

CSC Report 15

Mapping of Climate Service Providers

Theoretical Foundation and Empirical Results: A German Case Study



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Mapping of Climate Service Providers

Theoretical Foundation and Empirical Results: A German Case Study

Deliverable to JPI Climate,

Working Group 2

“Research for Climate Service Development and Deployment”

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1 Background and Aim of this Document

This work includes the preparation of a document to support the delivery of the Fast Track Activity (FTA) 2.2 on “Mapping Climate Service Providers within Europe”, which is a contribution of Module 2 “Research for Climate Service Development and Deployment” of the Joint Programming Initiative (JPI) Climate (<http://www.jpi-climate.eu/>) of the European Commission. FTA 2.2 aim was to collect and analyse information on climate service providers during the period of winter 2012/2013 to autumn 2013.

The aim of this document is to provide a guidance to support the climate service mapping activities in the JPI Climate member states and non JPI Climate members based on the experiences and lessons learned, including those learned in the initial pilot study in Germany. It provides examples, background information, supportive documents as well as results of this mapping activity and recommendations on how to proceed.

The intention is that this guidance provides an opportunity for those less experienced to learn from the experience of others and therefore provide the means to more efficiently target their mapping activities. The aim of the mapping activities is to review the current capabilities for providing climate services, to lay the ground for a mid to long-term multi-disciplinary research on governance of climate services and to identify the areas, where working on European scale, that provide added value.

The work on climate services is organised on the local, regional and national levels although some providers do operate at an international level. Often this causes an overlap that may have positive and negative implications for users. The mapping of the climate services activities has several aims: increasing the consistency at European level of data use, access and availability, methods use and development, the translation of climate knowledge into climate services and transboundary differences on the interpretation of climate services. Therewith, the efficiency, credibility and saliency of the climate services framework and the quality of provided climate services can be improved.

This document is structured into three main parts:

- Theoretical foundation, consisting of two chapters
 - The definition of climate services and an introduction to climate service providers (Chapter 2)
 - The methods to categorise and map climate services (Chapter 3)
- Empirical results, consisting of three chapters
 - Climate Knowledge Hub (Chapter 4).
 - Results of questionnaire from providers of climate services in Germany (Chapter 5)
 - National Dialogue for Germany (Chapter 6)
- Conclusions and recommendations

Theoretical Foundation

2 How to Define Climate Services?

2.1 What are climate services?

When in this document the wording “climate information” appears, we mean data, information, knowledge and expertise to understand and inform adaptation, mitigation, impacts, vulnerability and risk assessments. Climate information producers (e.g. researchers, consultants) are increasingly exposed to diverse groups of stakeholders. The stakeholders are asking for information about changes, consequences, probabilities and the range of possible outcomes related to climate. Users of this information can, e.g., be policymakers, managers, researchers, the public, students or engineers. Hence, to meet the users’ needs climate information is provided and distributed – climate services (WMO 2011). The climate service is based on science, but should contain a strong component of studies of users’ requirements and of translation of climate and climate impact data for users and decision support (JPI Climate 2011). Climate services are also strongly related to the management of risks, which are supposed to evolve due to climate change.

The field of climate services is developing rapidly and many different types of services and service providers have evolved throughout the world. While some institutions have provided climate information for quite some time, many new initiatives have been established within the last few years. The development of service portfolios within existing initiatives and institutions is very dynamic. The perception of what a climate service should deliver varies substantially. The results vary depending on the specific demands that different users have and the providers addressing them. Additionally, there exists many differences between the providers’ data sources.

Due to the fact that several approaches to define climate services exist, a set of common characteristics of climate services was developed in JPI Climate Module 2 in order to be able to conduct this inventory.

JPI Climate definition of climate services:

“User driven development and provision of knowledge for understanding the climate, climate change and its impacts, as well as guidance in its use to researchers and decision makers in policy and business.” (JPI Climate 2011, p.44).

Within this document we understand climate services as defined above and use the term according to this.

2.2 Who are climate service providers and what do service providers mean by climate services?

In the provision of climate services we differentiate between providers and purveyors of climate services. The providers or purveyors of climate information follow different approaches to satisfy demands. A purveyor in comparison to a provider is a special type of climate service provider that does not necessarily produce their own climate data, but uses that available from other providers and adds value (knowledge and expertise) to provide the information required by the users. Within this document and the activities of the FTA we discuss both climate service providers and climate service purveyors, although often only naming climate service providers.

Differences in the operations result from multiple factors: the diversity of sectors that is addressed, the spatial scale covered, the dissemination strategies to supply data and information and from focusing on varying key activities, including adaptation, mitigation or risk reduction. Users may request sector-specific services or be interested in system-based decision support. In case that the provider specialises his products and services on specific target sectors (e.g. agriculture, forestry, health, energy, tourism etc.), these influence the organisational structure depending on which sectors the products and services are specified for and the number of target sectors addressed (von Flotow & Cleemann 2009). Existing providers focus on different spatial scales for which climate information is provided: the local level that is a distinct area within a nation, the national scale, the regional scale, being determined as an entity that stretches across national borders and the global level (von Storch et al. 2011, 2008). An analysis of existing climate service providers should also address their key activities and the question, how the relation between different activities is implemented into the operations? (Semazzi 2011, Visbeck 2008).

An inventory and analysis of existing climate service providers should identify the organisational structure and the governance of the providers. Many different operational approaches can be identified, e.g. research institutions, private companies, collaborative networks, governmental bodies and virtual platforms. The differences result from the multi-disciplinary backgrounds of providers, as they can accrue from fundamental climate science, climate impact, vulnerability and adaptation research, political science, psychology or communication. Another aspect is the funding of the providers: they might be financed publicly or privately, which leads to different approaches in their organisational structure and their service portfolio.

The analysis of the organisational structure will reveal the structure of the climate service provisioning landscape at a national level, e.g. if there are official national providers assigned, how providers exist parallel to each other and if a coordination of activities exists.

Nevertheless, there exist several commonalities of climate service providers. A provider stands for:

- The provision of knowledge and expertise to improve the understanding of climate, climate change and the framing of these in the context of users' requirements
- The provision of access to credible, legitimate and salient climate data, products, information and advice
- The provision of guidance in applying and interpreting climate data
- Forum for engagement of users
- Skills in client relationships and expertise in climate and their ability to inform
- The search for new services, better adapted to users' needs.

Examples for climate service providers are:

- National meteorological and hydro-meteorological services
- (Federal) state agencies
- Ministries
- Research institutes
- Universities
- Private companies
- Consultancies
- Engineering offices
- Consortia of different provider types.

Climate service providers are not always easy to identify as they do not solely advertise their services as climate services, and may use different terms. This is due to the broad range of climate services offered and their dynamic development. Thus, there is no standard key word that could be used to identify climate service providers through an internet research. The best way to identify climate service providers is to look into existing initiatives, such as dedicated climate service providers, coordinators of research projects, national programs, regional activities and their partner institutions. Another possibility is checking participant lists of pertinent events like the International Conference on Climate Services. The present analysis aims at identifying more terms under which climate services are offered.

2.3 What products/portfolio do they have?

Existing climate service providers offer a variety of different services and products, which are often organised in portfolios. Climate service providers can exist at three levels: providing data (from observations or projections), providing products (created from data) and/or providing information (interpretation of products). The types of outputs provided include toolkits, guidance and support, training and knowledge. The scope of the services provided varies widely and depends mainly on the target group for the service and the capacity of the provider. Fundamental climate science results such as climate data (past, current and future), facilitate the exchange of information to applied research in impacts, vulnerability, adaptation, mitigation, risk reductions and societal dimensions of climate change (JPI 2011). Climate data in itself might not be sufficient for decision making processes, but the results of applied research involving impact, vulnerability etc. are very relevant for decision makers.

The following listed products are only some examples for climate services:

- Basic climate data, climate parameters, derived climate variables, analyses and indices
- Climate change scenarios and projections
- Basic climate impact data, climate impact indicators, impact studies
- Vulnerability studies
- Climate risk assessments
- Cost-effectiveness analyses of adaptation measures
- Socio-economic indicators related to climate change
- Synthesis reports
- Factsheets, charts, figures
- General guidance
- Tailored user support
- Climate change education and training (JPI Climate 2011, WMO 2011).

For all offered services it is also important to provide access to information on the characteristics of the services on offer (e.g. assumptions, limitations and uncertainties). This includes the reliability of information on current and future climate, as well as in results of climate impact models (Von Flotow et al. 2011). Each climate data set and the derived information has strengths and weaknesses due to underlying assumptions. To communicate these characteristics transparently and saliently providers should have an understanding of the specific sensitivities and capacities of individual users and supply advice about the applicability of the respective climate information (Steiniger et al. 2012, JPI Climate 2011).

In addition to the above information, the analysis of this inventory should address the nature of the service in terms of different categories of a service. The nature of the service often relates to

the conditions under which it is offered: to what extent are services provided without charge to the user, when are they commercially available and who is offering the service. Another question to be addressed is why as well as to what degree services are generic or tailored to specific users' needs. A service can either be provided in anticipation (supplier driven) or respond to a specific request of a certain user or user group (demand driven). As the demand of specific user groups, e.g. financial institutions, for climate information is growing, the amount of tailored services is likely to increase too. Besides gathering information on commercially available services, the inventory should also aim to identify how the provision and the development of climate services are financed. It could be with public funds, private support or just the users' charges.

It is also a requirement to include the aspect of the service related to the evaluation of services. The inventory has to assess if services are evaluated at all and if yes, who is conducting the evaluation, under whose responsibility, how the results of the evaluation are being used and why?

2.4 Which users do they focus on?

As broad as the range of climate service providers is, climate service users also vary substantially. Users can be differentiated according to their sectorial focus, the intended use of the climate services and the capability of accessing, using and interpreting climate services. Different types of users include:

- Researchers working on impacts, adaptation or mitigation studies
- Consultants
- Teachers and others working in the field of education
- Policy makers
- Politicians
- NGOs and other stakeholder groups
- Practitioners
- General public
- Media.

The intention of the analysis is to find out if climate service providers do have a focus on a specific user group as introduced above. The focus could among others result from the sectorial focus of the provider, its core activities and its service portfolio offered. The task of the inventory will be to assess if a focus on a user group exists for the providers, how this focus has developed and what are the reasons or preconditions of the providers to do so.

2.5 How do they offer climate services?

The primal idea of climate services is to provide information, data, knowledge and expertise to support and inform decisions. The development and implementation of a well-functioning dissemination and engagement strategy is essential to deliver climate services effectively.

An inventory and analysis of dissemination strategies of climate service providers should address the variances in the methods applied to transfer the information and the reasons for choosing the methods applied.

The dissemination of climate information such as the data, the tools to use the data and the information itself includes several possibilities, e.g. the science based production of publications

through peer-reviewed scientific journals, survey reports, brochures or the production of user-relevant services that are disseminated effectively to the user and may be also wider distributed.

The organisation of education programmes and the application of participatory approaches where the information is provided through the active engagement of users in the development and delivery of climate services is still a rather developing concept, though it is already practiced in many circumstances. The latter addresses the role of users and the scope of their involvement within the development and delivery of services, as well as mechanisms used to involve and engage them. Services in addition to data and information can also include workshops, webinars, third-party education, advice, and face-to-face consultancy.

A main purpose of educational services and consultancies is to enhance the users' understanding of the range of possible outcomes and specificities related with the climate information. With the feedback of informed users, providers can directly adjust the services they offer and the way they are delivered.

The internet serves as an important communication platform for both advertisement of services and their delivery. Nevertheless, it should be recognised that the communication strategy of a provider is not the same as the dissemination strategy. The former aims to inform possible users about the activities, the services provided and the different products available, whereas the latter relates to the delivery channels of the services. In the present inventory, we aim at assessing the two strategies separately.

The inventory aims at identifying the way providers advertise their services and how they raise attention for their services and get in contact with existing and potential customer. Examples for communication channels are:

- Provider's website
- Newsletters and news tickers
- Direct contact
- Climate portals
- Social media
- Blogs
- Newspaper articles and press releases
- Workshops, symposia, courses
- Existing networks.

Examples for delivery channels are:

- Direct computer/database access
- Data sharing
- Face-to-face advice
- Networking
- Print media
- Internet (JPI Climate 2011, WMO 2011).

2.6 Why do they offer climate services?

There may be several reasons why a climate service is provided. The variety of climate service providers and purveyors reflects this diversity. Several research organisations provide climate services as a consequence of research results that have gained interest by decision makers.

National meteorological services provide climate information in addition to their primary task of delivering weather forecasts. As the public interest in climate information has increased drastically during the last years many other demands have also evolved, e.g. increasing awareness, educating and informing other climate-sensitive decisions. An inventory of existing climate service initiatives should investigate these rationales and demands. The inventory provides information as to the rationale for the climate services on offer, including whether those services have developed i) as a side product alongside the provider's core business (e.g. Meteorological services and consultancies) ii) based on the provider's core business (e.g. climate research institutions) or iii) together with a newly founded provider institution. It will also be useful if the inventory provides information on the role of the users in the defining service provision (i.e. whether the service is supply or demand driven, the scope of user engagement in the development of services and the mechanisms of their involvement).

2.7 What do users need to know about climate service providers?

First, for the user, knowledge of the existence of climate service providers is indispensable. Secondly, he/she will need information about the provider's service portfolio, its key activities provision and the legitimacy of the provider (experience and reputation). The user should have available information related to providers' track record such as information on the credibility and saliency of the service provided and whether those services (and the provider) meet recognised standards (McNie 2007). The user has to trust in the expertise and services of the provider. This is easiest for him/her if there is access to any kind of verification of the provider. The user will also be interested in knowing if services are available in an appropriate language and the costs of those services, as well as whether the services requested are available or would need to be specifically developed.

3 How to Categorise Climate Service Providers?

The categorisation of climate service providers should be established in different identification phases through the collection of data. By means of this data it will be possible to create a criteria list for the definition of climate service providers.

3.1 Methods for gathering information

In the first stage we will conduct a climate service provider analysis based on techniques used for stakeholder analysis. It will identify the relevant climate service provider groups such as national meteorological institutes, research organisations, etc.

This information will be supplemented by looking into existing climate service initiatives like research projects, national programmes and participant lists of pertinent events. Further information can be found in the web searching through information material, annual reports, brochures, flyers, websites and presentations. Doing so, we will have a first group of services providers.

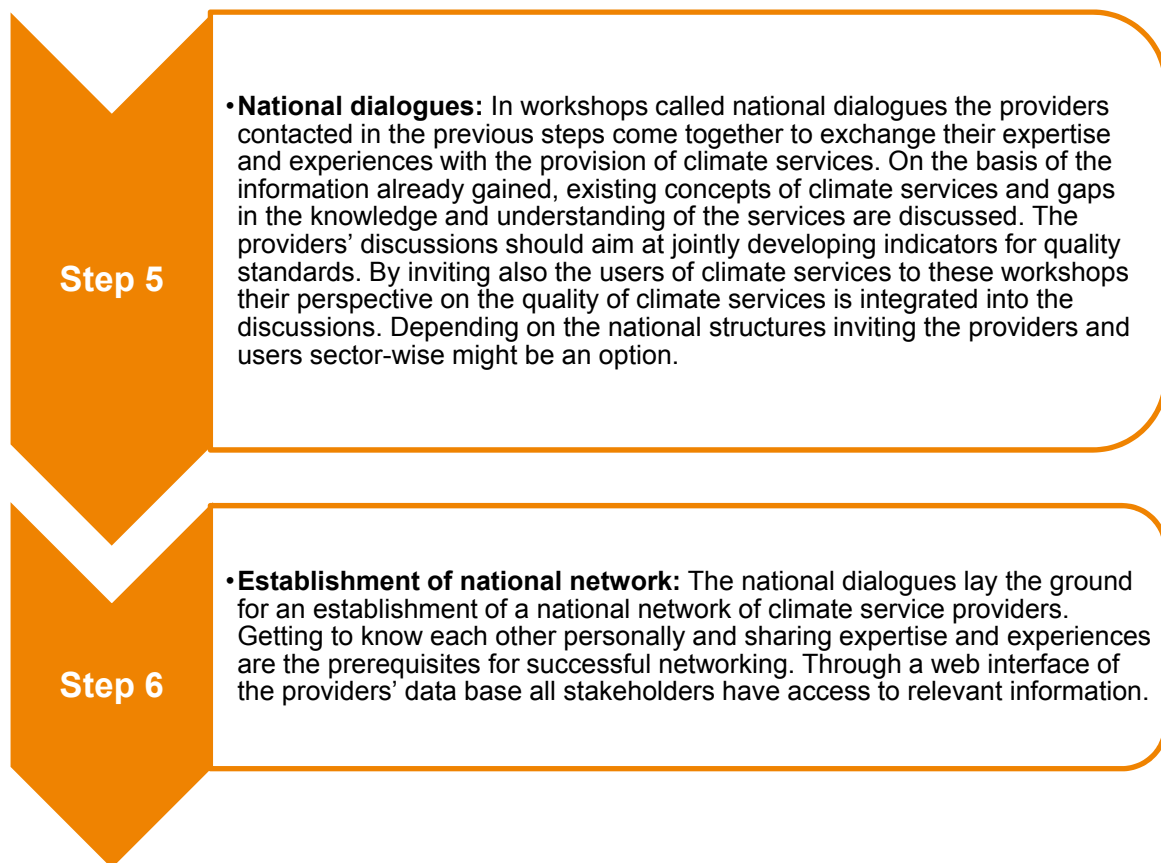
Subsequently, we will design a questionnaire to collect information on the questions suggested in the previous section. This questionnaire will be sent to the identified services providers, which we sorted into a database with contact details. In many cases interviews will also be conducted face-to-face with the providers. We expect to obtain contact details of additional service providers, which we have missed in the first group. For conducting the interviews and the questionnaire it can be helpful to provide examples and definitions of the terms you are talking about (e.g. different scales, different services).

With the gathered information about climate service providers, national level workshops, the so-called national dialogues, can be initiated and organised. The aim of the national dialogues is to bring the climate service providers at the national level together to discuss the way they are offering services and to enhance the database of national providers. In the first round of national dialogues it is our intention to focus on a sub-set of sectors: finance, agriculture and water. All providers who support these sectors are supposed to exchange their expertise and experiences with the provisioning of climate services and share their ideas for a future common framework of climate services. The providers will benefit from the dialogues as they have the chance to expand their networking and are part of developing quality standards for their services. Also, users of climate services will be invited to the national dialogues and thus, both sides, supply and demand, are brought together to exchange their information. This is the link to the FTA 2.1 “Mapping user requirements” of JPI Climate. An outcome of the national dialogues may be the identification of the need for and scope of a certification effort of climate services.

Concluding, we have followed the subsequent steps (see also subchapter 7.1):

- Stakeholder analysis
- Internet sources and descriptions of climate services providers
- Questionnaires
- Direct interviews
- Workshops/national dialogues.





Continuously: Extension and updating of climate service providers' data base

While going through the six steps introduced above it is important to work continuously on the data base and include newly identified climate service providers.

The nature and scope of the analysis will need match to the specific aims and available resources.

3.2 Methods for categorising information

Once the data is collected it should be possible to categorise the identified climate service providers depending on different criteria. For this analysis many categories are possible and will need to be defined further after the first round of interviews and workshops when we know what information is available and where the gaps are. The table in annex 1 gives an overview about possible categories and their characteristics.

The proposed categorisation will lead to a matrix of climate service providers on a national scale and can reveal the characteristics of climate service provision in each country. The matrix is intended to reflect the nature and scope of climate service providers and of the services provided, but can also identify gaps in our knowledge of the providers and provide information about where services are not able to meet the needs of users. All countries that have carried out the mapping will share their national results and a synthesis report of all countries will be produced. This report will reveal the differences in climate service provisioning among the countries and rise questions like what is the added value to work on a European scale or how the national dialogues can be

used to progress on a European scale. Using the results of this analysis, recommendations will be developed for future research and other efforts needed to improve climate service provision at a European level.

3.3 Outlook on future activities

Additionally to the FTA, we intend to explore what is needed to improve the quality of climate services (from both the providers and users' perspectives), what are indicators for the quality of climate services, what will mechanisms such as e.g. certification of services achieve, how will these mechanisms be used, by whom and for what purpose, and then how the nature of the desired quality assurance programme/mechanism will be assessed. The need and scope for this develops from the national dialogues. Other issues in need of discussion are the questions, who is able to verify provided information and what such quality assurance measures as certification mean for the liability of a service provider (JPI 2011).

Empirical Results

The empirical results are based on the activities that the CSC implemented from January to October 2013. Those activities were: 1) a stakeholder analysis; 2) questionnaires development and implementation; 3) direct and indirect interviews with experts; 4) creation of the climate-knowledge-hub and 5) national dialogue in Germany.

Nevertheless, there are additional existing on-going initiatives, which are looking into climate services. The overview of examples includes both examples for mapping initiatives as well as examples of enhancing the relationship between providers and users. You can find an overview about these examples in annex 2 and 3.

The different activities in this field highlight that the concept of climate services is highly relevant at the moment and that the mapping activity within the JPI Climate's Module 2 can build on cooperation and knowledge sharing with existing activities.

There should be a priority for JPI Climate for close coordination with the different on-going processes with the aim of designing effective and efficient work streams that do not duplicate processes and outcomes. A major task will be to explore synergies where potentially appropriate and effective.

To bring the concept of climate services closer to the users we should be working collaboratively with others that have similar remits and ensuring that the information we are making available is consistent with those supplied by others.

Within the FTA 2.2, a guidance document was developed with support of some of the partners of Working Group 2. Based on this guidance document, a questionnaire was established and implemented (cf. annex 3) sending it out to the identified climate service providers in Germany; the list of identified providers consists of approximately 240 institutions and is provided in annex 4. The onlined questionnaire has two aims: it is directly linked to the Climate Knowledge Hub (chapter 4) and supports the mapping of climate service providers in Germany and the other JPI members, in a second step the questionnaire will/was evaluated to create a picture of who provides what for whom in which way. The results are presented in Chapter 5.

Finalising FTA 2.2, a workshop – The National Dialogue (Chapter 6) – was held in Berlin in late October 2013. The National Dialogue was designed to bring providers and users of climate services together to discuss open questions stemming from the questionnaire.

4 Climate Knowledge Hub

As result from the gathered information and the analysis of FTA 2.2 a map and navigator of climate service providers was developed together with the Austrian Center for Climate Services for each of the member states. Thereby, we intend to reflect the results of the mapping of climate service providers in an interactive manner with web-based maps (for more information see <http://www.climate-knowledge-hub.org>). Based on the analysis of the identified climate service providers conducted in the previous section the location of climate service providers in one member state will be represented. The interactive map not only visualises the results of the providers' mapping, but is a service for climate service users, possible users and the interested general public to get an overview about potential providers. We aim at providing a search and filter function to facilitate a purposeful information tool for these users. The idea is to allow the user to filter according to the criteria of the categorisation of climate service providers, e.g.:

- Form of corporate governance (public or private)
- Key activities (adaptation or mitigation, etc.)
- Service portfolio
- Spatial approach
- Sectorial activities
- The location of the providers is already presented on the map to allow the search for providers which are located close to the users (e.g. for face-to-face advice).

The questionnaire was sent out to approximately 240 identified institutions, of which 60 filled out the questionnaire fully (response rate of 25%). By the 31st of October 2013, 55 of these 60 institutions agreed that their portfolio could be published on the Climate Knowledge Hub.

The mapping activities are currently taking place in Austria and Italy as well; Sweden is following a slightly different approach.

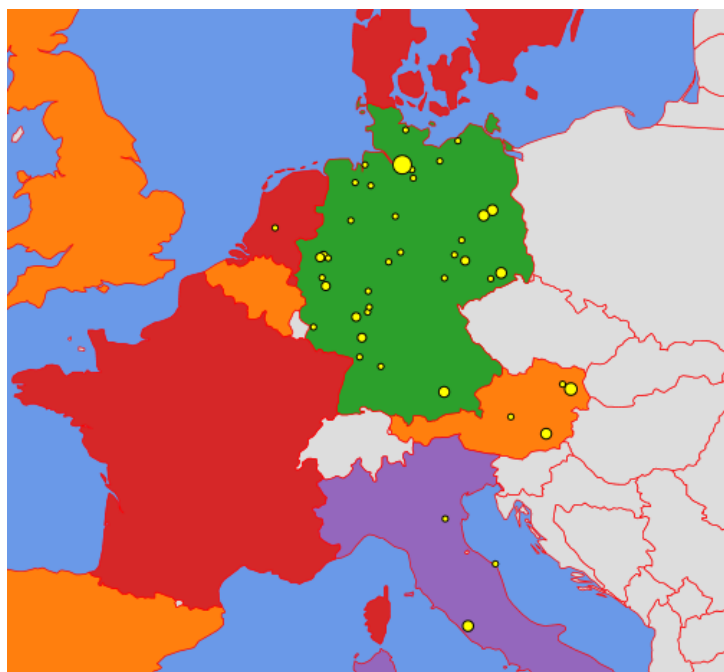


Figure 1: The Climate Knowledge Hub

Additionally, and if possible, we would like to use different layers of maps to display some of the information of the categorisation more visually. Examples could be displaying the financial flows of how and from where the service provisioning of the providers is funded or displaying the information and knowledge flows from the service providers to the users. The figure 2 illustrates this intention.

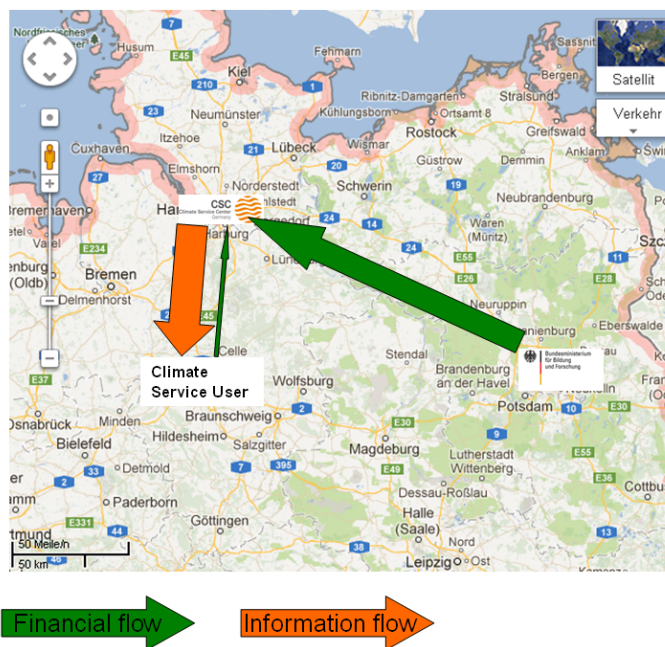


Figure 2: Own draft, information displayed may not be correct nor complete

Already during the information gathering process of climate service providers it was necessary and very important to examine which information about the providers (especially the private providers and commercial organisations) is allowed to be published online.

Since the internet currently is an effective tool for the dissemination and visualisation of spatial data, within this project it is proposed that a platform will be established inspired by, or based on, existing mapping activities. The process of such a web-based map production and design in general involves a series of phases starting from deciding the definition of what is needed. Then the best means of delivery and the type of web map to be created – dynamic or static – have to be defined, including the implementation of an online Geographic Information System (GIS) that supports the required degree of interaction between the user and the data base reflected in the map. The collected data on climate service providers needs to be captured in a database and analysed with the help of the criteria, including those of particular interest to the intended users. The platform design should recognise that it will be necessary to sustain the effort throughout the collection, analysis and development of the web-based maps as information about existing providers will need updating and new providers will have to be added to provide a picture of climate service providers in the member state as complete as possible.

The examples in annex 2 show that a geographical filter is an obvious category that users should be able to select. In the case of climate service providers this might not be the only criterion users are interested in and therefore other criteria in addition to spatial information such as sectors, service portfolio and organisational structure should be integrated into the filter function.

The biggest difficulty with the development of an appropriate web tool will be the development of a two-way-dialogue to exchange information from the provider to the user and additionally from the user to the provider. This dialogue could for example be stimulated by offering discussion

fora, blogs, or networks among providers and users. The database and the interactive map could facilitate this engagement.

5 Results of Questionnaire

The questionnaire was sent out to approximately 240 climate service providers in Germany, covering the whole range from research institutions to private companies, from small sized entities to big players. 78 out of these 240 institutions at least started to fill the questionnaire, 18 quit so that we have 60 completely answered questionnaires, which will be the basis for the represented results.

5.1 Profile of Respondents

Most of the institutions which responded to the questionnaire are private companies (28%), followed by public institutes, administrative entities, and research institutions (app. 12% each). Four stated others without any specification and, remarkably, no provider stated university network as institutional setting (see figure 3). 33 providers offer three different climate services, nine offer two climate services and 18 offer one climate service; in total 153 climate services are covered by the survey.

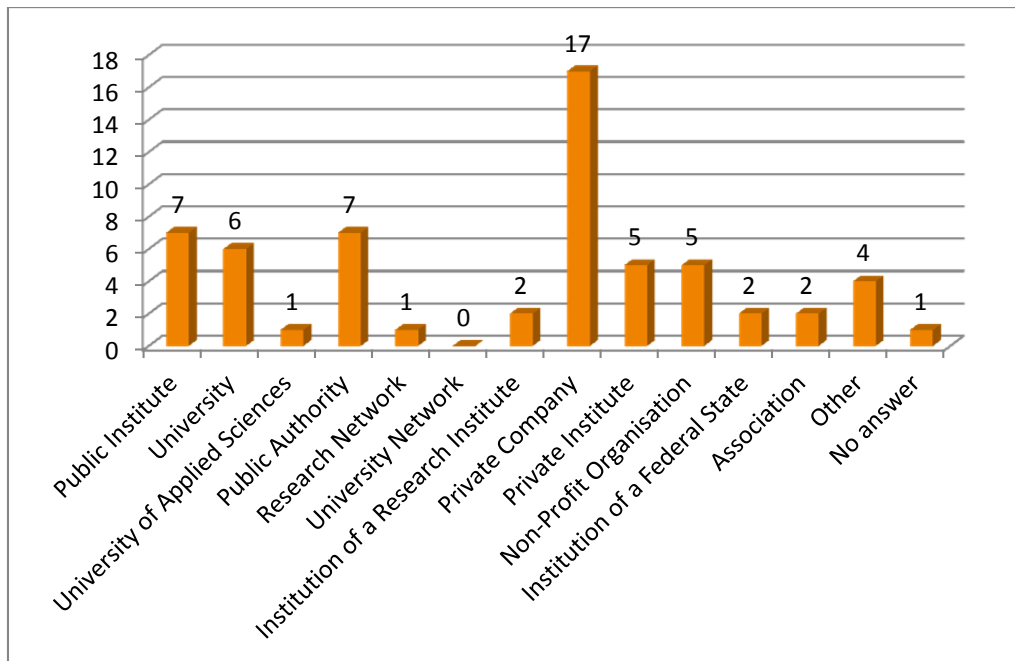


Figure 3: Institutional organisation of Climate Service Providers

All participants provided answers on the following information. The size of the institutions is more or less equally distributed except for the category 201 to 500 employees. The private companies offering climate service are small units; 16 out of the 17 private companies do not have more than 50 employees, whereas research and administrative institutions mostly have more than 50 employees (see figure 4).

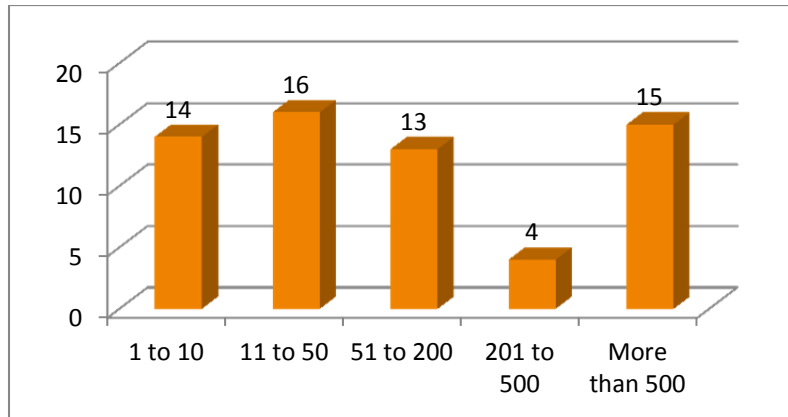


Figure 4: Number of employees

According to organisational structure of the institutions (most of them are private companies), most climate services offered are related to or include consulting and guidance (see figure 5). Only a few services include financial support tools like funding.

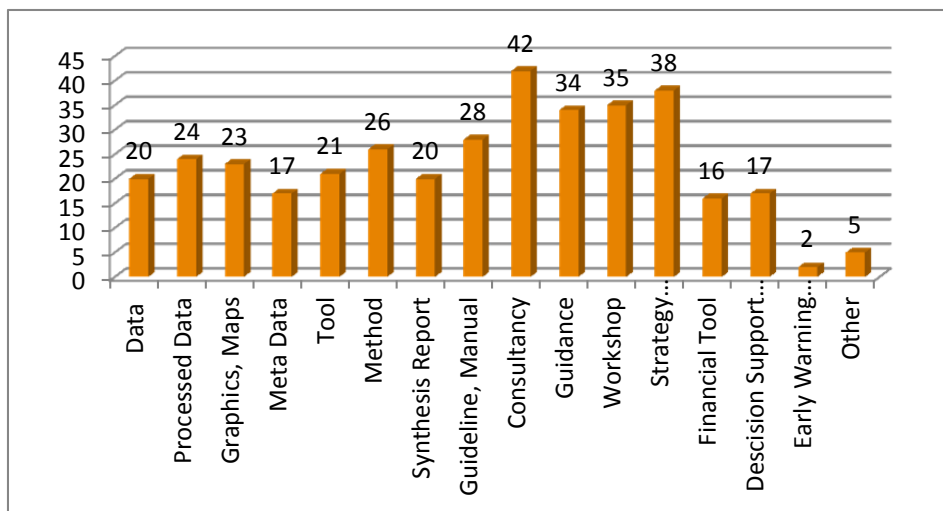


Figure 5: Types of climate services offered

According to the climate service providers, the users belong to the sectors depicted in figure 6. The largest user groups are research, education, energy, and politics (see figure 6). This corresponds with the results of a second survey, in which users were asked which sector they belong to. The two most important user groups according to the second survey are politics/administration on different federal levels (but mostly at the local level/municipalities) and research.

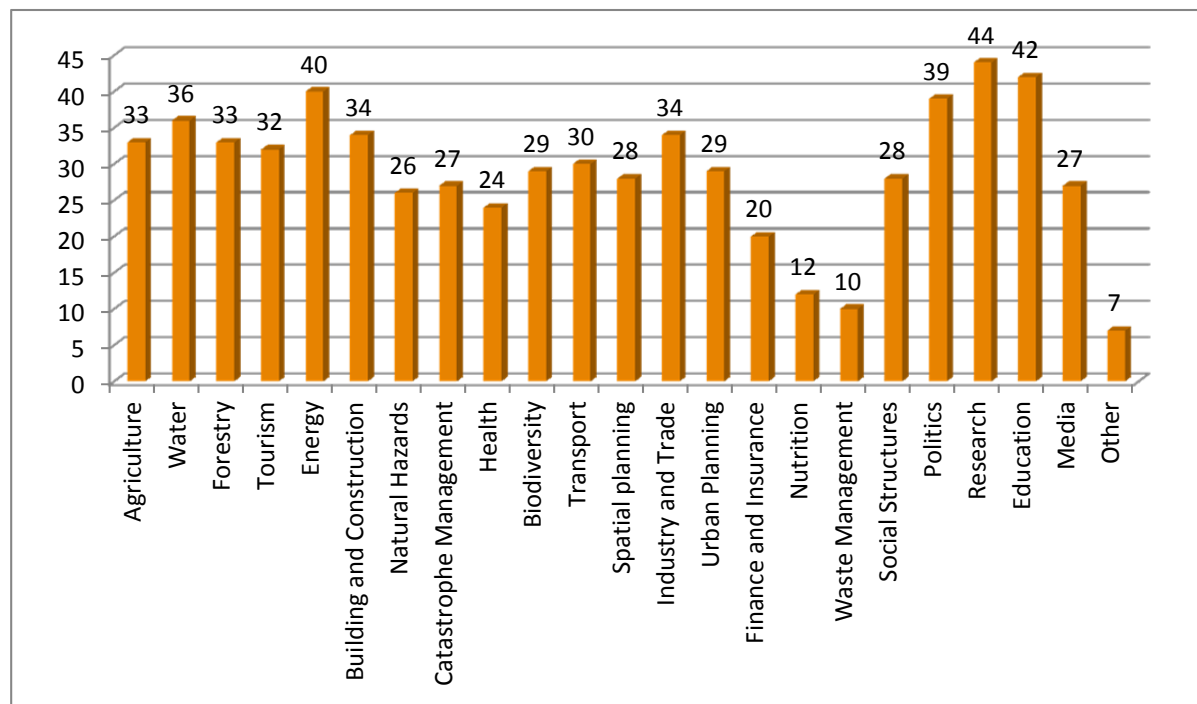


Figure 6: Services demanded by sectors

5.2 Most important results

When analysing the questionnaire it became obvious, that some questions are of higher importance than others when it comes to the improvement of climate services. Thus, only the most important findings should be discussed here, which are related to 'communication and networking' and 'quality and transparency'.

Communication and Networking

Most of the climate service providers in Germany – 54 of 60 (90%) – collaborate with other providers in one way or the other. This collaboration, however, in most cases is related to specific projects. Furthermore, the majority of providers are interested in continuous communication, independent from projects. Even though, the percentage of providers who explicitly expressed their interest in continuous communication, is a bit lower than the 90% in the first case, only one provider is not interested at all (see figures 7 and 8).

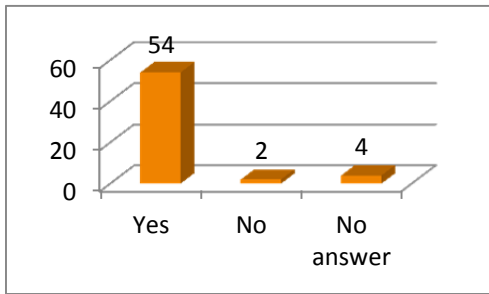


Figure 7: Networking amongst providers

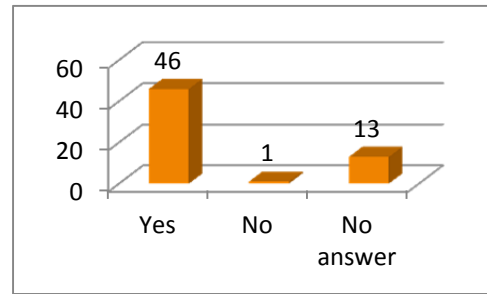


Figure 8: Continuous communication

The main aim of the questionnaire was the identification of knowledge gaps and not necessarily the provision of solutions. Some questions to be addressed in the future should be: How to establish a communication process that enables a continuous communication amongst providers (and probably with users as well)? What kinds of design or structure do we need – workshops, web-based platforms and portals, social media tools, webinars? Should it be sector specific? These questions are not addressed in the questionnaire and need a more in depth analysis.

Quality and Transparency

The questionnaire comprised questions that addressed quality or transparency issues, e.g. referring to the development of climate services, and the evaluation of services.

The providers were asked which data the services rely on. Surprisingly, way more than 50% of the providers did not, or at least not properly, indicate where the data used comes from; only a small percentage ($\approx 17\%$) of providers based their services on credible sources such as the German Climate Computing Center (Deutsches Klimarechenzentrum), the German Meteorological Organization (Deutscher Wetterdienst), Max-Planck-Institute for Meteorology, Climate Service Center, Potsdam Institute of Climate Impact Research and so on.

Currently, no framework for the evaluation of climate services exists, which makes it difficult for users to identify high quality climate services; especially, when providers do not provide information on databases, methods used, etc. The evaluation, however, is being done on a voluntary basis and so is not following a certain standard, which makes the results difficult to compare. Over all, only approximately 20% of the providers have a certain evaluation tool or process established. Nevertheless, the findings are very heterogenic. Referring to figure 3, almost 50% of the private companies have set up an evaluation process containing user questionnaires, feedback talks, audits, etc. The proportion of research institutions evaluating their services is lower and, what is more important, the evaluation is mostly carried out by curatorship, advisory boards, or project executing organisations (e.g. Federal Ministries). In these cases, the evaluation addresses not necessarily the quality of climate services; it is more likely, that other criteria are evaluated. Over all, only four out of 60 respondents ($\approx 7\%$) explicitly stated to use their evaluation results to improve the services provided (all of which were private companies).

As mentioned in section 3.3, one goal is to improve the quality of climate services. This seems to be a very important question. The questions to be addressed might be the following:

- What are indicators for the quality of climate services?
- What will mechanisms such as e.g. certification of services achieve?
- How will these mechanisms be used ?
- By whom and for what purpose?

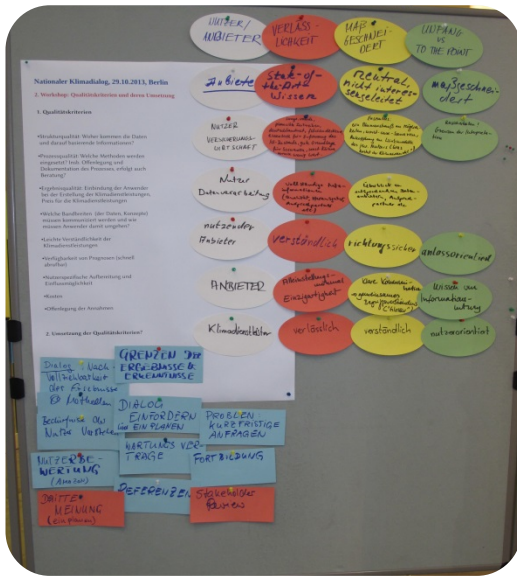
Definition of Climate Services

The providers were asked whether they agree with our (JPI Climate) definition of climate services (see section 2.1) or not. Over all, there is a broad consent; however, some additional points were made that should be part of a definition:

- Instrument for implementing adaptation measures
- Climate adaptation should be integrated
- Aspects of governance
- Target group should include civil society (mentioned multiple times)
- Delineation of mitigation and adaptation
- Consultancy should be part of a climate service
- Development of climate services in a transdisciplinary context
- Subject to costs (in one way or another).

These important questions identified where the main input for the National Dialogue in Germany, that took place on the 29th of October in Berlin.

6 National Dialogue in Germany



The national dialogue in Germany was an important step in the process of corroborating the data obtained during the questionnaire phase and direct interviews. Some of the open questions related to the previous phases were tackled during the meeting of the 29th of October 2013 in Berlin.

Using the results of our stakeholder analysis on climate services users and providers, we invited representatives of institutions, enterprises and private offices to participate in the national dialogue. The dialogue was organised in two sessions: one presented the results of the data collection phase and a second was organised into working sessions in which the participants were divided into working groups. Main topics were communication processes for climate services and the quality assurance of climate services.

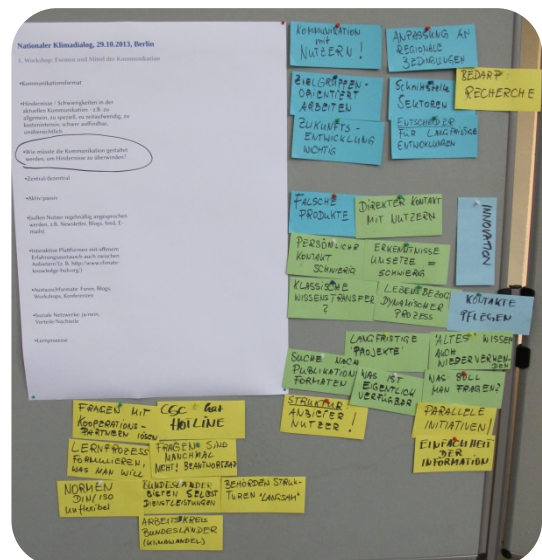
These topics came out of the analysis done in the previous phase (see subchapter 5.2). The main outcomes of the German national dialogue should flow into the European one.

First working session

The objective of the first working session was to facilitate the communication flow between service providers and users. Strategies on communication and different communication channels were described.

The participants were divided into two working groups and the following results summarise the concerns of the participants. The main concerns were around how to make information about the services providers more transparent and accessible and how to facilitate the contact between services providers and user:

- For communication purposes, the stakeholders have to be clearly defined and involved
- It is important to clarify to the users which institution is offering which service
- Multiple of similar activities and initiatives in different institutions might be confusing for the users. A need arises for combining efforts between different services providers
- More clarity about the offer of services is needed
- Data provision should be linked to data communication



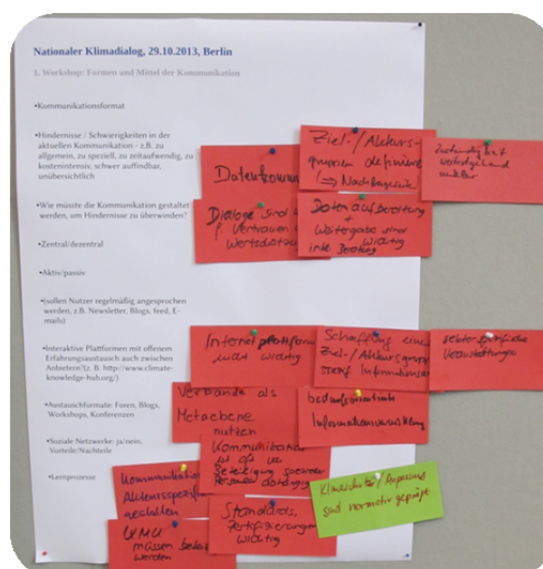
Regarding the question on ways to enhance the communication between service users and providers, the participants mentioned:

- There is a need to customised information to a particular group or user
- Transfer of climate knowledge should be placed in meetings and conferences where many users have access and the possibility of obtaining the same range of information (like Deutschen Städtetag)
- There is a need for actor-based platforms that would facilitate knowledge acquisition. This should happen taking into account the existing initiatives that already have users
- Standards on climate service provision might help to enhance communication.

Second session

The second session dealt with the quality of services and also on how to ensure this quality for users. The workshop participants divided again in two groups delivered a list of quality criteria to take into account when providing climate services:

- Robustness of the data used is very important. In the cases in which there are no robust data, a proper explanation on this is very important
- The services have to be based in the “state of the art” science
- Meta-data is important criteria
- Customised products based on generic ones
- Meteorological data on its own is not a climate service: the analysis, interpretation and formulation of this data for adaptation are very important
- Results from climate models are not products but the interpretation and analysis of these models for particular processes
- Transparency of the data origin is important. Therefore the documentation of the individual steps taken up until the provision of the climate service should be visible
- Also, the methods used should be understandable for the service user
- The reputation of the services providers and their link to science is very important
- Neutrality of the service provider.



Additionally to these results the definition of “climate services” was discussed and particularities from the German participants to the JPI description will be taken into account.

The German national dialogue should be developed as a forum for exchange on climate services and further meetings should take place in the coming years. These meetings will be specifically developed for sectors and also for different kinds of providers. Aims of the future meetings will be to create a definition of climate services accepted at the national level, to work together on the establishment of quality criteria and standards for climate services and to contribute to the European Dialogue.

7. Conclusions and Recommendations

The final conclusions and recommendations are not solely based on the findings of the questionnaire and the national dialogue, to some degree they also stem from talks with colleagues and other projects.

7.1 Improving communication

The questionnaires amongst providers and users showed that both groups have an increased interest in communication and networking with each other and amongst themselves. While networking and communication amongst providers seems to be sufficiently developed, the existing communication strategy fails in reaching the main target groups.

The user questionnaire sent out in Germany was mostly answered by representatives of political or administrative institutions. The respondents indicated that they have a need to be informed and a need for climate services. But only two of the respondents managed to come to the national dialogue to be part of the further process.

How can users be addressed in a more effective way? Two things became clear at the national dialogue in Germany:

- The communication has to be **user/sector specific**. Because in Germany, one of the most important user groups is municipalities, a strategy is needed to address them. It was stated at the national dialogue that associations like the German Association of Cities (Deutscher Städtetag; www.staetetag.de/englisch/index.html) or the German Association for Water, Wastewater and Waste (DWA; www.dwa.de) can be important multipliers to reach a large number of end-users of a specific group.
A proper strategy is needed to identify and integrate the multipliers of the most important sectors. Part of such a strategy could be presentations, workshops, consultancy, etc. Lessons learned from other countries would also be helpful to move forward in this field.
- The communication strategy should consist of web-based platforms as well as direct face-to-face communication. Important to note here is, that numerous platforms already exist leading to a non-transparent supply – which platform offers what for whom (see also subchapter 6.1)? It might be important for the future to either make clear, what the differences between platforms are, or to merge different platforms and initiatives to reduce their number.
Setting up an integrated communication strategy, it might be helpful to involve communication experts from fields like marketing or applied linguistics.

7.2 Quality

Since users usually are not climate experts, it is difficult for them to judge the quality of a certain climate service. This becomes even more challenging as most providers (the majority being private providers) do not provide information on which data or methods they used to develop their climate service or how to deal with uncertainties.

To make provided services a bit more transparent, labeling the quality of climate services might be helpful to distinguish between good services from those of suboptimal quality. This question was controversially discussed at the national dialogue (for results please see subchapter 6.2).

Final remark

Taking into account these two fields of major interest, communication is the more important one. We need to learn more about important user groups, which can differ from one country to another. In Germany by far the most important user group is administration, followed by research.

8 References

- JPI Climate (2011) JPI Climate Strategic Research Agenda, Helsinki, Finland.
- McNie, E. C. (2007) Reconciling the Supply of Scientific Information with User Demands: An Analysis of the Problem and Review of the Literature. *Environmental Science & Policy*, Vol. 10, pp. 17-38.
- Semazzi, F.H.M. (2011) Framework for climate services in developing countries. *Climate Research*, 47:14, pp. 145-150.
- Visbeck, M. (2008) From climate assessment to climate services. In: *Nature Geoscience* 1, pp. 2-3.
- Von Flotow, P. & Cleemann, L. (2009) Requirements for the Climate Service Center (CSC) from the perspective of the financial sector. 23pp., Hochheim am Main, Frankfurt.
- Von Flotow, P., Cleemann, L., Hummel, A., Ludolph, M., Clements-Hunt, P., Fischer, R. & Lopez, J. (2011) Advancing adaptation through climate information services – Results of a global survey on the information requirements of the financial sector, UNEP Finance Initiative & Sustainable Business Institute,
- Von Storch, H., Meinke, I., Stehr, N., Ratter, B., Krauss, W., Pielke, R.A . jr., Grundmann, R., Reckermann, M., Weisse, R. (2011) Regional Climate Services – illustrated with experiences from Northern Europe. In : *Journal of Environmental Law and Policy*, 1/2011.
- Von Storch, H. & Meinke, I. (2008) Regional climate offices and regional assessment reports needed. In: *Nature geosciences* 1 (2), p. 78.
- WMO (2011) Climate knowledge for action: a global framework for climate services – empowering the most vulnerable, WMO-No. 1065, Geneva, Switzerland.

9 Annex 1: Possible Criteria for Categorising Climate Service Providers

Categories	Criteria
Spatial approach	Local
	National
	Regional
	Global
Main sectorial focus	Agriculture
	Water
	Urban planning
	Energy
	Finance
	Tourism
	Others
Core activities within climate services	Adaptation
	Mitigation
	Disaster risk reduction
	Combinations
	Others
Institutional organisation	Research Organisations (non-university)
	National meteorological services
	Universities
	Companies
	Government agencies
	Networks
	Private institutes
	Others

Dissemination strategies	Providing information through scientific publications, lectures and conferences
	Information services upon requests
	Educational programmes, capacity building and consultancy
	Internet-based dissemination
	Others
Financing	Public
	Private and profit oriented
	Private and not profit oriented
	Public-private partnership
	Others
Service portfolio	General climate information
	Specific climate information on request
	Others
Target groups	General public
	Sectoral users
	Policy makers
	Impact researchers
	Others

Table 1: Possible criteria for categorising climate service providers

Additionally to the above proposed categories the following information could be relevant for climate service users, too:

- Who/which institutions invest in climate service provisioning?
- Which ancillary products, services or data can be provided?
- What is the mission of the climate service provider?
- Description of experiences and background of the provider
- Website and contact details of providers.

10 Annex 2: Examples of Interactive Websites

In order to illustrate this information using a web-based map, it might be useful as a first step to have a look at already existing online platforms dealing with the mapping of institutions in different ways.

10.1 Klimanavigator, Germany

One possible way to present the overview of climate services for Germany as a case study might be an integration in – or adaptation of – the already existing platform “Klimanavigator” coordinated by the German Climate Service Center (CSC) as an institution of the Helmholtz-Zentrum Geesthacht.

The “Klimanavigator” (<http://www.klimanavigator.de>) is a gateway to climate knowledge in Germany. Currently about 60 German research institutions and networks are represented on the website, where information about their work and the latest findings from climate research and adaptation can be found. Thus the “Klimanavigator” is an information portal for actors who have to respond to climate change. The tool gives an overview of the present state of research and the landscape of German climate research institutions. Economists, policymakers, administration and the media are bound to find the names of scientific experts and institutions with this tool. Furthermore a chapter on “Dossiers” provides state-of-the-art information on specific topics from different perspectives. Portraits of the member institutions draw a map of science in Germany and also help to find appropriate cooperation partners. The interactive map represents the location of the networking research institutions and associations. A simple filter function allows the user to display either the institutions or the associations. A further tool zooms into a chosen federal state of Germany.

Even though the “Klimanavigator” currently is only available in German language, it might be a good role model for new platforms to be developed.

10.2 Interaktiver Forschungsatlas Erneuerbare Energien, Germany

Another, quite similar, approach that might be used as a potential model is the so-called “Interaktiver Forschungsatlas Erneuerbare Energien” (<http://www.energie-studien.de/de/forschungsatlas.html>).

The interactive map shows academic institutions, companies and organisations involved in research and consultancy on renewable energy. It includes a variety of disciplines, from technology research to economics and politics. Thereby it is possible to filter information related to different topics, e.g. economics, politics, solar energy, wind energy, etc., or zoom in geographically to the different federal states of Germany.

10.3 Renewables 100 Policy Institute

Finally and as a worldwide example it will be interesting to have a look at a project run by the Renewables 100 Policy Institute. They established an online platform mapping all initiatives worldwide that aim at 100% RE (<http://www.go100percent.org/cms/index.php?id=4>).

If one is interested whether e.g. a residence, city, region, state, country, private company or non-profit-organisation runs a 100% renewable energy project it is possible to have a world view or to

have a more focused look at e.g. Africa, Asia, Europe or North America. The platform also provides short descriptions as well as contact details and further information for all projects included.

10.4 Climate-Adapt: European Climate Adaptation Platform

The initiative Climate-Adapt (<http://climate-adapt.eea.europa.eu>) of the European Commission aims at supporting the adaptation process in Europe. The website helps users to access and share data and information on expected climate change, vulnerabilities and adaptation activities within Europe. In categories like general adaptation information, sectorial information and information per country and transnational regions the user can access a collection of summaries, studies and projects. A compilation of tools, e.g. Adaptation Support Tool, Case Study Search Tool and Uncertainty Guidance, supports the user's search for information and guidance on the development of adaptation strategies. The database of the website contains quality checked information that can easily be searched. One category of the database is "organizations" which lists a range of organisations together with a short summary and their website. All of the organisations provide climate services in any form. The figure below shows the database search form of Climate-Adapt and the categories a user can choose.

11 Annex 3: Examples of Climate Services Mapping Activities

11.1 AACIFI: Advancing Adaptation through Climate Information for Financial Institutions

AACIFI is an initiative of the UNEP Finance Initiative (UNEP FI; <http://www.unepfi.org>) in cooperation with the Sustainable Business Institute (SBI), Germany. It is also supported by the World Meteorological Organization (WMO) and a group of meteorological offices and climate service providers (CSC Germany and others). A structured dialogue between financial institutions and climate service providers shall be developed to implement user-oriented climate information systems for the financial sector and its clients from the real economy. Given the key macro-economic role of the financial sector and investment community, the project's overall aim is to contribute to enhancing the climate change resilience of the economy and society. The project is building upon an UNEP FI/SBI report on the information requirements of the financial sector, published in 2011 and involves the perspectives of a variety of different insurance-, lending- and investment-related financial business lines. Part of the project's intended activities are to develop an advanced demand side mapping and support a supply side (climate services) mapping. These mappings shall emerge in cooperation with mapping activities currently being planned and prepared by initiatives like JPI and others. Based on these proceedings, the project will identify current climate service gaps, potentials and limitations and contribute to the creation of a joint roadmap for future climate services development in cooperation of the climate service community and the financial sector as a key stakeholder.

11.2 Climate Service Partnership (CSP)

The Climate Service Partnership (<http://www.climate-services.org>) was established in 2011 during the first International Conference on Climate Services. The aim was to form an open and informal coalition to enhance the provision and the development of climate services around the world. This resulted in a platform for sharing climate knowledge and advancing climate service capabilities. The platform invites everyone actively involved in climate services, both providers and users. The membership is free of charge and provides access to the community. The Partnership is organised by associates of the International Research Institute for Climate and Society (IRI) and its activities are coordinated by a group of representatives from different institutions.

11.3 Global Framework for Climate Services, WMO

The Global Framework for Climate Services (<http://www.wmo.int/hlt-gfcs/>) was established by WMO to strengthen the provision and the use of climate information globally. Therefore, WMO coordinates approx. 200 nations. The aim is to provide climate services and apply them in decision making at every level of society. To put this framework into place, both collaboration and the further development of existing capacities are required. The implementation plan was first published in October 2012. The five main components of the framework will be: a User Interface Platform, a Climate Services Information System, Observations and Monitoring, Research and Capacity Building. The User Interface Platform will serve as an interaction tool for users, climate researchers and climate service providers and thus help to develop improved applications of climate information. The Climate Services Information System will be the database of information and help to distribute it from the providers to the users.

11.4 ECLISE: Enabling Climate Information Services for Europe

The ECLISE research project (<http://www.eclipse-project.eu/>) wants to initiate the realisation of a European Climate Service to support climate adaptation policies. Therefore, it demonstrates and further develops local climate services at sectorial levels, with a focus on North and East Europe. In a next step it aims at defining a concept on how a European Climate Service could be established. This work package “Conceptualization” uses the experience from the local case studies and activities of national climate services. It collects existing initiatives of climate services worldwide and is going to represent them in the web sorted by geographic location and with information on different categories. Furthermore, an assessment about user requirements and feedback on existing climate services will be conducted. The ECLISE project ran until January 2014.

11.5 ClimRun: Climate Local Information in the Mediterranean Region Responding to User Needs

The objective of the ClimRun research project (<http://www.climrun.eu>) is to contribute to the new establishment of a Climate Service Network in the Mediterranean region. Unlike other initiatives it uses a bottom-up approach and a direct involvement of stakeholders to strengthen the knowledge flows between science and climate service providers and users. Thus, the needs for climate information at regional and local levels will be identified. A communication tool will be used to respond to the identified user requirements. The exchange of information between climate science and users will be activated to improve the quality, the reliability and the detail of climate information. The concept will be illustrated by case studies from the Mediterranean region and from key economic sectors, e.g. energy and tourism. The mentioned activities are supposed to lead to the development of a web portal, which connects the different levels of climate information and optimises the information distribution and communication between the levels. The ClimRun project runs until spring 2014.

11.6 EUPORIAS: European Provision of Regional Impact Assessments on Seasonal and Decadal Timescales

The EUPORIAS project (<http://www.euporias.eu>) intends to increase the societal benefits of conducting projections of future environmental conditions. Its aim is to develop new types of climate services that are addressing the needs of specific users. It will stimulate the market for the newly developed climate services to increase the competitiveness of European enterprises and to enable effective decisions in climate sensitive sectors. The projects consist of 24 partners from UN organisations to small enterprises and runs until 2017.

11.7 SPECS: Seasonal-to-decadal Climate Prediction for the Improvement of European Climate Services

SPECS (<http://www.specs-fp7.eu/SPECS/Home.html>) is working on the development of new climate forecast systems at seasonal-to-decadal time scale. It aims at enhancing the communication and the services to satisfy the demand for climate information of various public and private stakeholders. Envisaged methods for enhancing the communication are, among

others, e-based dissemination tools, multi-media, sector-tailored examples and stakeholder surveys. SPECS runs until 2017.

12 Annex 4: Questionnaire

Introduction to questionnaire:

Welcome to the online questionnaire about the mapping of climate service providers!

We are pleased that you are supporting our project by taking the questionnaire about climate service providers and their service portfolio. For completing the questionnaire you will need approx. XX min.

What is the use of this questionnaire?

The questionnaire helps to identify climate service providers and to assess the offered climate services. This information is incorporated into the Joint Programming Initiative (JPI) Climate initiated by the European Commission (www.jpi-climate.eu).

What are climate services?

As climate services we understand information about climate, climate change and its impacts, which are tailored to specific users' needs and made available to them, as well as guidance in using this information.

For what will the results of the questionnaire be used?

The questionnaire is conducted in the member states of JPI Climate. Its evaluation provides information about the currently offered climate services and allows together with another survey about the users of climate services the improvement of the exchange between providers and users of climate services. In workshops on national level – national dialogues – providers and users of climate services will jointly discuss a framework for climate services. Thereof, new research questions and possibilities for cooperation arise on European scale. The climate service providers comprised with the present questionnaire will be registered into a data base, which is publicly available and supports the establishment of a climate service network.

The questions marked with a red * are obligatory questions.

Do you want to be part of the climate service provider network with your services?

Yes

No

Your public profile will look like this.

The climate service providers comprised with the present questionnaire will be registered into a data base, which is publicly available and supports the establishment of a climate service network.

A. WHO is offering climate services?

Your institution

1. For which institution are you working?

Contact details	
Institution *	
Department	
Position	
Contact person *	
Address *	
Telephone	
Email	

2. Which institutional organisation does your institution have? *

Public institute

Research network

University

University network

University of applied sciences

Institution of a research institute

Public authority

Institution of a federal state

Private enterprise company

Association

Private institute

Others:

Non-profit organisation

3. How many employees does your institution have?

1 to 10

201 to 500

11 to 50

More than 500

51 to 200

Your expertise in climate services

4. Can you identify yourself with our definition of climate services? Do you want to add or change something? *

5. Since when do you offer climate services?

6. Why do you offer climate services? *

Your networks

7. Do you collaborate with other providers of climate services?

No

Yes. With whom? In which way?

8. Are there any other institutions in your country which offer similar services than you? Please, provide examples.

9. Are you interested in a continuous exchange among climate service providers?

Yes

No

B. WHAT kind of climate services do you offer?

Which services do you offer as climate services? *

Please, name the 3 most important climate services for your institution and describe them more detailed in the next sections. In case you're offering less than 3 services, name only them. In case you're offering more than 3 services, please list them below.

- Service A:

- Service B:

- Service C:

- Others:

1. Service A:

Contents, base data and format of your climate service

1.1 Please, describe your climate service in 3 to 4 sentences. *

1.2 What is your expertise in climate and climate change? * (Check all that apply)

Key competences

- Fundamental research
- Applied research/ technology
- Management
- Education

Thematic focus

- Climate system
- Impacts of climate change
- Vulnerability to climate change
- Adaptation to climate change
- Climate protection

1.3 What is the type of your climate service? * (Check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Data | <input type="checkbox"/> Consultancy |
| <input type="checkbox"/> Processed data | <input type="checkbox"/> Guidance |
| <input type="checkbox"/> Graphics, maps | <input type="checkbox"/> Workshop |
| <input type="checkbox"/> Meta data | <input type="checkbox"/> Strategy development |
| <input type="checkbox"/> Tool | <input type="checkbox"/> Financial tool |
| <input type="checkbox"/> Method | <input type="checkbox"/> Decision support tool |
| <input type="checkbox"/> Synthesis report | <input type="checkbox"/> Early warning system |
| <input type="checkbox"/> Guideline, manual | <input type="checkbox"/> Other: |

1.4 Is your climate service project-bound?

- No Yes

1.5 On which climate data/indicators is your service based? *

1.6 Where does your climate data/indicators come from and why did you choose exactly these ones?

1.7 Which methods do you need to produce your climate service? (Check all that apply)

Data collection. Please specify (e.g. measurements or interviews):

Data analysis. Please specify (e.g. mean or extreme values):

Literature research

Modelling. Please specify:

Policy analysis

Applied research/ technology

Capacity building

Program coordination/ management

Other:

1.8 How do you communicate the uncertainties related to your service? As uncertainties we define uncertainties related to climate data and the range of results of climate scenarios.

1.9 Which time horizon is relevant for your service? (Check all that apply)

Past

Present

Future until 2040

Future until 2070

Future until 2100

Special time horizons like seasonal projections. Which?

1.10. What is the spatial scale of your service? (Check all that apply)

Local. Where:

Regional. Where:

National. Where:

Transnational. Where:

Continental. Where:

Global

1.11. How do you finance the development and the provision of your service

- With public funds With private funds
 Hybrid forms. Please specify:

1.12. Are there any restrictions caused by the financing?

Users of your climate service

1.13. Who are the users of your service? *

- Researchers Practitioners
 Consultancies General public
 Decision makers/ politicians

1.14. In which sector/sectors do the users operate? * (Check all that apply)

- Agriculture Politics
 Water Research
 Forestry Consultance
 Tourism Education
 Energy Other:
 Building and construction
 Natural hazards
 Catastrophe management
 Health
 Biodiversity
 Transport
 Spatial planning
 Industry and trade
 Urban planning
 Finance and insurance
 Nutrition
 Waste management
 Social structures

1.15. For what do the users use your service?

1.16 What kind of services were the users originally demanding?

1.17. Do users pay for the service?

Yes

No

1.18. Why do users choose exactly your service?

Relationship between provider and user

1.19. How did it come to the development of your climate service?

1.20. How does the relation to the users normally start?

Evaluation of your climate service

1.21. Are your services evaluated?

No.

Yes. By whom? How? Why?

Communication and dissemination of your climate service

1.22. Do you promote your service?

No

Yes. How? Which type of media do you use?

1.23. How do you disseminate the service to the user? (Check all that apply)

Print material

Digital data

Workshop

Face-to-face advice

Presentation of results

Media

Others:

2. Service B:

3. Service C:

C. Do you have comments or suggestions concerning our survey?

Thank you for supporting our survey!

13 Annex 5: List of Reported Climate Service Providers in Germany

adelphi consult GmbH
akzente kommunikation und beratung gmbh
Alfred-Wegener-Institut für Polar- und Meeresforschung, Klimabüro
Alfred-Wegener-Institut für Polar- und Meeresforschung, REKLIM
Allianz Climate Solutions GmbH
Allianz Umweltstiftung
ARGE SOLAR e.V.
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BTU Brandenburgische Technische Universität Cottbus, Umweltmeteorologie
BUND - Bund für Umwelt und Naturschutz Deutschland e.V.
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