



## *Climate Service Action Plan for the Nile Basin Initiative (NBI CSAP)*

On behalf of :



Federal Ministry  
for the Environment, Nature Conservation  
and Nuclear Safety

In cooperation with:

**Deutscher Wetterdienst**  
Wetter und Klima aus einer Hand



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## Abbreviations

BMU	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit
CBOs	Community-based Organizations
CS	Climate Services
CSI	Enhancing Climate Services for Infrastructure Investments
CSAP	Climate Services Action Plan
DWD	German Meteorological Service (Deutscher Wetterdienst)
ENTRO	Eastern Nile Regional Technical Office
NELSAP	Nile Equatorial Lakes Subsidiary Action Program
NBI	Nile Basin Initiative
NMHS	National Meteorological and Hydrological Services
NGO	None Governmental Organizations
Nile-COM	Nile Council of Ministers
Nile-SEC	Nile Secretariat
RKH	Regional Knowledge Hub
UN	United Nations
WMO	World Meteorological Organization

# Climate Service Action Plan for the Nile Basin Initiative (NBI CSAP)

## 1. Introduction

### 1.1. Objectives and structure of NBI

The Nile Basin Initiative (NBI), an all-inclusive basin-wide institution was established in 1999. It is an intergovernmental partnership of 10 Nile Basin countries, namely Burundi, DR Congo, Egypt, Ethiopia, Kenya, Rwanda, South Sudan, The Sudan, Tanzania and Uganda. Eritrea participates as an observer. The objectives of the NBI are:

1. to develop the Nile Basin water resources in a sustainable and equitable way to ensure prosperity, security, and peace for all its peoples
2. to ensure efficient water management and the optimal use of the resources
3. to ensure cooperation and joint action between the riparian countries, seeking win-win gains
4. to target poverty eradication and promote economic integration
5. to ensure that the program results in a move from planning to action.

The NBI institutional framework consists of three key institutions:

- The Nile Council of Ministers (Nile-COM), which is comprised of Ministers in charge of Water Affairs in each NBI Member State, provides policy guidance and makes decisions. The council holds regular annual meetings as well as extraordinary meetings.
- The NBI Technical Advisory Committee is made up of senior civil servants and provides technical advice and assistance to the Council of Ministers. The committee is made up of one representative from each riparian country and one alternate. It meets two to three times a year.
- The NBI Secretariat (Nile-SEC), provides administrative support to the Council of Ministers and the Technical Advisory Committee. The Nile-SEC is responsible for the overall corporate direction. It is based in Entebbe, Uganda and is headed by an Executive Director.
- Two subsidiary programs are managed by the Eastern Nile Regional Technical Office (ENTRO), which is based in Addis Ababa, and the NELSAP Coordinating Unit (NELSAP-CU), which is based in Kigali, Rwanda. In addition, various projects have regional project management units located in different countries of the Nile Basin.

### 1.2. Background of CSAP development

The Nile Basin Initiative formulated its Climate Change Strategy in 2013. The Strategy, which was approved by the NBI governance, serves as the overarching guiding document for NBI's efforts to support member countries in climate change adaptation.

The NBI Climate Change Strategy states the following as one of the target results of the strategy

*Output 1: A NBI climate change service function is established*

The NBI Secretariat is supporting riparian states on demand in their efforts and actions on climate change adaptation and mitigation. This includes provision and sharing of information and technical support through a Regional Knowledge Hub (RKH), a shared data base on projects and initiatives in the region, an expert roster, the development of joint methodologies and analytical tools, and the targeted use of DSS components to improve predictions on climate change impacts.

The NBI is yet to establish its climate service function for which an Action Plan being formulated.

*This concept note is intended to inform the development of the NBI Climate Service Action Plan. It provides proposal on the scope and high level description of the Action Plan.*

### 1.3.Objectives and scope of NBI CSAP

Over the past several years has built its capacity in the generation of water resources relevant data and information and application of the same to address a range of transboundary water resources issues. However, while the NBI has clear mandate to provide climate information service to its member states and developed and further expanding range of information services it can provide to users basin-wide, the extent of reach out to users in the Nile Basin is very limited. A range of factors contribute to this. A primary reason for this is that the NBI hasn't yet sufficiently positioned itself as provider of (value added) climate information and services. Therefore, the NBI intends to develop an Action Plan (referred to as Climate Service Action Plan) to structure its efforts in the short to medium term so that it becomes.

The primary purpose of the Action Plan is to help NBI position itself as a regional climate service provider for hydrological issues within its mandate. The Action Plan is envisaged to spell out key actions NBI needs to take in order to establish and further enhance its climate services to its member countries.

The actions identified within the Action Plan refer to the improvement of key climate services that are already provided by the NBI or yet under development. The enhancement of the NBI product portfolio is only of secondary priority unless additional products support the usefulness and usability of existing climate service products. All identified actions are supposed to be implementable in short-to medium terms.

## 2. Framework for Climate Services for the NBI

### 2.1. Concept of Climate Services

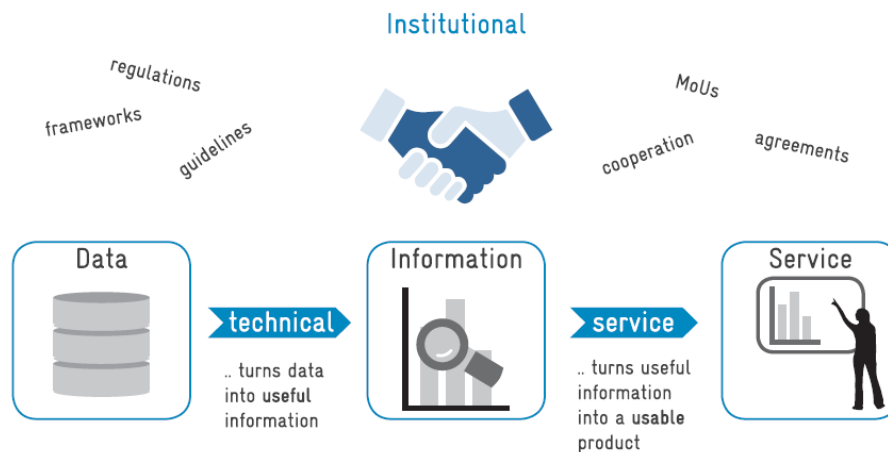
According to the World Meteorological Organization (2014) Climate Services are defined as follows:

*“Providing climate information in a way that assists decision making by individuals and organizations. A service requires appropriate engagement along with an effective access mechanism and must respond to user needs.”*

Two key aspects should be highlighted that provide a unique selling point of Climate Services and thus a discrimination from climate data and information: climate information should be **ready to use**, while considering **user needs**. Thus, a Climate Service is always an end-to-end product, i.e. integrating all steps from data to decision-making. In order to ensure this, the concept of the **“three dimensions of Climate Services”** has been created (see also **Figure 1**). These dimensions are defined as follows:

- The technical dimension defines the *usefulness of a climate information product*. It refers to the content of climate information and its relevance for a specific user, user group or sector (e.g. suitable parameters and indices and the type of statistical analysis). It also refers to the contextualization of climate information with respect to temporal and spatial scale and resolution. And furthermore, it comprises the quality of climate information and the provision and communication of meta-data and information on uncertainty along with the climate information.
- The service dimension defines the *usability of a climate information product*. It refers to dissemination and utilization of climate information. Dissemination comprises the provision of physical access to climate information (e.g. data platforms, filter systems, etc.) but also the promotion of climate information to enhance visibility and perception of the added value for the user. A critical aspect of dissemination is the timing of delivery and update frequency of climate information. Utilization refers to the format and style of presentation of climate information (e.g. maps, graphs, diagrams, etc.) but also the support of the user in using climate information for his decision-context. This may comprise assistance for data interpretation, decision-support tools and advice for the implementation in decision-making processes as well as training and educational material on these issues.
- The institutional dimension constitutes a *framework for the formation of the technical and service dimension*. It refers the cooperation of relevant stakeholders which are involved in the production of a Climate Service. This implies the cooperation between various (climate) data and information providers as well as the relationship to users to guarantee usefulness and usability of climate information. But also cooperation to political stakeholders to ensure appropriate data policies (data access and availability) mandates and guidelines for the use of climate information” (GIZ 2018:18f).





**Figure 1:** The three dimensions of Climate Services. The technical dimension turns data into useful information by tailoring of the data. The service dimension turns useful information into a usable climate information product by tailoring the presentation and format of the information as well as providing user-specific support and advice. The institutional dimension provides the institutional framework within a co-production of Climate Services can be realized by the cooperation of climate information providers and users.

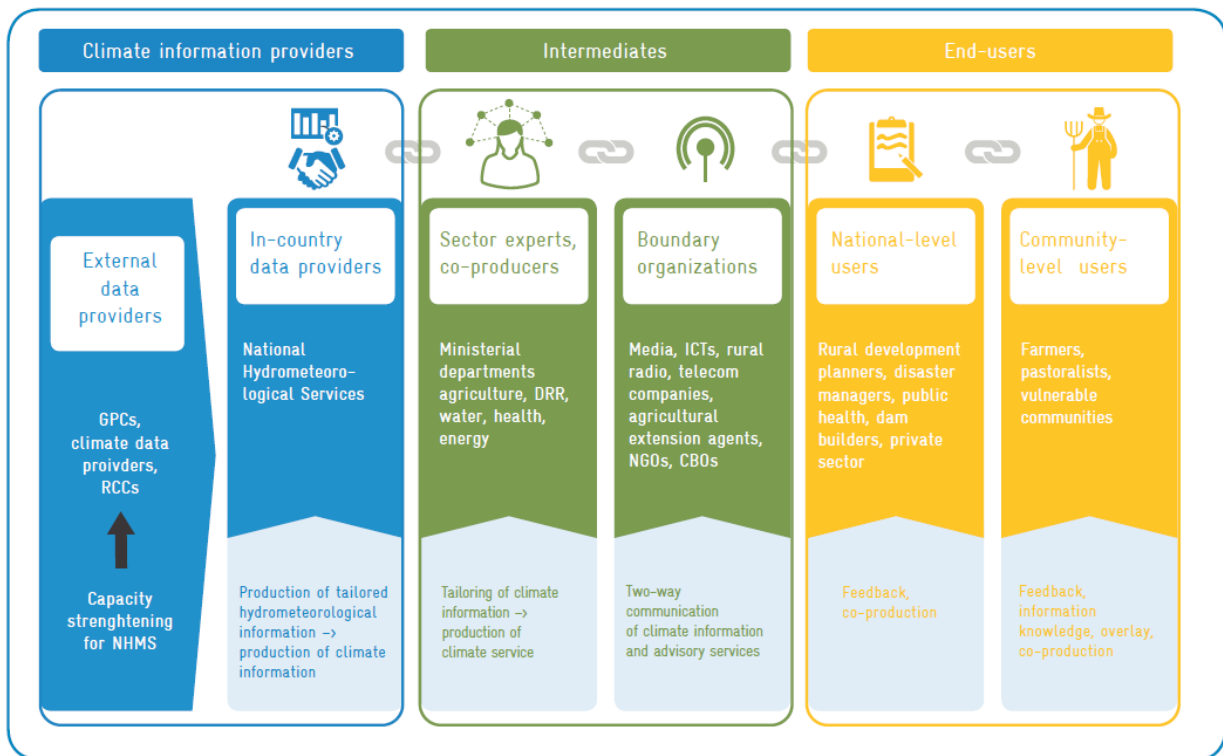
By these means, a Climate Service product does not only need technical input but also needs to focus on the provision, communication, and advice on climate information, as well as the interaction with users and other stakeholders. Hence, the governance of climate information production and provision plays a major role. From this point of view, a Climate Service product needs to be considered in most cases as a joint product of several stakeholders, what requires cooperation and coordination in order to produce added value to users and – therefore – be ready to use.

In this context, the term **climate value chain** has been created. It describes an end-to-end climate information production cycle that “is characterized by one or several steps of value-adding which might be tailoring of data or provision of information and services, etc. to make climate information usable” (GIZ 2018:19). These steps are performed by various stakeholders, characterized as follows (see **Figure 2**):

- **Providers:** providers of climate information collect, manage, archive and provide climate data and also basic climate diagnostic- and monitoring products as well as climate predictions and projections. Key providers at national level are mainly National Meteorological and Hydrological Services (NMHS). Also important are academia (e.g. universities, research institutes) for model and product development as well as external data providers which provide data and products from the regional or global level. In many contexts the private sector may also collect relevant climate data for own interests which is, however, not systematically provided to a central database of a NCS.
- **Intermediates:** intermediates have the function of adding value to climate data or purely climate information in order to make it useful for the context of the decision-maker. They can be differentiated in basically two types: (1) technical intermediates refine basic climate data or information by tailoring and/or adding external data (e.g. modelling future river flow, based on climate data and river flow models). Important stakeholders may be impact modelers, risk managers or authorities (line ministries) who can often be found at the sectoral level; (2) institutional intermediates or boundary organizations have the function as communicators of climate information as well as advisors for decision-making. This can be the preparation of special publications, or the communication of climate information in reports or trainings. Private companies, None Governmental Organizations (NGOs), Community-based Organizations (CBOs) and media are important stakeholders. Another group of institutional

intermediates are “enablers” who provide basic resources like global and regional data, knowledge and capabilities (e.g. UN organizations) and funding (e.g. development banks). Intermediates are also users of climate information but with the main function as a value-adder, communicator or purveyor of climate information.

- **End-Users:** the term end-user predominantly targets stakeholders who use climate information for decision-making in a practical context, from the national to the community level. In this concern they can be distinguished from intermediates. Important stakeholders for infrastructure sectors are managers, planners, engineers or politicians” (GIZ 2018:19).



**Figure 2:** Presentation of climate-value-chain. Concept of the climate value chain including the three major stakeholder types: climate information providers (blue box), intermediates (green box) and end-users (yellow box). The stakeholder types are subdivided by sub-types. For each sub-type examples for specific stakeholders are given (colored area) as well as their functions regarding Climate Service development and provision (grey area) (GIZ 2018, modified from WMO 2018)

## 2.2. Role of NBI as Climate Service stakeholder

The NBI has the potential to take a classical role of an intermediate climate service provider regarding hydrological issues on a regional level. In this context, the NBI may potentially take several tasks that enhance the provision climate Services for water sector:

- Establishment of a regional hub for transboundary climate information and knowledge by pooling regional data within a central data and information portal
- Provision of added-value products for the water sector on the regional level
- Provision of methods, support, guidance and training for climate change adaptation
- Communication and dissemination of climate change knowledge and application options
- Moderation of provider-user exchange
- Tendering and coordination of research and adaptation projects
- Acquisition of project funding
- Provision of limited targeted climate and hydrological services

## 2.3. Climate Service in the Nile Basin region

Table 1: Short Summary of baseline NBI and reference to product catalogue

Domain & products	Format	Provider
<b>1. Hydrological and Meteorological data</b>		
Monitoring the Nile Basin Using Satellite Observations Bulletin	Publication	NILE-SEC
Nile Basin Regional Hydrological Monitoring System	Infrastructure	NBI
<b>2. Climate Change and hydrological scenarios</b>		
Regional climate change scenarios for the Nile Basin	Projection data	NILE-SEC
Hydrological scenarios for the Nile Basin	Projection data	NILE-SEC
Guidance tool on selection and use of climate change scenarios for different applications in the Nile Basin	Guide	NILE-SEC
<b>3. Hydrological modelling and forecasting</b>		
Flood early warning for Eastern Nile	??	ENTRO
Seasonal hydrological forecast	??	NILE-SEC
<b>4. Decision-support tools</b>		
Climate proofing of water infrastructure tool	Guide	NILE-SEC
Checklist for data needs for application of climate proofing guidance	Publication	NILE-SEC
Nile Basin Decision support tool	Software	NILE-SEC
<b>5. Climate Service communication &amp; outreach</b>		
Climate Service portal	Web interface	NILE-SEC
Communication products to inform about available services	various	NILE-SEC
Policy makers awareness products	various	NILE-SEC
<b>6. User support &amp; training</b>		
Help desk	Advisory service	NILE-SEC
Advisory assignments	Advisory service	NILE-SEC
Peer-to-peer learning & exchange	Training	NILE-SEC
E-learning course	Training	NILE-SEC
Tailor made face to face training formats	Training	NILE-SEC

## 3. Climate Service Action Plan

### 3.1. Methodology and structure

#### 3.1.1. Climate Service product definition – product module types

The unique selling point of a Climate Service product is its end-to-end characteristic. I.e. a Climate Service product integrates all (processing) steps from data to decision-making and provides ready to use climate information that is tailored to the user's needs. However, transferring this concept into practice, there are various modes of Climate Service products possible. The crucial point in identifying Climate Service product characteristics is the definition of the user and the identification of his needs. Thus, a Climate Service product may be very variable regarding its complexity and scope:

**Comprehensive product:** The classic Climate Service product addresses the end-user, which is commonly a decision-maker in politics or economy and someone who has no direct relation to climate, climate data processing and climate data interpretation. The classic product is commonly a tool that interlinks climate data and data processing (modelling) as well as a decision-support (advice). Entry needs for climate or other data as well as for information on the user context are pre-defined and the user is guided to make appropriate selections.

**Product modules:** if the user is for example an intermediate (e.g. a consultant for risk assessment), the Climate Service product can also be a 'simple' climate data set. In this context, the climate data set becomes a Climate Service product, in case its characteristics (e.g. format, quality, access mode) are tailored to the intermediate's needs. However, the intermediate does not use the data set for its own sake but to generate another value-added climate-related information product. Thus, the data set, even if it meets the criteria of a Climate Service, is no comprehensive Climate Service product but a product module. Such product modules in combination (also denoted as value-chain) do constitute a comprehensive Climate Service product. There are several types of modules:

**Core modules:** core modules refer to the climate information itself (technical dimension) and comprise various forms of value-added climate information (e.g. climate data, climate analysis, impact analysis, etc.).

**Service modules:** service modules specifically address the usability of one specific or several core modules (service dimension) and comprise standards, tools, guidelines, trainings or other supplements.

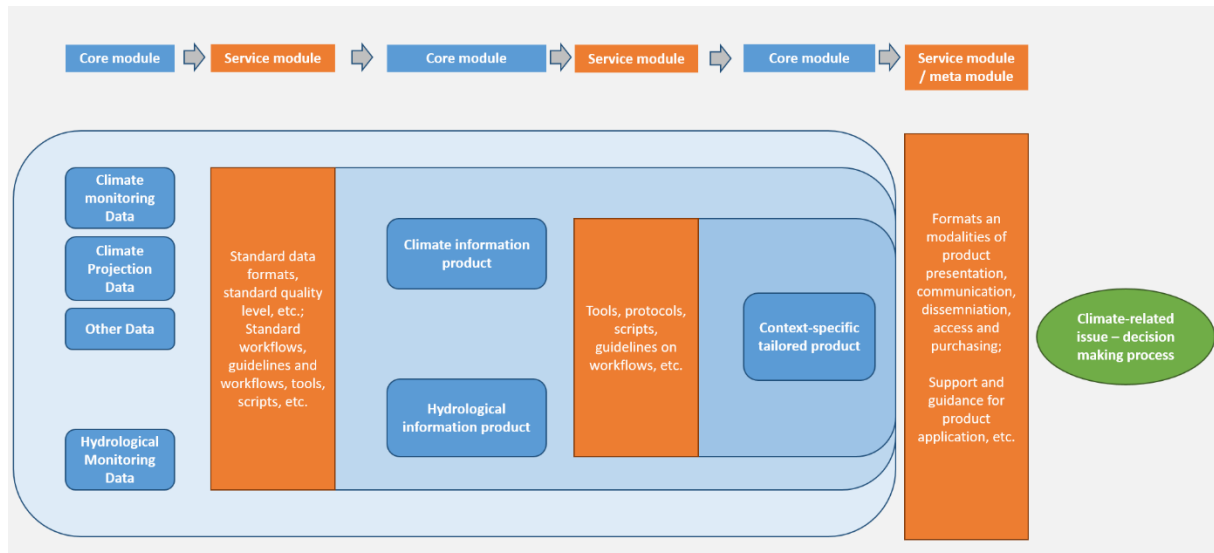
**Meta modules:** meta modules also address the usability of core modules but in a general way. They comprise systems of product presentation or purchasing (e.g. portals) and various formats of user exchange, learning and support (e.g. user interface platforms, help desks, etc.). Thus, meta modules can also be considered as CS infrastructure.

It is important to keep in mind, that all modules, no matter which type, can only be considered as CS modules if they meet CS criteria: they are ready-to-use products and they are tailored to the users' need (for the next processing step). The benefit of CS modules is a multipurpose application for many different CS products at the same time which is very efficient in production and maintenance. However, at the same time there is the challenge to equally tailor-made multipurpose modules for different applications.

#### 3.1.2. Climate product value chain

The climate product value chain describes the refinement or upgrading of climate information regarding the degree of user-specific tailoring. Thus, the climate product chain is basically composed of three fundamental core modules with increasing refinement (climate data product, climate information product, climate service product) that are interlinked by service modules (**Figure 3**). The

service modules guarantee the usability of the precedent core module as well as a smooth interlinkage (tailoring) to the neighboring core-modules. The end of each climate product chain is characterized by a service module that refers to the presentation, dissemination and access of a climate service product or module no matter how long and complex the product is. Often, this position is taken by a meta module that work product-independent.



**Figure 3:** Introduction to product-value chain for climate service products. Interlinkage of core modules (blue) and service modules (orange) in order to generate a comprehensive Climate Service product usable and ready for decision-making (green).

### 3.1.3. Process of gap analysis

The process of gap analysis for NBI Climate Service products directly refers to the definition of Climate Service products or modules as described above. Thus, the objective of the gap analysis is to review the value-chain of existing NBI products regarding:

- the completeness of the value-chain by the identification of missing modules.
- opportunities for improvement of the quality of existing modules.
- opportunities of extending or refining existing value-chains...
  - ...by interlinking existing modules.
  - ...by identifying new modules.

In order to do so, the following analysis steps need to be conducted for each product:

- Localization of the NBI product (module) within the product value chain (*where within the product value chain can the NBI product of concern be localized?*) => this provides the basis of the gap analysis and reveals the modules that needs to be reviewed
- Clarification of product scope (*what is the purpose of the NBI product? What are opportunities of application of the NBI product? Which decision-making contexts are targeted by the NBI product? Who is the user of this product?*) => the determination of the product scope allows a refinement of existing climate service products with respect to user- and context-specific tailoring of contents.
- Review of existing product value-chain and check of completeness (*are all necessary modules existent? Are the interlinkages of existing modules intact?*) => a product can only work as service if the data ingredients are of good quality and available and adequately interlinked (tailored) to the scope of the product

- Review of existing modules for opportunities of improvement (*can the quality of existing modules be improved?*) =>
- Checking opportunities for value-chain extension (*how can data products and information products be upgraded to service products?*)

### 3.2. Analysis of value chains for NBI Climate Service

#### 3.2.1. Overview of NBI Climate Service products in CS product value-chains

The existing NBI Climate Service products (see also 2.3) were integrated in the template of CS product value chains and allocated to specific module types (**Table 2**). The localization of the NBI products within the value chain happened according to the current state of knowledge. According to the logic of the value chain, the product only works well at its location within the value chain if the preceding modules (i.e. left to the product) are existent in a meaningful quality as well as the last service module [F] which ensures the link to the user. This table provides thus a viable overview on the current state of the NBI climate service products.

**Table 2:** NBI Climate Service products localized in the climate product value chain. Blue columns indicate core modules ([A]=data products, [C]=information products, [E]= service products) and orange columns indicate service modules (Form [F] and [H]: specific=service modules; global=meat modules). The green column indicates the decision-making context for each Climate service product.

[A] Core module	[B] Service module	[C] Core module	[D] Service module	[E] Core module	[F] Service module	[G] Decision-making context	[H] Service module
Climate & hydrological data products	Linking service (enhancement of usefulness)	Value-added climate & hydrological information products	Linking service (enhancement of usefulness)	Context-specific tailored products	Linking service (enhancement of usability)	Climate-related issue – decision-making process	User support, interface & training
					specific   global		specific   global
<i>Climate &amp; hydrological observation data (all kind); raw model data from predictions and projections;</i>	<i>Standard data formats, standard quality level, etc.; Standard guidelines and workflows, tools, scripts, etc. that enhance the process of turning data into information</i>	<i>Products which provide standard climate &amp; hydrological information (no specific application – multipurpose information that may require further tailoring for specific applications)</i>	<i>Tools, protocols, scripts, guidelines on workflows, etc. which support the process of tailoring and contextualizing in order to get user-/problem-specific climate information</i>	<i>User-/or problem-specific aggregated and contextualized climate &amp; hydrological information which serves a specific problem and is tailored for a specific user type and location</i>	<i>Formats an modalities of product presentation, communication, dissemination, access and purchasing; Support and guidance for product application, etc.</i>	<i>The climate-related issue for which the CS product is developed for; the specific decision-making process which should be enhanced by the CS product</i>	<i>Formats of learning and training for staff and users in order to be able to provide or use the provided products</i>
Nile Basin Regional Hydrological Monitoring System: hydrological and rainfall measuring data compilation for stations that are part of the basin network		Monitoring the Nile Basin Using Satellite Observations (bulletin)					<ul style="list-style-type: none"> <li>Help desk</li> <li>Peer-to-peer learning &amp; exchange</li> </ul>
		Regional climate change scenarios for the Nile Basin	Guidance tool on selection and use of climate change scenarios for different applications in the Nile Basin				Tailor made face to face training formats
		Hydrological scenarios for the Nile Basin				evaluating changes in water balance of the Nile Basin; climate proof water resources plans evaluation of changes to extreme flood situations and estimates of design floods for water infrastructure, etc.	Tailor made face to face training formats
				Flood early warning for Eastern Nile			
		Seasonal hydrological forecast				support operational decisions on dam operation and scheduling of irrigation	
			Climate proofing of water infrastructure tool				
			Checklist for data needs for application of climate proofing guidance				
				Nile Basin Decision Support System	E-learning course on NBI e-learning platform		E-learning course on NBI e-learning platform
				Policy makers awareness products			
			Advisory assignment				

### 3.2.3. NBI Climate Service products – opportunities of improvement

Table 3: Template for improving the current NBI climate products.

#	Domain & products	Value chain position	Product scope	Lacking modules	Module opportunities	Quality improvements
	<b>1. Hydrological and Meteorological data</b>					
1.1	Monitoring the Nile Basin Using Satellite Observations Bulletin					
1.2	Nile Basin Regional Hydrological Monitoring System					
	<b>2. Climate Change and hydrological scenarios</b>					
2.1	Regional climate change scenarios for the Nile Basin					
2.2	Hydrological scenarios for the Nile Basin					
2.3	Guidance tool on selection and use of climate change scenarios for different applications in the Nile Basin					
	<b>3. Hydrological modelling and forecasting</b>					
3.1	Flood early warning for Eastern Nile					
3.2	Seasonal hydrological forecast					
	<b>4. Decision-support tools</b>					
4.1	Climate proofing of water infrastructure tool					
4.2	Checklist for data needs for application of climate proofing guidance					
4.3	Nile Basin Decision support tool					
	<b>5. Climate Service communication &amp; outreach</b>					
5.1	Climate Service portal					
5.2	Communication products to inform about available services					
5.3	Policy makers awareness products					
	<b>6. User support &amp; training</b>					
6.1	Help desk					
6.2	Advisory assignments					
6.3	Peer-to-peer learning & exchange					
6.4	E-learning course					
6.5	Tailor made face to face training formats					



### 3.3. Activities for NBI Climate Service Action Plan

*Activities referring to complete missing modules*

**Activity 1:**

- [reference to NBI product]

*Purpose:*

*Characterization:*

*Recommendation for implementation:*

*Activities referring to improve existing modules*

**Activity n:**

- [reference to NBI product]

*Purpose:*

*Characterization:*

*Recommendation for implementation:*

*Activities referring to refine existing value-chains*

**Activity n:**

- [reference to NBI product]

*Purpose:*

*Characterization:*

*Recommendation for implementation:*