WATER & WASH FUTURES 2022

Water, WASH and Climate Virtual Symposium

Welcome to the session:

Managing climate-related risks to WASH and water management approaches

ADB

unicef for every child

LEAD PARTNERS Australian Aid

IWC International WaterCentre

Griffith UNIVERSITY Queensland, Australia

Water For Women

ADB

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WATER & WASH FUTURES 2022
Water, WASH and Climate Virtual Symposium

Asian Water Development Outlook 2020

Achieving Water Security in Asia and the Pacific

Christian Walder
Water Supply and Sanitation Specialist
Asian Development Bank

Lachlan Guthrie
Adjunct Research Fellow
International WaterCentre / Griffith University

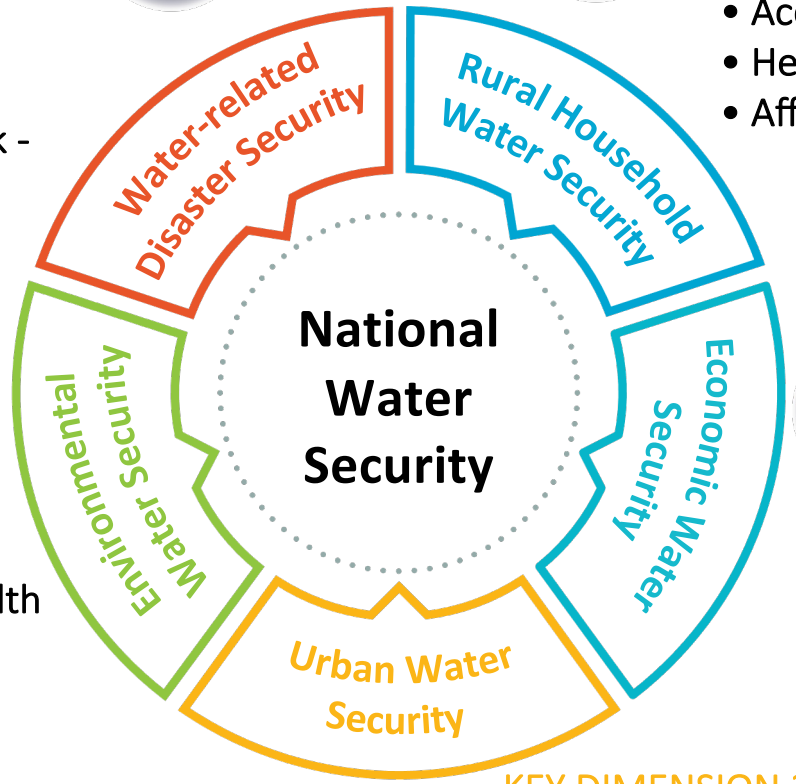
20 June 2022

ADB

Asian Water Development Outlook - Evaluates National Water Security

ADB FLAGSHIP PUBLICATION

Five Key Dimensions of National Water Security



KEY DIMENSION 1
- Access to water supply
- Access to sanitation
- Health impacts
- Affordability

KEY DIMENSION 2
- Broad economy
- Agriculture
- Energy
- Industry

KEY DIMENSION 3
- Access to water supply
- Access to sanitation
- Affordability
- Drainage/floods
- Environment

KEY DIMENSION 4
- Catchment and aquatic system health
- Environmental governance

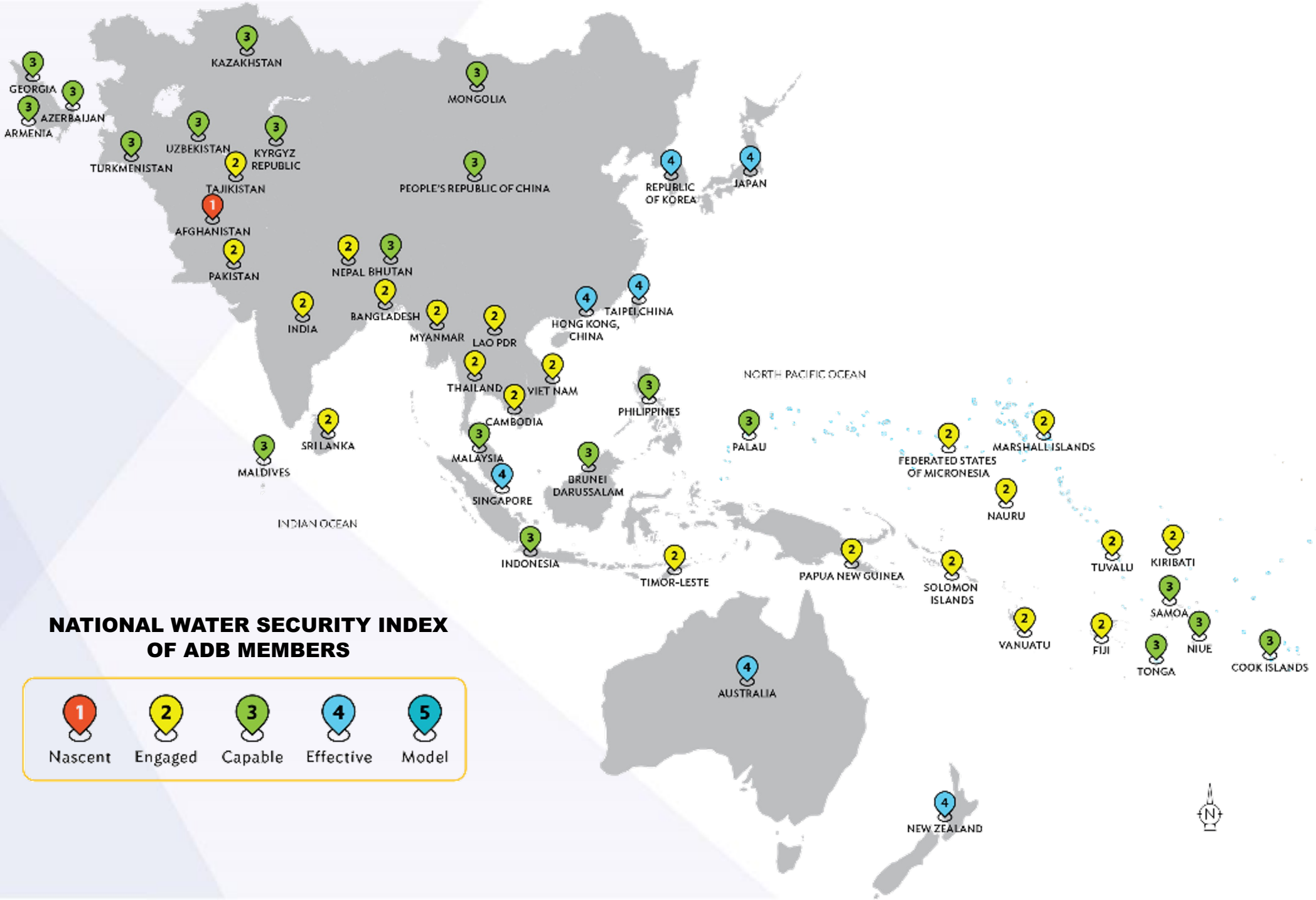
KEY DIMENSION 5
- Climatological risk - drought
- Hydrological risk - flooding
- Meteorological risk - storms

ADBWater adbwater adb-water water@adb.org

AWDO 2020: National Water Security Stages and Scoring

NWSI	NWS Score	NWS Stage	Description
5	96 and above	Model	All people have access to safe, affordable, and reliable drinking water and sanitation facilities. Economic activities are not constrained by water availability. Environmental governance is good, and pressure on aquatic ecosystems is limited. Water-related risks are acceptable and relatively easy to deal with.
4	78–96	Effective	Nearly all people have access to affordable safe drinking water and sanitation facilities. Economic water security is high. Environmental governance is generally acceptable, and attention is given to ecological restoration. There are systematic commitments to reduce disaster risk.
3	60–78	Capable	Access to safe drinking water and sanitation facilities is improving. Economic water security is moderate. Environmental governance is moderate, with clear pressure on the ecosystem. There are some institutional commitments to reduce disaster risk.
2	42–60	Engaged	A significant majority of rural and urban households have access to basic water supply but less to sanitation. Economic water security is low. Environmental governance is moderate, with severe pressures on aquatic ecosystems. Progress in achieving disaster risk security is low.
1	0–42	Nascent	A low proportion of rural and urban households have access to basic water supply and sanitation. Economic water security is low. Environmental governance is poor, with significant pressures on the aquatic ecosystems. Hardly any attention is given to disaster risk reduction.

Results


KAZAKHSTAN
GEORGIA
AZERBAIJAN
ARMENIA
MONGOLIA
UZBEKISTAN
KYRGYZ REPUBLIC
TURKMENISTAN
TAJIKISTAN
PEOPLE'S REPUBLIC OF CHINA
REPUBLIC OF KOREA
JAPAN
AFGHANISTAN
PAKISTAN
NEPAL
BHUTAN
INDIA
BANGLADESH
MYANMAR
LAO PDR
HONG KONG, CHINA
TAIPEI,CHINA
THAILAND
VIET NAM
CAMBODIA
PHILIPPINES
NORTH PACIFIC OCEAN
SRI LANKA
MALDIVES
MALAYSIA
SINGAPORE
BRUNEI DARUSSALAM
PALAU
FEDERATED STATES OF MICRONESIA
MARSHALL ISLANDS
NAURU
INDIAN OCEAN
INDONESIA
TIMOR-LESTE
PAPUA NEW GUINEA
SOLOMON ISLANDS
TUVALU
KIRIBATI
SAMOA
VANUATU
FIJI
TONGA
NIUE
COOK ISLANDS
AUSTRALIA
NEW ZEALAND
NATIONAL WATER SECURITY INDEX OF ADB MEMBERS
1 Nascent
2 Engaged
3 Capable
4 Effective
5 Model

Comparing water security results 2013 – 2016 – 2020

- **Positive trend**

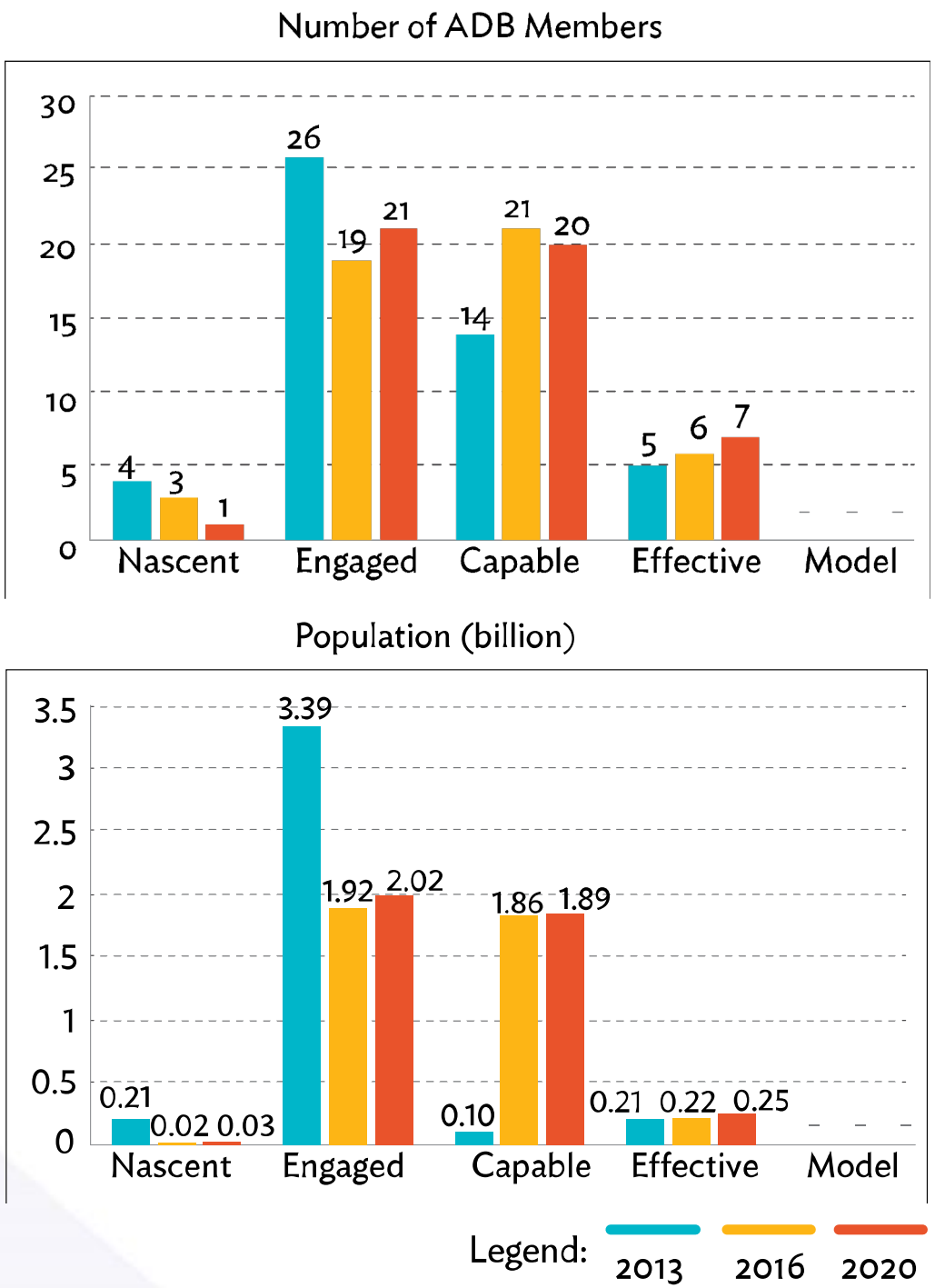
  Several ADB members have improved from the *Nascent* and *Engaged* rating to the *Capable* and *Effective* rating:

  – PRC from Engaged to Capable (2013–2016)

  – India from Nascent to Engaged (2013–2016)

- **Challenges remain**

  However, many people are still living in *Nascent* and *Engaged* stages of Water Security.



Rural Household Water Security (KD1)

Definition
KD1 assess the extent to which ADB members provide sufficient, safe, physically accessible and affordable water, and sanitation services for health and livelihoods, coupled with an acceptable level of water-related risk, in rural households

- KD1 now measures only Rural HH WS
- Four indicators in total
  - Access to Water Supply
  - Access to Sanitation
  - Health Impacts
  - Affordability
- Though considering a relatively small volume of water, RHWS has enormous societal impacts
- Closely linked with the “for all” principle of the SDGs

Rural Household Water Security (KD1)

KEY FINDING – RESULTS

- Afghanistan and PNG are the least secure countries
- The Maldives most improved
- Concerningly most countries with declining scores were in the Pacific

Policy recommendations

- Whole of systems strengthening approach is needed, as focusing on a single element is not likely to achieve SDG 6
- For example, many countries have comprehensive WASH policies but have severely inadequate resources (both capital and human resources) to implement.
- Systems strengthening should specifically include;
  - Better engagement and empowering of socially vulnerable groups
  - Addressing the severe shortage of human resources
  - Locally appropriate solutions are needed, particularly in the Pacific

Urban Water Security (KD3)

Definition:
KD 3 assesses the extent to which countries are providing safely managed and affordable water and sanitation services for their urban communities to sustainably achieve desired outcomes.

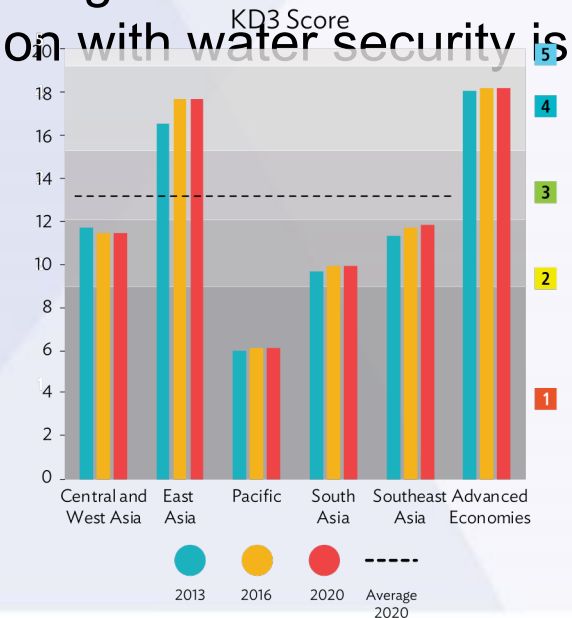
Urban water security means sustainably meeting the community's water needs (technical, economic, environmental, and social) now and in the future. Adding the SDGs for water and sanitation leads to the functional definition of KD3 in AWDO 2020.

- Access to Water Supply
- Access to Sanitation
- Affordability
- Drainage/floods
- Environment

Urban Water Security (KD3)

KEY FINDINGS – RESULTS

- 7 countries Nascent many in the Pacific and 1 in South-East Asia, in total 1.9 million people.
- 18 ADB member countries (790 urban million people), are at the “engaged” level.
- Investment is improving security, but urban population growth means the overall proportion with water security is increasing slowly.



Policy Recommendations

- Attention on countries with ‘nascent’ or ‘engaged” levels.
- Invest in sanitation, wastewater treatment - circular economy.
- Improve water cost-effectiveness and affordability.
- Improve drainage security.
- Improved attention to including urban growth, nonrevenue water, water consumption (and efficiency), energy use costs, and climate change.
- Improved management of data
- More precise urban definition including informal settlements.
- Quantification of “future security” risks.

Water-Related Disaster Security

Definition

KD 5 assesses a nation's recent exposure to water-related disasters, their vulnerability to those disasters and their capacity to resist and bounce back.

Risk Assessment Criteria:

$$RISK = \sqrt[3]{HE \times V \times (1 - C)}$$

Water-related Disasters Assessed

- Climatological Risk (Drought)
- Hydrological Risk (Flooding)
- Meteorological Risk (Storms)

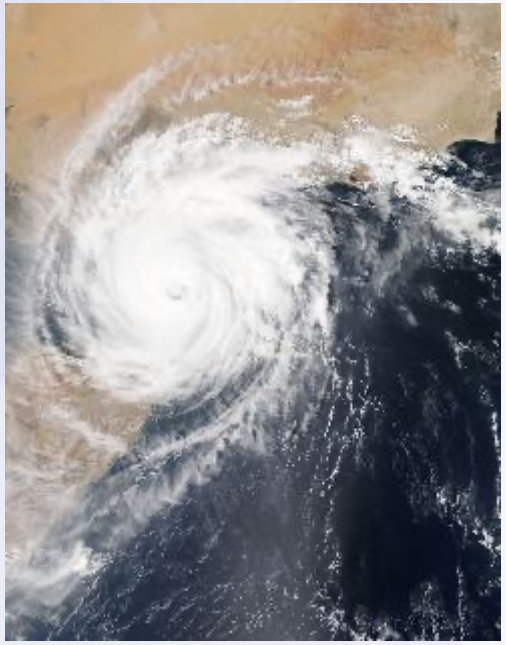
Indicators Assessed

- Hazard-Exposure
- Vulnerability
- Capacity

Water-Related Disaster Security

KEY FINDINGS – RESULTS

- Greatest Risk in Pacific Island Nations
- Rapidly Decreasing Risk Across East Asia
- Hydrologic Disasters Affected the Most People in Asia from 2010-2019



Policy Recommendations

- Enhance international efforts for standardized data collection of disaster impacts.
- Promote women's leadership and a gender-responsive approach to disaster risk reduction and climate change adaptation globally.
- Promote new mechanisms for financing risk-mitigating green and grey infrastructure.
- Adhere to international agreements, such as the Hyogo and Sendai Frameworks, and promote regional cooperation in reducing the risks of water-related disaster.

Recommendations of AWDO 2020

- **Position water as the centerpiece of sustainable rural development :** By Promoting water-effective irrigation agriculture (KD2), community-based water and sanitation services (KD1), and locally resilient disaster risk reduction (KD5).
- **Achieve urban water security** (KD3): By investing in water, sanitation, and disaster risk reduction infrastructure (KD5) services not only in cities but also in slums and peripheral areas while following a gender-based approach.
- **Provide a healthy environment** (KD4): By drastically reducing pollution, stimulating a circular economy, increasing terrestrial protection, and embracing nature-based solutions.
- **Increase resilience of water systems** to avoid water-related disasters and prepare for climate and other global changes. Build back better.

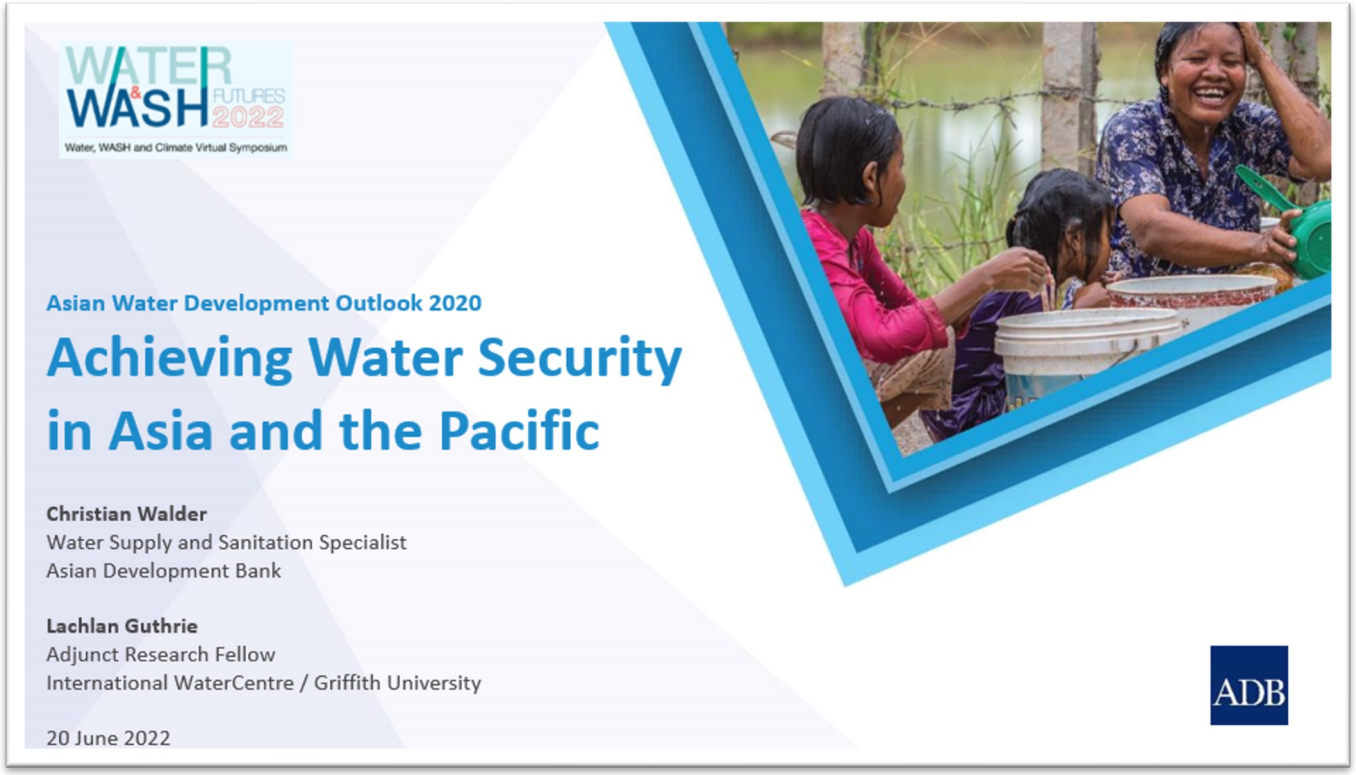
AWDO 2020

Download the AWDO 2020 report
www.adb.org/publications/asian-water-development-outlook-2020

New features

- **Improved methodology**
- **Many working partners**
- **Country Case Studies** (Thailand, Karnataka, PRC, Timor-Leste)
- **Future Risk Framework**
- **Living AWDO Website**
  Ongoing Knowledge and Policy in Action

Asia-Pacific Water Forum · Australian Government Department of Foreign Affairs and Trade · The Australian Water Partnership · IWC International WaterCentre · IWMI International Water Management Institute · KICT Korea Institute of Civil Engineering and Building Technology · OECD Better Policies for Better Lives



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Q&A

Strategic Framework for WASH Climate Resilience

Silvia Gaya, Regional Adviser, WASH Climate & Sustainable Environment
UNICEF East Asia & Pacific Regional Office

Global Water Partnership

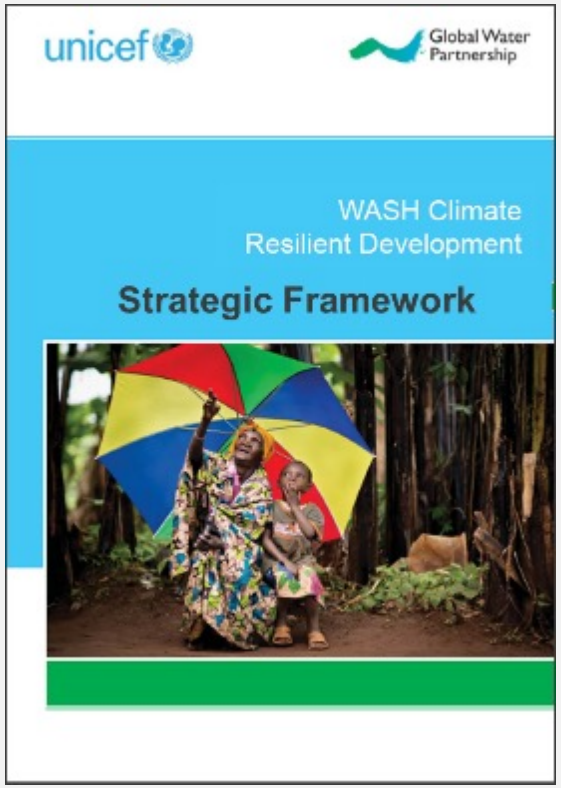
unicef

Climate Change impacting WASH and Children

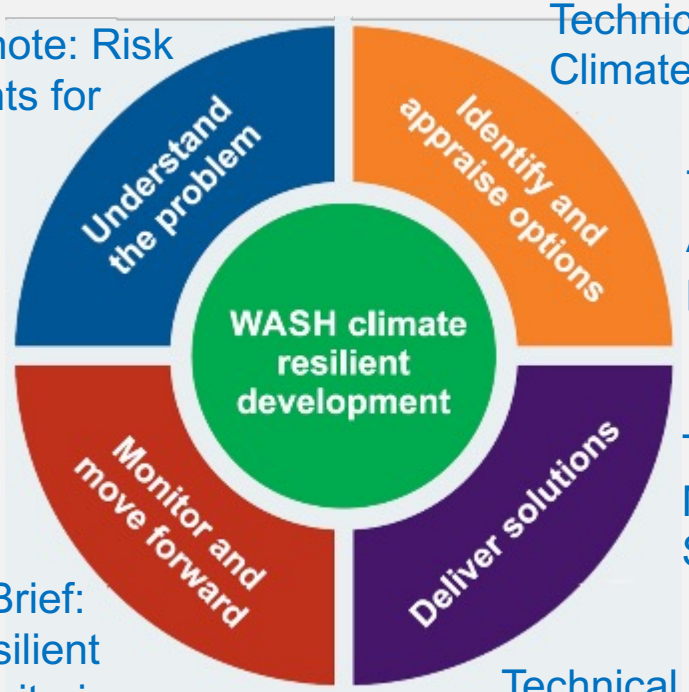
Climate effect	Hazard	Impact on WASH sector
Decrease in precipitation	Drought	Reduction in raw water supplies, reduced flow in rivers, less dilution/increased concentration of pollutants in water, challenge to hygiene practices.
Increase in precipitation and severe weather	Flooding	Pollution of wells, inundation of wells, inaccessibility of water sources, flooding of latrines, damage to infrastructure, landslides around water sources, sedimentation and turbidity, challenges to sustainability of sanitation and hygiene behaviours, and waterborne diseases.
Increase in temperatures	Heatwaves	Damage to infrastructure, increase in pathogens in water leading to increased risk of disease.
	Melting and thawing of glaciers, snow, sea ice and frozen ground	Seasonality of river flows affected leading to a reduction in water availability in summer.
Sea-level rise	Flooding and saline intrusion into freshwater aquifers	Reduction in availability of drinking water, with high impacts on quality.

FRAMEWORK FOR WASH CLIMATE RESILIENCE

Collaboration with Global Water Partnership



Guidance note: Risk assessments for WASH



Technical Brief: WASH Climate resilient options

Technical Brief: Appraising and prioritizing options

Technical Brief: Modified Water Safety Planning

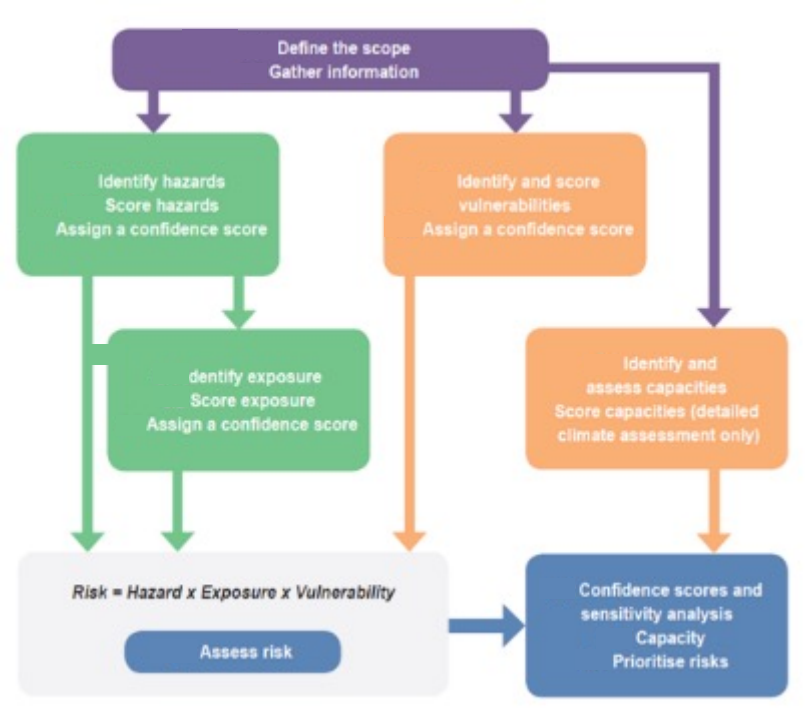
Technical Brief: Integration of climate resilience into WASH strategies and plans

Technical Brief: Climate resilient WASH monitoring and evaluation

Understand the problem: Assess climate risk to WASH and set the climate rationale for UNICEF interventions

Risk assessment participatory methodology

Opportunity for Covid-19 responses to integrate climate risks!!



Identify and Appraise Options: Identify a longlist of potential options to address prioritized risks

Climate resilient WASH options to:

1

Ensure that WASH infrastructure and services are sustainable, safe and resilient to climate related risks

2

Ensure that resilient WASH systems contribute to build community resilience to adapt to the impacts of climate change

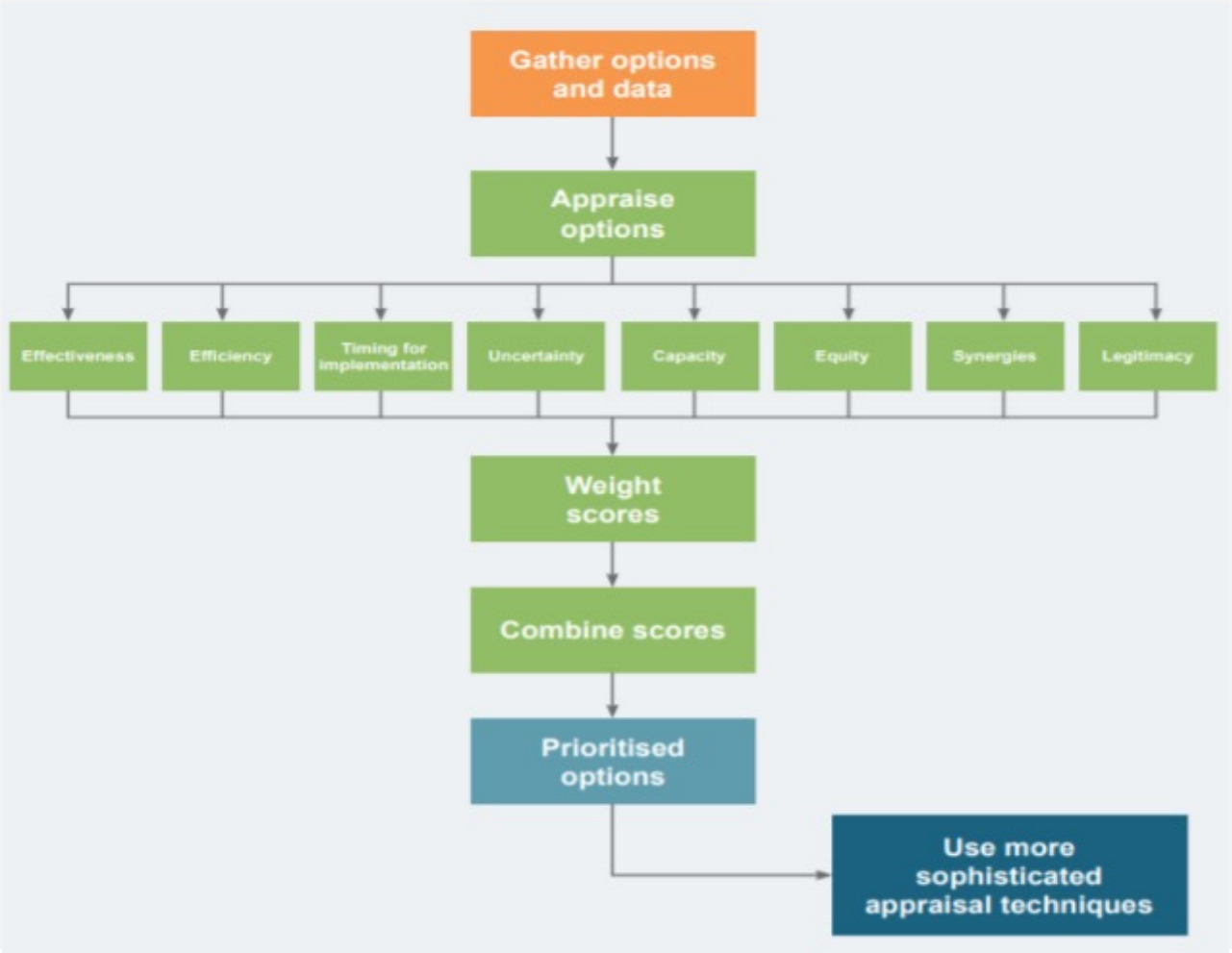
3

Advance towards a low carbon WASH sector

Identify and Appraise Options: Appraise and shortlist options for UNICEF´s support

Screening methodology using a “climate lens” to prioritize interventions

SHIFT TO CLIMATE RESILIENT WASH

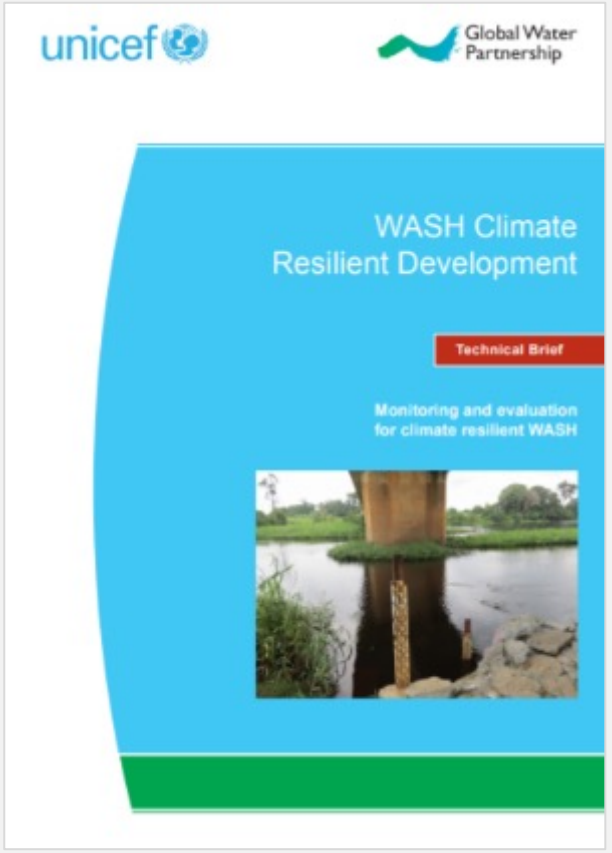


Deliver Solutions: Capacity Building

Capacity development on WASH Climate Resilience:

- Brings new challenges that require additional knowledge, skills and approaches
- Needs to be firmly grounded in existing institutional roles and responsibilities
- Will be important at all levels

Monitor and Move forward: Design SMART climate-resilient indicators for WASH



Sample and generic indicators available

Outcome/output/activity	Indicator	Hazard
Intermediate outcome: An enabling environment conducive to climate resilient WASH services and communities	Perceived adequacy of the enabling environment for climate resilient WASH services and communities	General
Output: Knowledge of climate risks generated and shared	Perceived adequacy of available evidence on the potential impacts of climate change on the WASH sector	General
	Do national WASH related ministries and departments understand climate risks and how best to respond to these?	General
	Is understanding of climate risks shared among experts and stakeholders?	General
Activity: Improving understanding of climate risks	Has a national climate risk assessment been completed for the WASH sector?	General
	Are key national government agencies involved in carrying out climate risk assessments?	General
	Have government-led impact evaluations, which include the impact of climate, been carried out in the past 5 years?	General
	Is a process in place to review and update risk data each year?	General
Activity: Understanding resilience of technology types	Percentage of water supply and sanitation technologies screened according to their suitability to withstand climate-related shocks and stresses	General

Scope of the Framework Update

Guidance Note:
- Risk assessments for WASH

Updating to reflect on lessons learned (including web tool)

New:
Climate Modeling for WASH

Technical Briefs:
- Linking risk with response: options for climate resilient WASH
- Appraising and prioritising options for climate resilient WASH

New:
Climate Resilient Sanitation

Technical Brief:
- Monitoring and evaluation for climate resilient WASH

Updating with new indicators

New:
Climate Financing for WASH

Community Resilience and WASH

Technical Briefs:
- Integrating climate resilience into national WASH strategies and plans
- Local participatory water supply and climate change risk assessment: modified water safety plans

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Panel

Tri Dewi Virgiyanti
Director of Housing and Settlements, Ministry of National Development Planning/ BAPPENAS, Republic of Indonesia

Suranga de Silva
WASH Specialist
UNICEF Timor-Leste

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Q&A

ADB's Climate Risk Management Framework

Water and Wash Futures - Thematic Session: Frameworks to Manage Climate Risks to WASH and Water Resources

Charles Rodgers, Senior Advisor Climate Change Adaptation, Asian Development Bank, Manila Philippines

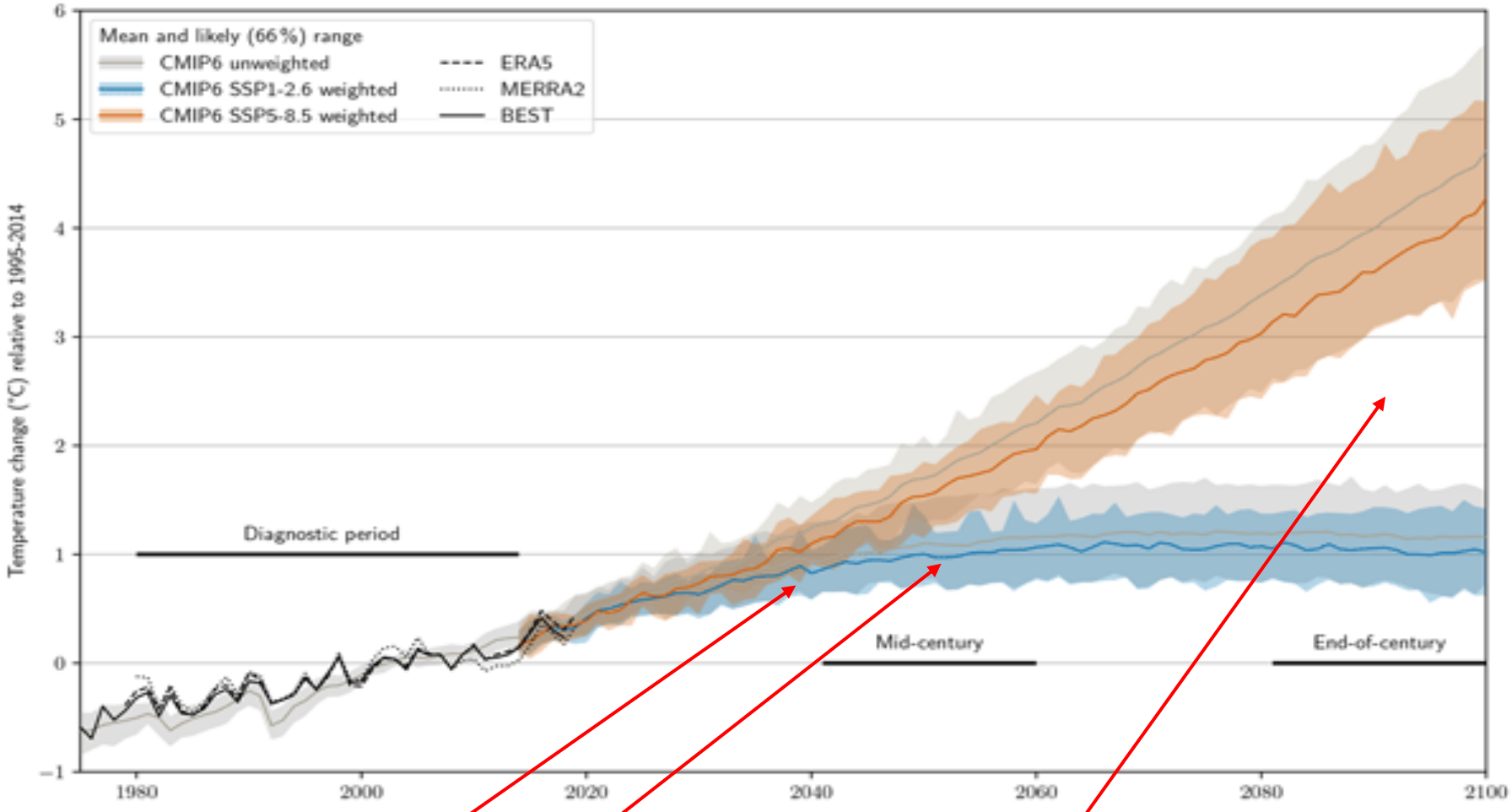
Jatigede Dam, Cimanuk Basin, West Java, Indonesia

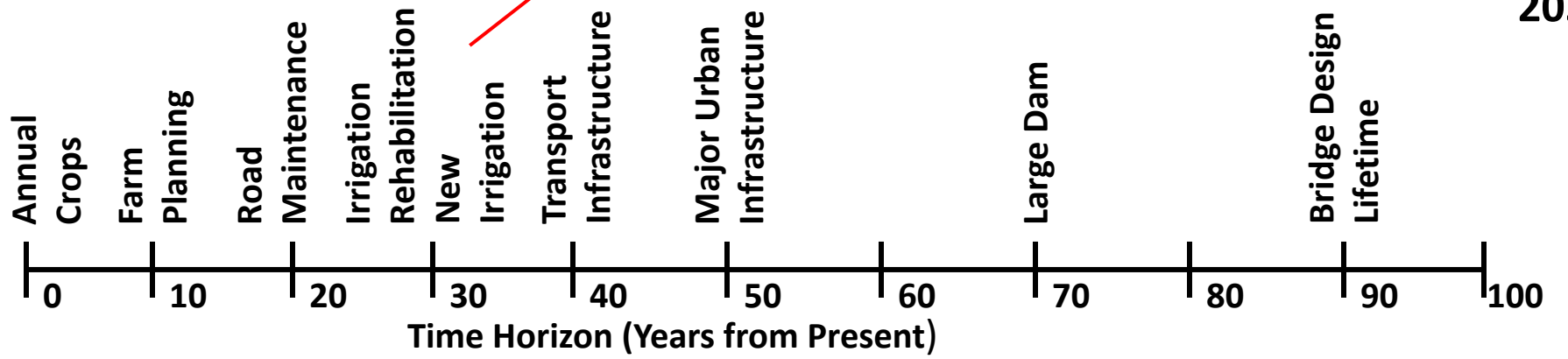
Why does ADB have a Climate Risk Management Framework?

- **ADB provides financing for *long-lived public infrastructure* that supports development (exposed to long-term climate risks)**
- **Investments are justified only if infrastructure delivers intended development benefits**
- **Both lender (ADB) and borrower (sovereign nations) must make decisions based on shared, scientifically rigorous understanding of climate-related risks to project**
- **Climate risk management is needed to ensure that risks are reduced to acceptable levels consistent with scientific understanding of climate change (including uncertainty), engineering and technology standards, and economic and environmental considerations, among others**

Level of Effort in Climate Risk Management

- ***Lifetime of the scheme***: Projects with a longer operational lifetime are likely to be exposed to greater climate change risks, as climate signals are expected to increase with time.
- ***Risk of lock-in*** (irreversible decisions): Some investments are extremely difficult or costly to alter retrospectively (retrofit) in later years in response to a changing climate.
- ***Level of precaution warranted*** (consequences of being wrong): Examples are large dams and other critical infrastructure.
- ***Potential economic impact of climate change on adaptation costs***: are climate impacts likely to affect the economic rationale for the project?
- ***Size of the project***: large projects have an element of financial risk from portfolio concentration and risk concentration.





Lifetime of the Scheme:

- Economic lifetime?
- Design lifetime?
- Service lifetime?
- Path dependence?

For shorter-duration projects (1-20 years) historical data remains critically relevant

The choice of SSP (emissions) scenario really becomes critical after 2040-2050

Project Concept Phase: Climate Risk Screening

PROJECT PHASE

Project Concept Phase

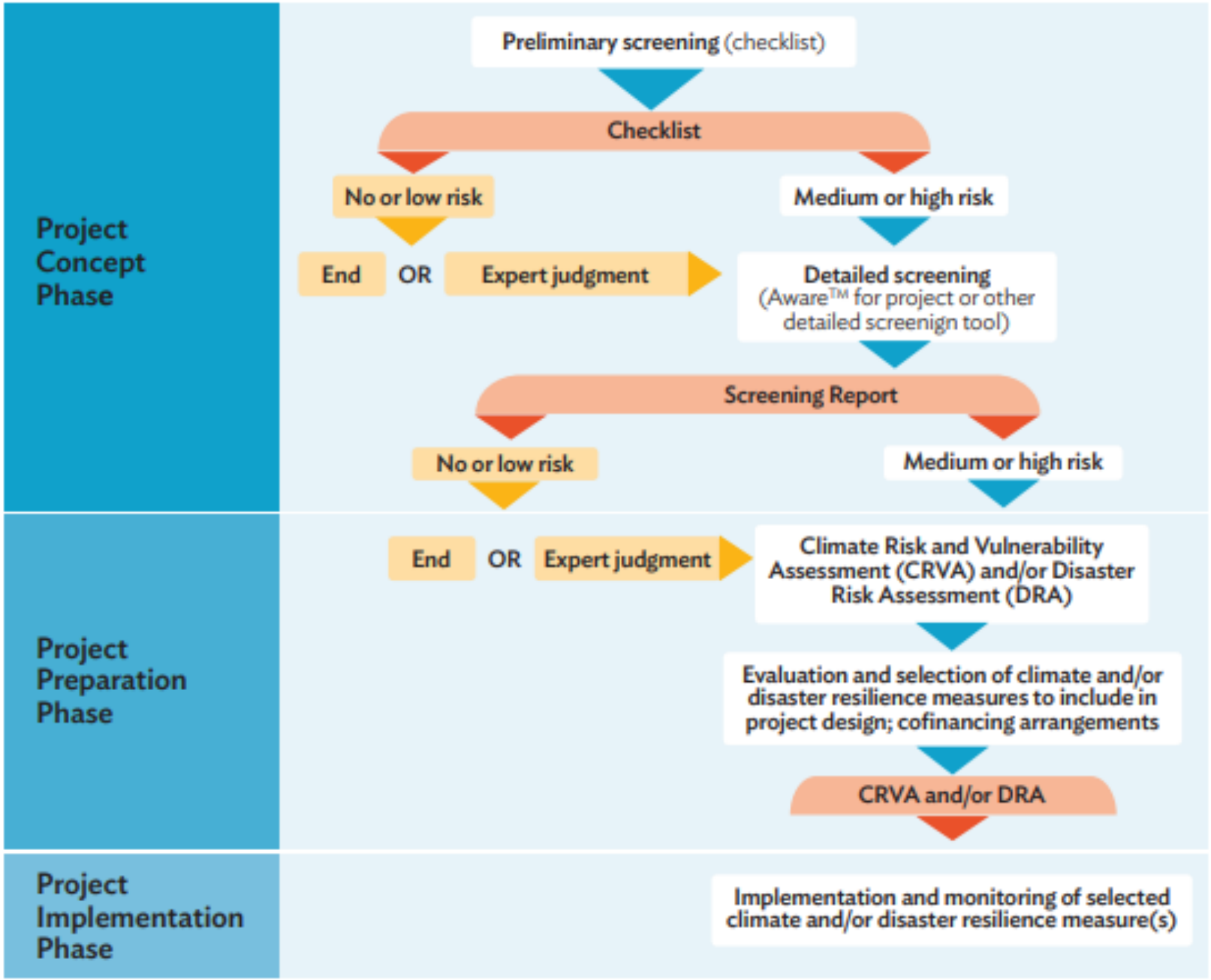
Project Preparation Phase

Project Implementation Phase

STEPS

Climate Risk Screening:

1. Preliminary climate risk screening
2. Detailed climate risk screening
3. Survey existing information & knowledge
4. Identify data needs and required expertise
5. Prepare terms of reference for Climate Risk and Adaptation Assessment (CRA)



Source: Adapted from ADB (2014b).

ADB Climate & Disaster Risk Management Framework for projects (since 2014)

- ***Climate and geophysical hazard screening*** at the concept development stage
- ***Climate risk and adaptation assessment / Disaster risk assessment*** prepared for projects at risk
- ***Identification and evaluation of adaptation measures***
- ***Monitoring and reporting*** of climate risk and adaptation spending

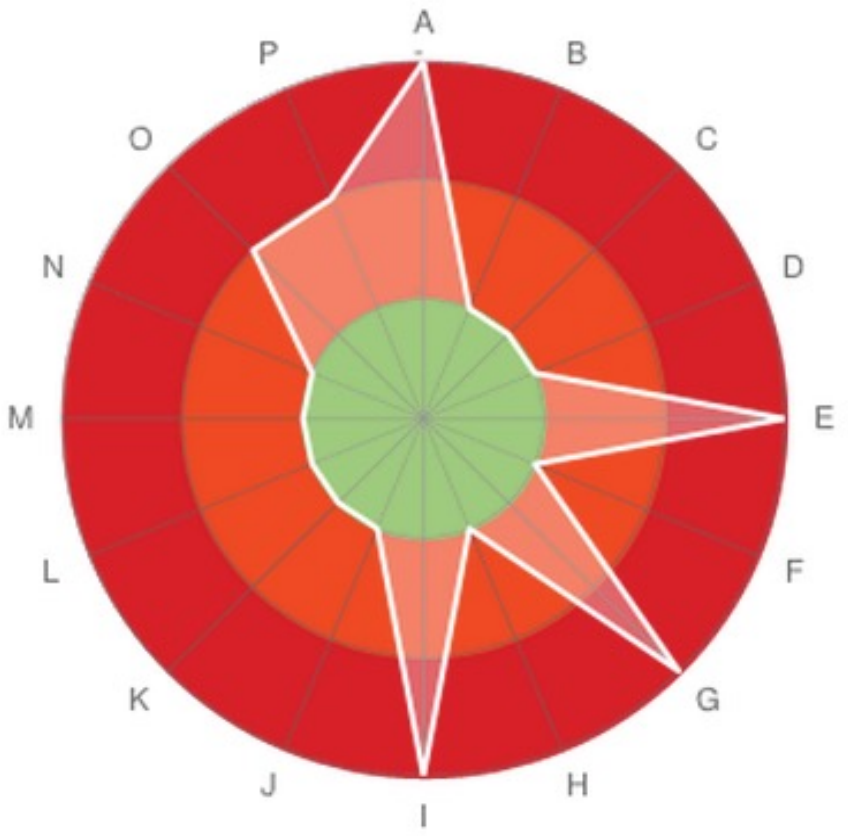
Climate Risk Screening with AWARE

Final project risk ratings

High Risk

- Web-based tool for climate risk screening projects
- Data from CMIP5 general circulation models; databases on natural disasters
- Combines exposure data and sensitivity information in 16 areas of risk
- Provides formatted output report with links to more detailed source data; guidance on model agreement, uncertainty, critical thresholds and robust decision making

Breakdown of risk topic ratings



A) Temperature increase
B) Wild fire
C) Permafrost
D) Sea ice
E) Precipitation increase
F) Flood
G) Snow loading
H) Landslide
I) Precipitation decrease
J) Water availability
K) Wind speed increase
L) Onshore Category 1 storms
M) Offshore Category 1 storms
N) Wind speed decrease
O) Sea level rise
P) Solar radiation change

Project Preparation: Climate Risk Assessment

PROJECT PHASE

Project Concept Phase

Project Preparation Phase

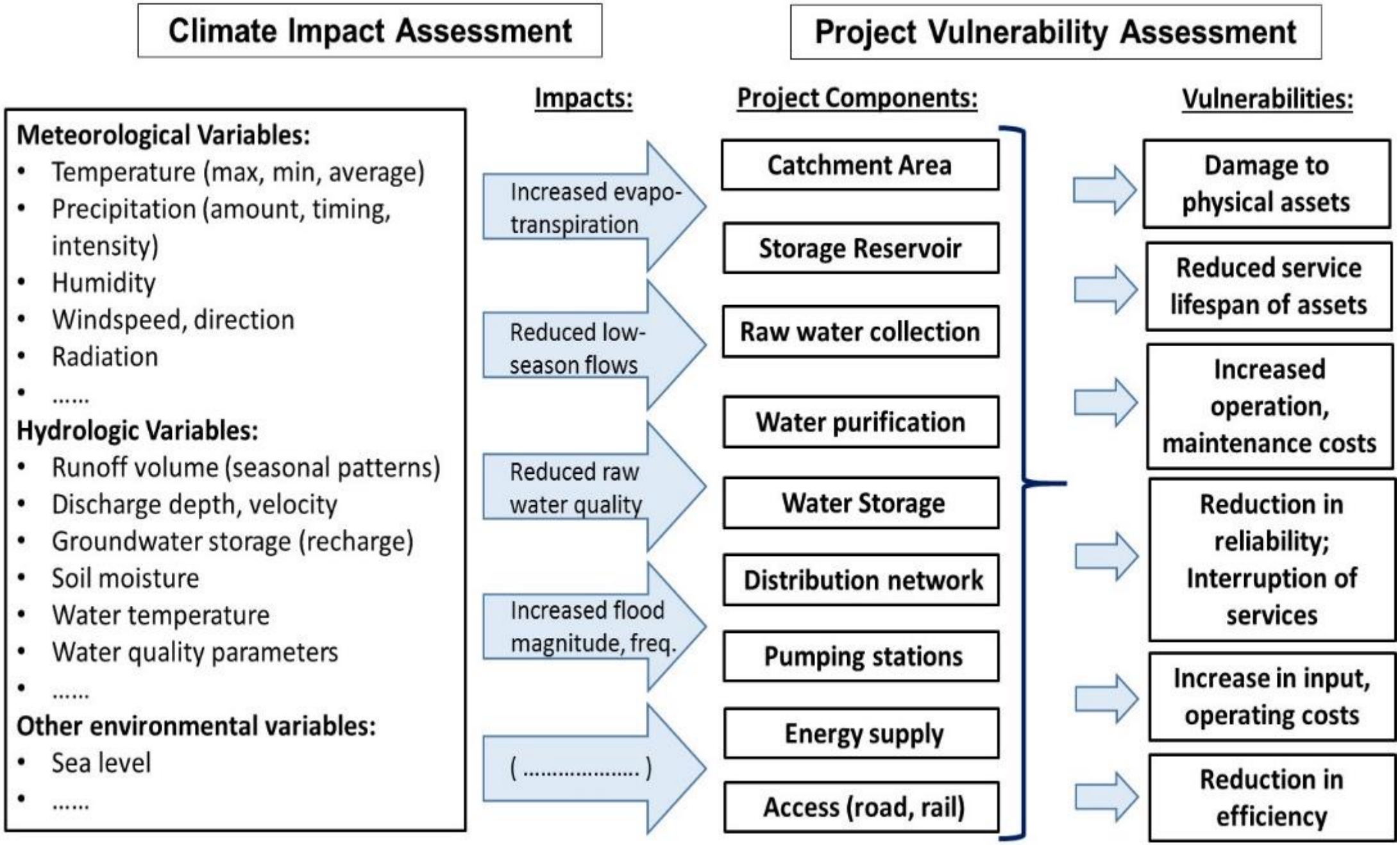
Project Implementation Phase

STEPS

Climate Risk Assessment:

6. Identify climatic vulnerabilities of project components
7. Identify biophysical drivers of vulnerabilities
8. Identify socioeconomic drivers of vulnerabilities
9. Develop appropriate climate change scenarios
10. Estimate future biophysical impacts
11. Assess impacts on investment project

Climate Risk Assessment, Water Sector



Project Preparation: Evaluation of Options

PROJECT PHASE

Project Concept Phase

Project Preparation Phase

Project Implementation Phase

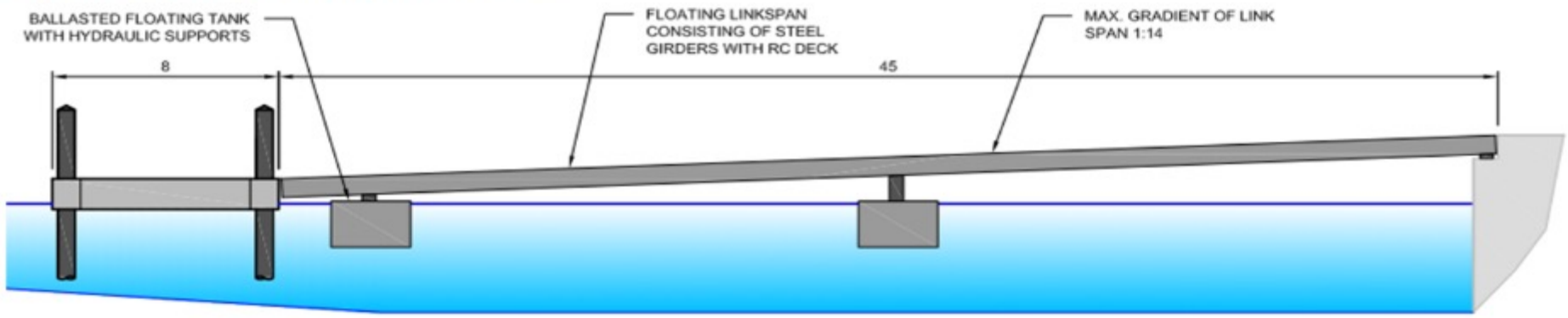
STEPS

Adaptation Assessment:

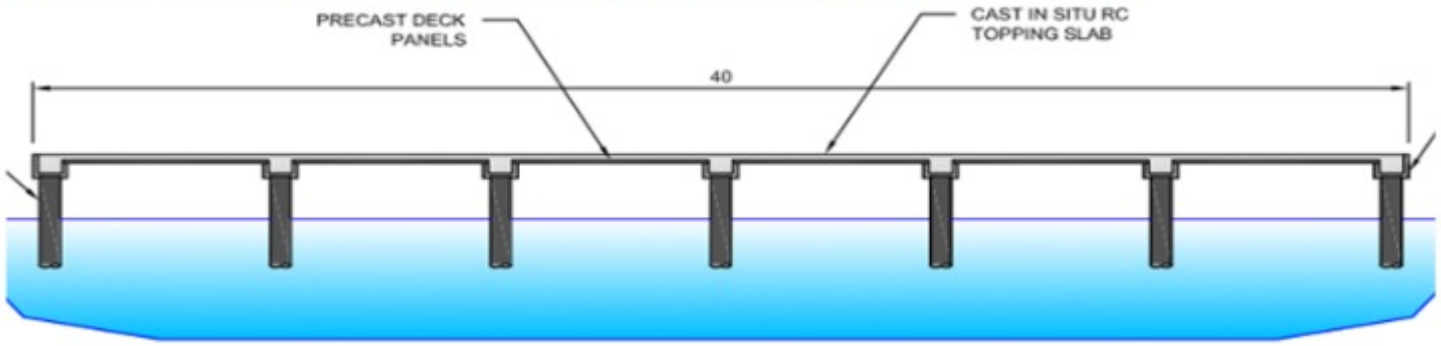
12. Establish the adaptation objectives
13. Identify all potential adaptation options
14. Conduct consultation
15. Conduct economic analysis of adaptation options
16. Prioritize and select adaptation options

Identify Potential Adaptation Options

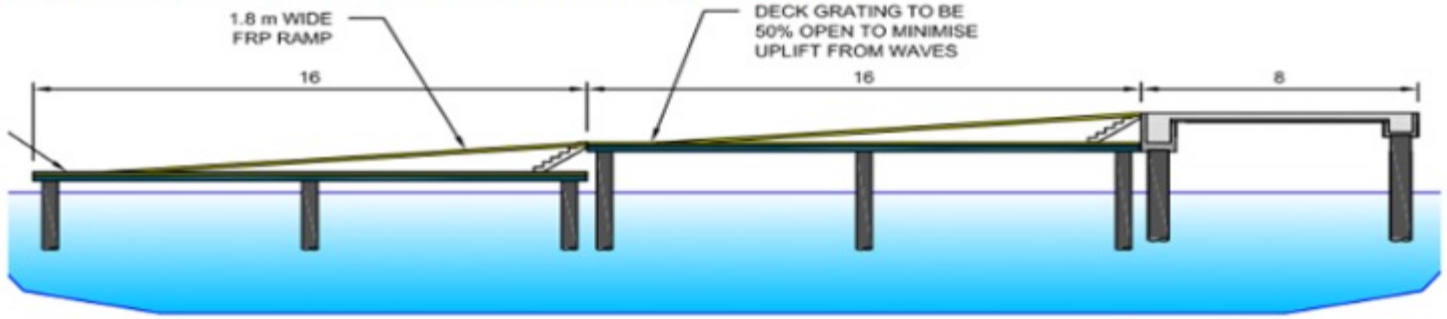
Option 2: New floating pontoon wharf



Option 3: New single-level, climate proofed wharf



Option 4: New fixed dual-height wharf



Prioritize, Select Adaptation Options

Table 16 – Multicriteria Assessment of Options 1 to Option 4.

	Cost	Complexity	Maintenance	Robustness	Flexibility of use	*Total*
Option 1	3	4	3	2	4	*16*
Option 2	5	5	5	5	2	*22*
Option 3	1	1	1	1	4	*8*
Option 4	2	1	2	1	1	*7*

1 = Most favourable, 5 = Least favourable

Implementation Phase: Following Through

PROJECT PHASE

Project Concept Phase

Project Preparation Phase

Project Implementation Phase

STEPS

Implementation Arrangements:

17. Establish arrangements for implementation
18. Identify needs for technical support and capacity building

Monitoring and Evaluation:

19. Design monitoring and evaluation plan, including suitable performance indicators
20. Feedback into policy-making and knowledge management processes

Resources to Support Climate Risk Management

ADB/WBG Country Risk Reports

Country Overview

Climatology

- Climate Baseline (overview, key trends)
- Climate Futures

Climate-Related Natural Hazards

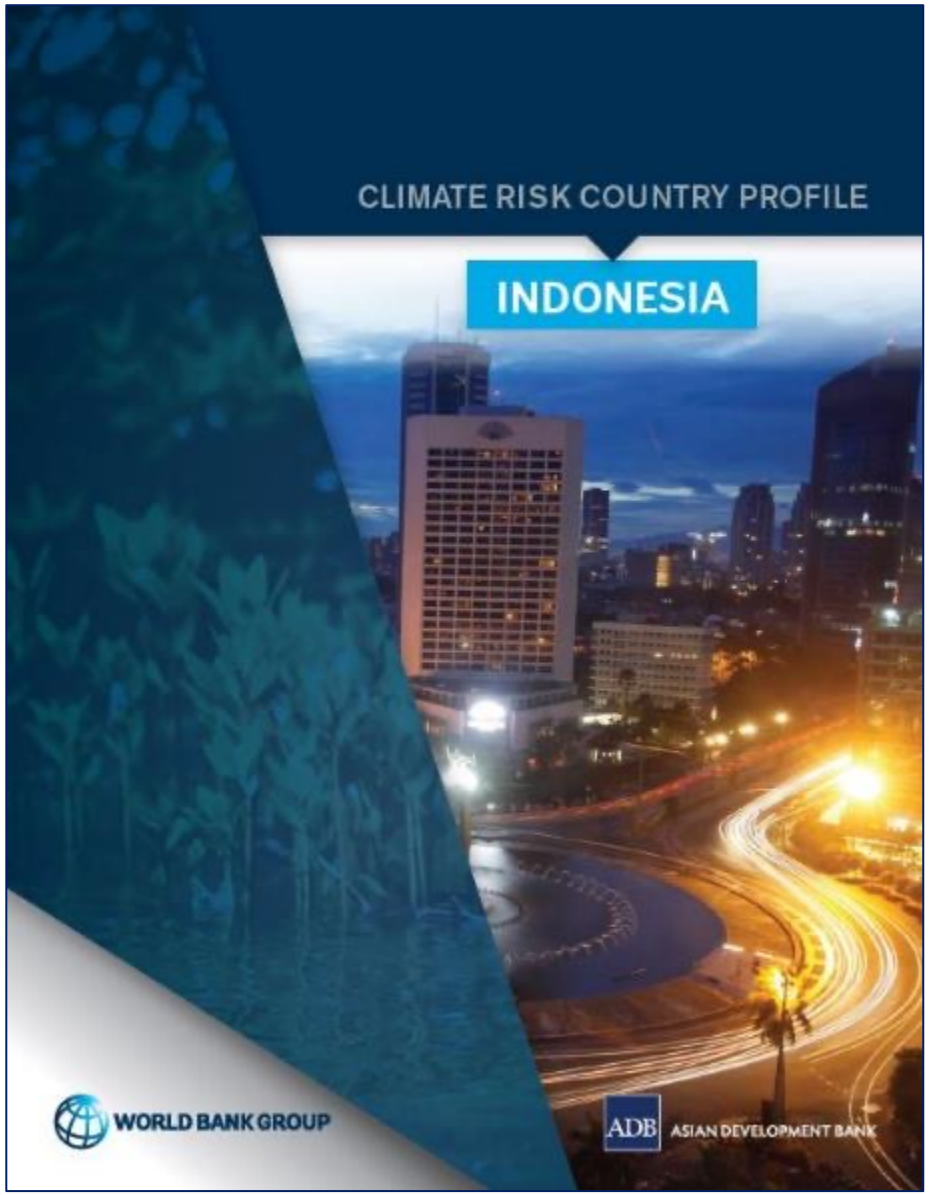
- Heatwaves
- Drought and Fire Risk
- Flood
- Sea Level Rise
- Cyclones

Climate Change Impacts

- Natural Resources (Water, Fisheries, Forests, Biodiversity)
- Economic Sectors (Agriculture, Urban, …)
- Communities (Poverty and inequality, Gender, Health)

Policies and Programs

- National Adaptation Policies and Strategies
- Climate Change Priorities at ADB and the WBG



Priority 1: Understand the project

Aim: to frame the CRA in the context of the project objectives

- Understand the project activities, outputs and objectives using the CN problem tree
- Revisit the climate risk screening results and produce updated list

Priority 2: Identify and focus on what matters

Aim: to identify the first order issues, i.e. what matters and where to focus for the CRA

- How do climate change risks affect the economic and financial performance of the project
- What is the importance of the risks – consequence and likelihood
- What are the characteristics of the project and decisions (lifetime, lock-in and level of precaution)

Priority 3: Decision led climate scenarios to inform rapid risk and impact assessment

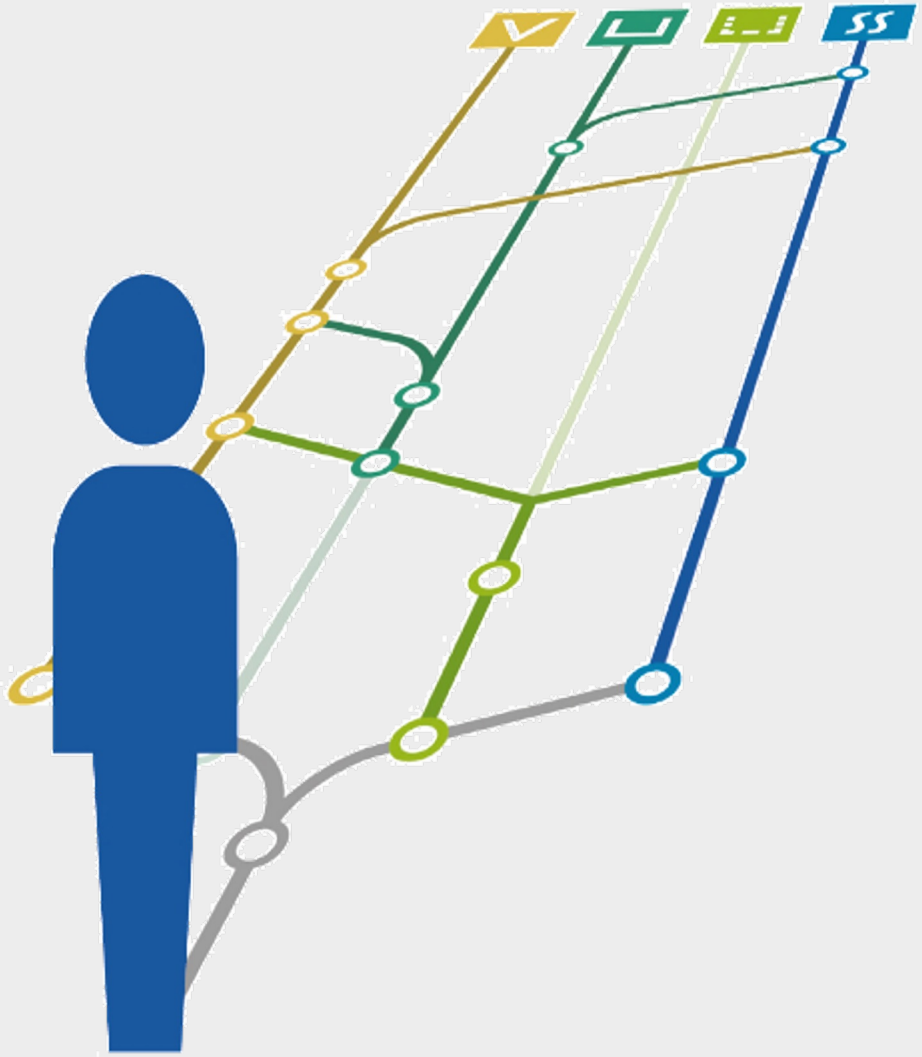
Aim: to make the CRA decision led

- Understand the decision/s with the 3Ls
- Identify project specific risk metrics
- Identify project specific information and data available
- Identify how can do simple analysis to inform
- Use climate information to sensitivity test and understand likely 'impact' on project and need for adaptation

Priority 4: Identify adaptation in context of timing and uncertainty

Aim: to identify (and cost) options within DMUU/low regret approach

- Identify sets of options (design now, change later, non-technical) – mapping to the decision identified earlier (3Ls)
- Identify low regret options and cost information
- where need more detailed appraisal



enabling delta life

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Dynamic Adaptive Policy Pathways

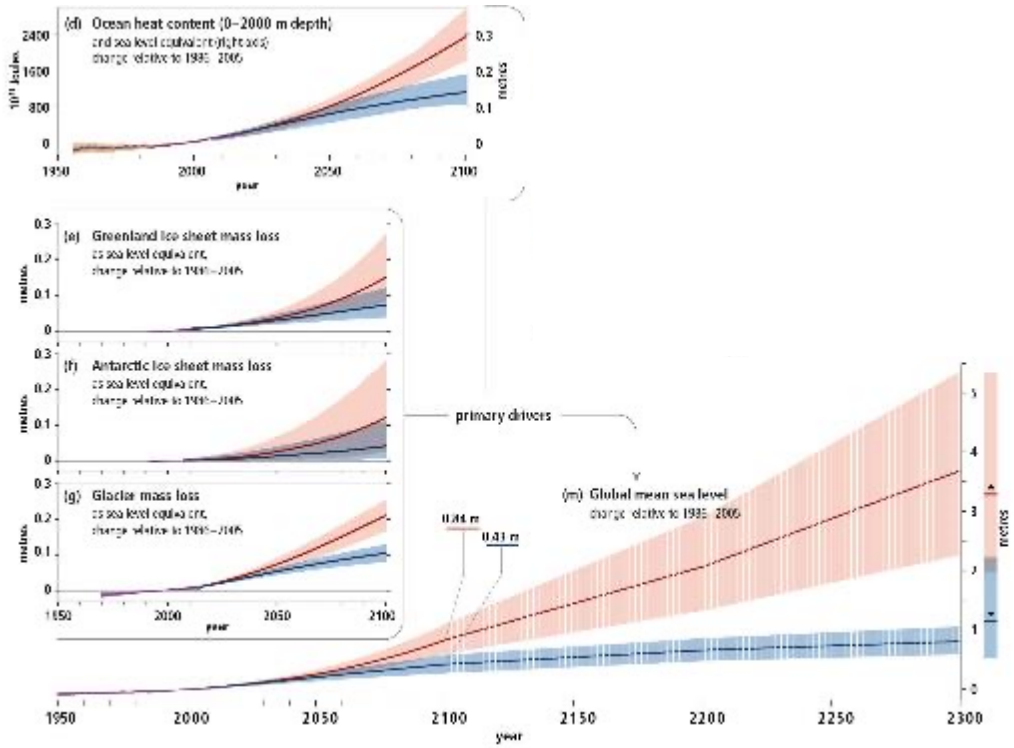
Confronting long term (climate) uncertainties in planning

Andrew Warren

20 June 2022

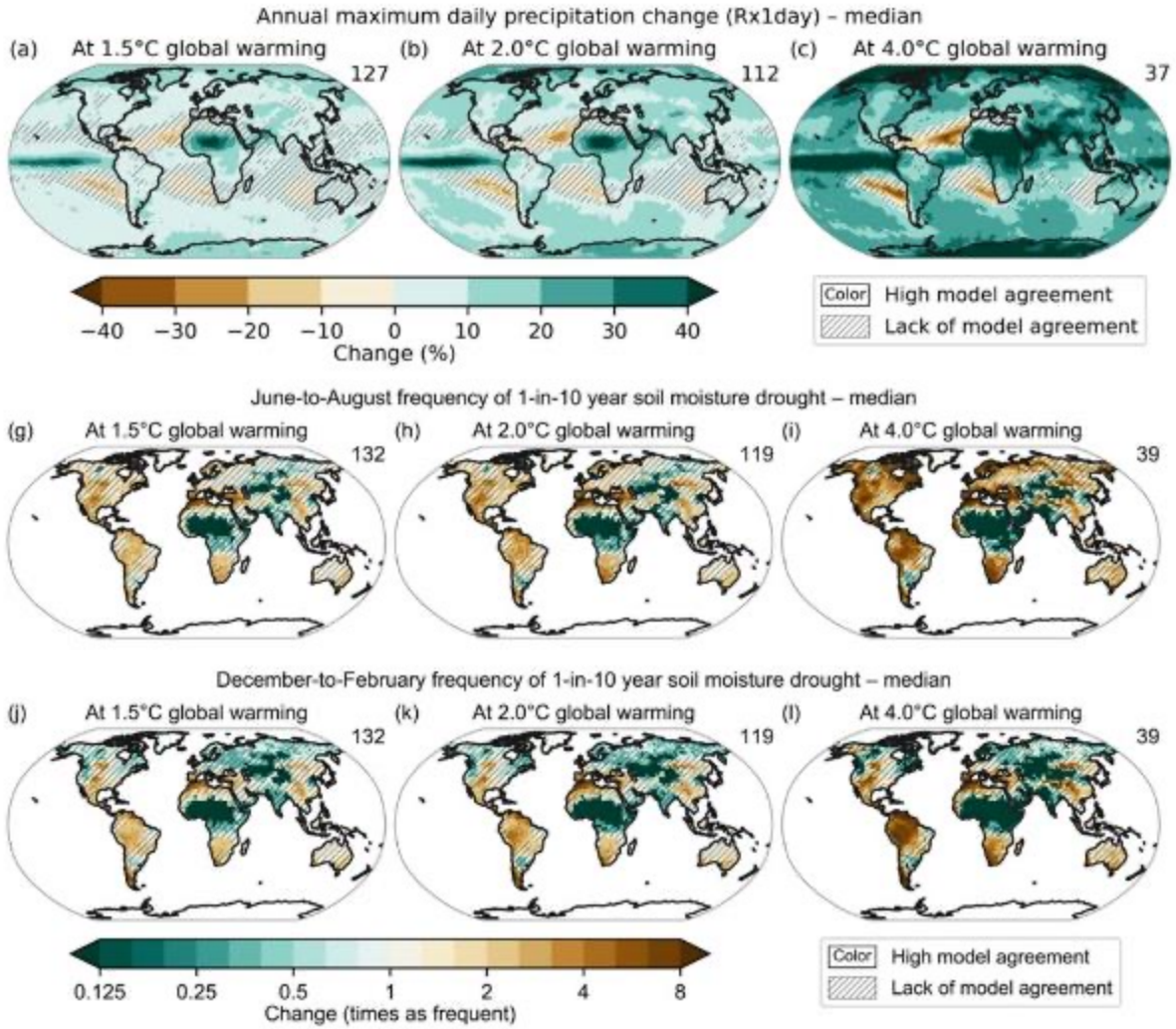
Why confront uncertainties in planning for water security?

Projected Sea Level Rise



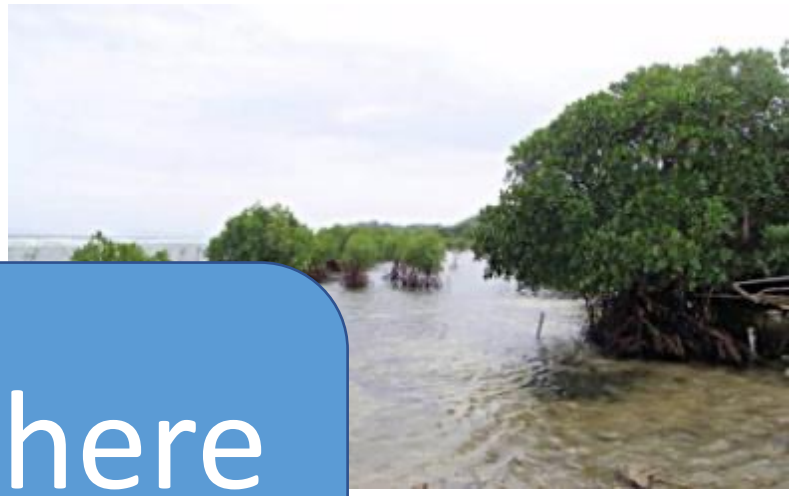
Source: IPCC – SROCCC (2019)

Projected Changes in Extreme Precipitation & Drought Frequency



Source: IPCC – AR6 SPM (2021)

How best to plan for SLR and climate-related extremes?



Protect or nour

olution or retreat?

What to choose where and when?

Under deep uncertainty decision makers should aim for robust plans that can be adapted over time

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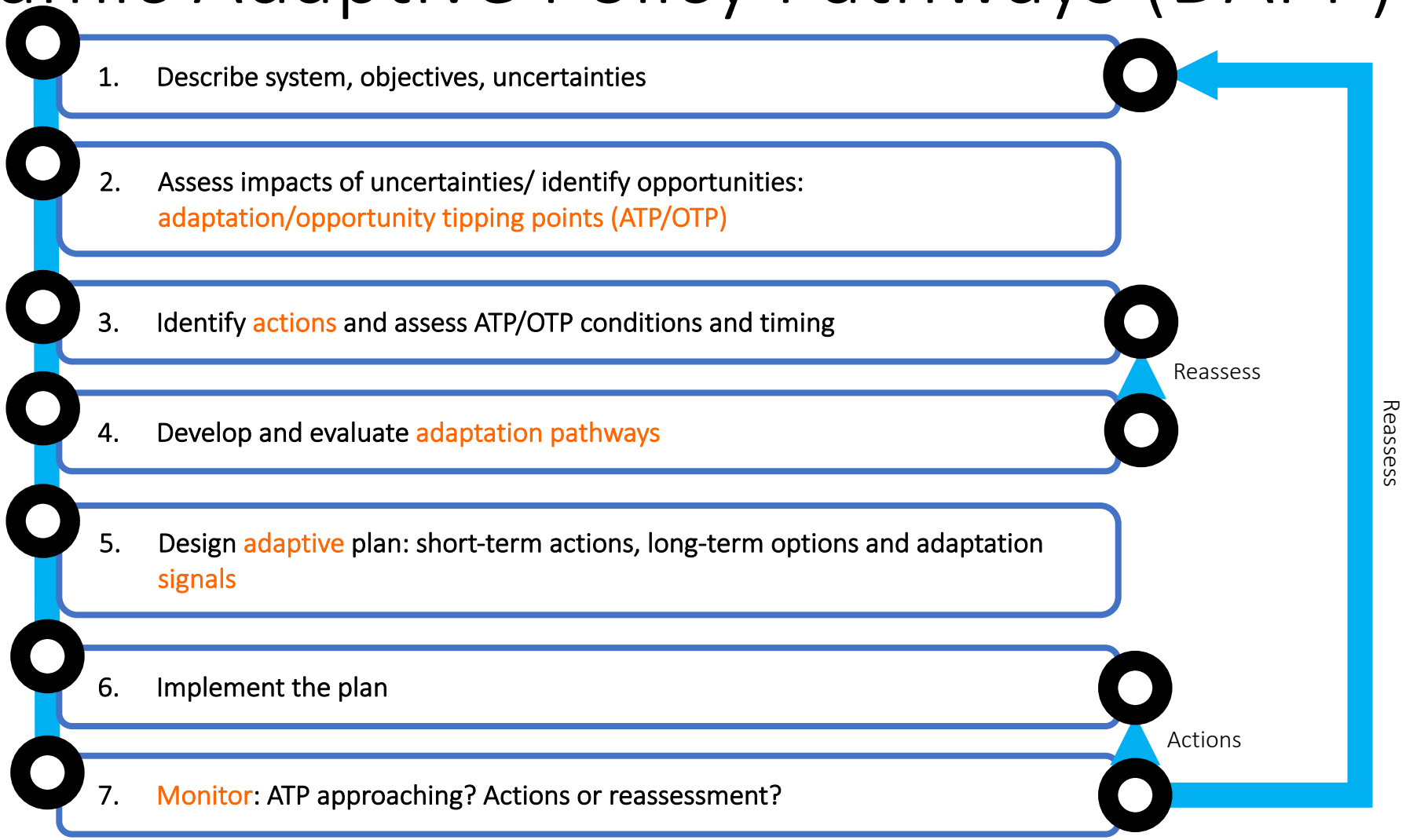
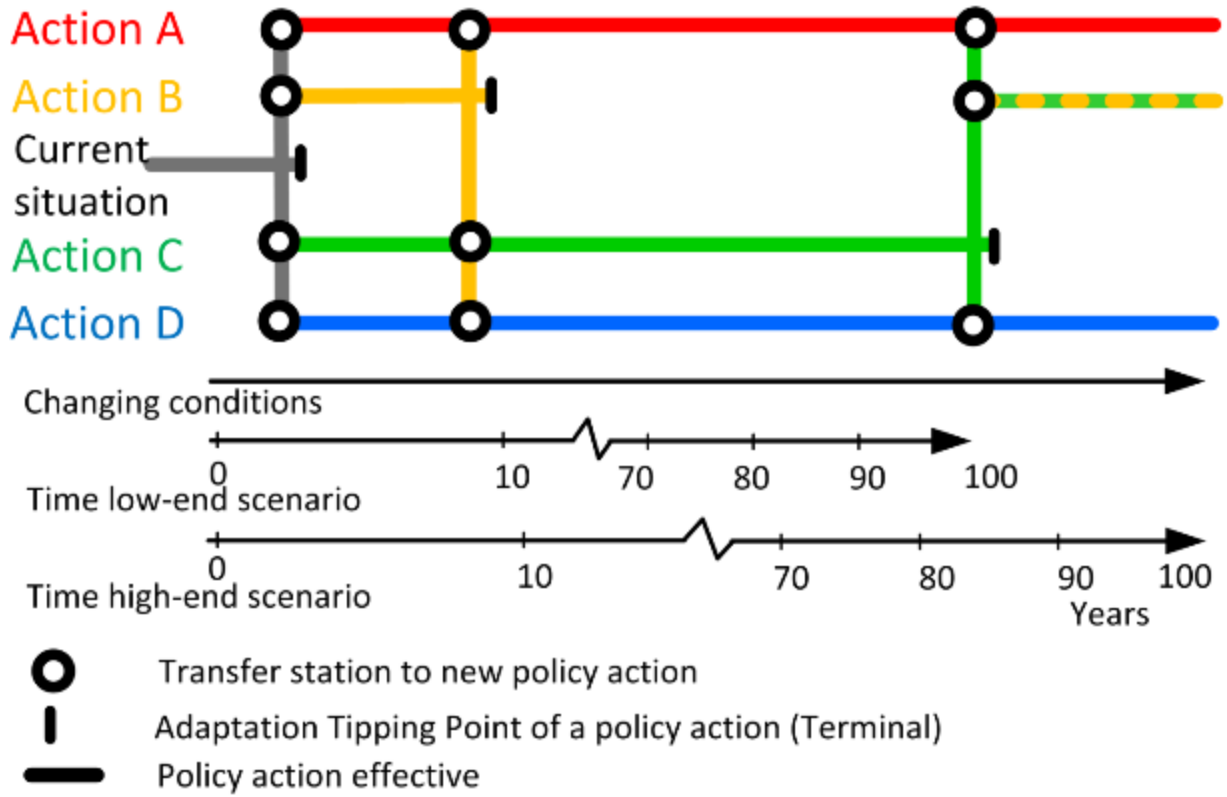
Dynamic Adaptive Policy Pathways (DAPP)



Adapted from Haasnoot et al. (2013). [10.1016/j.gloenvcha.2012.12.006](https://doi.org/10.1016/j.gloenvcha.2012.12.006)

Adaptation Pathways



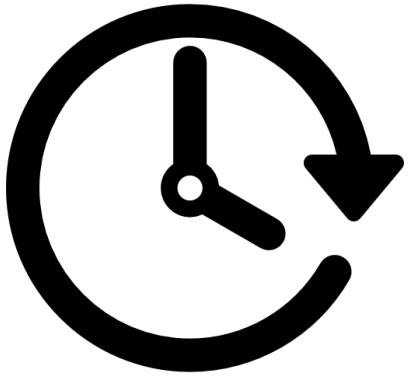
Time horizon 100 years

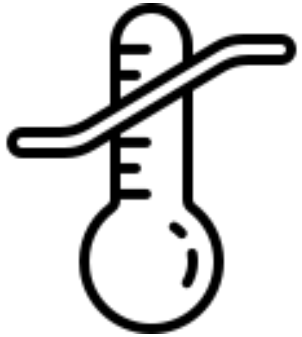
Pathway	Costs	Benefits	Co-benefits
1	+++	+	0
2	+++++	0	0
3	+++	0	0
4	+++	0	0
5	0	0	-
6	++++	0	-
7	+++	0	-
8	+	+	- - -
9	++	+	- - -

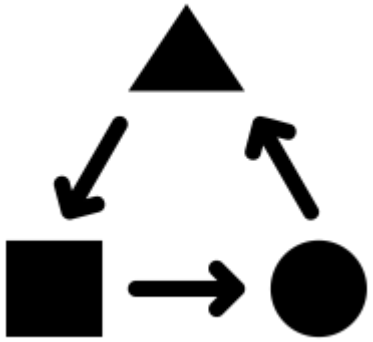
- Maps show different possible sequences of decisions to achieve objectives under variety of scenarios, given limits to possible actions (adaptation tipping points/thresholds)
- Scorecard helps to evaluate the pathways and decisions

Haasnoot et al. (2013). [10.1016/j.gloenvcha.2012.12.006](https://doi.org/10.1016/j.gloenvcha.2012.12.006)

When to use DAPP?







Long infrastructure lifetime

System sensitivity to (uncertain) future changes

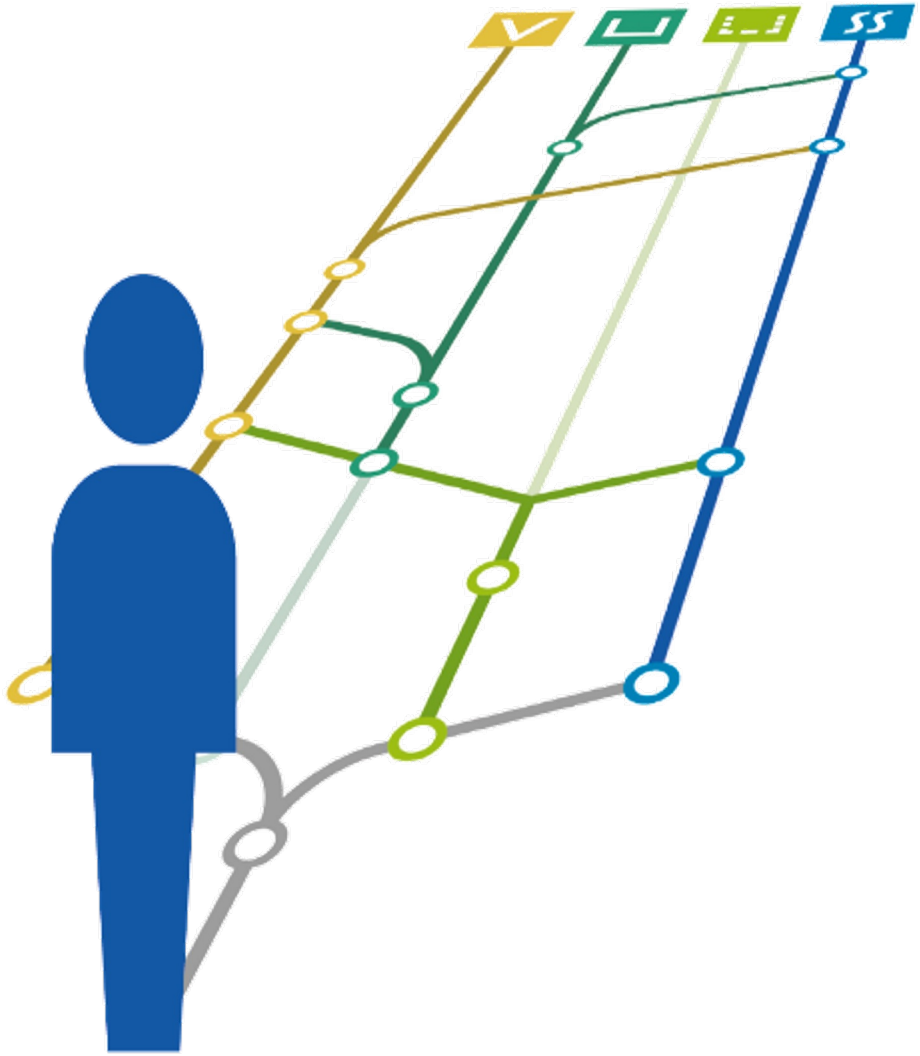
High path-dependency risks

High investment costs

i.e. When potential for regret is high

Summary

- DAPP is a versatile approach to incorporate **deep uncertainties** into planning processes and identify **flexible** and **robust** strategies
- **Tipping points** and **scenarios** assess if and when any limits, thresholds, or opportunities occur.
- **Adaptation pathways** identify **'regrets'**, path-dependencies and formulate adaptive plans
- **Monitoring plan** identifies approaching thresholds
- Can be performed at various **levels of assessment**: narratives, model-based pathways
- **Stakeholder engagement** of key importance throughout the approach



Q&A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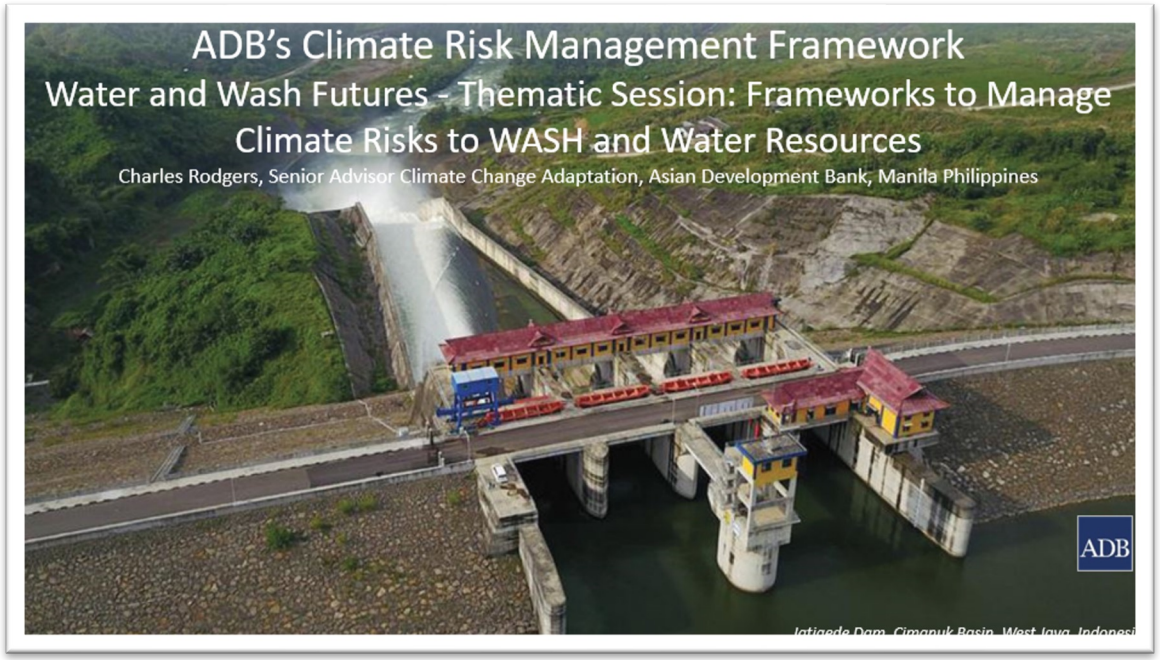
ADB's Climate Risk Management Framework
Water and Wash Futures - Thematic Session: Frameworks to Manage Climate Risks to WASH and Water Resources
Charles Rodgers, Senior Advisor Climate Change Adaptation, Asian Development Bank, Manila Philippines
ADB

WATER & WASH FUTURES 2022

Water, WASH and Climate Virtual Symposium

Closing

Christian Walder, ADB

Visit the Symposium website – webpage for this session to access resources, contacts & the recording

Coming up……

Registrations open until an hour before sessions start washfutures.com

Tuesday

Nature-based and other sustainable WASH solutions to climate change

Building equality into climate resilience

Wednesday

Water management to alleviate water-mediated disasters

Stories from Practice Exhibition (Remo)

Early Career Professional Session (for <35 year-olds!)

Thursday

Partnerships for scaling up private sector investment in WASH

Closing Panel: Collaborating across sectors for local water security

LEAD PARTNERS Australian Aid · International WaterCentre · Griffith University Queensland, Australia · Water For Women · ADB

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