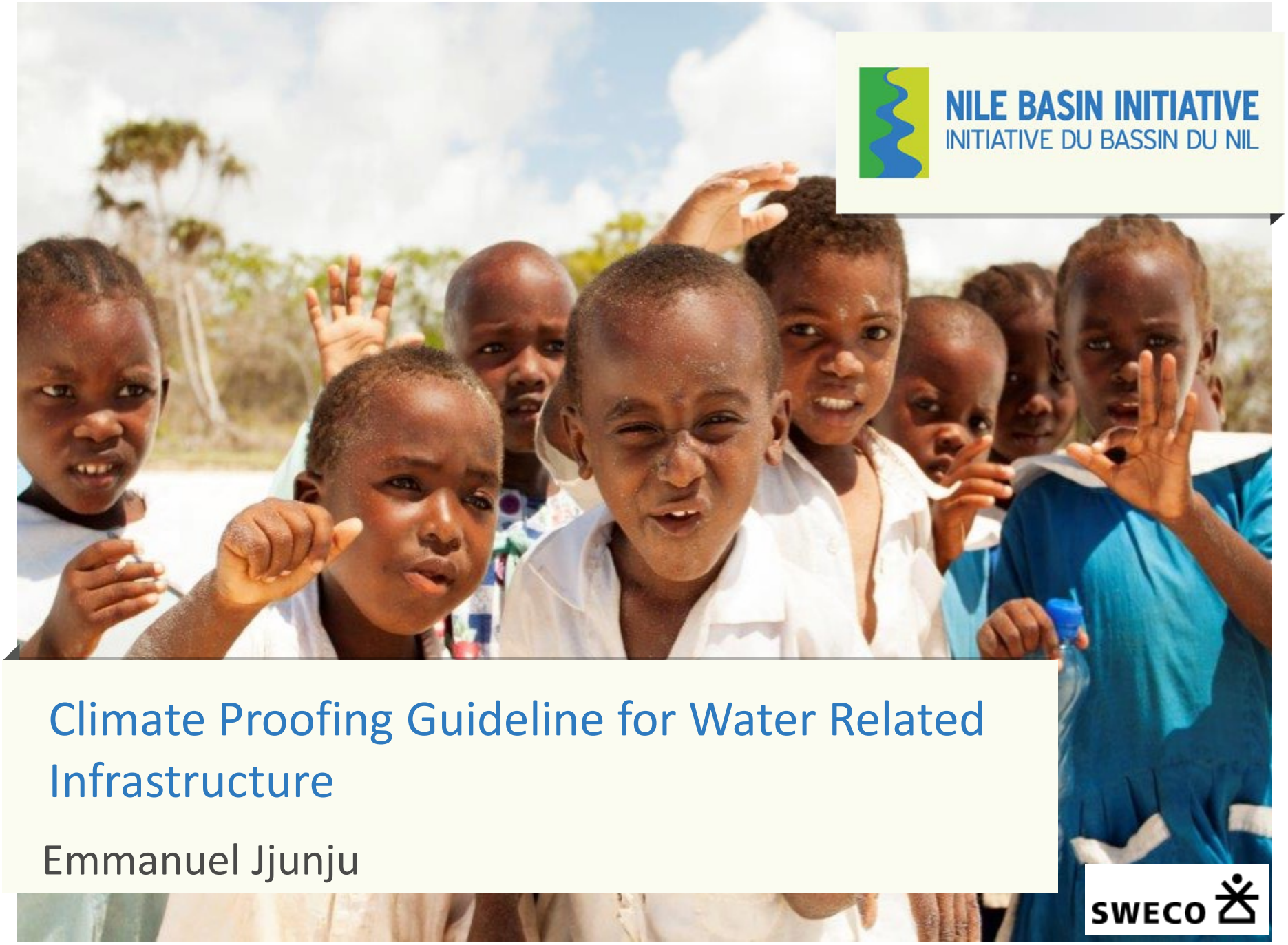


NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

Climate Proofing Guideline for Water Related Infrastructure

Emmanuel Jjunju

SWECO

Structures and vulnerability

Services and vulnerability

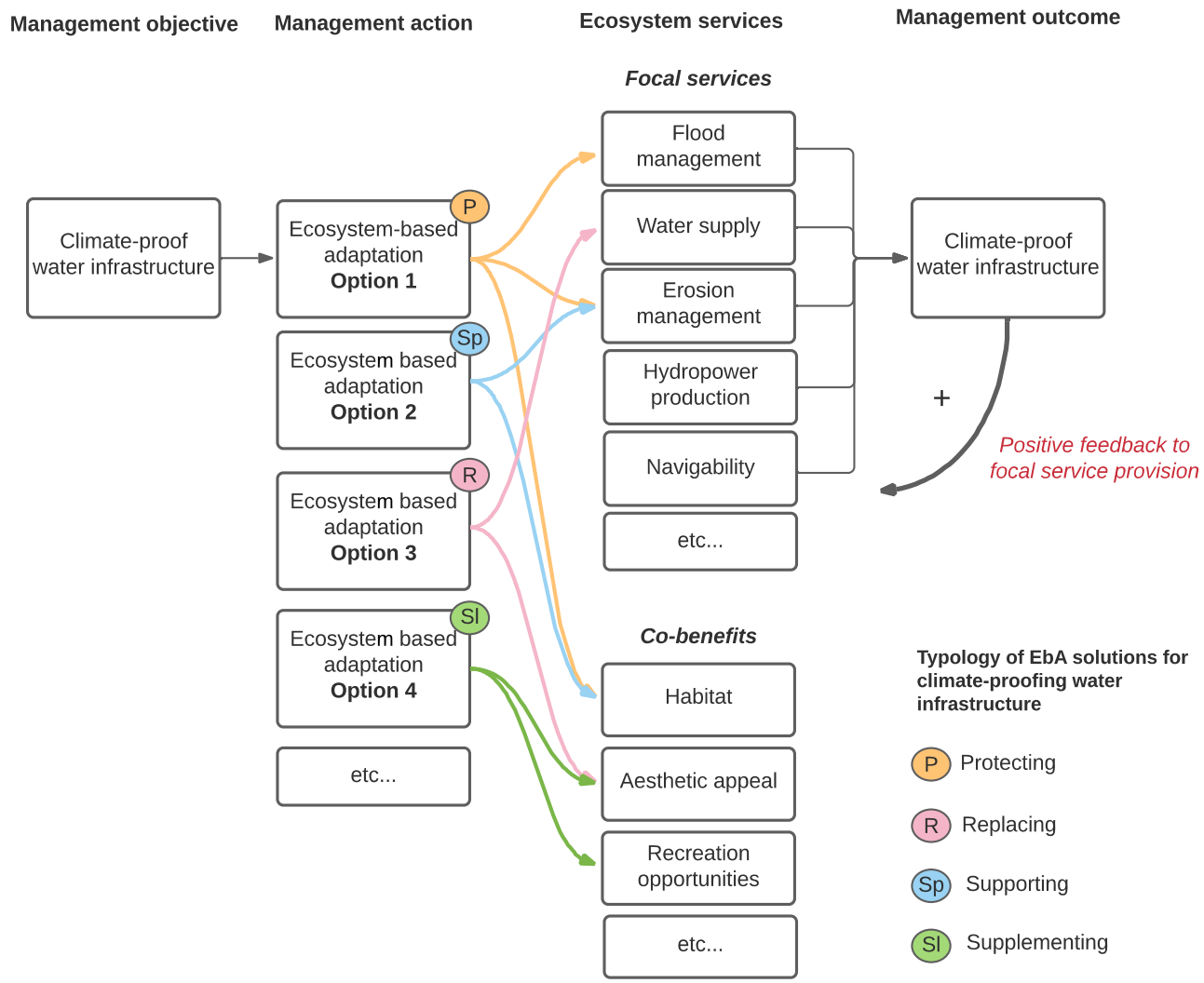
Food security

Electrification

Flood resilience

Ecosystem-based Adaptation

- Harness the benefits of biodiversity and ecosystem services to reduce climate-related impacts to water infrastructure
- Examples,
  - Minimize the impacts of increased sedimentation due to erosion
  - Flood damages
  - Evaporation
  - Concentration of pollutants



Structure of the Guideline

- SECTION 1
  - Problem definition, Enumerating Climate risks and Objectives of the Guideline
- SECTION 2
  - Framework, risk management approach
- SECTION 3
  - Mainstreaming within NBI project cycle
  - Step by step Guidance
- SECTION 4
  - Structural and functional Adaptation options, cases and references

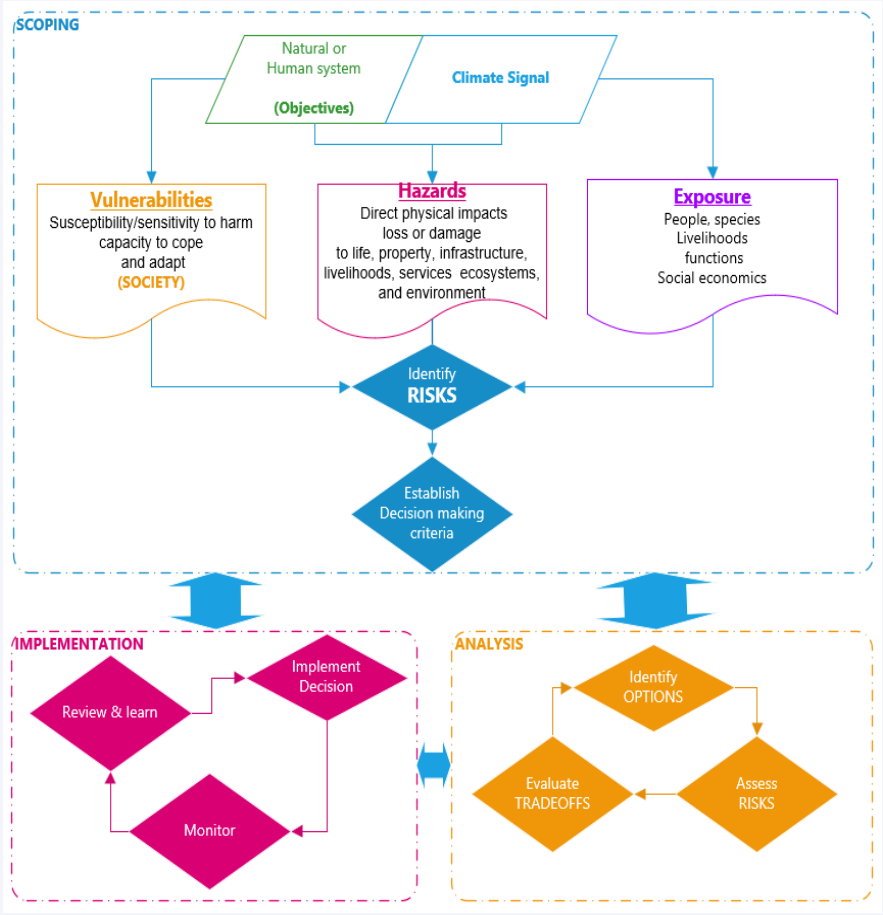
Objectives, scope & users

- Enable the integration of Climate change in planning, designing and operation of water infrastructure
- Scope:
  - Focus on project level investments
  - Services & structures & Environment
  - Broad, generic approach that can be applied across countries
  - Updatable with evolving experience
- Users
  - Owners/developers, operators
  - Professionals carrying out planning, design and operation

Rating Bands (a x b)		
LOW RISK (1 – 8)	MEDIUM RISK (9 - 12)	HIGH RISK (15 - 25)
Continue, but review periodically to ensure controls remain effective	Continue, but implement additional reasonably practicable controls where possible and monitor regularly	-STOP THE ACTIVITY- Identify new controls. Activity must not proceed until risks are reduced to a low or medium level

Risk Management

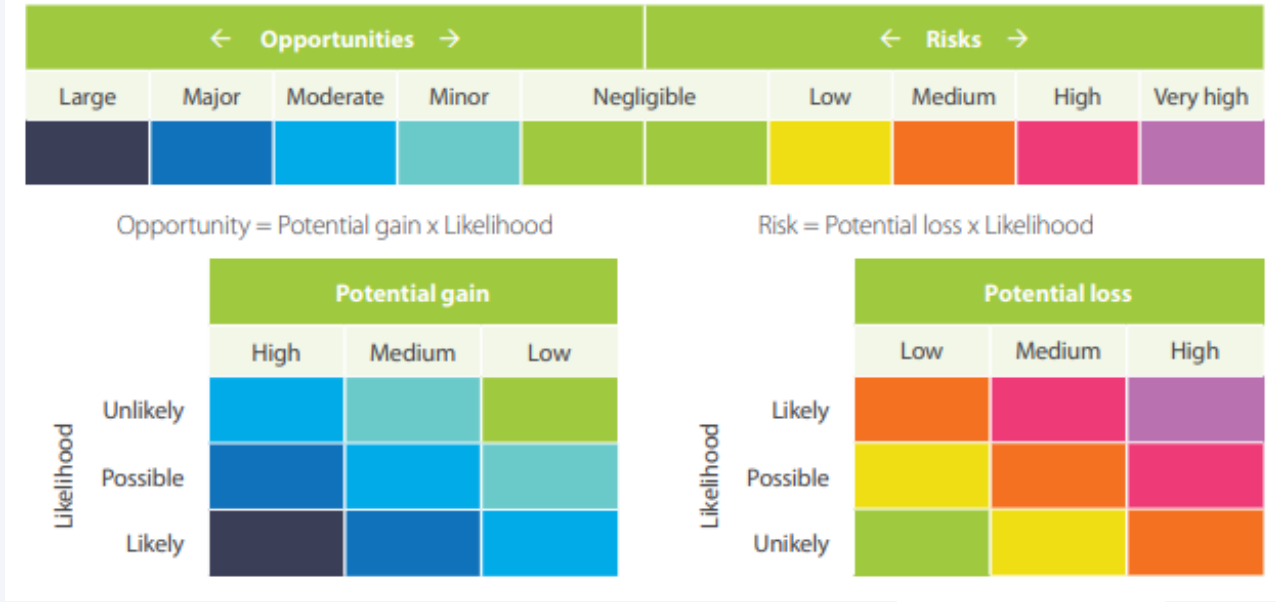
- Iterative risk management process
  - Scoping
  - Risk Assessment
  - Risk treatment
  - Monitoring and Evaluation
- Stakeholder involvement
- Thresholds



Risk and opportunity register

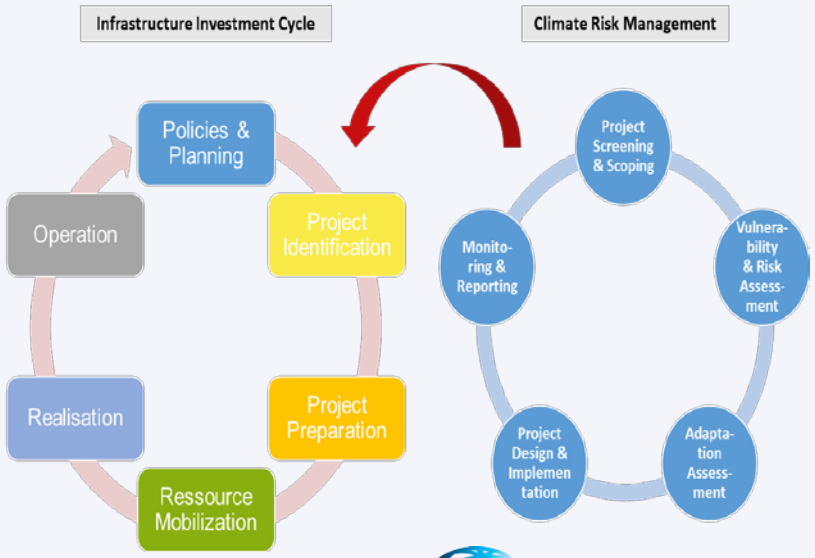
- Established for different climate stressors at an early level
- Updated for each step
- Example of a register (IHA)
- Example of risk/opportunity assessment scale scores (IHA).

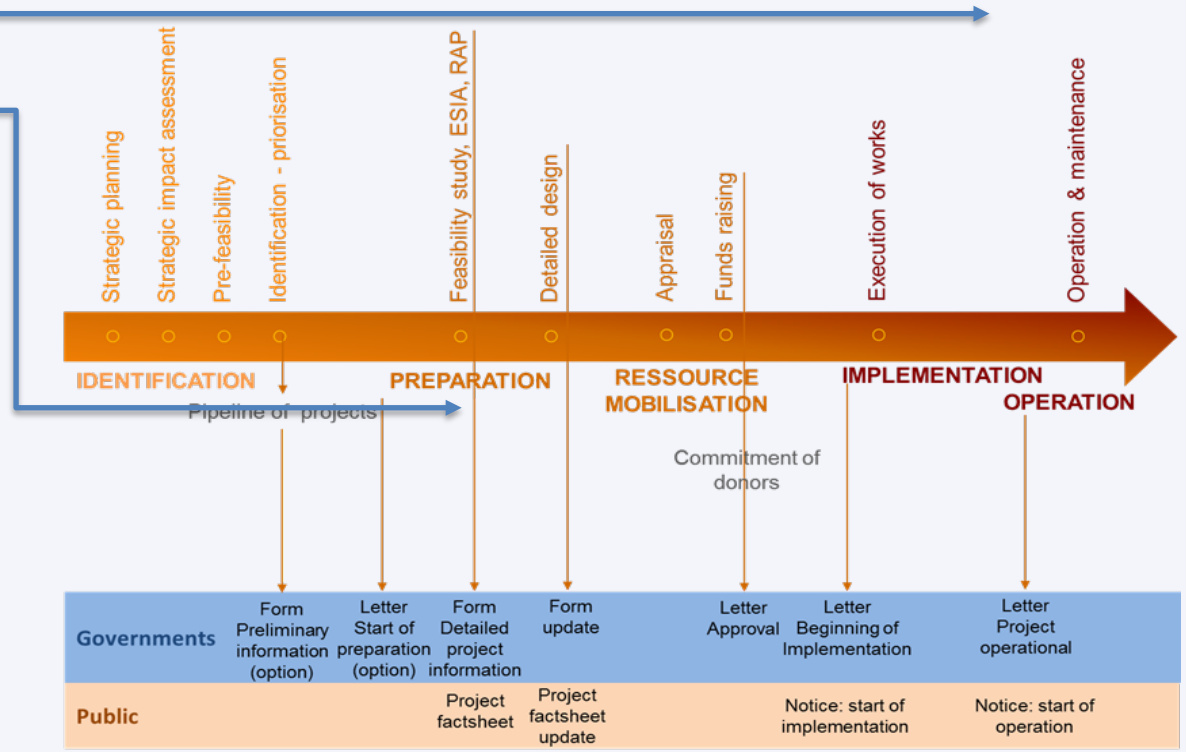
Climate stressor	Threat/ opportunity	Time scale	Potential loss/ gain	Likelihood	Risk/ opportunity level
E.g. increased streamflow	Description of the threat event or the opportunity	E.g. scale 1-3	E.g. scale 1-3	E.g. scale 1-3	E.g. negligible, low, medium, high, very high



NBI's Climate Proofing Approach

- Mainstream Climate Risk Management into NBI's project cycle
- Entry points
  - New projects
  - Existing projects

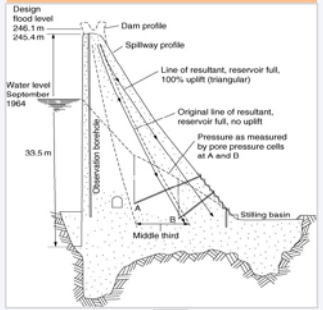
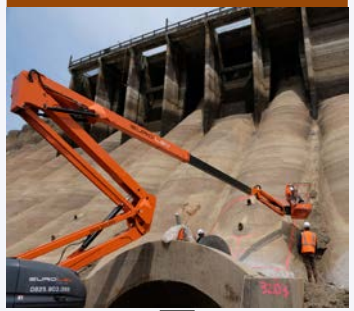
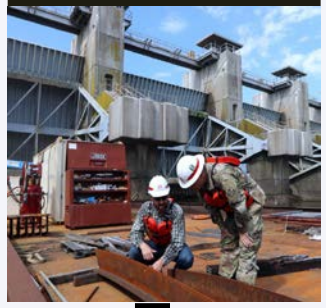




NBI's Climate Proofing Approach

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

Infrastructure investment contexts & **objectives** for Climate Proofing

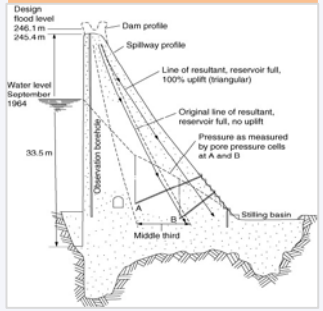
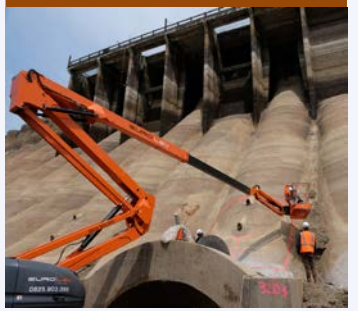
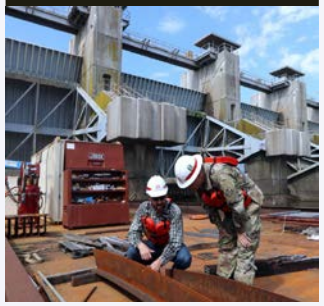
SECTOR POLICY, PLANS & REGULATION	PROJECT IDENTIFICATION	PROJECT PREPARATION	RESOURCE MOBILIZATION	CONSTRUCTION	OPERATION & MAINTENANCE
					
✓Consider climate change <u>in water resource policies, infrastructure. planning</u> *(maintenance plans, new portfolios)* <u>&</u> <u>regulation</u> *(codes & standards)*	✓Consider climate change in the <u>project framing and project specific site selection</u> (feasibility studies)	✓Consider climate change in the <u>feasibility study</u> (alignment with ESG studies) <u>and detailed design</u> of a project	✓Consider climate change in decisions on <u>costings</u> and <u>insurance schemes</u>	✓Consider climate change in the <u>operational procedures of dam construction</u> (construction period can take several years)	✓Consider climate change <u>in operational procedures and maintenance schemes</u> (adjustments to maintain reliable services of the infrastructure

german cooperation
DEUTSCHE ZUSAMMENARBEIT
giz
THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP
CIWA
SWECO
6th Nile Basin Development Forum - Ethiopia 2021

NBI's Climate Proofing Approach

Infrastructure investment contexts & **phases** for Climate Proofing

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

SECTOR POLICY, PLANS & REGULATION	PROJECT IDENTIFICATION	PROJECT PREPARATION	RESOURCE MOBILIZATION	CONSTRUCTION	OPERATION & MAINTENANCE
					
Scoping	Scoping	Scoping	Scoping	Scoping	Scoping
Risk Assessment	Risk Assessment	Risk Assessment	Risk Assessment	Risk Assessment	Risk Assessment
Risk treatment	Risk treatment	Risk treatment	Risk treatment	Risk treatment	Risk treatment
Monitoring & Evaluation	Monitoring & Evaluation	Monitoring & Evaluation	Monitoring & Evaluation	Monitoring & Evaluation	Monitoring & Evaluation

german cooperation
DEUTSCHE ZUSAMMENARBEIT

giz

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

CIWA

SWECO

6th Nile Basin Development Forum - Ethiopia 2021

Project Identification

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

IDENTIFICATION

Decision making context for climate proofing

- **Project Site identification**
- **Prefeasibility study**
- **Prefeasibility Report**

Climate Proofing Process & Activities

Scope / key questions	**Are alternative project sites key quality criteria regarding finance, design and operations potentially under risk from changing climate conditions?**
Risk Assessment	Spatial risk screening for understanding roughly climate impacts on potential project sites. Based on existing studies and literature and on analysis of pre-processed climatic data
Risk Treatment	Identify and select measures that ensure the resilience framing for the project development.
Monitoring & Evaluation	Are key criteria for the investment are valid or need to be changed due to changing climate conditions. Stress test needed?

Project Preparation

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

PREPARATION

Decision making context for climate proofing

- Field Investigations
- Feasibility Study
- Environmental, Social Impact Assessment (ESIA)
- Resettlement Action Plans (RAP)

Climate Proofing Process & Activities

Scope / key questions	Is infrastructure , operational procedures & services potentially under risk of climate change?
Risk Assessment	Climate stress test
Risk Treatment	Identify & select measures for the climate resilient budgeting, design, O&M of the infrastructure investments. Mainstream into the budgeting O & M of the infrastructure investment
Monitoring & Evaluation	Re-Assess whether identified measures have been proofed successful and viable

Resource Mobilisation

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

RESOURCE MOBILIZATION

Decision making context for climate proofing

- **Financing Plan**
- **Appraisal by Financers/Donors**
- **Financial closure**

Climate Proofing Process & Activities

Scope / key questions	**Is the investment potentially under risk due to climate change?**
Risk Assessment	**Detailed economic risk assessment on loss and damages, as well as cost for recovery of the asset in focus. Requires Climate Stress test**
Risk Treatment	**Climate resilient insurance policy covering climate risk (monetary loss) identified.**
Monitoring & Evaluation	Re-Assess whether policies contracted cover current & future climate risks

Project Implementation

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

IMPLEMENTATION / CONSTRUCTION

Decision making context for climate proofing

- Detailed drawings
- Execution of Works
- Construction management and supervision
- Operation and maintenance

Climate Proofing Process & Activities

Scope / key questions	**Is the construction of the infrastructure able to respond to climate related extreme events during construction and during operation?**
Risk Assessment	Detailed scenarios for climate-related hazard impacts on the construction site different phase of construction.
Risk Treatment	**Implementation of standard operation procedure (SOPs) for the construction site regarding warning and immediate response options to protection of assets and people in case of climate related extreme events**
Monitoring & Evaluation	Focus on monitoring that the measures that were integrated into the design are actually implemented.

Operation

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

OPERATION

Decision making context for climate proofing

- Operation and Maintenance
- Dam safety
- Monitoring & Evaluation

Climate Proofing Process & Activities

Scope / key questions	**Is the performance of the infrastructure potentially under risk due tot climate-related hazards?**
Risk Assessment	Continuous performance and vulnerability assessment (physical design, operations) under conditions of climate change (like risk assessment in project preparation phase) . Track how resilient the project is in operation.
Risk Treatment	In case changes risks are identified, identification and selection of adaptation measures to increase the resilience of the project. Implementation of operation related measures to increase the resilience of the project
Monitoring & Evaluation	In case changes in risks are identified, provide feedback into the entire investment cycle where appropriate.

Integration into the digital Hub

NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

SECTOR POLICY, PLANNING & REGULATION | **PROJECT IDENTIFICATION** | **PROJECT PREPARATION** | **RESOURCE MOBILIZATION** | **OPERATION & MAINTENANCE**

Intro

Project identification is the selection of the least **cost** project configuration from the available resources or alternatives and translate that into a suitable project for the stated purpose. The project identification stage typically consists of a reconnaissance study and prefeasibility studies. In some cases, project identification may be done as part of national or regional water resource inventories rather than a project specific study.

The findings of the project Identification stage are documented in a reconnaissance report and prefeasibility report.

Climate Proofing guidance

Scoping | Risk Assessment | Risk Treatment | Monitoring & Evaluation

1.Risk Assessment

Scope

Risk Assessment consists of identification, analysis and evaluation of risks and opportunities. The results of the Risk assessment are documented in a risk/opportunity register. At the project identification stage, each project alternative should have a separate risk register.

Process

The analysis may be qualitative, semi-quantitative or quantitative.

- **Prepare a risk/opportunity register.** This is a record of the potential risks and opportunities related to the project(s) focusing on climate sensitive issues. The risk register is the documentation of the outcome of the three steps (i.e., 1) Identification, 2) analysis/screening and 3) evaluation)
- **Identification of risks:** Identification of risks should ensure that no risk is unwittingly excluded. This should cover all potential climate stressors relevant to the project. Examples (link). The register should include the threats/opportunities associated with each climate risk and/or stressor and an estimate of the likelihood and potential loss/gain of each threat/opportunity. Figure 12 shows an example of a risk /opportunity register. Note that the list of stressors in the example are not exhaustive. The risk team and stakeholders must identify all the stressors and then list them.

- Intro video
- Manual
- Peer-learning & exchange
- Best practices
- Climate Service

german cooperation
DEUTSCHE ZUSAMMENARBEIT

giz

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

CIWA

6th Nile Basin Development Forum - Ethiopia 2021


NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL
THANK YOU!