The Netherlands are:

- Getting to know users as a continuous process. Aims to remain in close contact with stakeholders to ensure a platform continues to meet the expectations and capacities of users e.g. by offering help desk, facilitating user group sesssions, participating in joint projects when planning specialist platforms e.g. with local authorities, private businesses etc.
- Experimenting and innovating with offering new knowledge developed with users. The platform has a budget for innovation and pilot studies e.g. working with one province to monitor the impact of measures, which can then be shared more widely.
- Using small feedback loops: continually testing and improving products with the users as they are being developed.
- Communicating in user-focussed language. Keep it simple, use plain language, and try to adopt the perspective of the targetted user, e.g. having different entry points for residents, students, professionals, governmentt official etc.

The Alpine transnational portal has:

- Developed and installed an online editing tool to allow users to share their own resources. This includes a quality assurance process prior to publication, checked by a small team of climate adaptation experts within the platform team. Also have a set of criteria to define what is useful for the platform, and a comprehensive online user guide to help users. But it is difficult to stimulate and maintain the user interest in sharing content as it does require effort on their part.
- Offered 'thematic collections' which include a set of pre-compiled information of interest to specific user groups. Must try to anticipate and be responsive to changing needs and policies within the community when establishing new collections.
- Added new content as user needs shift. This is often driven in part by finance (whoever pays can drive the provision of information).

Austria is:

- Using a digital newsletter to improve communications
- Using clean-up exercises to identify and remove content that is out-of-date
- Adding new information as user demands evolve e.g. a new linked micro-site that provides an advisory tool requested by local municipalities.

Copernicus Climate Change Service (C3S):

- Balance between the tailoring that can be offered by C3S and empowering downstream users.
- As the data base is very large, cannot realistically tailor information for everyone so have compiled case studies (and soon to be story maps) to help advise potential users.
- Central to C3S is the climate data store which provides access to data but also importantly access to in-cloud infrastructure that allows manipulation of the data and generation of results. This allows user to understand how the interface and application is developed so they can tailor data for their own use. All is open and free. There is also an application gallery giving a number of workflows that users can tailor as required.
- Active user support service and a user learning service (training etc.)
- Use all possible channels for engagement (social media, newsletters, website, press)

For C3S, quality control (for data) is crucial do there is a quality brief attached to every data set in the data store, including an independent evaluation. For the communication of narrative information (plots etc) this is reviewed internally. Some background information about the C3S approach to QA/QC is available at: https://climate.copernicus.eu/ensuring-quality-performance-c3s

How are user groups used and what changes does that drive?

Canada is still developing having launched in 2018 so new sectors/themes are still being added. Feedback from user groups, input from the help desk etc. are all used very actively in this early stage as the platform develops rapidly. Such interactions can also lead to co-development of products. Also focussing on empowering the users.

For the Netherlands, the flow of ideas for developments continues from all sources throughout the year with information collected widely. User groups are then used to test and validate the new ideas and to give them a certain legitimacy as having been agreed with stakeholders.

Invested more and more in the QC of communications, not easy to pitch texts correctly for different users. All texts are written and edited by different members of the team using the concept of 'plain language' – to ensure all can access the information (not just educated professionals)

Japan/Asia-Pacific: Aiming to supporting local governments and centres but some have much more experience and capacity than others, so need to start with the basics. Facilitating a number of annual training sessions to support users at all levels, including indicating how the platform can support them.

Appendix 4. Plenary.

Demonstrating and promoting the benefits and relevance of your platform to stimulate and enhance users' interests.

1. Using quality control to demonstrate the value of the information offered.

How can users interact with a site without impacting on the quality of the platform? This has issues related to levels of openness, appropriate editorial control, transparency, how to say 'no' to suggested content, etc. Platforms are there to help users and only valuable if they contain relevant information, users have valuable information so want to encourage the supply-side where possible. This also links to financing, as funding agencies may have a view on what content is appropriate.

C3S: quality is not an absolute value but is dependent on the specific use and user. Might need to think about the minimum quality standard required, but it is critical to provide information with sufficient quality attributes to allow the user to make their own decision as to whether it is of value to them. One of the key topics is how to deal with versioning of data/information. The approach of IT is quite informative here. In that sense it should be essential to follow the principle behind the DOI and more generally the FAIR principles, https://libereurope.eu/wp-content/uploads/2017/12/LIBER-FAIR-Data.pdf. For DOI principles based on ISO 25324: https://www.doi.org/faq.html.

Austria: has a 2-stage registration procedure for users interested in becoming a platform editor. To date, this simple approach has been sufficient to stop unwanted input. Benefits for users include enabling them to share their expertise and research results, resulting in greater visibility and uptake of outputs.

WeADAPT: has a two-stage review process (knowledge managers and topic experts) for user-contributed content before it is published. The contributors of the content are responsible for the accuracy of the information being communicated; a contributor has to be connected to the content e.g. via a user profile, so that users can contact them if necessary. For user-contributed content, https://panorama.solutions take an interesting approach - they have full 'solutions', and also 'building blocks' for activities still at the pilot stage. There is also potential to make available a concise log of updates of the content (when, why, how) to help enhance transparency.

What is the entry of new content (from supplier) but as soon as it is on the platform how do you keep it up-to-date. Possibly easier for data where you can replace existing data with new sets.

2. Updating to help maintain relevance and usability

Users quickly become disillusioned if information is found to be out-of-date, poorly categorized or difficult to access.

WeADAPT: has been operating for 12 years and is now reviewing old content and deciding whether to archive, update or keep it. This is an important process to ensure a platform remains up-to-date and relevant, but can be resource-intensive and is not always easy to fund. Currently working with experts who act as editors for a specific theme.

See Breakout Session 2.

3. How can you demonstrate the benefit and value of platforms to different types of users?

Ireland: work with users to employ the tools available on the platform as they develop their own adaptation plans and then showcase this work as examples. Platforms can both showcase successful outcomes to others in the same sector/target group, highlight appropriate uses of tools across sectors, and provide a encouragement for other uses to adopt similar approaches.

New users tend to want a single answer, so platforms need to help users develop their own capacity to use information both through training and by using real-world examples of the application of

tools etc. This helps demonstrate the benefits of the platform to users who can then both highlight their own work and champion the platform.

4. What level of detail is needed to ensure relevance?

People always want more information at greater levels of details but need to consider what is both appropriate and possible:

- is there a role for platforms to help put additional, underpinning infrastructure in place?

- platforms can highlight where data gaps are.

- platforms have a role in making users understand that you don't always need fine-scale information to start the adaptation process.

South Africa: starting to make information and data available from climate service provides to users, but realize that the level of supporting infrastructure (monitoring stations) needed to provide the information tailored to specific geographic and climatic regions that users are requesting is not available. This can reflect on the perceived value of a platform.

Climate Ireland: spent the first two years working through relevant research outputs to synthesis a common database of projection data (2.5km spatial scale). But none of local authorities used this information in their first adaptation plans – they focused on more general national-scale statements and observed climate changes in their region (extreme weather). This reflected the stage at which the decision-makers were at in their adaptation journey and illustrates that sometimes larger-scale statements are appropriate.

Canada: like South Africa, Canada is a very large country with many sub-climates.

- Long-term monitoring is a real issue especially in remote areas. Using their influence in terms of hearing from users and making connection to those with a monitoring mandate. Looking to do community-based monitoring e.g. working in the northern region with indigenous communities to training people to run local monitoring stations.
- Looking to develop inventories of data from monitoring stations outside the usual government-run networks e.g. from mining companies, from those involved in forest fire monitoring, and adding this information to the database (recognizing QA/QC issues).
- Learning from indigenous communities and the changes they have seen. Aiming to blend this local, narrative knowledge with scientific data to work towards a better understanding of climate change and impacts.

Philippines: currently developing a national mega-portal with a number of sub-portals. Within this work, is 'Project Upturn' looking to provide examples of adaptation strategies and action in the Philippines. Currently the team are scanning through peer-reviewed literature to create an inventory. Chose to focus initially on peer-review publications as an indication of quality but are now trying to incorporate grey literature e.g. government documents, but recognize the difficulty in assessing how impactful these solutions are. Currently considering providing disclaimers to explain the provenance of information.

C3S: There are two elements to platforms:

1. The underpinning data; production, delivery, operationalization, QA/QC.
2. Based on the data: messaging, user-interface, tailoring to user needs

These are linked but do not always need to be considered together.

Encouragingly, there are strong international initiatives related to the operationalization of the data layer with many programmes working towards free access to data as an underpinning layer. So this aspect is becoming less of an issue and there are resources and examples available that can be used

by CAPs (e.g. the interface being developed between Climate-ADAPT and C3S). The focus then is on the tailoring layer.

5. Others ways of making information relevant to users to enhance their experience?

Users mention the need to integrate historical data with observations and projections. This links to the flow of information and how to keep this up-to-date. Deleting information is difficult as you can break links elsewhere and you also lose the context – possibly try to be transparent by linking with more relevant new concepts.

Canada: have adopted a quick approach which complements the more resource-intensive co-development approach. Climatedata.ca have developed an analysis page which allows users to select specific variable and thresholds to provide individual, custom datasets. This one tool can be used to tailor information for a variety of users.

Ireland: when starting, they looked at all available literature and then built sector-level tools giving access to relevant information. This helped start discussions in the early days.

Mexico: the general climate change platform has been available for 2 years and a recent evaluation showed that most users are the general public. So, they are now looking to engage more widely to attract different user groups and to demonstrate the value of the information provided by improving the interfaces and content to enhance usability – towards a service-oriented approach.