



Human Capacity Development for Enhancing Climate Services for Infrastructure Investments

Information sheet

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Dear Reader, dear training participant!

This information sheet on the Climate Proofing of Infrastructure Investments Training provides an overview about the training background, learning objectives, learning modules and contents, as well as the didactical approach followed. This information sheet shall also ignite your interest and can serve as a basis for preparing a customized training based on participants' training needs, areas of interest etc. We can offer the training as a "Training of Trainers" (ToT), or we provide training to the direct beneficiaries of our training contents, namely engineers, climatologists, infrastructure planners or operators, climate proofing process facilitators or even high level decision-makers who want to get an overview on the topic.

Please have a look at our new training and let us know whether you are interested to join! We can cover all target groups even in the same training. We also can tailor the training for the infrastructure sector you are interested in, such as transport, energy, waste water treatment, health and agriculture. For each training we will invite best suitable experts in your sector of interest and will give you the opportunity for peer-to-peer exchange and further networking.

As said, all modules can be tailored to the different needs of trainees, especially with respect to the different topics to be covered, the intensity / indepthness of investigation for all topics, as well the share of amount of time each topic shall be rolled out during the training. Once, you indicate your interest to join such a training, the trainers and organizers will ask you to join a training needs assessment inquiry.

Please, feel free to contact us in case you are interested!

All the best,

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Background - Climate Proofing of infrastructure planning and investments

Developing countries and emerging economies are investing billions in durable infrastructure every year. However, they often fail to take account of future climate change in their planning. As a result, new infrastructure projects are being implemented without considering climate change risks. This leads to high risks of damage, loss and misguided investment with potentially serious consequences for the economy and society.

Old planning practices based on past climate conditions need to be updated. Climate resilient infrastructure is needed for ensuring development and societal well-being in the course of accelerated climate change. Achieving infrastructure resilience means integrating climate change risk considerations into every step of the infrastructure investment cycle (Fig 1). It begins at the policy level, where it is decided how a country wants to develop and what this implies for infrastructure needs and goes down to the level of planning, operation and maintenance of single infrastructure projects.

To make sure infrastructure can remain a driver of development infrastructure investments need to be climate proofed throughout the entire investment cycle. Figure and Table 1 show different decision-making contexts of climate proofing in the different phases of the infrastructure investment cycle that also imply the need for contextual climate information products.

Figure 1: Infrastructure Investment Cycle

Infrastructure Investment Project Cycle



Table 1: Climate Proofing in the context of infrastructure investments

Investment cycle steps	Climate Proofing Steps			
	Scoping (defining decision making context, actors)	Risk Assessment / Climate Service	Adaptation Assessment	Monitoring & Evaluation
Policies and Planning	How shall Infrastructure policies and plans, as well as regulations be set up to manage climate risks and reap opportunities presented by climate change?	Risk Screening to obtain an overview on infrastructure exposure and key vulnerabilities	Identify, select and mainstream measures to adjust plans and policies (e.g. indicators, activities) according to identified risks	Monitor & re-assess whether climate resilience indicators and activities of the plans have reduced the risks.
Project identification	What are the key quality criteria for climate resilient finance, design, operations of different options for service delivery/ project concepts envisioned?	Risk screening for understanding roughly climate impacts for various options of project concepts (e.g. different sites)	Identify, select and mainstream measures that ensure the resilience framing for the project development	Monitor & re-assess whether key resilience criteria for the investment are valid or need to be changed
Project preparation & development	How shall the infrastructure asset and its operational procedures be configured to become climate resilient? What are the costs for climate resilient investment vs. benefits?	Asset-level, detailed risk assessment focusing on detailed physical design and operational aspects of the specific infrastructure	Identify, select and mainstream measures for the climate resilient budgeting, design, operation and maintenance of the infrastructure investment	Re-Assess whether identified measures have proven to be successful and viable
Finance	How shall the insurance policy for the specific investment look like to accommodate climate change risks?	Detailed economic risk assessment on loss and damage, as well as costs for recovery of the asset in focus	Negotiation of climate resilient insurance policy covering climate risks (monetary loss) identified.	Re-Assess whether policies contracted cover current & future climate risks
Realization	How shall the construction process of the infrastructure be able to respond to climate related extreme events?	Detailed scenarios for impacts of climate related hazard on the construction site during different phases of construction	Development of SOPs for the construction site with regard to warning and immediate response options to protect assets and people in case of climate related extreme events	Re-Assess performance of these SOPs

Investment cycle steps	Climate Proofing Steps			
	Scoping (defining decision making context, actors)	Risk Assessment / Climate Service	Adaptation Assessment	Monitoring & Evaluation
Operation	What is the performance of the infrastructure under climate conditions, how do the risks change due to changes in climate, exposure and vulnerability?	Continuous performance and vulnerability assessment (physical design, operations) under conditions of climate change (similar to risk assessment in project development phase)	In case changes in risks are identified, identification and selection of measures to increase the resilience of the project and provide feedback into the entire investment cycle where appropriate	

Figure 1: Climate Proofing in the context of Infrastructure Investments

The introduction and institutionalization of mechanisms, procedures, and tools for climate proofing requires competent governance by stakeholders in charge. This includes gearing stakeholder processes with different backgrounds such as climate data providers in the field of climatology as well as planners, designers and operators, and also financial stakeholders e.g. from the private sector or Multilateral Development Banks. Climate Service mechanism (e.g. Data management and regulation, projection research, customized and co-designed product development) to provide and use the best evidence on climate available need to be established and aligned with regulative climate proofing procedures defined.

From 2017 – 2019, the global project on Climate Services for Infrastructure Investments (CSI) - funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) - has addressed these challenges of climate proofing of infrastructure with a focus on how climate services need to be established to provide the knowledge base for sound climate proofing. Together with Engineers Canada, the project has piloted climate risk assessments of bridges (Costa Rica), power distribution systems and harbors (Brazil), sluice gates (Vietnam) and water resource management related infrastructures (Nile Basin Initiative). These pilot assessments together with the partners have served as a starting point for discussing the institutionalization of the concept of climate proofing within the infrastructure investment cycle as well as how to establish national frameworks for climate services to allow climate proofing to become evidence based.

The experiences and discussion of the diverse activities of CSI have been fed in the development of the training course at hand, with the objective to enhance the spread of lessons learnt and to broaden the opportunity to sensitize more stakeholders on the topic of climate services for the climate proofing of infrastructure investments.

Overall objective of the Training

The overall objective of the training course is to promote awareness about the topic of climate proofing of infrastructure investments amongst numerous national and local stakeholders such as policy makers and planners from infrastructure-related sector ministries and authorities. The training approach focuses

on institutional/policy/governance related, as well as technical/methodological related aspects of climate proofing of infrastructure. The suggested didactic methods and tools support the adult learning processes.

The overall objectives of the training are:

- Enhancing professional capacity on the concept of climate proofing of infrastructure investments and its practical implications for decision making
- Enhancing awareness on how to utilize climate services & information for evidence-based and resource-sensitive climate proofing of infrastructure
- Enhancing professional capacities to use Climate Services in the climate proofing of infrastructure
- Enhancing awareness on capacity and resource requirements for executing and managing climate proofing processes
- Enhancing awareness on roles and responsibilities as well as stakeholder involvement in the process of climate proofing of infrastructure projects
- Enhance the capacity of trainers to train decision makers and technical staff.
- Enhance the capacity of trainers to facilitate climate-proofing processes themselves.

Target group are trainers, decision makers and practitioners

The training can be carried out in two different formats;

- As a Training of Trainers (ToT) where the content of the training is a blend of training on didactics and on the subject of climate services and climate proofing of infrastructure investments. The success of a ToT training critically depends on the identification of those trainees who will further carry on the training tasks. Therefore, an important focus shall be on the selection of potential ToT trainees and, as appropriate, involve them in ongoing and future training activities with some adequate incentives in order to support their commitments in delivering trainings.
- As a technical training for decision makers and practitioners (Hydro-Met staff, engineers, infrastructure operators, legal experts), that require on-the-job training on the topics laid down to engage in transformative processes towards resilient infrastructure.

Concept & methodology

The training follows GIZ standards and applies up-to-date didactical approaches in adult and participatory training. The training is based on an integrated concept considering the diversity of contents, methods and tools. The core methodological approach follows the principles of the Harvard Case Study approach that supports adult learning from experience: Introduction to the topic – Group exercise with a given case – Presentation of results – Reflection on relevance to participants' needs and future applications. This method includes interactive exercises that integrate emotions and movement into sustainable learning processes.

The ToT has the capacity to adjust training contents based on the country's specific needs, depending on the main objective of partner organizations in the countries and the available profile of the designated participants.

Training materials

- The *trainer handbook* provides the technical and didactical support to design, plan and implement a training according to the needs of the target group.
- The *participant handbook* summarizes the background and methodological approach of climate proofing infrastructure investments, guides through exercises, which explore a specific case study. Exercises are tailored to non-technical, as well as technical target groups.
- *Training materials* for visual presentations, discussion and group-work include facilitation materials, power point presentations, videos, as well as instructions for dynamic interactions.
- The collection of methods, tools and materials is easy to adapt to changing target groups and interests, while addressing the needs of trainers or decision makers and technical staff involved in infrastructure planning.

Overview on modules of the training

All modules can be tailored to the different needs of trainees, especially with respect to the different topics to be covered, the intensity / indepthness of investigation for all topics, as well the share of amount of time each topic shall be rolled out during the training.

Module 1: Introduction into the Training

This module provides an overview of the design, content, methods and tools and evaluation of the training

Module 2: The importance of climate change for infrastructure investments

This module aims at laying the basic foundations on climate change, related terminology, and links between infrastructure investments, policies and plans (e.g. NAPs and NDCs).

Module 3: The role of Climate Services in infrastructure planning

This module aims at the development of basic knowledge on conceptual, institutional and organisational perspectives on Climate Services and their implications for the climate proofing of infrastructure investments.

Module 4: Climate Proofing for sustainable infrastructure investments at the project level

This module aims at the development of basic knowledge on climate proofing for sustainable infrastructure investments and focuses on the use and application of methods and tools for integrating adaptation to climate change into infrastructure project cycles (based on the PIEVC engineering protocol for vulnerability assessments for infrastructure and other guidelines for infrastructure risk assessment)

Detailed overview of training modules 2-4

Module 2: The importance of climate proofing for infrastructure investments <i>This module focusses on the basics about climate change, related terminology, and links between infrastructure investments, policies and plans (e.g. NAPs and NDCs).</i>					
No.	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
2.1	Introduction to climate change	<ul style="list-style-type: none"> The trainee understands what climate change is and is able to reflect on interactions between climate change and other topics/sectors. The trainee understands differences between different climate change related concepts and terms. The trainee is able to identify the context of climate change within specific climate change frameworks. The trainee is able to understand climate change information and to evaluate it according to trends and consistency. 	<p>Interpretation of historic climate data and climate projection</p> <p><u>Learning Objective:</u> Learning how to do interpret different available climate data in order to identify how different climate parameter have been changing in the past or may change in the future.</p>	<ul style="list-style-type: none"> Where do users obtain the climate data and climate information they need for decision-making? Which kind of climate data and climate information is needed to assess future impacts of climate change? Who should be invited to assess climate data and information? What are relevant criteria for climate data robustness? Are the criteria different, depending on parameters and sources? What can users do if available climate data is not helpful enough for decision-making, e.g. because they are not sufficient, or the robustness is poor? What are the results of the interpretation of the probability of climate parameter trends useful for? 	<ul style="list-style-type: none"> Climate change is an issue that affects societies and their livelihoods now, and it will affect them even more in the future, depending on how greenhouse gas concentrations in the atmosphere develop in the following years. It is uncertain how the climate will evolve in the next years and decades, but societies need to be prepared for change. Climate change affects different regions with different intensity. Even within regions, impacts of climate parameters can be different.
2.2	Climate Change and Public Infrastructure Investment	<ul style="list-style-type: none"> The trainee understands the importance of adaptation to climate change for sustainable infrastructure investments and is able to reflect on the role of 	<p>Apply a Climate Lens to infrastructure investment goals</p> <p><u>Learning objective:</u> Learning how to do a rapid appraisal of climate risk in</p>	<ul style="list-style-type: none"> Which are strategic entry points for taking up the discussion on adaptation to climate change as a support to sustainable infrastructure investment? Who are the relevant stakeholders to participate in the 	<ul style="list-style-type: none"> The climate change related increase of extreme weather events and sea level rise put stress on public infrastructure and related social and economic products.

Module 2: The importance of climate proofing for infrastructure investments

This module focusses on the basics about climate change, related terminology, and links between infrastructure investments, policies and plans (e.g. NAPs and NDCs).

No.	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
		<p>climate services and climate proofing</p> <ul style="list-style-type: none"> • The trainee is able to identify entry-points for adaptation to climate change in infrastructure investment planning. • The trainee is able to identify relevant stakeholder groups who should be involved in detailed infrastructure investment planning processes. 	<p>order to identify the relevance for adaptation to climate change for sustainable infrastructure investment planning, development, financing, and implementation.</p>	<p>planning and other decision-making processes?</p> <ul style="list-style-type: none"> • Which role does climate already play in investment planning, both at the national / policy level, the sector level, and the object / project level? • How to choose the appropriate scope of work for mainstreaming climate-related information into sustainable investment planning? 	<ul style="list-style-type: none"> • Public finance is a limited source of funding for sustainable climate resilient infrastructure investment. • Private investors and international funding for climate smart infrastructure are potential sources of funding if transparency and monitoring of effective investments are guaranteed. • Information on climate, and mainly climate change, is an essential component of sustainable infrastructure investment planning, implementation and monitoring to prove the effectiveness of climate resilient infrastructure. • Ecosystem services have the potential to mitigate climate change effects like flooding, storm surges, heat waves etc. and should be considered in a holistic approach of climate-smart infrastructure investment.

Module 3: The Role of Climate Services for infrastructure investments

No.	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
3.1	The Concept of Climate Services	<ul style="list-style-type: none"> The trainee gains awareness and understanding of the 5 main components of the concept of Climate Services. The trainee understands key issues related to the Climate Service value chain needed to construct Climate Service products. The trainee gains awareness about the “three dimensions of Climate Services” and their relevance to creating needs-oriented Climate Service products. 	<p>Climate Service product development</p> <p><u>Learning objectives:</u> You will discuss and learn how each of the Big 5 components contributes to the development of useful Climate Services.</p>	<ul style="list-style-type: none"> What is the selling point of Climate Services? What is the scope of “considering user needs” in the context of Climate Services? What are the elements of the climate value chain and what does it describe? Which tasks and roles should be covered by a National Framework for Climate Services, and how should the different components interact with each other? 	<ul style="list-style-type: none"> Climate Services are defined as climate information that is customized to user needs. User needs refer to three dimensions of Climate Services (technical, service, institutional) which need to be adequately met to guarantee the usefulness and usability of Climate Service products and thus their impact on decision-making. A Climate Service product requires an end-to-end provision which (most often) implies a cooperative production process at which several stakeholders working together, either collectively, concurrently or successively. The process of CS production by successive value-adding by several stakeholders is termed as climate value-chain. Stakeholders of the value-chain can be classified as providers, intermediates and end-users. The development, production and provision of Climate Services requires five elements which need to be covered and coordinated by stakeholders from the value-chain: (i) observation (ii) research, modelling and prediction, (iii) Climate Service information system (iv) user interface platform and (v) capacity development The governance of the CS development, production and provision (coordination of the five elements) is structured within a National Framework for Climate Services that delineates tasks and responsibilities of individual

Module 3: The Role of Climate Services for infrastructure investments

No.	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
					<p>stakeholders and defines legal settings. Key stakeholder groups are National Hydro-Met Agencies: NMHS, line ministries, academia, enablers, boundary organizations and users.</p>
3.2	<p>Demand-driven Climate Services for resilient public infrastructure investments</p>	<ul style="list-style-type: none"> The trainee understands the different requirements for Climate Service (CS) products for the specific sectoral and decision-making contexts of use and its challenges and opportunities. The trainee is able to apply and transfer knowledge about CS concepts in the field of infrastructure planning and climate risk assessments. The trainee understands the relevance of the three dimensions of CS to construct user-oriented CS. The trainee is able to identify CS needs for specific infrastructure planning stages. 	<p>User friendly CSI products</p> <p><u>Learning objectives</u></p> <ul style="list-style-type: none"> You will learn how uncertainty related to climate change affects investment-related decision-making under this kind of uncertainty. You will experience how investments get increasingly endangered due to climate-change. You will experience the value of proper Climate Services, and how they contribute to reduce climate related risks of loss and damage. You will understand how adaptation measures help to reduce your climate-related risks of adverse impacts. 		<ul style="list-style-type: none"> Different infrastructure planning frameworks and cycles require different kinds of Climate Services. Climate Service needs may vary regarding <ul style="list-style-type: none"> the context of use, i.e. sector, the type of decision which needs to be made based on climate information (e.g. planning investments, mainstreaming climate change into pre-feasibility and feasibility studies, developing new building codes and standards etc.), the decision-maker and his/her demands regarding the three dimensions of CS (user type), the characteristics of the climate-value chain for the specific CS product, i.e. the kind of stakeholders who are involved. The context of use may have consequences on the required temporal and spatial resolution and time-frame of projections, accuracy/uncertainty of projections, the tailoring and provision of the Climate Service product, required services like guidance and support as well as access mechanisms and provider-user interaction.

Module 3: The Role of Climate Services for infrastructure investments

No.	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
					<ul style="list-style-type: none"> • Competences and requirements of Climate Service “knowledge brokers” who guide the co-design of Climate Services include communication & social skills, technical skills and managerial skills. • User-interfaces for Climate Services can be operationalized and set up on an ad-hoc basis or institutionalized as a permanent service within a Climate Service governance regime (Link to 3.1).

Module 4: Climate Proofing of sustainable infrastructure investments at the project level

Nr	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
4.1	Climate Proofing for Sustainable Infrastructure Investments	<ul style="list-style-type: none"> • The participant understands common project cycles for infrastructure planning. • The participant is able to identify entry-points for climate change adaptation into the infrastructure project cycle. • The participant understand the role of climate services and risk assessment for different phases of the infrastructure project cycle. • The participant is able to identify non-climate 	<p>Screening and Scoping of an Infrastructure Project</p> <p><u>Learning objectives</u></p> <ul style="list-style-type: none"> • You will learn about how to scope your system of interest that will be subject to risk assessment. This means identifying and agreeing on the infrastructure components considered in the assessment. • You will understand the need for multisector cooperation for climate resilient infrastructures. <p>Scoping your system of interest is a crucial first step in risk assessment.</p>	<ul style="list-style-type: none"> • Which entry point for adaptation to climate change did you use at the level of the exercise? • Which were the major challenges you had faced during the exercise? • Which information and knowledge were missing with specific reference to climate services? • Which stakeholder groups are key as participants in the screening and scoping exercise and who should be involved in the development of climate service products? 	<ul style="list-style-type: none"> • Different entry points for climate proofing of infrastructure investments exist, e.g. the development or revision of building codes and standards for the design of infrastructure, project preparation such as pre-feasibility and feasibility studies of infrastructure project development, as well as during the realization of such projects and the monitoring of their performance. In addition, infrastructure investment policies and plans can be subject to climate proofing. • The existence of all these entry points reveals that climate services are required in different contexts and settings and hence have manifold application areas. This means that also different approaches and aggregation levels towards assessing risks and

Module 4: Climate Proofing of sustainable infrastructure investments at the project level

Nr	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
		<p>factors which interact with climate effects.</p> <ul style="list-style-type: none"> The participant is able to identify and appoint key stakeholders and their roles, tasks and interaction within the project. 	<ul style="list-style-type: none"> You will learn about the key features of the PIEVC risk matrix: Identifying and agreeing on the climate signals and the critical climate events to be considered in the assessment. You will understand the role of ecosystems for risk reduction and the importance to consider these during the scoping of the system of interest 		<p>therein, developing climate service products exist.</p> <ul style="list-style-type: none"> Climate service providers need to be capable to respond to these distinct demands and follow structured approaches towards understanding user needs. The first step of climate proofing, the screening and scoping helps to identify the most relevant climate hazards, vulnerable infrastructure components of a project (strategy or plan) with respect to these, further information gaps and key stakeholders.
4.2	Climate risk assessment and the role of Climate Services	<ul style="list-style-type: none"> The trainee understands the terminology and concept of Climate Risk Assessment for infrastructure projects as a Climate Service product following the PIEVC Engineering Protocol. The trainee is able to identify needs for the development of climate services products. The trainee is able to apply the experiences from the exercise to other infrastructure projects. 	<p>Infrastructure vulnerability and risk assessment</p> <p><u>Learning objectives</u></p> <ul style="list-style-type: none"> You will learn about how to identify climate-related vulnerabilities and risks within your infrastructure-centred system of interest. This means exploring all aspects of climate risk, including exposure sensitivity and adaptive capacity, exploring single climate hazards. Performing a vulnerability and risk assessment is crucial to identify possible entry points for adaptation. 	<ul style="list-style-type: none"> Which were major challenges you faced when performing this exercise? Why is it important to perform a climate risk assessment? What can be done if information to perform the climate risk assessment is very scarce? Which are key factors when planning to perform a climate risk assessment? What kind of resources are needed to perform a climate risk assessment? Which stakeholders groups are key as participants in the climate risk assessment process (refer to the Climate Service Value Chain)? Which climate services are needed to perform a climate risk assessment? 	<ul style="list-style-type: none"> Climate risk assessment is a decision support tool. Hence, results shall provide direct utility for taking adaptation decisions. Climate risk assessment is a climate service and represents a multi-stakeholder process representing different disciplines. Facilitating a climate risk assessment process relates to the coordination of support and contributions of a range of stakeholders. Risk assessments and related adaptation decision support always occur under conditions of uncertainty influencing the distribution of liabilities, and accountabilities for decision-making. Metrics and approaches towards risk assessment can vary depending on actors' capacity, whilst the equation for

Module 4: Climate Proofing of sustainable infrastructure investments at the project level

Nr	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
			<ul style="list-style-type: none"> • You will learn about the key features of the PIEVC risk matrix: Identifying and agreeing on the climate signals and the critical climate events to be considered in the assessment. • You will learn how to identify potential impacts to your system of interest, linked to climate change trends for specific infrastructure components and specific performance goals. • You will understand how potential (biophysical) impacts to your system of interest are linked to thresholds within single components of your system. • You will learn how to construct impact chains linking potential impacts to hazards to which your system of interest is exposed. • You will learn how to construct indices based on your impact chain that add meaning to the single components that conform the climate 	<ul style="list-style-type: none"> • How should a climate risk assessment be designed to fit to your working reality? 	<p>assessing risk remains the same. Flexibility in the operationalization of the assessment is needed depending on requirements, capacities and resources.</p> <ul style="list-style-type: none"> • Engineering risk assessment can include a mix of qualitative (in the absence of data) and quantitative assessment approaches. • The system of interest in the context of infrastructure needs to be defined based on the anticipated assessment scale, as well as on an infrastructure specific design-, functional- and operational components. • The definition of climate parameters, indices and projections to be applied depend heavily on political requirements, the sensitivity / vulnerability of the infrastructure (Impact thresholds), as well as the life cycle of the infrastructure. • Easy access and tapping effectively on climate service capacities and resources is a precondition for the uptake of climate information in processes of risk assessment.

Module 4: Climate Proofing of sustainable infrastructure investments at the project level

Nr	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
			<p>risk of your system of interest.</p> <ul style="list-style-type: none"> You will understand how factors apart from your infrastructure investment can increase its climate risk or potentially be part of the solution to decrease it. 		
4.3	Adaptation assessment and the role of Climate Services	<ul style="list-style-type: none"> The trainee understands the concept of Adaptation Assessment for infrastructure projects. The trainee is able to identify and cluster adaptation options. The trainee understands the difference among tools available for prioritization of options. The trainee understands the role of Climate Service Products as an adaptation option. 	<p>Adaptation assessment</p> <p><u>Learning objectives</u></p> <ul style="list-style-type: none"> You will learn about how to identify adaptation options based on the results of the previous climate risk assessment. You will learn about different types of adaptation options considerable for infrastructure projects. You will learn about different methods and tools that support the prioritization of adaptation options. 	<ul style="list-style-type: none"> What are the major challenges and risks during the process of identifying adaptation options for infrastructure projects? Which elements are essential for an integrated adaptation strategy for an infrastructure project? Which tools for selecting adaptation options for the project design and implementation work under real conditions? Which role plays Risk Assessment as a Climate Service Product for decision making in the process of prioritization the adaptation options? 	<ul style="list-style-type: none"> Adaptation options are linked to approaches towards climate risk management approaches that include options to reduce or prevent exposure, protect from impacts, transform the subject of analysis, manage residual risks to ensure or provide contingencies to maintain serviceability or business continuity (develop mechanisms for early warning & response, rescue and relief, as well as recovery). Climate risk management options or adaptation options can be mutually exclusive, but also complementary. Different tools exist to navigate through mutually exclusive options (CBA, CBE, MCA, comparative effectiveness assessment, adaptation performance assessment etc.) Risk Assessment shall be applicable as a decision support tool for the application of these (economic) evaluation tools
4.4	Project Design and Implementation	<ul style="list-style-type: none"> The trainee understands why climate proofing does not end with the identification or rejection of adaptation measures, 	Climate Services for Sustainable Investments into the Millenium Bridge Project	<ul style="list-style-type: none"> What was the most challenging part of this task? Why is it important to change perspectives and take the 	<ul style="list-style-type: none"> Establishing implementation arrangements is a requisite to ensure the effective implementation of the identified adaptation option(s).

Module 4: Climate Proofing of sustainable infrastructure investments at the project level

Nr	Module Name	Skills and Knowledge	Exercise	Guiding questions for reflection	Take away messages
		<p>but the integration of these into the project design and operation plan for implementation.</p> <ul style="list-style-type: none"> The trainee is able to define the roles of key stakeholder groups for successful implementation of the climate proofed project. The trainee is aware of complementary capacity development measures which facilitate the implementation of the project and coordination among key stakeholders. 	<p><u>Learning Objectives</u></p> <ul style="list-style-type: none"> You will learn that different stakeholder groups have a number of perceptions about the development and regular update of Climate Services for the implementation of a climate proofed infrastructure project. You will learn how to engage partners to support you with yours interests about the development of Climate Services. You will learn to avoid potential conflicts with stakeholders in planning sessions for the implementation of a climate proofed project which might affect your major interests. 	<p>position of other stakeholders in this process?</p> <ul style="list-style-type: none"> Which importance have personal, organizational and institutional capacities for win-win negotiations? How would you improve the framework for cooperation among different stakeholder groups? 	<ul style="list-style-type: none"> Capacity development at individual, organizational and institutional level are needed to improve sector crosscutting cooperation and a better understanding of the need for climate proofing infrastructure projects and climate service products for decision making during the process. Upscaling lessons learnt from project to policy level facilitates innovation for new cooperation models.



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