Holistic Approach towards Climate Proofing of Infrastructure Investements

The integration of climate risk management into different investment decision-making contexts requirng tailored types of risk assessment

	Project Cycle								
Decision making context for Climate Proofing	SECTOR POLICY	PROJECT IDENTIFICATION	PROJECT PREPARATION	RESOURCE MOBILIZATION	CONSTRUCTION	OPERATION & MAINTENANCE			
	Policies & Strategies: Future infrastructure development objectives (innovation in portfolio development) Planning: Infrastructure portfolio development, demand analysis Investment planning Regulation: Regulative framework for standards of infrastructure construction, operations, maintenance, retrofitting etc Overall supervision & law enforcement	Project Site identification (Reconnaissance) Desk studies of water resources Individuals projects vs Basin plans Priority plans Prefeasibility study Preliminary investigations Screening of projects, selection Project formulation Investigation of alternatives Preliminary layouts and project plan Basic designs Costs Investigation program Prefeasibility Report	Field Investigations Demand Studies Bio-physical conditions Ground and ecological surveys Feasibility Study Review of pre-feasibility Selection of alternatives Water, Power, demand studies Layout and project plans Deptimization studies and preliminary design Cost estimates & Cash Flow tables, economic & financial analysis Environmental, Social Impact Assessment (ESIA)	 Financing Plan Appraisal by Financers /Donors Financial closure 	Execution of Works	Operation Operational procedures Infrastructure safety Maintenance Maintenance schemes Monitoring & Evaluation Feedback loops to all other stages of the project cycle Results of Monitoring and Evaluation inform the other planning steps for future (re)investments and O&M of existing and planned infrastructure.			
Scoping	Can the sector policy, planning & regulative objectives be met under conditions of climate change and what are the response options to enhance climate resilient policy formulation and law enforcement?	Are the key quality criteria regarding service of the planned infrastructure, the design and operations under risk from changing climate conditions at alternative project sites?	Are the planned infrastructure assets and their operational procedures and services sensitive to climate change?	Are standard funding and insurance schemes adequately considering climate risks?	During construction, is the construction site able to respond to climate related extreme events?	Is the performance and serviceability of existing infrastructure potentially under risk due to climate-related hazards?			
Risk Assessment	Understand future climate change risks for the sector given future climate change and infrastructure demand scenarios: • Spatial climate risk screening: Understanding roughly exposure, climate	Understand climate change risks for a planned project and its service, considering geographic, regulatory, technical and socio-environmental characteristics: • Spatial climate risk screening: Understanding roughly exposure, climate constitution and imposts on alternative.	Understand climate change impact thresholds on planned infrastructure physical assets and their serviceability, and operations and maintenance schemes: • Climate stress test: Identify impact thresholds for exacts, appositions and	Understand the economics of loss and damage Cost of recovery analysis	Detailed scenarios for climate-related hazard impacts on the construction site during different phases of construction.	Continuous performance and vulnerability assessment (physical design, operations) under conditions of climate change (like risk assessment in project preparation phase)			
As	PIEVC Scanner?	PIEVC classic?	PIEVC classic?	Economic PIEVC?	PIEVC?	PIEVC classic / scanner / rapid			
Risk treatment	Based on Multi-Criteria Analysis, select most feasible policy, planning and regulative measures to insure climate resilience in the sector	Based on Multi-Criteria Analysis, select most feasible project site based on climate considerations Identify and select measures that ensure the resilience framing for the project development. Mainstream measures that ensure the resilience framing for the project development	Identify and select measures for identified sensitive infrastructure assets and operations and test their performance for the climate resilient budgeting, design, operation and maintenance schemes Mainstream selected measures into the budgeting, operation and maintenance of the infrastructure investment	Climate resilient insurance policy covering climate risk (monetary loss) identified.	Development of standard operating procedures (SOPs) for the construction site with regard to warning and immediate response options to protection of assets and people in case of climate related extreme events. 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	In case changes risks are identified, identification and selection of measures to increase the resilience of the project. Implementation of operation related measures to increase the resilience of the project			
Monitoring and Evaluation	Monitor & re-assess whether key policies, planning systems and regulative frameworks comply with the resilience objectives of the sector infrastructure portfolio	Monitor & re-assess whether key criteria for the investment are valid or need to be changed due to changing climate conditions. Decide whether a climate stress test may be carried out under the project preparation and resource mobilization stages.	Re-Assess whether identified measures have been proofed successful and viable	Re-Assess whether policies contracted cover current & future climate risks.	Implementation of standard operation procedure (SOPs)	In case changes in risks are identified, provide feedback into the entire investment cycle where appropriate			

	Project Cycle								
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Entry points for A Climate A Proofing of A Infrastructure A Investments									
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Risk Assessment	Understand future climate change risks for the sector given future climate change and infrastructure demand scenarios: • Spatial climate risk screening: Understanding roughly exposure, climate sensitivities of the infrastructure portfolio as well as its service delivery to inform policy development, planning and regulation	Understand climate change risks for a planned project and its service, considering geographic, regulatory, technical and socio-environmental characteristics: • Spatial climate risk screening: Understanding roughly exposure, climate sensitivities and impacts on alternative project sites and the impact of climate change on overall service that the project intends to deliver.	Understand climate change impact thresholds on planned infrastructure physical assets and their serviceability, and operations and maintenance schemes: • Climate stress test: Identify impact thresholds for assets, operations and service and develop duration and frequency curves for them (Climate Scenarios)	Understand the economics of loss and damage Cost of recovery analysis	Detailed scenarios for climate-related hazard impacts on the construction site during different phases of construction.	Continuous performance and vulnerability assessment (physical design, operations) under conditions of climate change (like risk assessment in project preparation phase)			
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