Implementation of River Basin Management Plans of Latvia towards good surface water status" (LIFE GOODWATER)

International Conference **"Nature-based solutions (NBS) for improvement of water quality and river basin management**" 26-27 October 2022, Riga, Latvia

'NBS and Ecosystem Services Frameworks Towards Reforming the Conventional Water Governance Agenda': "Crossing the Barriers to Water Security"

Dr Nidhi Nagabhatla

McMaster University

UNITED NATIONS UNIVERSITY

UNU-CRIS

Institute on Comparative Regional Integration Studies

MILLENNIUM ECOSYSTEM ASSESSMENT

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Guide to the Millennium Assessment Reports

Full Reports

The Working Group assessment reports are between 500–800 pages in length, with a volume of summaries of about 120 printed pages.

Learn more

- Current States & Trends
- Scenarios
- Policy Responses
- Multiscale Assessments

Synthesis Reports

The first set of assessment reports consists of an overall synthesis and 5 others that interpret the MA findings for specific audiences.

Learn more

- Overall synthesis
- Biodiversity
- Desertification
- Business & Industry
- Wetlands and Water
- Health

Statement of the MA Board

The MA Board of Directors has developed an interpretation of the key messages to emerge from the assessment, entitled *Living Beyond Our Means: Natural Assets and Human Well-Being.*

Learn more

Download the Statement

About the MA Board of Directors

A Framework for Assessment

In late 2003, the MA and Island Press published *Ecosystems and Human Well-being: A Framework for Assessment.* This volume lays out the assumptions, processes and parameters that were used in the MA.

Learn more

ICSU

About the Millennium Assessment

The Millennium Ecosystem Assessment assessed the consequences of ecosystem change for human well-being. From 2001 to 2005, the MA involved the work of more than 1,360 experts worldwide. Their findings provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide, as well as the scientific basis for action to conserve and use them sustainably.

Read More

Useful Links

ISLANDPRESS

Order printed reports from Island Press

GreenFacts.org

GreenFacts: Popularized synthesis report

USGS

MA Data Portal

Also on This Site

Directory of Authors

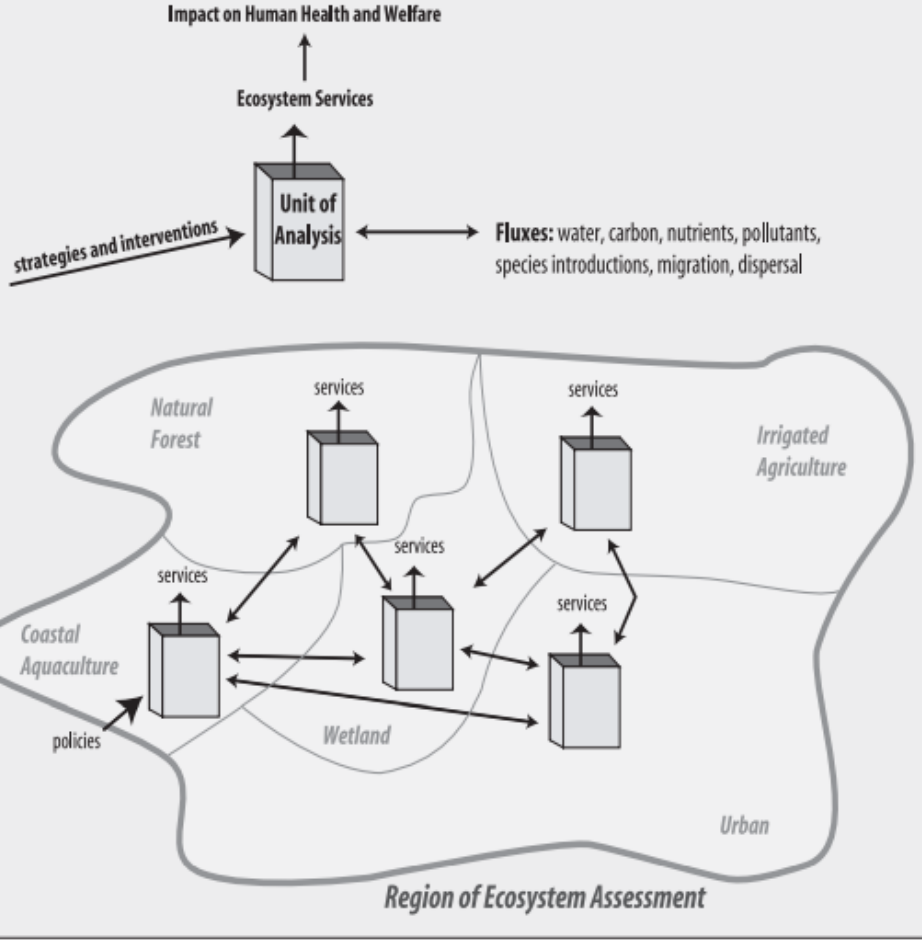
Slide Presentations

https://www.millenniumassessment.org/en/index.html

BOX 2.3 Analysis of Ecosystem Services

Any region of Earth produces a set of services that in turn influences human well-being. It also receives flows of energy, water, organisms, pollutants, and other materials from adjacent regions and releases similar materials into those regions. Various strategies and interventions influence the quantity and quality of the services provided.

An ecosystem is typically composed of a number of different regions, such as forest, agriculture, and urban areas, each of which produces a different bundle of services. In an ecosystem assessment, both the production of services from each area and the flows of materials between areas must be assessed.



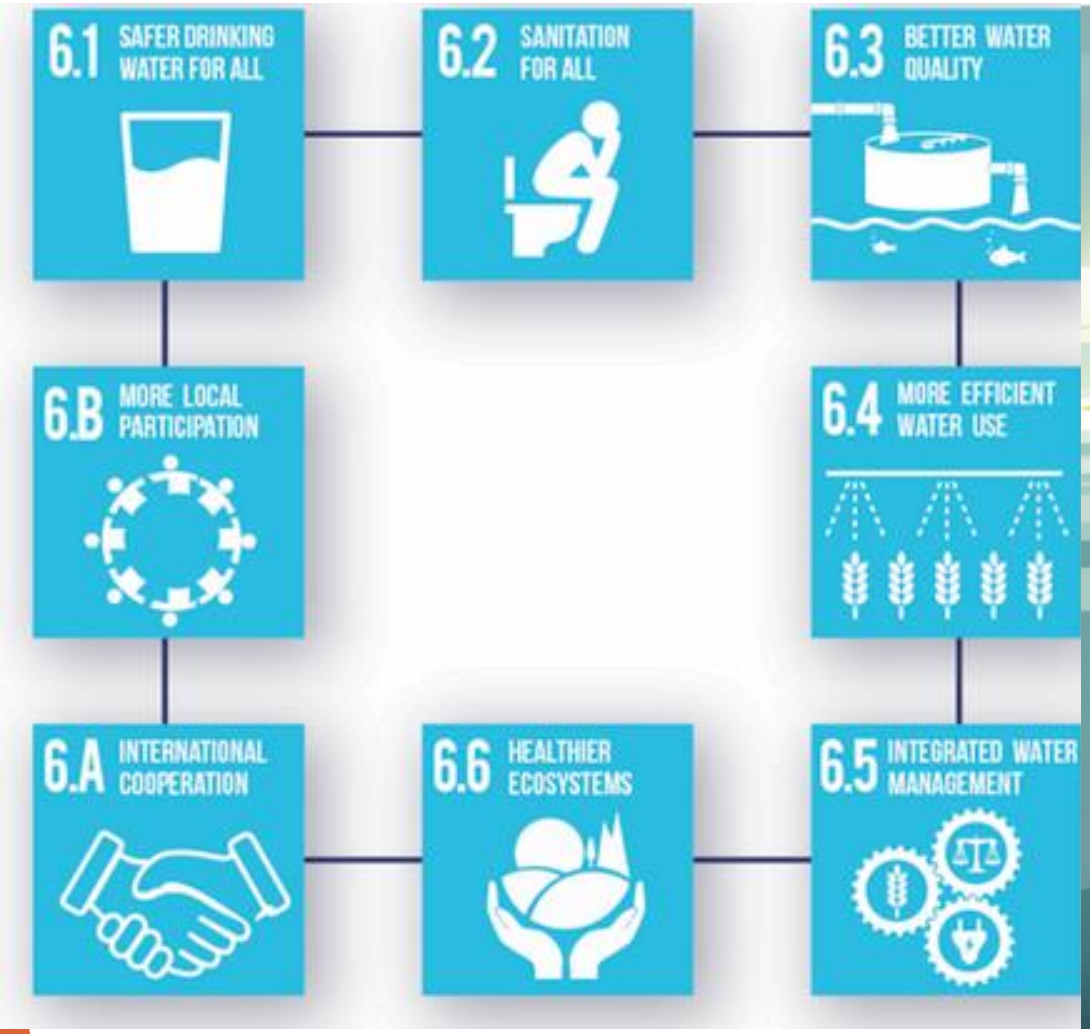
https://www.millenniumassessment.org/documents/document.300.aspx.pdf

https://sustainabledevelopment.un.org

SUSTAINABLE DEVELOPMENT GOALS (SDGs)

17 goals, 169 targets, several indicators per target

Adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future



SDG6 : "ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL"

Each target has several numerical indicators that need to be regularly monitored in countries

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Agents and Agency

SUSTAINABLE DEVELOPMENT GOAL 16

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

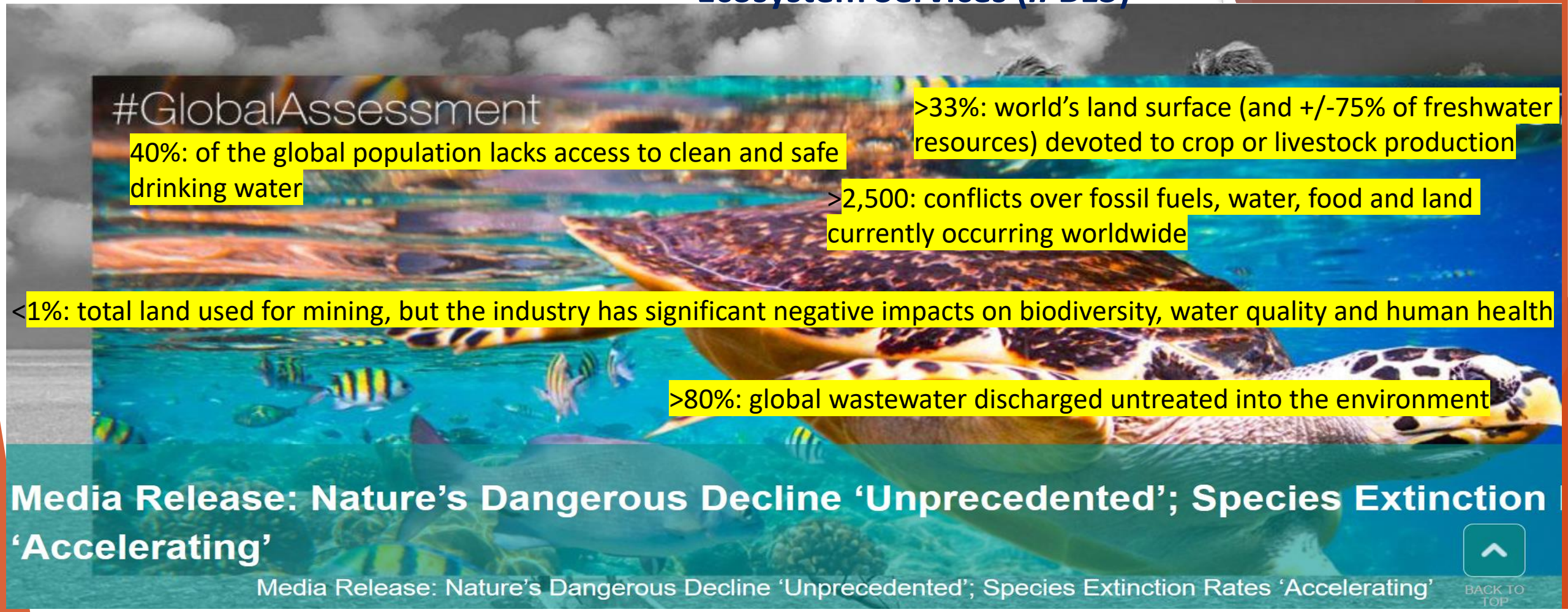
SUSTAINABLE DEVELOPMENT GOAL 17

Strengthen the means of implementation and revitalize the global partnership for sustainable development

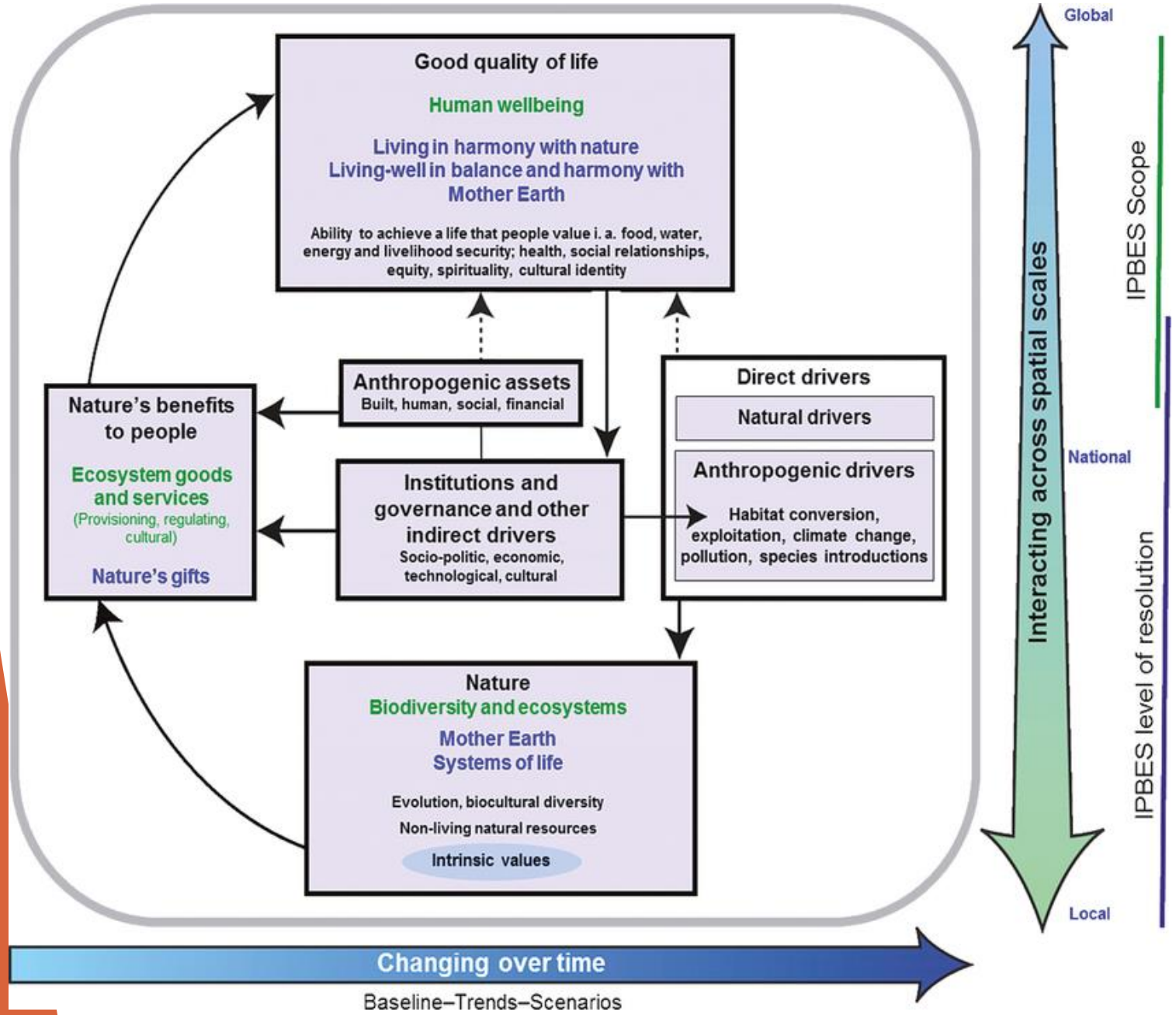
17 PARTNERSHIPS FOR THE GOALS

https://www.ipbes.net/

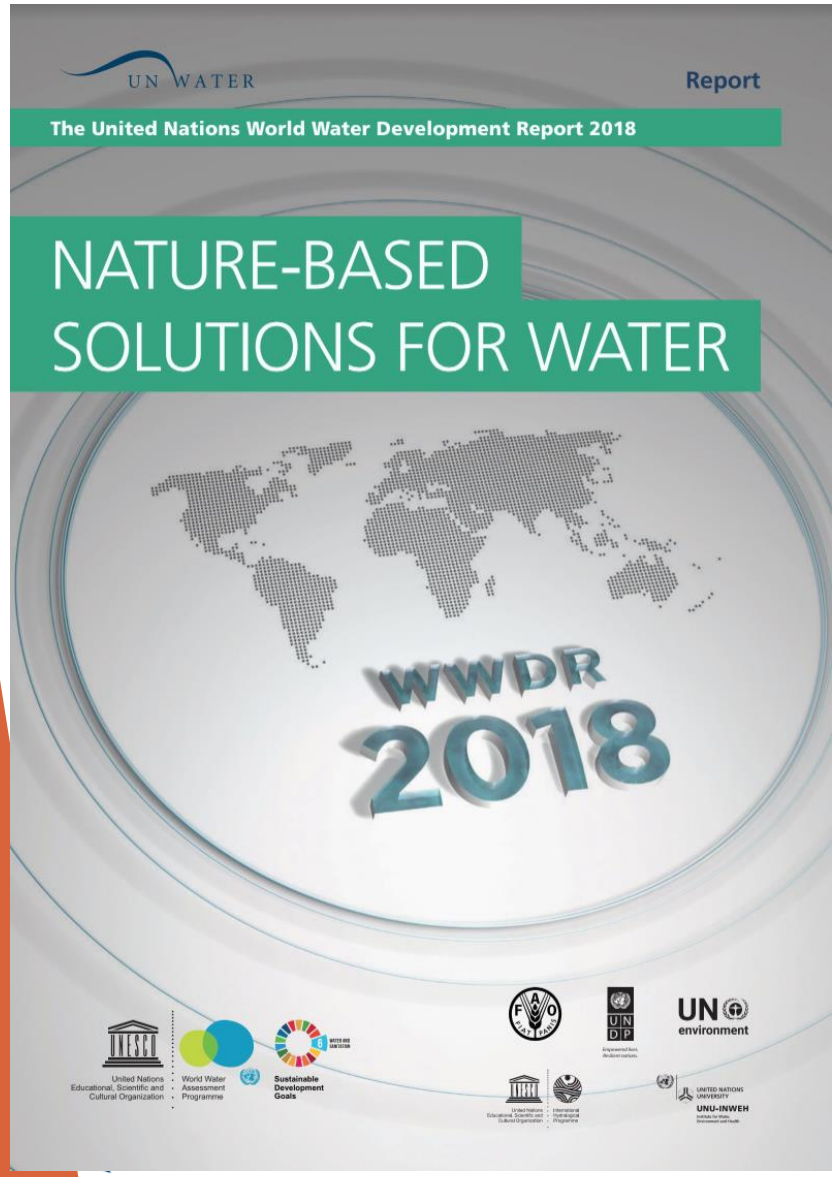
The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (*IPBES*)

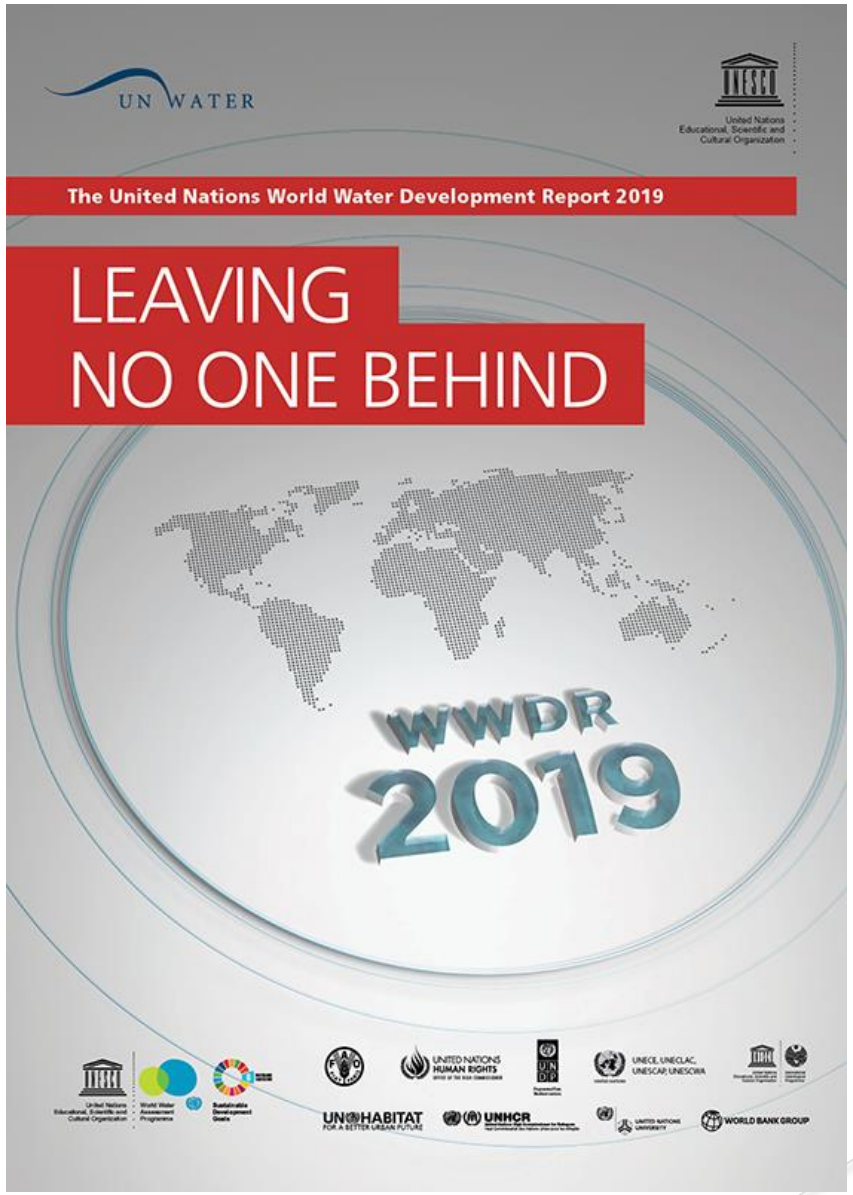


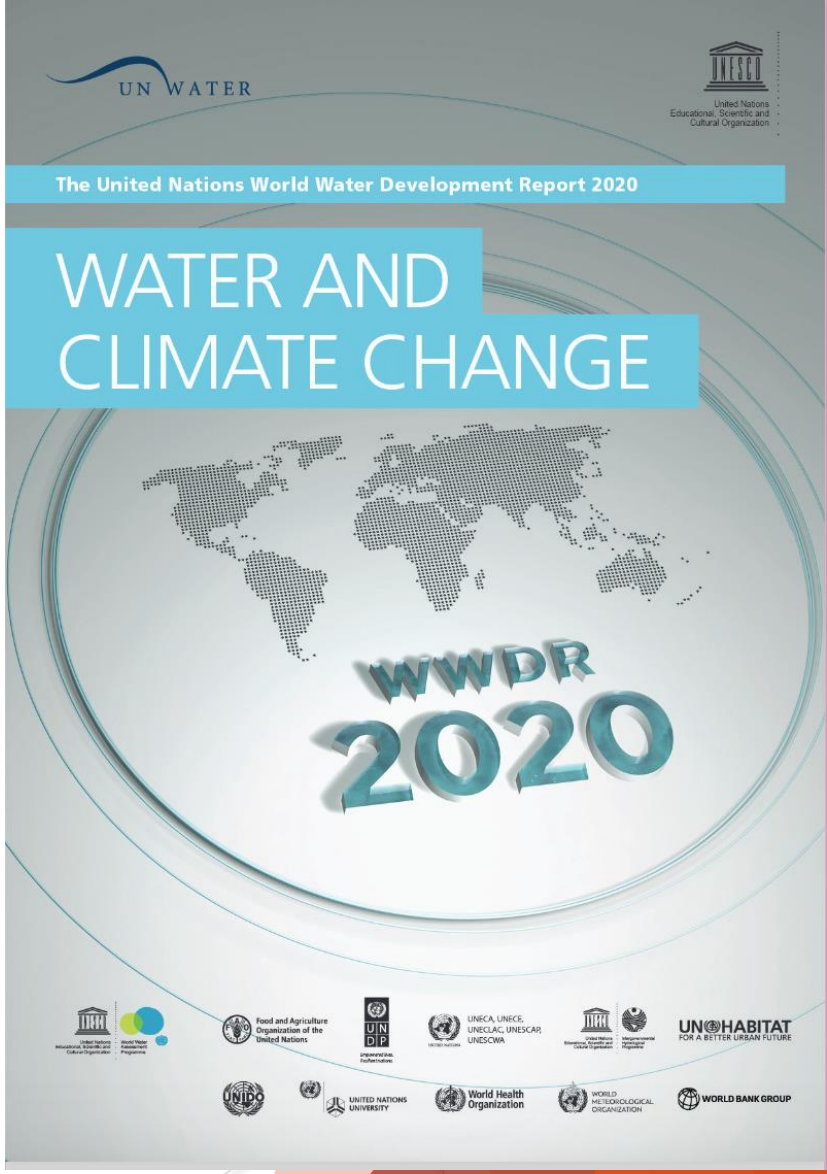
25%: average proportion of species threatened with extinction across terrestrial, freshwater and marine species that have been studied in sufficient detail


Good quality of life
Human wellbeing
Living in harmony with nature
Living-well in balance and harmony with Mother Earth
Ability to achieve a life that people value i. a. food, water, energy and livelihood security; health, social relationships, equity, spirituality, cultural identity
Anthropogenic assets
Built, human, social, financial
Nature's benefits to people
Ecosystem goods and services
(Provisioning, regulating, cultural)
Nature's gifts
Institutions and governance and other indirect drivers
Socio-politic, economic, technological, cultural
Direct drivers
Natural drivers
Anthropogenic drivers
Habitat conversion, exploitation, climate change, pollution, species introductions
Nature
Biodiversity and ecosystems
Mother Earth
Systems of life
Evolution, biocultural diversity
Non-living natural resources
Intrinsic values
Changing over time
Baseline–Trends–Scenarios
Global
Interacting across spatial scales
National
Local
IPBES Scope
IPBES level of resolution

UN World Water Development Reports

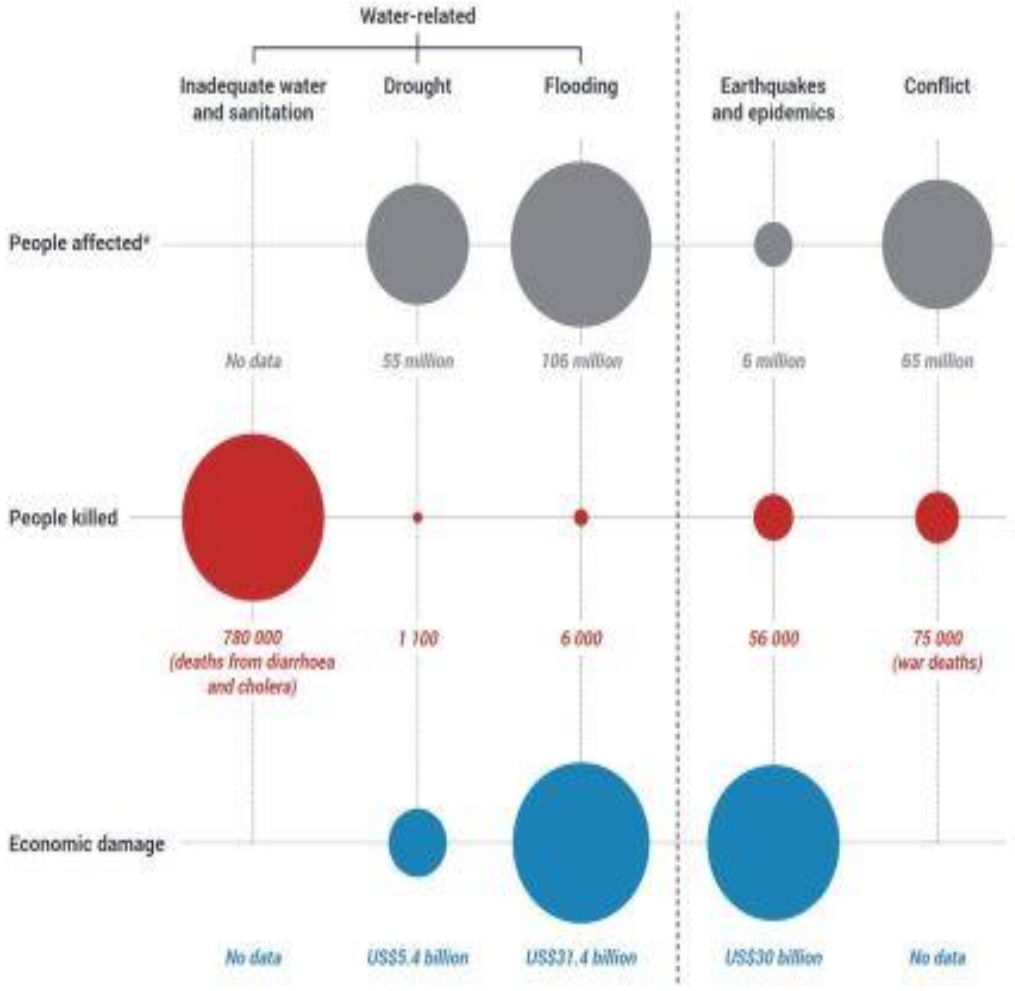






WWDR 2019

Figure 1 Average annual impact from inadequate drinking water and sanitation services,[1] water-related disasters, epidemics and earthquakes, and conflicts



*People affected are defined as those requiring immediate assistance during a period of emergency; this may include displaced or evacuated people.

Source: Adapted from PBL Netherlands Environmental Assessment Agency (2018, p. 14). Licensed under Creative Commons Attribution 3.0 Unported (CC BY 3.0).

What is Water Security

Water security, at any level—from the household to the global—means that every person has access to enough safe water, at an affordable cost, to lead a clean, healthy, and productive life, while ensuring that the natural environment is protected and enhanced *Global Water Partnership. Towards Water Security: A Framework for Action; GWP: Stockholm, Sweden, 2000.*

Water security is the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems, and production, coupled with an **acceptable level of water-related risks** to people, environments, and economies-

Grey,and Sadoff, C.W. Sink or Swim? Water security for growth and development. Water Policy 2007

Water security is the **capacity of a population** to safeguard sustainable access to adequate quantities and acceptable quality of water for sustaining livelihoods, **human well-being**, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of **peace and political stability**.

UN-Water, Water Security and Global Water Agenda: UN-Water Analytical Brief ; UNU INWEH: 2013.

What is Water Security?

"The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability."

Working definition, UN-Water, 2013

GOOD GOVERNANCE

Adequate legal regimes, institutions, infrastructure and capacity are in place.

TRANSBOUNDARY COOPERATION

Sovereign states discuss and coordinate their actions to meet the varied and sometimes competing interests for mutual benefit.

DRINKING WATER AND HUMAN WELL-BEING

Populations have access to safe, sufficient and affordable water to meet basic needs for drinking, sanitation and hygiene, to safeguard health and well-being, and to fulfill basic human rights.

ECONOMIC ACTIVITIES AND DEVELOPMENT

Adequate water supplies are available for food and energy production, industry, transport and tourism.

ECOSYSTEMS

Ecosystems are preserved and can deliver their services, on which both nature and people rely, including the provision of freshwater.

WATER-RELATED HAZARDS AND CLIMATE CHANGE

Populations are resilient to water-related hazards including floods, droughts and pollution.

PEACE AND POLITICAL STABILITY

The negative effects of conflicts are avoided, including reduced water quality and/or quantity, compromised water infrastructure, human resources, related governance, and social or political systems.

FINANCING

Innovative sources of financing complement funding by the public sector, including investments from the private sector and micro-financing schemes.

Water is central to achieving a larger sense of security, sustainability, development and human well-being. UN-water supports the inclusion of water security in the post-2015 development agenda as part of the Sustainable Development Goals.

World Water Day 2013 International Year of Water Cooperation

Achieving water security requires collaboration across sectors, communities, disciplines and political borders, to reduce the risk of potential conflicts over water resources, between sectors and between water users or states.

UN WATER

www.watercooperation2013.org www.unwater.org

Issue 03 | August 2017

UNU-INWEH

POLICY BRIEF

UNITED NATIONS UNIVERSITY
UNU-INWEH
Institute for Water, Environment and Health

WITHOUT WATER, NOTHING IS SECURE

Water Security and IWRM join forces to deliver effective and measurable SDG plans; country decision makers will benefit from them.

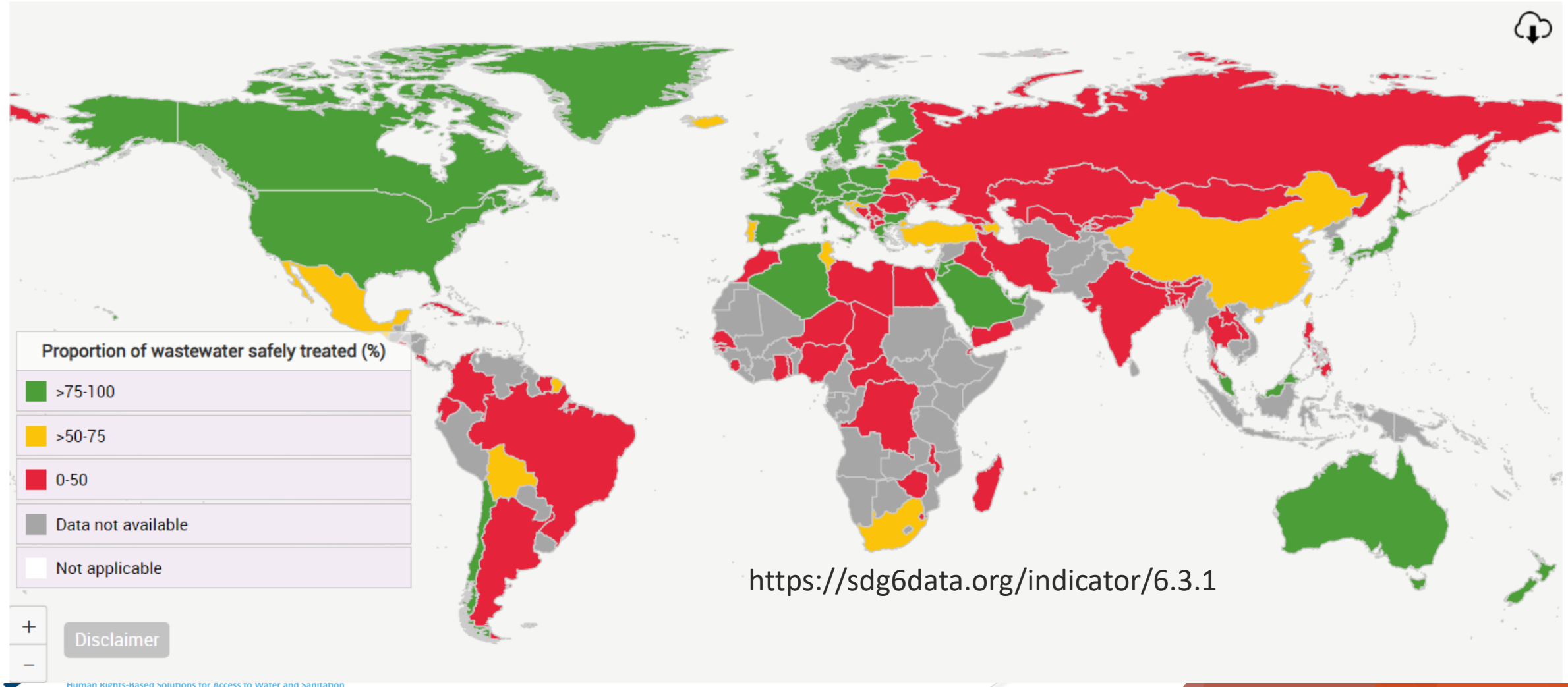
Key Messages

- Future innovations that improve water management depend on novel ideas. Framing these around the concept of 'water security' is a strategy that will improve the effectiveness of management and its related policies – benefiting the efforts of countries, as well as local, regional and global water institutions.
- The concept (of water security) is gaining attention on the world stage. Yet, today, there is no agreed understanding, definition and action agenda for water security that is fully supported by the UN. Stakeholders in the water sector can consider the UN-Water Task Force on Water Security's proposed working definition to align their water management priorities and goals.
- As security issues move beyond a limited focus on military risks and conflicts, there is a renewed interest, at UN Security Council level, on water security – despite concerns expressed by some Member States that it may contravene national security, and human and environmental security.
- The underlying message of the Sustainable Development Goals is to 'leave no one behind'. Achieving several of the 17 SDGs will ensure that water is better managed and available for multiple uses. Achieving this will mean that water is secured for all.
- Attempts to measure water security are being made by a number of international organisations and programs. It is deemed important that the concept of water security is operationalised. However, water security may not be just a finite target, but an evolving concept that needs to be adapted to changing circumstances to ensure the best possible outcomes.

Circularity in Water (Water Water) Management

The data displayed in the below maps and charts are preliminary estimates (based on data available in August 2018) and may change.

Global status of Indicator 6.3.1 Proportion of domestic and industrial wastewater flow safely treated (2020)

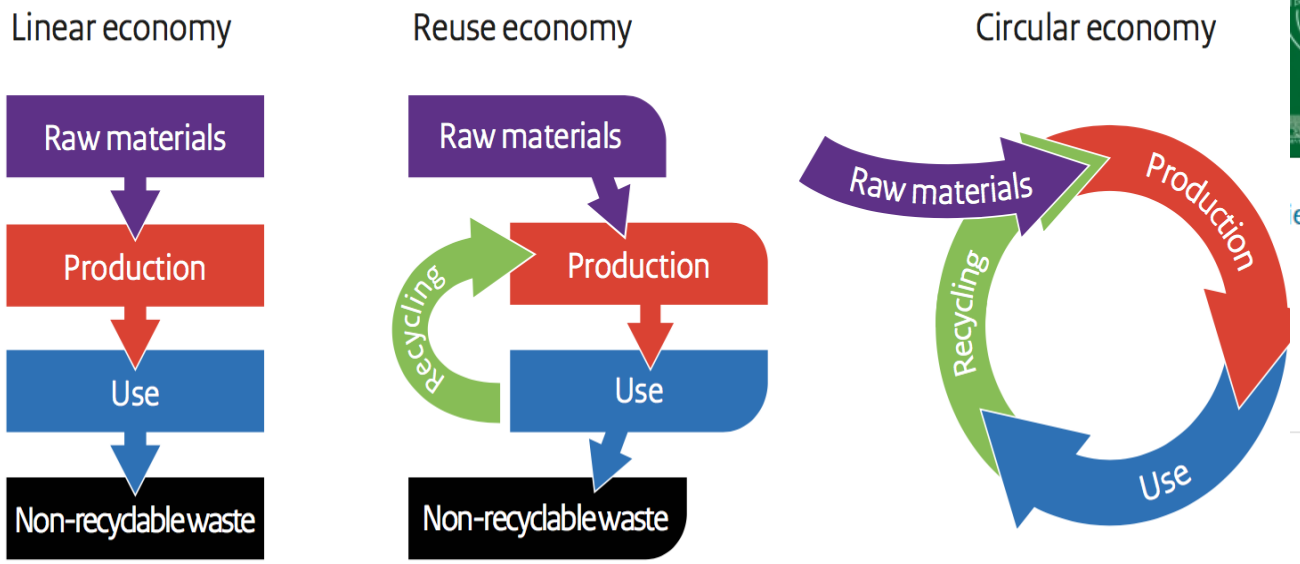


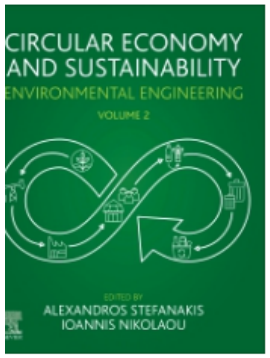
https://sdg6data.org/indicator/6.3.1

Transformative Pathway

http://cocreatesa.nl/news/the-transition-to-the-circular-economy-and-why-it-bodes-well-for-south-africa/

From a linear to a circular economy

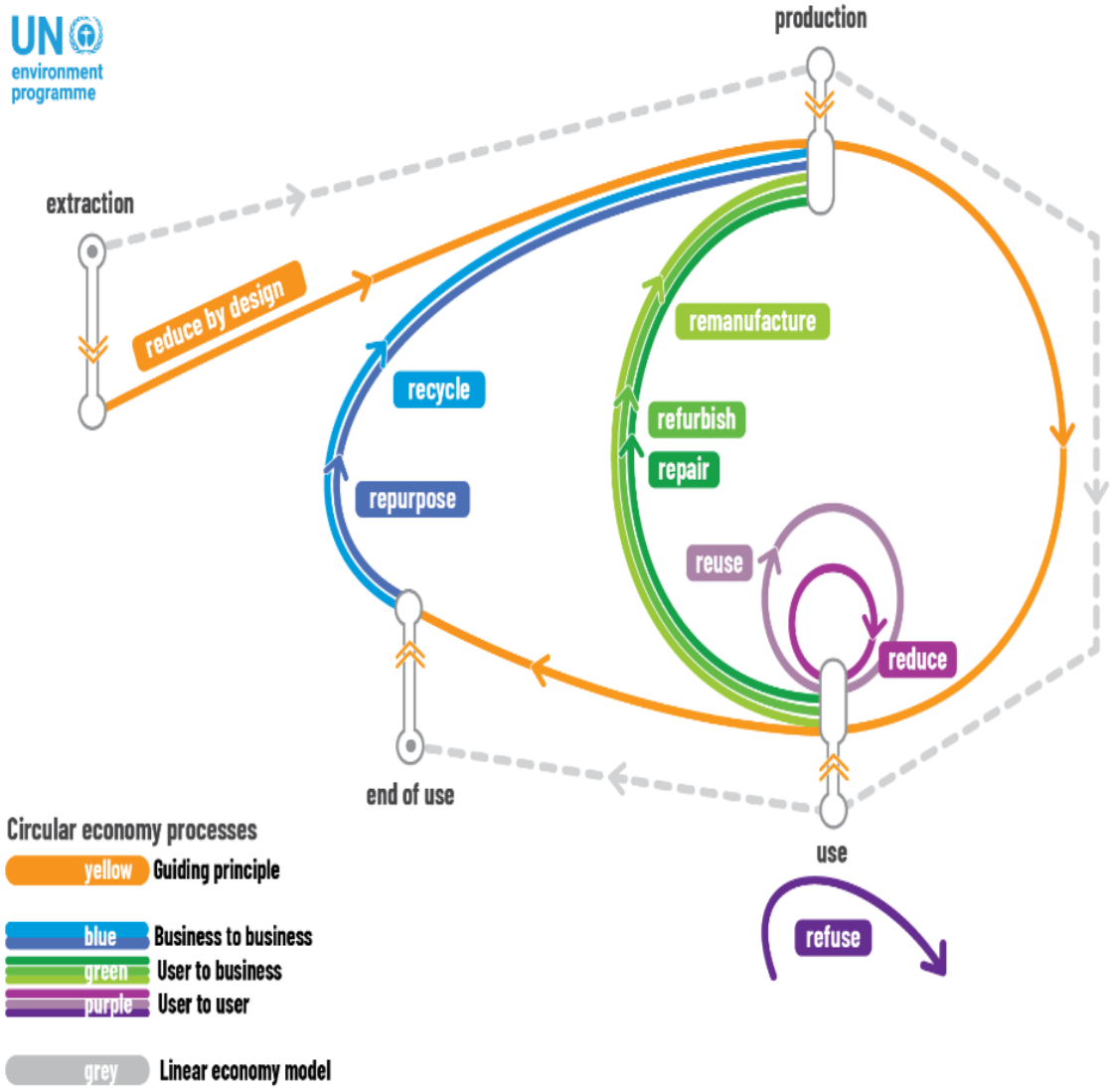




Chapter 2 : Integrating circularity to achieve sustainability: examples of various wastewater treatment systems

Tamara Avellán, Nidhi Nagabhatla, Ishita Jalan, and Danielle Liao

UNEP Circularity Platform



Building circularity in 4 steps

Circularity builds upon value retention loops:

- **User-to-user** processes: shorter loop, where a product or component remains close to its user and function
- **User-to-business** processes: medium/long loop, where a product or component is upgraded and producers involved again
- **Business-to-business** processes: Long loop, where a product or component loses its original function

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

UN environment programme

Food and Agriculture Organization of the United Nations

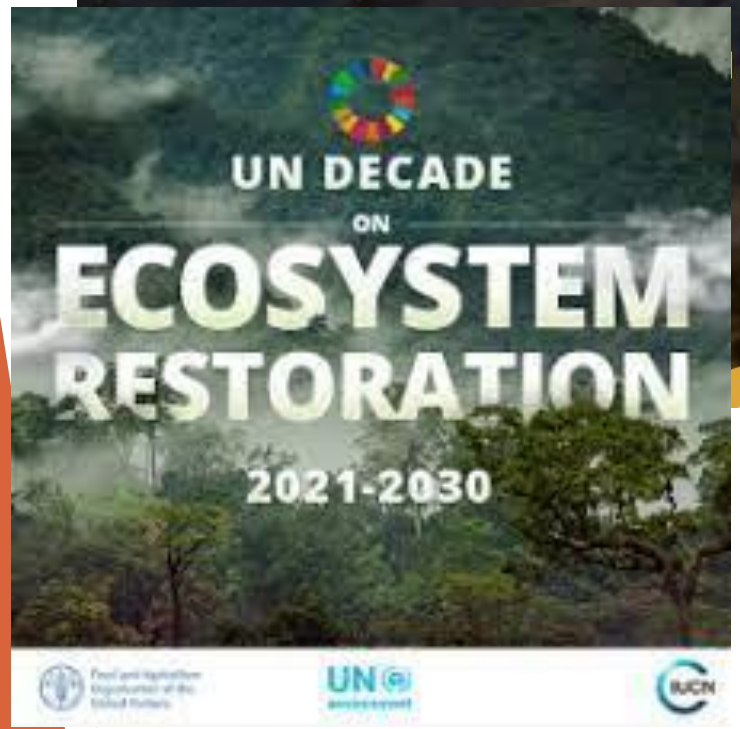
EN

PREVENTING, HALTING AND REVERSING THE DEGRADATION OF ECOSYSTEMS WORLDWIDE.

Decade on Ecosystem Restoration is a global rallying cry to heal our planet. What will you restore?

Learn to restore

Image by: Stephanie Foote / UNEP



THE TASK FORCE ON BEST PRACTICES IN A NUTSHELL

A collaborative effort on knowledge dissemination and capacity development

To date, **241** members from **100** organizations

OUTPUTS

1. Operationalization of the task force
2. Prioritization of ecosystems
3. Identification of key resource partners
4. Capacity needs assessment
5. Development of knowledge and learning plan
6. Drafting ToRs of Decade flagship products
7. Dissemination of good practices

https://www.fao.org/in-action/forest-landscape-restoration-mechanism/our-work/gl/tfbp/en/

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

UN environment programme

Food and Agriculture Organization of the United Nations

IUCN CEM

SER SOCIETY FOR ECOLOGICAL RESTORATION

PRINCIPLES FOR ECOSYSTEM RESTORATION TO GUIDE THE UNITED NATIONS DECADE 2021-2030

TEN PRINCIPLES THAT UNDERPIN ECOSYSTEM RESTORATION

- GLOBAL CONTRIBUTION
- BROAD ENGAGEMENT
- MANY TYPES OF ACTIVITIES
- BENEFITS TO NATURE AND PEOPLE
- ADDRESSES CAUSES OF DEGRADATION
- KNOWLEDGE INTEGRATION
- MEASURABLE GOALS
- LOCAL AND LAND/SEASCAPE CONTEXTS
- MONITORING AND MANAGEMENT
- POLICY INTEGRATION

KEY AREAS FOR CAPACITY DEVELOPMENT

GLOBAL CAPACITY NEEDS ASSESSMENT:

KEY GAPS AND CAPACITY PRIORITIES FOR RESTORATION TO SUPPORT THE UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030 | Food and Agriculture Organization of the United Nations | UN environment programme

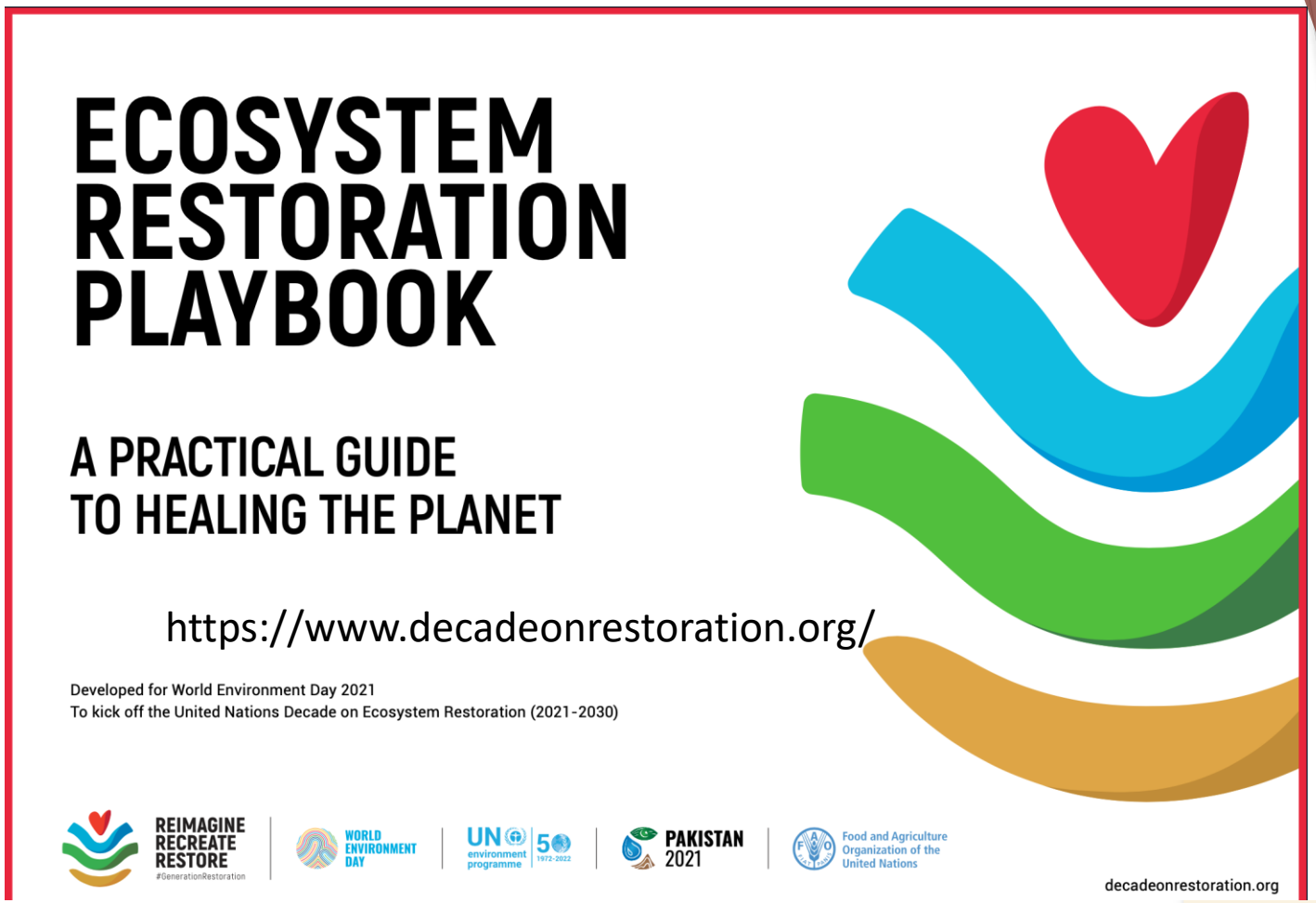
DEVELOPING CAPACITIES OF INDIVIDUALS AND ORGANIZATIONS ACROSS SECTORS AND SCALES

1) Financing

2) Inclusive stakeholder engagement

3) Technical capacities

4) Policy

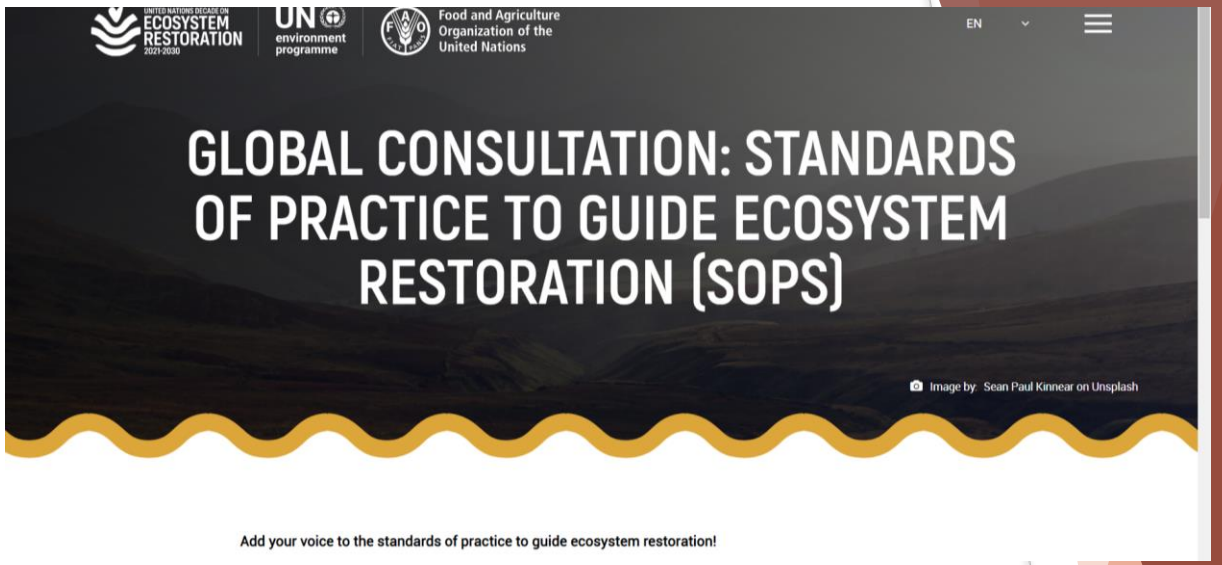


- Taking action such as starting or support an on-the-ground restoration project
- Making smart choices like buying only sustainable products and changing diets
- Raising your voice in support of ecosystem conservation and restoration

The 21-page guide describes approaches to restoring eight key types of ecosystem – forests, farmlands, grassland and savannahs, rivers and lakes, oceans and coasts, towns and cities, peatlands, and mountains. It also lays out how all parts of society – from individuals and community groups to businesses and governments – can become part of #GenerationRestoration, a global movement to restore ecosystems everywhere for the good of people and nature.

English
Arabic
Chinese
French
Portuguese
Russian
Spanish

Community Organizing Toolkit on Ecosystem Restoration



http://restoreyourcommunity.org/

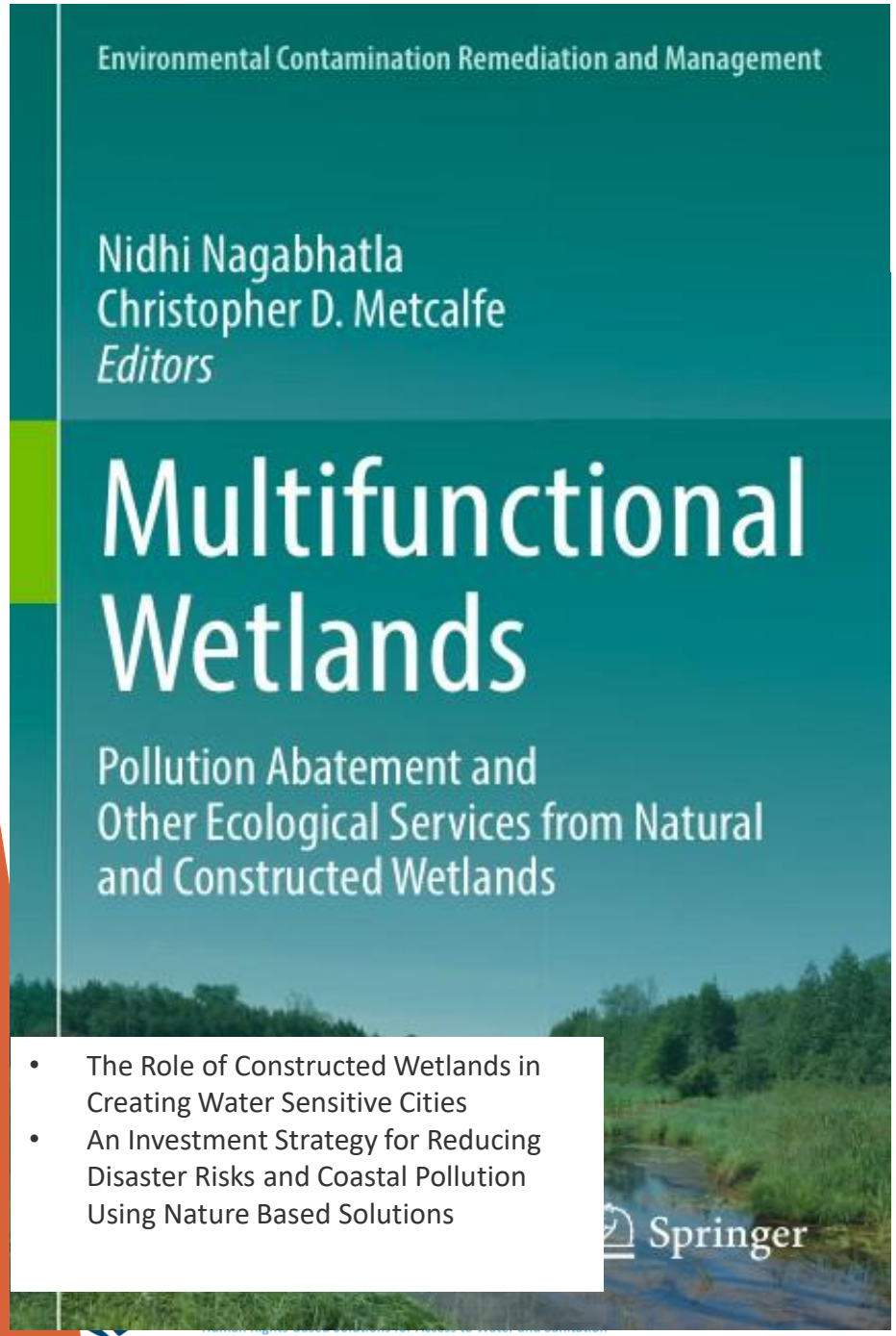
Question yourself

These questions will play a big role in determining how to shape your action and whom to engage with as you take steps towards organizing and reaching your wider restoration goals.

WHAT IS MY MOTIVATION?

WHAT ARE THE SOCIAL BENEFITS OF MY ACTION?

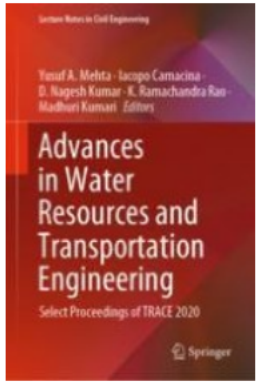
IS IT POSSIBLE THAT MY ACTION NEGATIVELY IMPACTS OTHERS?



- The Role of Constructed Wetlands in Creating Water Sensitive Cities
- An Investment Strategy for Reducing Disaster Risks and Coastal Pollution Using Nature Based Solutions

For the water sector, NBS offers innovative thinking to move beyond business-as-usual towards addressing a variety of water challenges and delivering additional ecological and socio-economic benefits- covering many aspects of sustainable development.

Nature-Oriented Paradigms for Urban Water Security: Perspective on Framework, Scale, and Sector



Authors: Negin Balaghi-Ficzkowski, Nidhi Nagabhatla, Tariq A. Deen

Publisher: Springer Singapore

UN Decade on Ecosystem Restoration (2021–2030)

Published in: Advances in Water Resources and Transportation Engineering

» Get access to the full-text

Abstract

Water security in urban areas is threatened by a multitude of direct and indirect drivers. On the one hand, the demand for water is increasing on a daily basis as the urban population and lifestyle needs increase; on the other hand, events such as floods, tropical cyclones, and other natural hazards result in disruption of water provisioning systems and processes. Additionally, climate change impacts such as heat waves and sea-level rise affect the sustainability of water supplies in urban areas.

Blue-Green Infrastructure Across Asian Countries pp 25–58 | Cite as

Regional Trends in Social-Ecological-Technological (SET) Approaches to Sustainable Urban Planning: Focus on Asia

Swetha Thammadi, Nidhi Nagabhatla, Sateesh Pisini, Stephanie Koza & Ashraf Mahmood

Chapter | First Online: 25 March 2022

252 Accesses

Abstract

Rapid urbanization coupled with inadequate infrastructure development impacts urban air and water quality amidst other challenges. Sustainable urban planning considers the integration of blue-green infrastructure (BGI) and ecosystems to produce environmental benefits together with improvement in the quality of life. In this context, the social-ecological-technological (SET) framework provides guiding principles for projects visioning sustainable urban futures. Based on the case study analysis and review of integrated SET frames, BGI innovations, and nature-based solutions (NBS) approaches, it is suggested that the policies to improve the urban landscape could consider interlinkages of environmental, economic, and social systems

Drawing on the key observations from the past and ongoing NBS- and BGI-focused projects and programs in selected cities of Asia, this chapter highlights the role of co-designing, **technological innovations**, participatory implementation and **evaluation**, and up-to-date knowledge as significant to address challenges in **operationalizing** the sustainable urban planning vision.

Incorporating Ecosystem Services into Water Resources Management: Tools, Policies, Promising Pathways.

A special issue in Environmental Management (Springer)

This SI brings together editors/authors/experts/ ESP members to facilitate discussion on emerging scholarship on ecosystem services and water resources management/water security

Context

IWRM

Understand water-land interactions

Balance between beneficiaries

Manage complex systems

Secure long-term supply of benefits

ECOSYSTEM SERVICES CONCEPT & METHODS

- **Understand water-land-beneficiary interactions**
- **Assess supply-demand of ES**
- **Analyze bundles, tradeoffs and synergies of ES**
- **Advance sustainable management approaches**

Aim of the SI

Highlight the advances and challenges in incorporating the Ecosystem Services paradigm - linking ecosystems to human benefits - into Water Resource Management, by selecting multi- and interdisciplinary efforts to measure, plan for, incentivize, and implement projects to enhance water-related ES in basins around the world.

Identifying Spatial Patterns and Ecosystem Service Delivery of Nature-Based Solutions

Blue–Green Infrastructure for Flood and Water Quality Management in Southeast Asia: Evidence and Knowledge Gaps

Complementary use of the Ecosystem Service Concept and Multi-criteria Decision Analysis in Water Management

Ecosystem Services as a Promising Paradigm to Protect Environmental Rights of Indigenous Peoples in Latin America: the Constitutional Court Landmark Decision to Protect Arroyo Bruno in Colombia

Operationalizing Integrated Water Resource Management in Latin America: Insights from Application of the Freshwater Health Index

Local Society Perception on Ecosystem Services as an Adaptation Strategy in Urban Stream Recovery Programs in the City of São Paulo, Brazil

Integrating Ecosystem Services Into Water Resource Management: An Indicator-Based Approach

A Bayesian Modelling Framework for Integration of Ecosystem Services into Freshwater Resources Management

Ecosystem Services in the Nemunas Delta: Differences in Perceptions of Farmers, Birdwatchers and Scientists

Stakeholder Analysis on Ecosystem Services of Lake Manyara Sub-basin (Tanzania): How to Overcome Confounding Factors

Stakeholders, Institutional Challenges and the Valuation of Wetland Ecosystem Services in South Sudan: The Case of Machar Marshes and Sudd Wetlands

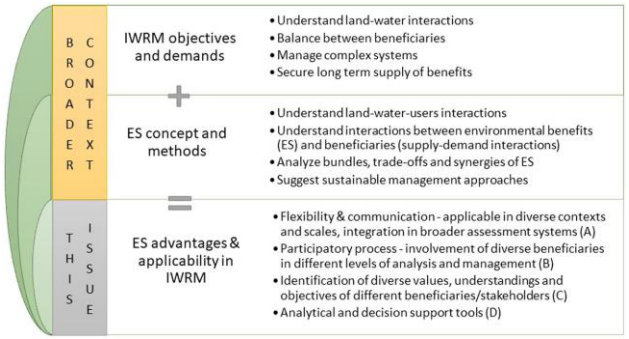
Willingness to Pay for Gray and Green Interventions to Augment Water Supply: A Case Study in Rural Costa Rica

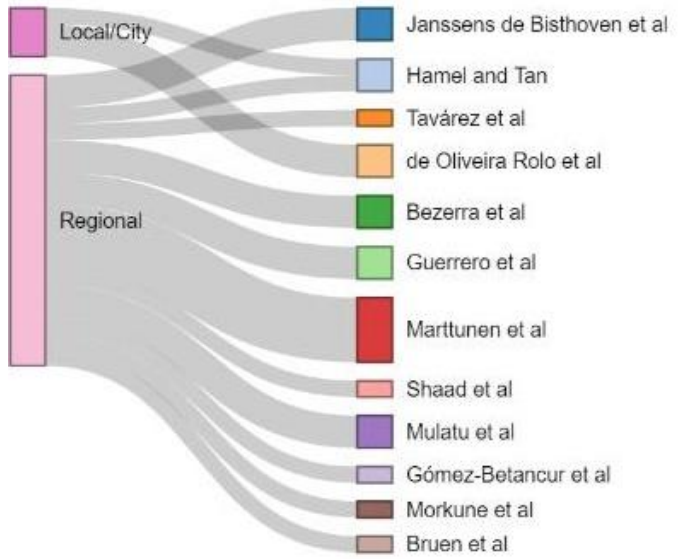
Environmental Management
https://doi.org/10.1007/s00267-022-01640-9

Incorporating Ecosystem Services into Water Resources Management—Tools, Policies, Promising Pathways

Derek Vollmer[1] · Kremena Burkhard[2,3] · Blal Adem Esmail[4] · Paulina Guerrero[4] · Nidhi Nagabhatla[5,6]

Geographic coverage





https://doi.org/10.1007/s00267-022-01640-9

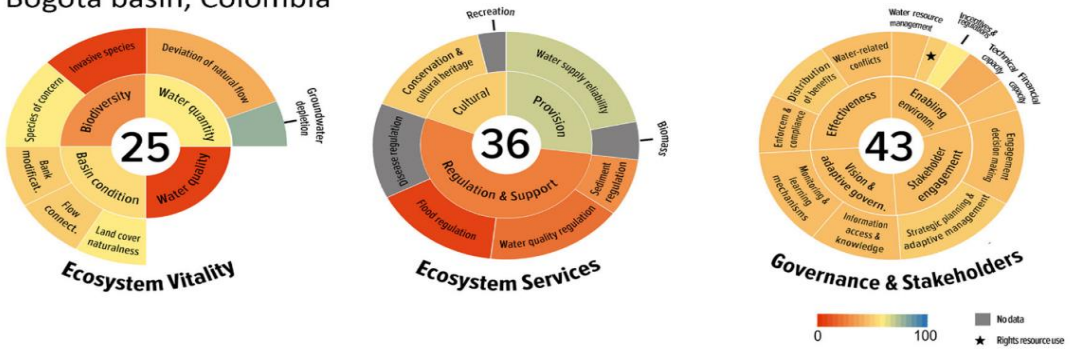
Key Highlights

Operationalizing Integrated Water Resource Management in Latin America: Insights from Application of the Freshwater Health Index

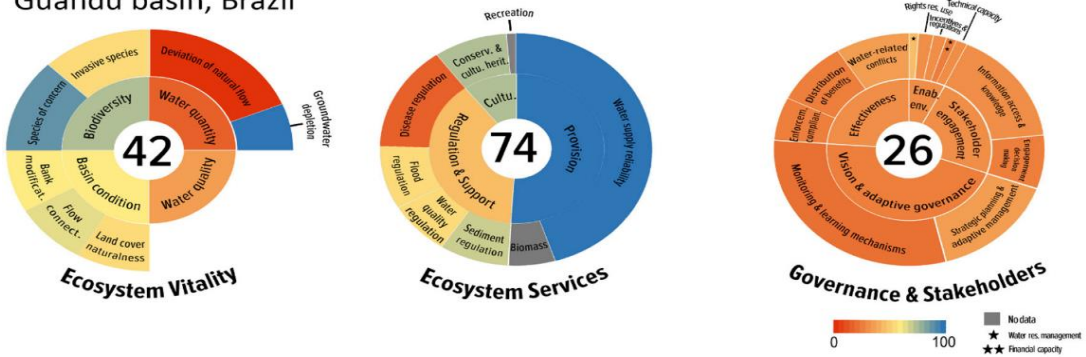
Maíra Ometto Bezerra[1] · Derek Vollmer[1] · Natalia Acero[2] · Maria Clara Marques[3] · Diego Restrepo[2] · Eddy Mendoza[4] · Bruno Coutinho[3] · Ivo Encomenderos[4] · Lina Zuluaga[2] · Octavio Rodríguez[2] · Kashif Shaad[1] · Sarah Hauck[1] · Ramon González[5] · Francisco Hernandéz[5] · Rodolfo Montelongo[5] · Eliana Torres[5] · Lina Serrano[5]

https://doi.org/10.1007/s00267-021-01446-1

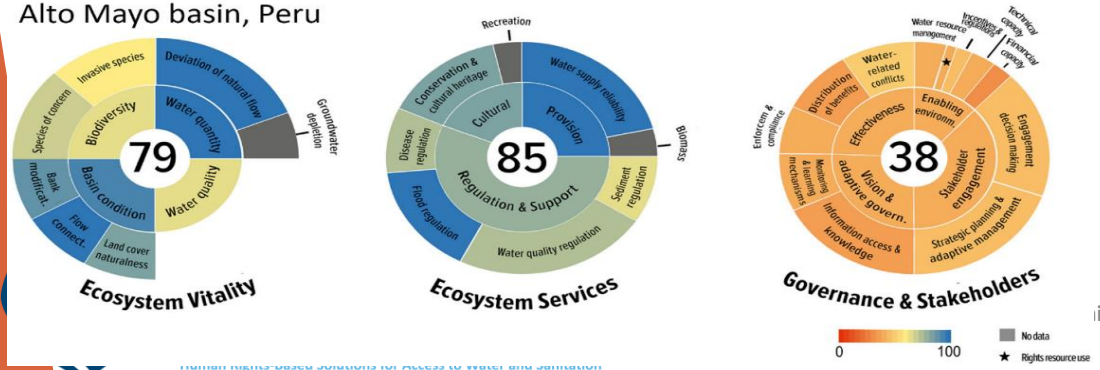
Bogotá basin, Colombia



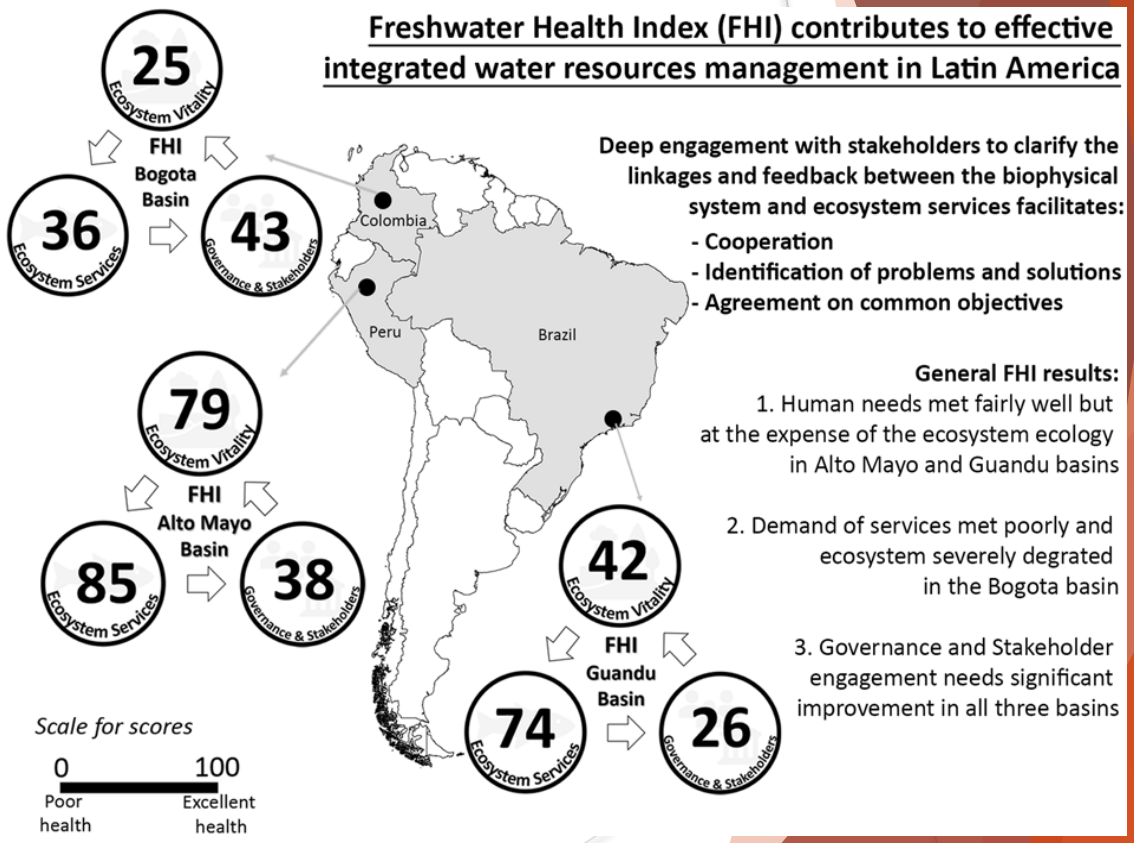
Guandu basin, Brazil



Alto Mayo basin, Peru



Freshwater Health Index (FHI) contributes to effective integrated water resources management in Latin America



Deep engagement with stakeholders to clarify the linkages and feedback between the biophysical system and ecosystem services facilitates:

- Cooperation
- Identification of problems and solutions
- Agreement on common objectives

General FHI results:

1. Human needs met fairly well but at the expense of the ecosystem ecology in Alto Mayo and Guandu basins

2. Demand of services met poorly and ecosystem severely degrated in the Bogota basin

3. Governance and Stakeholder engagement needs significant improvement in all three basins

Complementary use of the Ecosystem Service Concept and Multi-criteria Decision Analysis in Water Management

Mika Marttunen[1] · Jyri Mustajoki[1] · Virpi Lehtoranta[1] · Heli Saarikoski[1]

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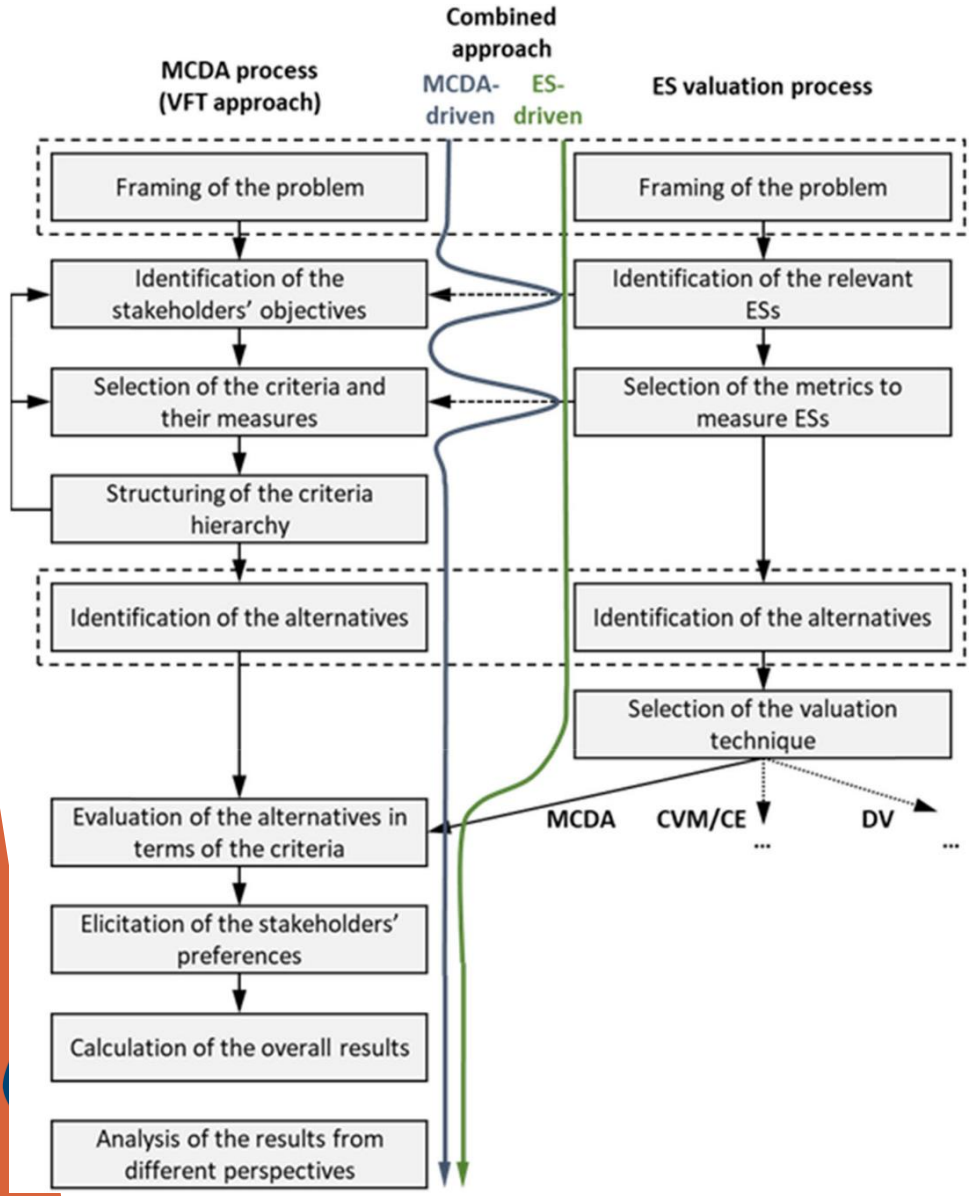

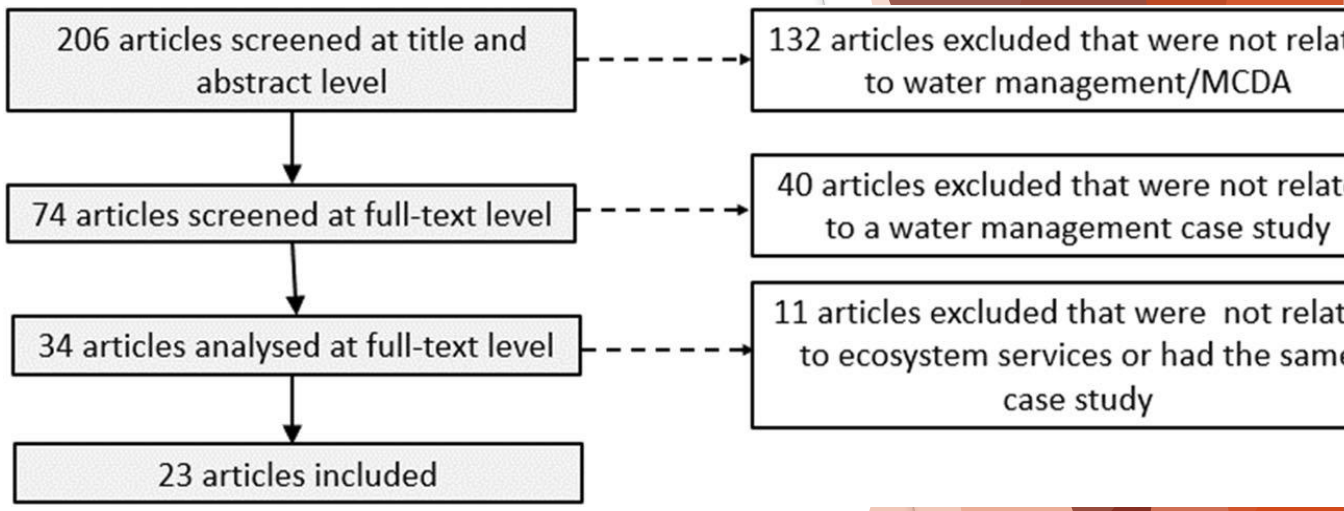

Incorporating Ecosystem Services into Water Resources Management: Tools, Policies, Promising Pathways

Cross-cutting themes

ES advantages & applicability in IWRM

- Ecosystem services and NBS as a flexible way to connect with stakeholders
- *Applicable in diverse contexts and scales, integration in broader assessment systems*
- Participatory processes in ecosystem services /NBS research
- *Involvement of diverse beneficiaries in different levels of analysis and management*
- Multiple approaches to valuing ecosystem services and NBS-based planning
- *Identification of diverse values, understandings, and objectives of different beneficiaries/stakeholders in the water sector*
- Role of Decision-support systems
- *Analytical and decision support tools for environmental/ water security analysis*

Five Closing Points

1. Context-specific challenge applies to water security in different geographic, cultural, and political settings.

2. Approaches and frameworks such as circularity and NBS, hold the potential to address challenges stemming from the new and emerging patterns of water crises.

3. Managing and implementing integrated water management systems and water security agenda would also need to boost human, technological, and institutional capacity at multiple levels.

4. Dialogue on risks, challenges,, opportunities and solutions should be tandem and collective, and participatory- co-creation of solutions

5 Standardized available governance mechanisms are a good reference material – however, the solution (including NBS) should be designed via collective action, and alongside steering institutional capacity gaps and needs, consensus building long-term strategies for integrated agenda's