GREEN CLIMATE FUND

UN CTCN
Learning event for Korean network members

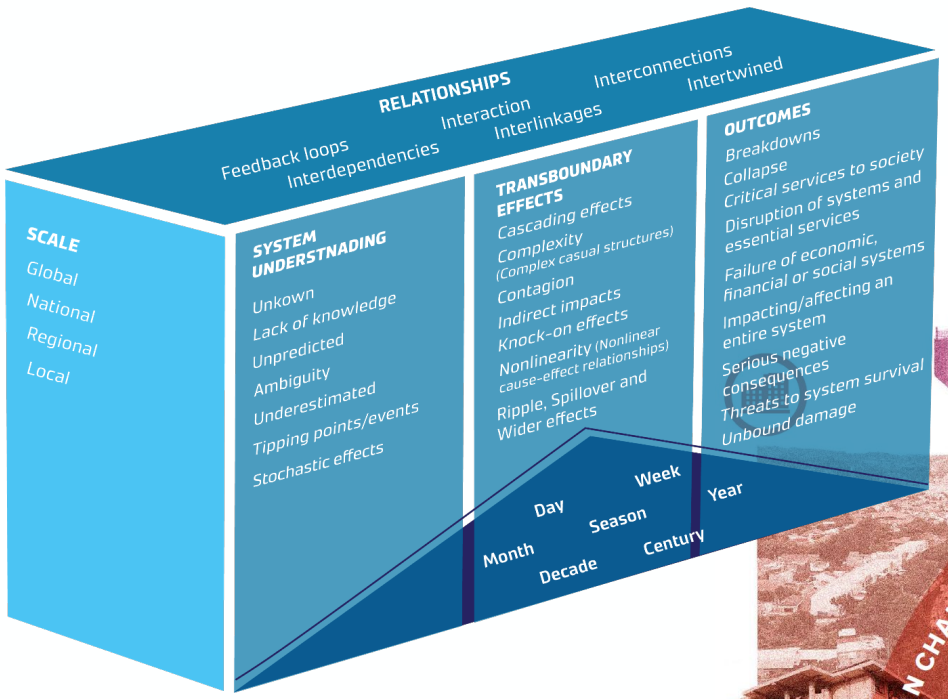
Green Climate Fund

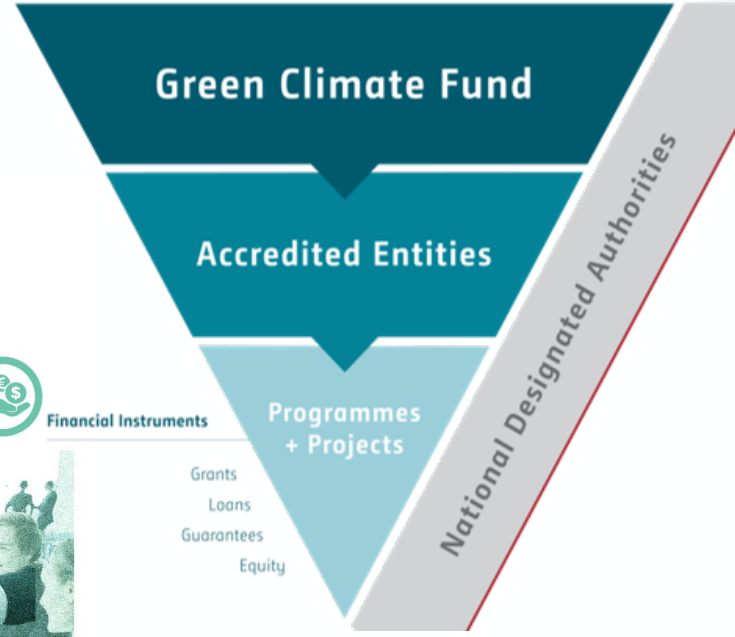
Transforming Adaptation: Water-Energy-Food Security Nexus

Dr Bapon Fakhruddin

Water Sector Lead

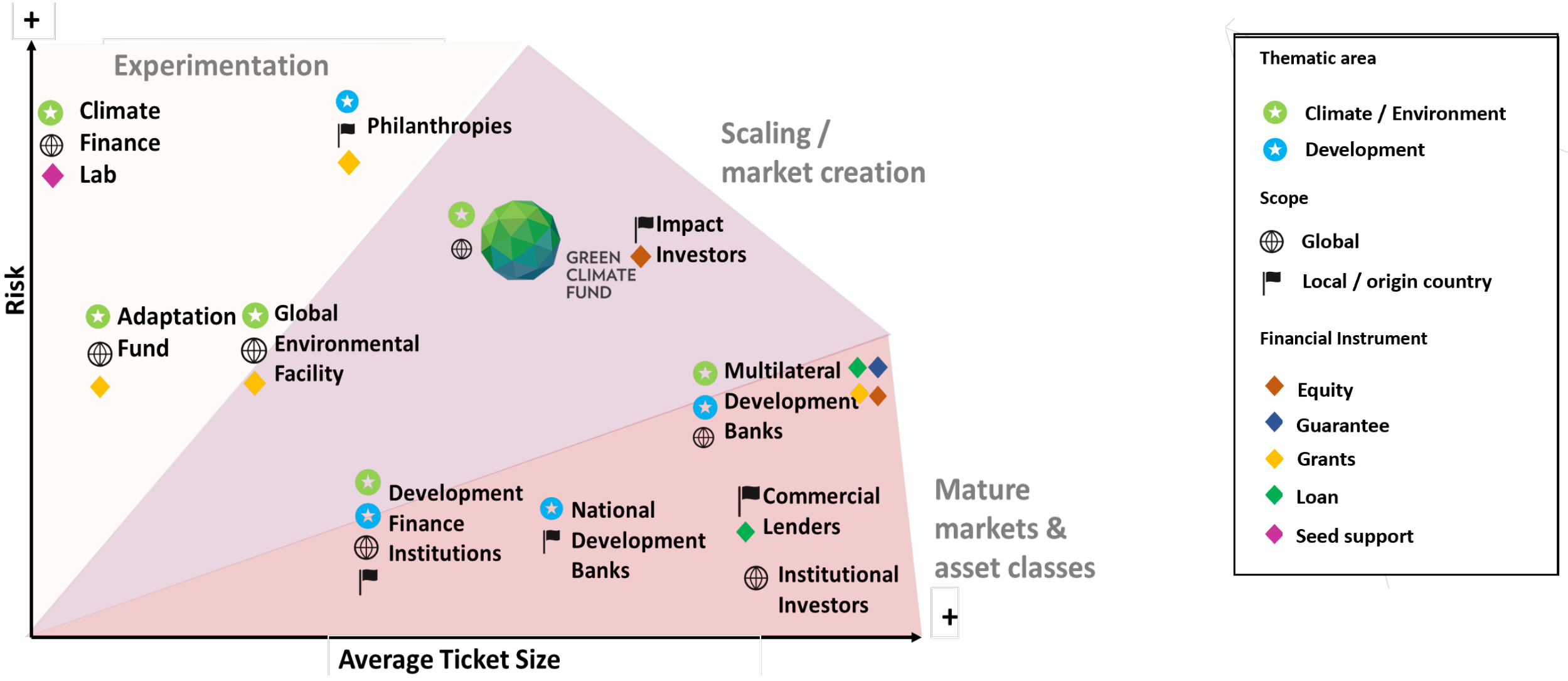
Attributes of systematic, interconnected, and cascading risk and partnership





(Source: Fakhruddin et al., 2022)

GCF is positioned for scaling & market creation: A unique nexus of scale and risk-appetite

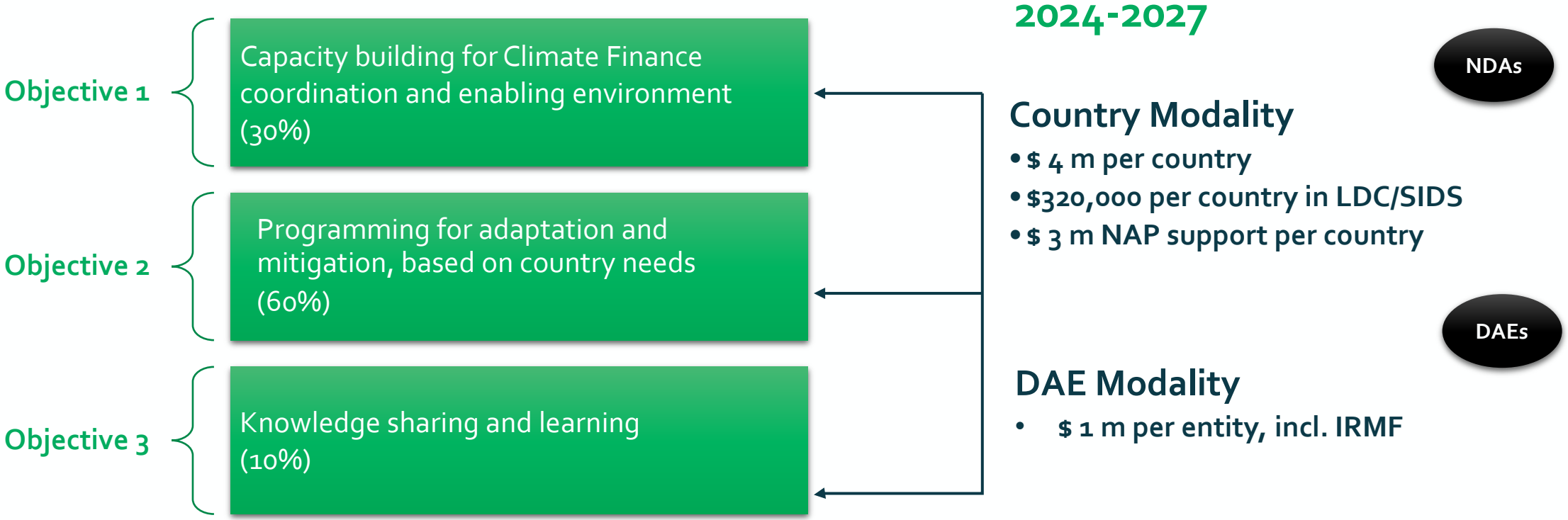


‘50 by 30’ Vision

GREEN
CLIMATE
FUND

1. Target and reach the most vulnerable people and communities.
2. Maximize private sector investments.
3. Reinvent the partnership model.
4. Simplify the project review and approval processes
5. From one-off projects to programmatic and systemic responses.

Fostering an environment for green investments through Readiness support

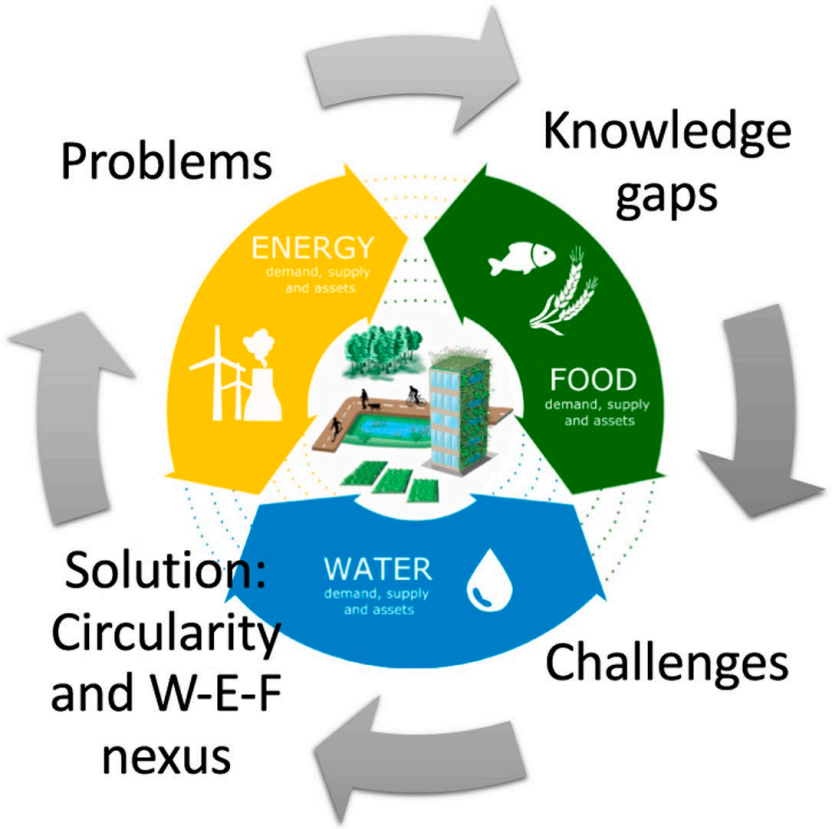


2024-2027 programming priorities

GREEN CLIMATE FUND

1. Readiness and Preparatory Support: Enhanced focus on climate programming and direct access;
2. Mitigation and Adaptation: Supporting paradigm shifts across sectors;
3. Adaptation: Addressing urgent and immediate adaptation and resilience needs including for the most vulnerable; and
4. Private Sector: Promoting innovation and catalysing green financing

Water-Energy-Food Nexus



Challenges
- Technical
- Sustainability and barriers
- Governance

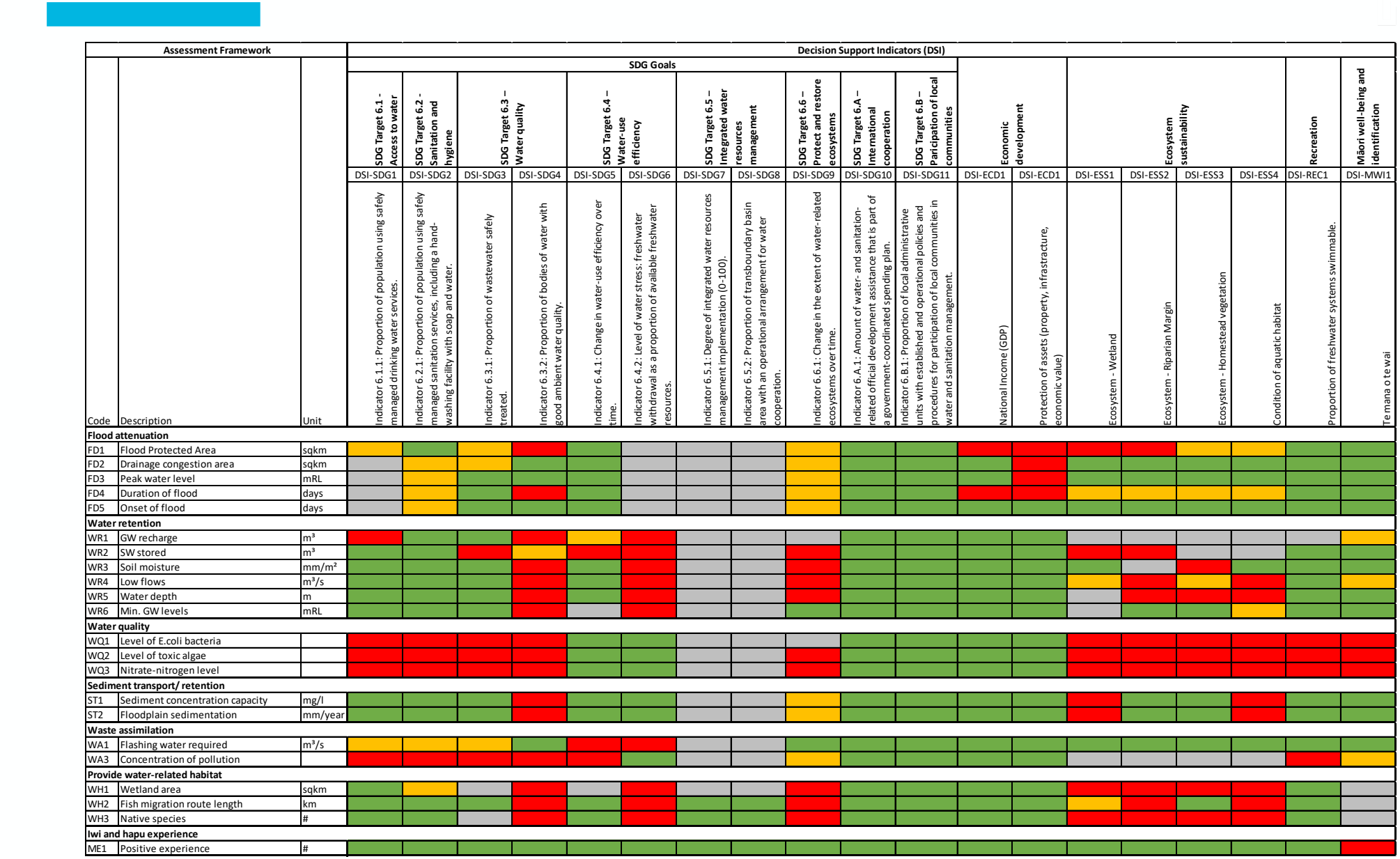
Problem
- Climate change
- Food security
- Water cycle disruption
- Renewable energy supply

Solution: Circularity and W-E-F nexus
- Avoiding to cross the planetary boundaries
- Ensuring W-E-F security by means of circular flows
- Adoption of systemic thinking and multipurpose design

Knowledge gaps
- Few integrated assessments
- Lack of appropriate (or fitting) indicators and their quantification
- Lack of design tools and parameters
- Lack of economic assessment

(Source: Pedro et al., 2022)

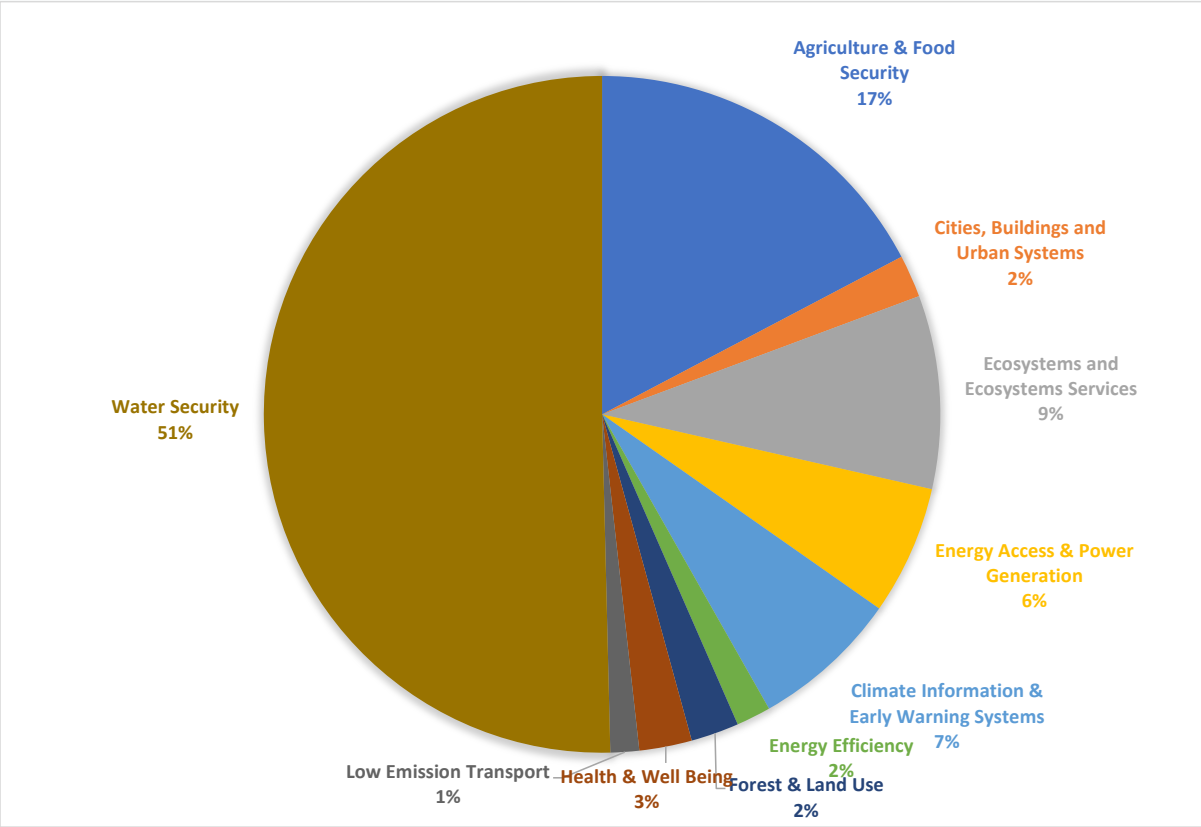

GREEN
CLIMATE
FUND

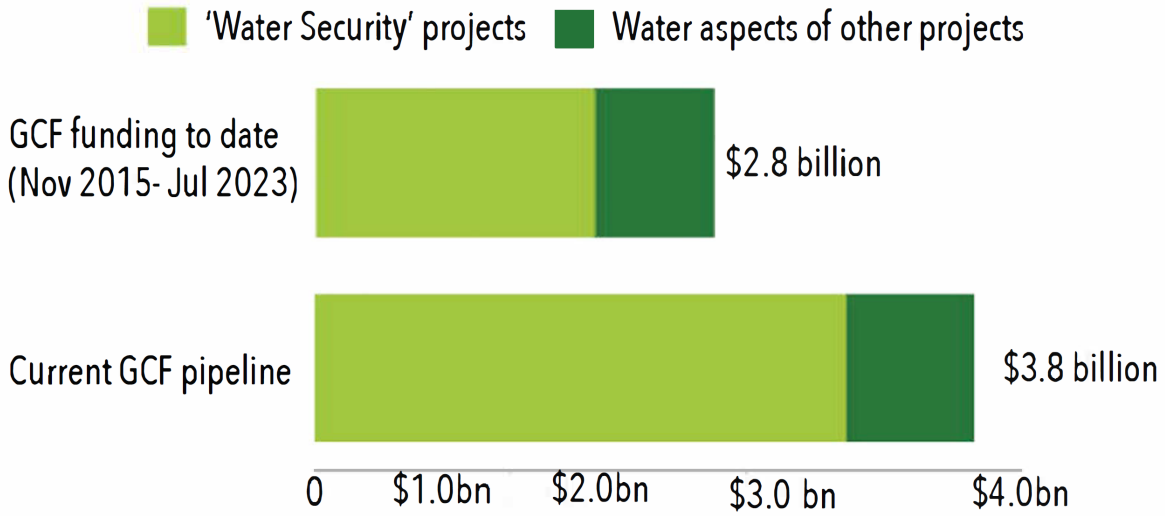


Assessment Framework			Decision Support Indicators (DSI)																			
			SDG Goals											Economic development		Ecosystem sustainability				Recreation	Māori well-being and identification
			SDG Target 6.1 - Access to water	SDG Target 6.2 - Sanitation and hygiene	SDG Target 6.3 – Water quality		SDG Target 6.4 – Water-use efficiency		SDG Target 6.5 – Integrated water resources management		SDG Target 6.6 – Protect and restore ecosystems	SDG Target 6.A – International cooperation	SDG Target 6.B – Paricipation of local communities								
			DSI-SDG1	DSI-SDG2	DSI-SDG3	DSI-SDG4	DSI-SDG5	DSI-SDG6	DSI-SDG7	DSI-SDG8	DSI-SDG9	DSI-SDG10	DSI-SDG11	DSI-ECD1	DSI-ECD1	DSI-ESS1	DSI-ESS2	DSI-ESS3	DSI-ESS4	DSI-REC1	DSI-MWI1
Code	Description	Unit	Indicator 6.1.1: Proportion of population using safely managed drinking water services.	Indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water.	Indicator 6.3.1: Proportion of wastewater safely treated.	Indicator 6.3.2: Proportion of bodies of water with good ambient water quality.	Indicator 6.4.1: Change in water-use efficiency over time.	Indicator 6.4.2: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.	Indicator 6.5.1: Degree of integrated water resources management implementation (0-100).	Indicator 6.5.2: Proportion of transboundary basin area with an operational arrangement for water cooperation.	Indicator 6.6.1: Change in the extent of water-related ecosystems over time.	Indicator 6.A.1: Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan.	Indicator 6.B.1: Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management.	National Income (GDP)	Protection of assets (property, infrastracture, economic value)	Ecosystem - Wetland	Ecosystem - Riparian Margin	Ecosystem - Homestead vegetation	Condition of aquatic habitat	Proportion of freshwater systems swimmable.	Te mana o te wai
Flood attenuation																						
FD1	Flood Protected Area	sqkm																				
FD2	Drainage congestion area	sqkm																				
FD3	Peak water level	mRL																				
FD4	Duration of flood	days																				
FD5	Onset of flood	days																				
Water retention																						
WR1	GW recharge	m^3																				
WR2	SW stored	m^3																				
WR3	Soil moisture	mm/m^2																				
WR4	Low flows	m^3/s																				
WR5	Water depth	m																				
WR6	Min. GW levels	mRL																				
Water quality																						
WQ1	Level of E.coli bacteria																					
WQ2	Level of toxic algae																					
WQ3	Nitrate-nitrogen level																					
Sediment transport/ retention																						
ST1	Sediment concentration capacity	mg/l																				
ST2	Floodplain sedimentation	mm/year																				
Waste assimilation																						
WA1	Flashing water required	m^3/s																				
WA3	Concentration of pollution																					
Provide water-related habitat																						
WH1	Wetland area	sqkm																				
WH2	Fish migration route length	km																				
WH3	Native species	#																				
Iwi and hapu experience																						
ME1	Positive experience	#																				

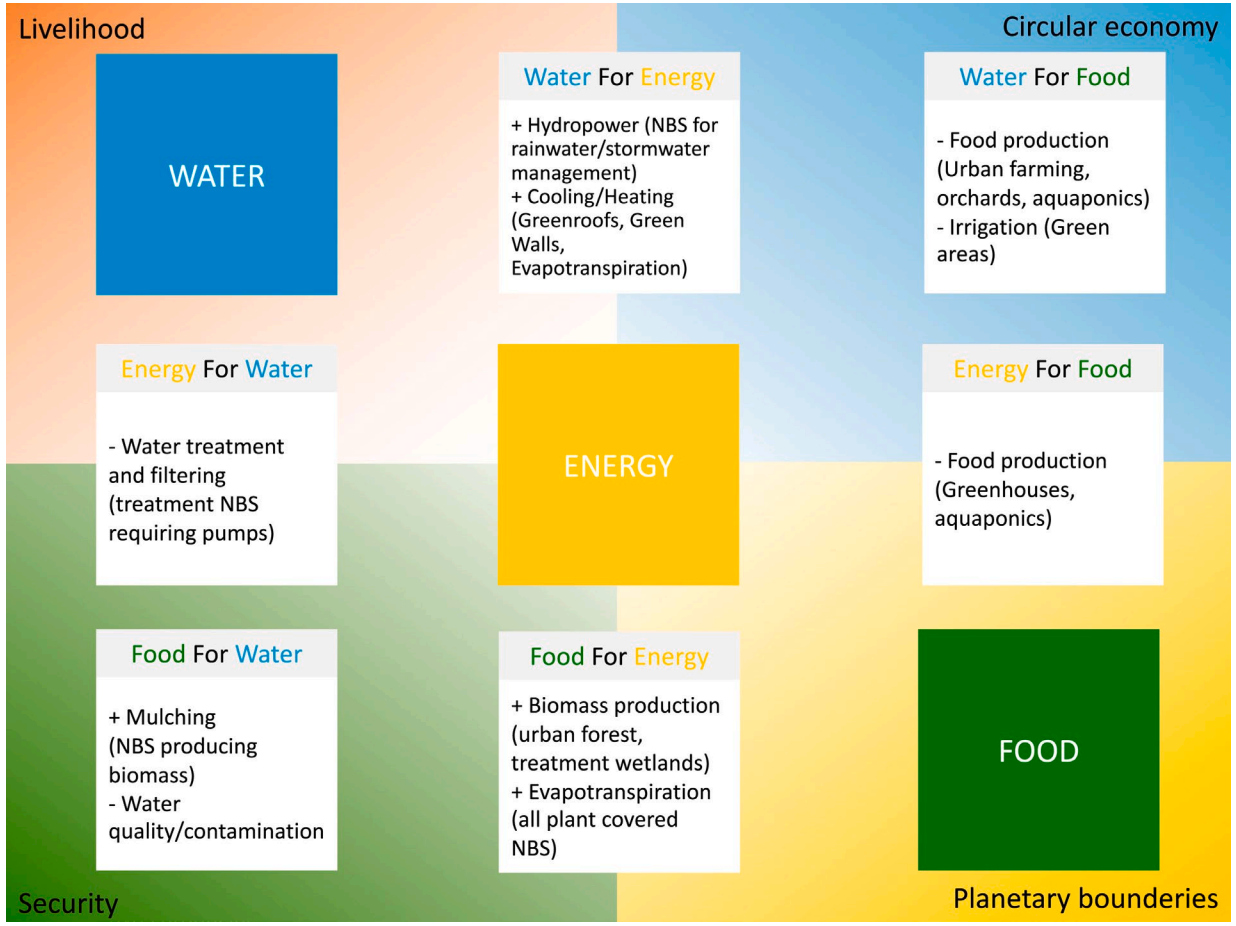
Relationship between SIs + DSIs

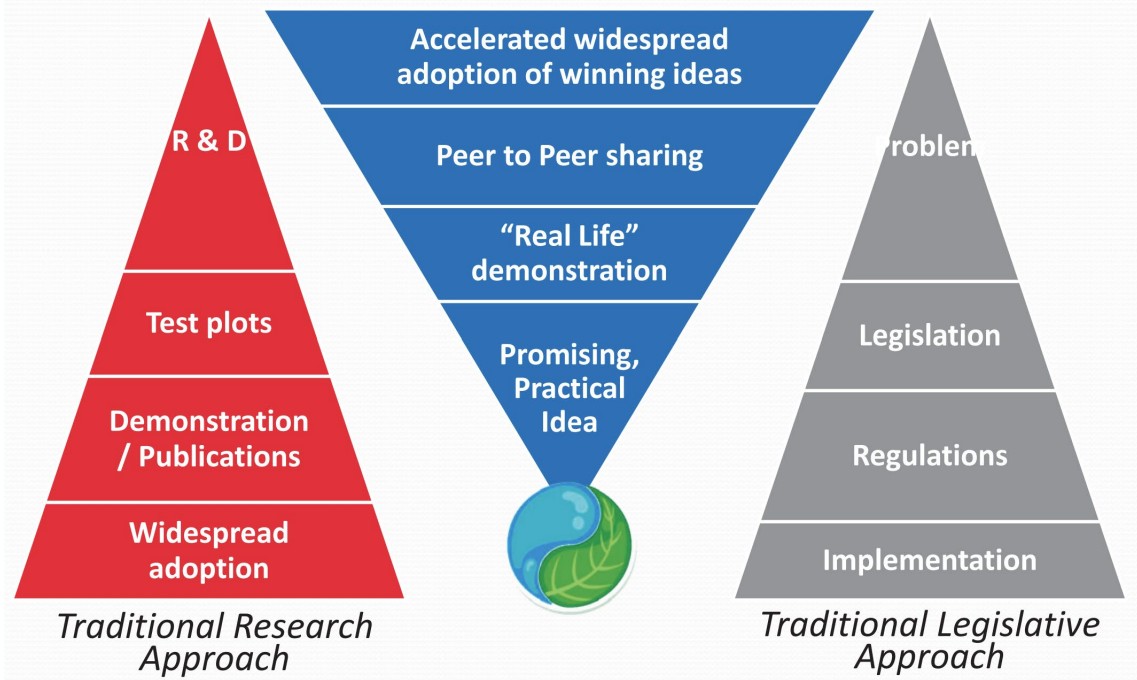
Water Security Projects (2023)





W-E-F Transformational Adaptation





Water Security Transformation

Blending grants with innovative financial instruments like water bonds, cat bonds, guarantors, investment, insurance, debt for climate swaps

GREEN CLIMATE FUND

Flexible and delegated need-based projects for countries using nexus and integrated approach

WSCR-CoP

Pathways

- Water conservation, efficiency and reuse
  - Global & regional lead advocacy
- Hydrological observation, forecasting & risk assessment
  - Global & regional lead advocacy
- Integrated water management & SDG
  - Global & regional lead advocacy
- Ecosystems Based Adaptation
  - Global & regional lead advocacy
- Climate resilience WASH
  - Global & regional lead advocacy
- Community Knowledge
  - Global & regional lead advocacy

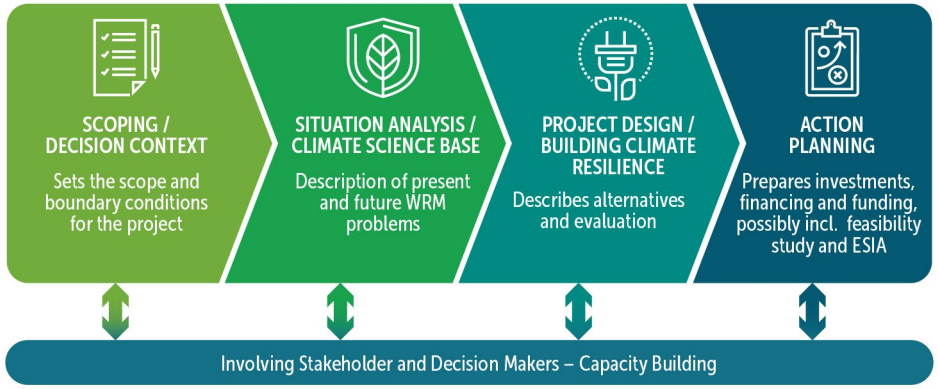
GCF-accredited AEs/DAEs

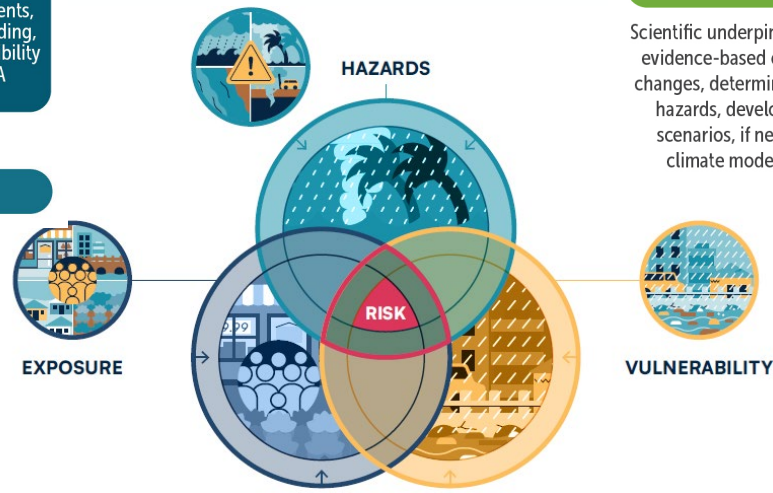
Enabling environment, policies, frameworks → Transformational planning and programming → Innovative approaches/asset transition → Mobilization of finance/Investments → Coordination, learning and knowledge

GCF Investment criteria for Water Security Sector

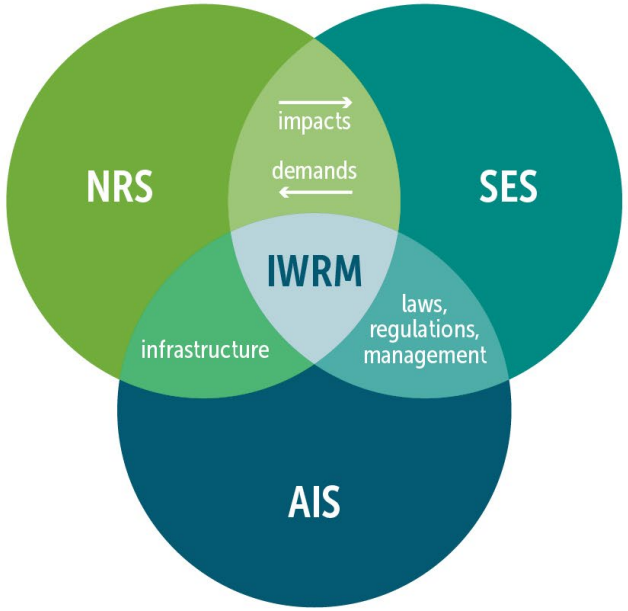
Impact potential	High-impact areas in water security are countries and project areas with high to extreme water stress
Paradigm shift	Move climate finance from grant funding to concessional finance and then enable private finance for scaling=up
Sustainable development	724 climate actions identified under UN-SDG6 combined with gender and minority sensitive development impacts
Recipients needs	Limitations in institutional support; need for developing capacity; and mechanisms for monitoring compliance
Promote country ownership	Bring together ministries, National Designated Authorities & constituents going beyond climate policies
Efficiency & effectiveness	Project design builds on best practices and lessons learned

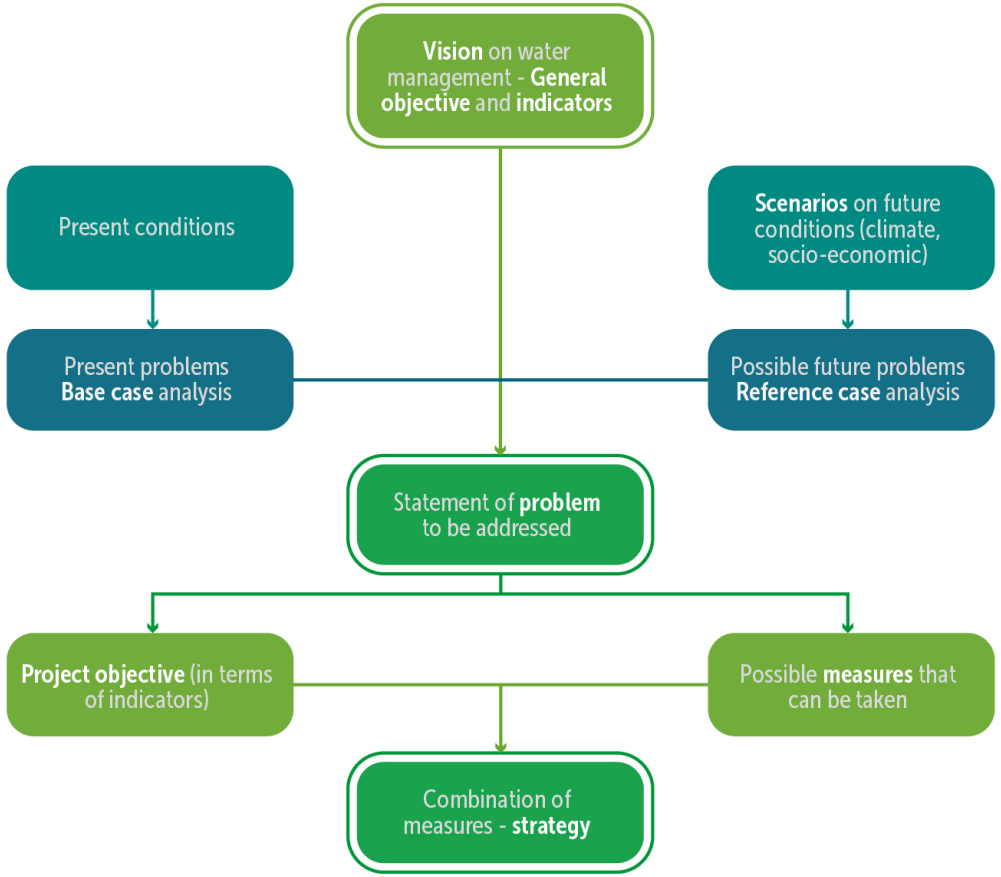
Key Principles- Structured approach for project design





Approach and terminology in developing a project



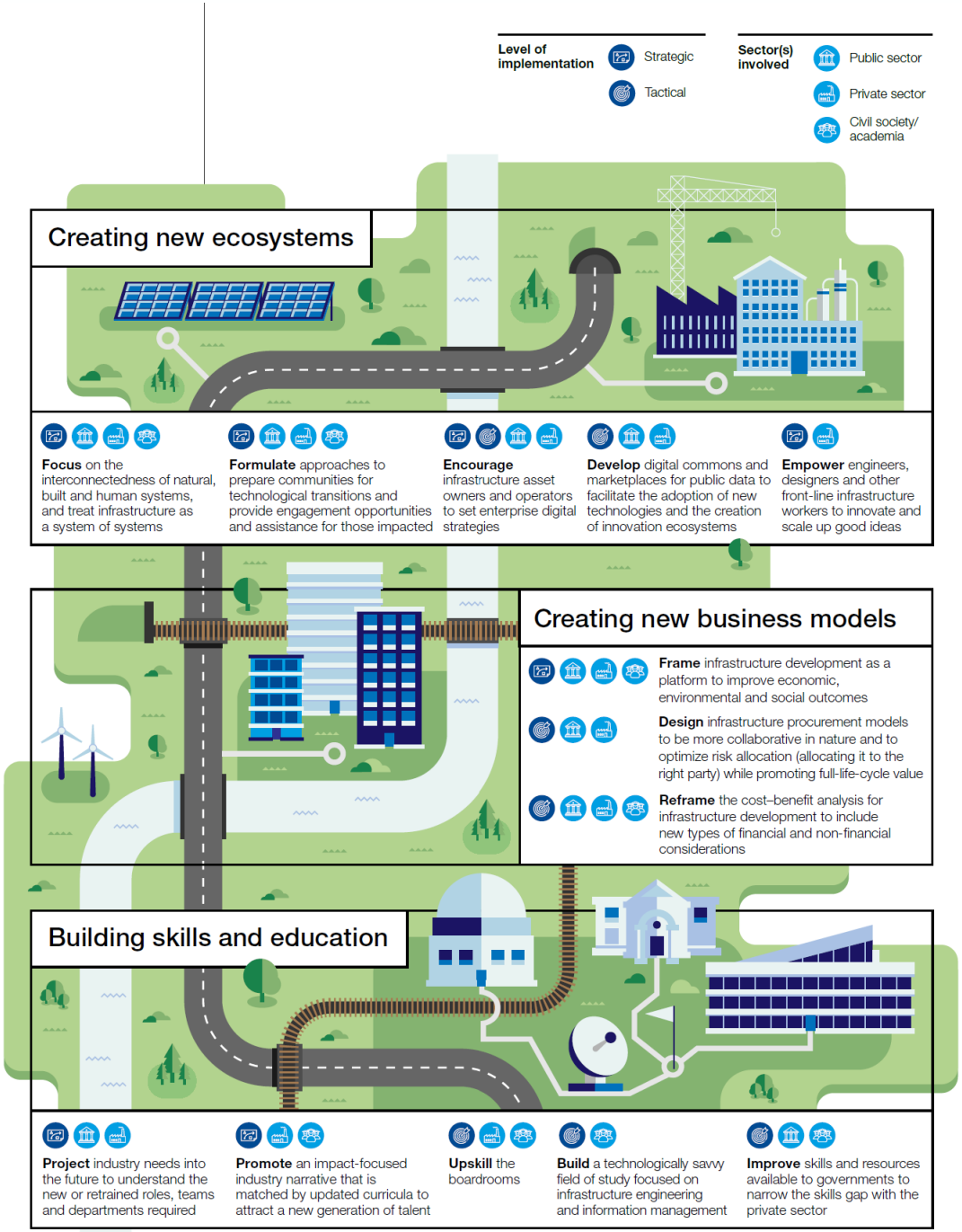


Water-Energy-Food Nexus- Transformative Potential

Technology	Water-Energy Nexus	Water-Food Nexus	Food-Energy Nexus	Water-Energy-Food Nexus	Transformative Potential for Climate Action
Nature-based solutions (NBS)	Engström et al. (2018)	-	-	Bennett et al. (2016)	Enhances ecosystem services, carbon sequestration, and resilience
Urban trees, forests, and green spaces	Livesley et al. (2016)	-	-	-	Reduces urban heat island effect, improves air quality, and sequesters carbon
Green roofs	Engström et al. (2017)	-	-	-	Reduces building energy consumption, improves stormwater management, and sequesters carbon
Constructed wetlands	Kumar and Singh (2020)	Langergraber and Masi (2018), Masi et al. (2018)	-	Avellan et al. (2017), Avellán and Gremillion (2019)	Treats wastewater, provides habitat, and sequesters carbon
Floodable parks	-	-	-	Jodar-Abellan et al. (2018), Miguez et al. (2019)	Reduces flood risk, improves water quality, and provides recreational space
Retention ponds	Ramos et al. (2013a, 2013b, 2013a)	-	-	-	Manages stormwater, improves water quality, and provides habitat
Urban farming/agriculture	-	-	Nadal et al. (2017)	Amos et al. (2018), Avgoustaki and Xydis (2020), Mohareb et al. (2017), Toboso-Chavero et al. (2019)	Reduces food miles, improves food security, and sequesters carbon
"Ponics" (hydroponics, aquaponics, aeroponics)	-	-	Nadal et al. (2017)	Proksch and Baganz (2020)	Reduces water and energy consumption, improves food production efficiency, and reduces waste


GREEN
CLIMATE
FUND

Infrastructure 4.0: Achieving Better Outcomes with Technology and Systems Thinking



Source: World Economic Forum

INSPIRE more climate ACTION