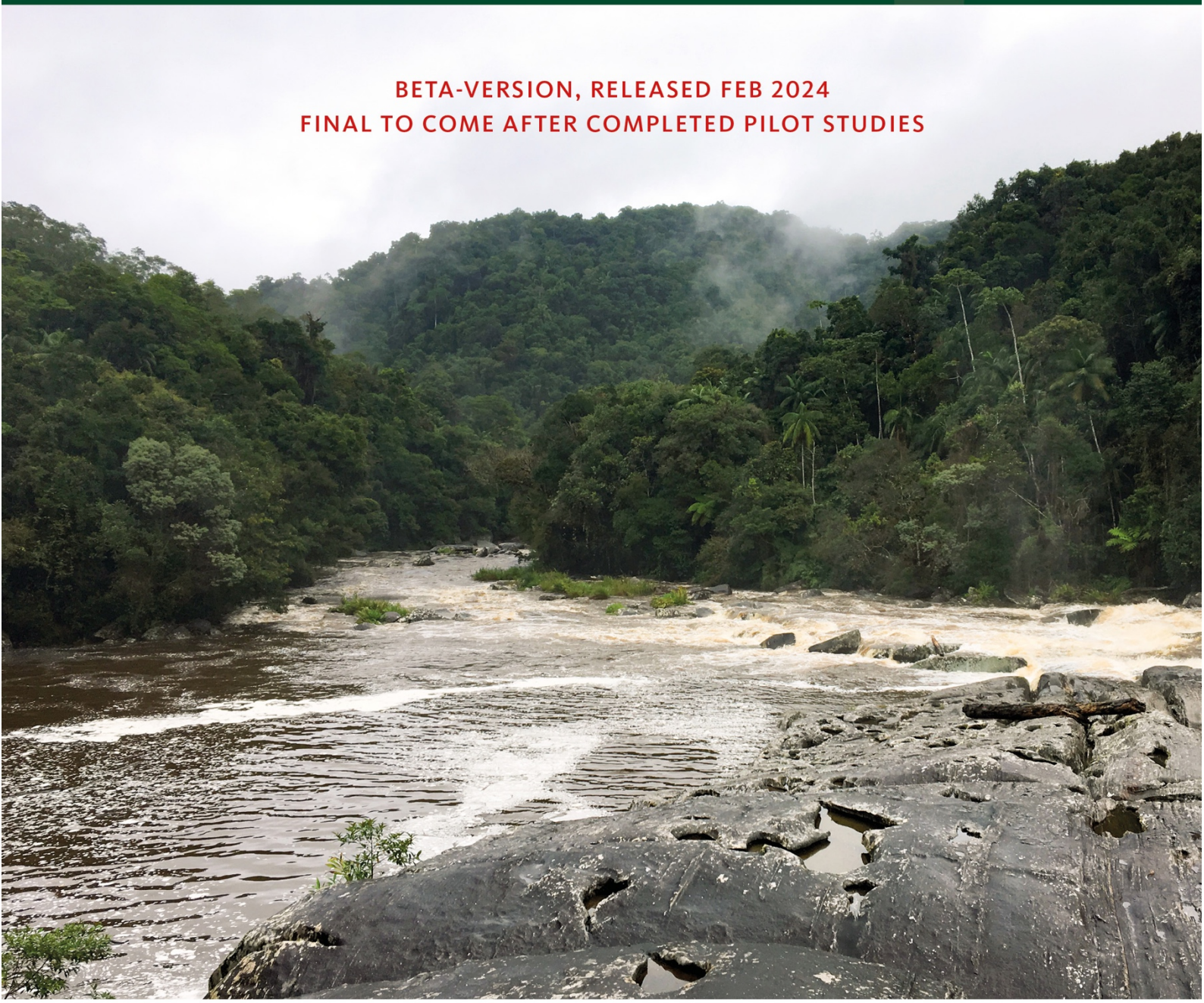
HANDBOOK

W-FLR Tool: Water-smart Forest and Landscape Restoration

Including water in forest and landscape restoration initiatives, to ensure their sustainable and resilient success in the long-term.

BETA-VERSION, RELEASED FEB 2024
FINAL TO COME AFTER COMPLETED PILOT STUDIES



Swedish Water House

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Contents

Abbreviations

CBD – Convention on Biological Diversity
CBD NBSAPs – National Biodiversity Strategies and Action Plans
CS – Citizen Science
FLR – Forest and Landscape Restoration
HRBA – Human rights-based approach
M&E – Monitoring and Evaluation
NGO – Non-Governmental Organisation
SDGs – Sustainable Development Goals (SDGs)
UN – United Nations
UNCCD – United Nations Convention to Combat Desertification
UNCCD NAPs – National Action Programmes to Combat Desertification
IWRM – Integrated Water Resources Management plans/River basin plans/Watershed plans
UNFCCC – United Nations Framework Convention on Climate Change
UNFCCC NAPs – National Adaptation Plans
UNFCCC NDCs – Nationally Determined Contributions, especially in priority interventions related to ecosystem management, etc.
W-FLR – Water-smart Forest and Landscape Restoration

1. Introduction

Key messages:

- Human activities, including deforestation and forest and landscape degradation, and climate change threaten ecological functionality and associated water-related ecosystem services.
- Threats to water-related ecosystem services result in increased risks to local communities and adjacent urban areas that rely on functional ecosystems and ecosystem services for their livelihoods.
- Forest ecosystems and water security are highly interlinked – especially in the context of climate change.
- Forest and Landscape Restoration (FLR) is a landscape approach, aiming to unite competing societal interests for restoring degraded forest land, and requires a multi-year vision.
- It is essential to consider hydrological aspects when restoring forest landscapes, to avoid unintended side-effects and to ensure that restoration efforts are successful both in the short and long term.
- Until now, many forest and landscape initiatives do not integrate hydrological aspects.

Forest ecosystem services and water security are inextricably linked – especially in the context of climate change. Forests are critical to the successful implementation of ecosystem-based climate change mitigation and adaptation actions since they act as carbon sinks and flood moderators. In addition, forests are water filters and reservoirs which ensure water quality and quantity in a time where water security is increasingly under threat due to climate change. Forests also offer essential habitats for endemic species, contributing to biodiversity. However, forests are also water consumers in a time where water scarcity is becoming more serious in many parts of the world. Any action with cross-sectoral implications on water need to be carefully planned to avoid unintended side-effects. This means that integrated management of forest and water resources is crucial and more important than ever – not the least in forest and landscape restoration (FLR). Therefore, the Water-smart Forest and Landscape Restoration (W-FLR) Tool is designed to guide planners and policymakers to systematically integrate water into new and ongoing FLR initiatives.

Background to FLR

Increased need for - and *awareness* of the need for - restoration has brought together restorative activities at the landscape scale under a common approach, Forest and Landscape Restoration (FLR). This is the main approach behind the Bonn Challenge and many other global restoration initiatives

(Table 1). FLR is a long-term, planned process that aims to regain ecological functionality and enhance human wellbeing in deforested or degraded multifunctional forest landscapes (Besseau et al., 2018; IUCN & WRI, 2014). FLR is designed to be a flexible process that includes multistakeholder participation, adequate monitoring and evaluation processes, and adaptive management responsive to social, economic, and environmental change (Maginnis & Jackson, 2012).

> "FLR is an active process that brings people together to identify, negotiate and implement practices that restore an agreed optimal balance of the ecological, social and economic benefits of forests and trees within a broader pattern of land uses."
>
> Global Partnership on Forest Landscape Restoration

Restoration efforts may include natural regeneration and tree planting such as reforestation, afforestation and agroforestry, as well as assisted natural regeneration within a longer-term goal to regain ecological functionality across whole landscapes. The pace of recovery in FLR initiatives is site-specific and dependent on a number of factors, e.g., the initial level of degradation, current and past land management, as well as planned/implemented restoration methods. FLR requires a multi-year vision for most of the ecosystem services and benefits to human well-being that restoration of ecological functionality will produce. FLR is also a key measure to mitigate climate change directly through increased carbon sequestration, and indirectly through increasing evapotranspiration to reduce local air temperatures and providing moisture recycling (Ingemarsson et al., 2024, chapter 6 on climate mitigation in land-based ecosystems). Fully restoring these ecosystem services and functions can take decades.

Table 1. Examples of existing international commitments on forest and landscape restoration.

Initiative	Objective or commitment	Mha (million hectares)	Year of launch/adoption & organisations behind it
Bonn Challenge for 2030	Restore 350 Mha of forests globally.	350 Mha	Launched by the Government of Germany and IUCN in 2011
African Forest Landscape Restoration Initiative (AFR100)	Restore at least 100 Mha of degraded land in Africa by 2030.	100 Mha	Launched by the African Union Development Agency, WRI, Germany's Federal Ministry for Economic Cooperation and Development, and the World Bank in 2015.
Initiative 20x20	Bring 50 Mha of land in Latin America into restoration by 2030.	50 Mha	Launched at the 2014 UN COP20 by WRI, CIAT, CATIE, and IUCN
ECCA30	Bring 30 Mha of land in Europe, the Caucasus and Central Asia into restoration by 2030.	30 Mha	Launched by UNECE, FAO, IUCN, WRI and the World Bank in 2019
New York Declaration on Forests	10 goals including end the loss of natural forests by 2030 and restore 350 Mha of degraded landscapes and forestlands.	350 Mha	A voluntary political declaration, built on dialogue at the UN Climate Summit in 2014. Signed by 37 governments, 20 sub-national governments, 53 multi-national companies, 16 indigenous communities and 63 NGOs.

UNCCD's Land Degradation Neutrality	Achieve land degradation neutrality.	Unspecified	SDG Target 15.3 is linked to the UNCCD: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.
UN Global Forest Goals and Targets	6 Global Forest Goals and 26 associated targets to be achieved by 2030, including global forest area is increased by 3 %.	Unspecified	Adopted by the UN General Assembly in 2017
CBD Kunming-Montreal Global Biodiversity Framework (GBF)	4 goals and 23 targets to be achieved by 2030, including conserve at least 30 % of lands and oceans by 2030.	Unspecified	Adopted at the UN 2022 CBD COP15
Glasgow Leaders Declaration on Forests and Land Use	Halt and reverse forest loss and land degradation by 2030.	Unspecified	Launched at the 2021 UN COP26, endorsed by over 140 nations
UN Decade on Ecosystem Restoration 2021-2030	Restore a total of 1,000 Mha of ecosystems globally.	1,000 Mha	Launched by UNEP in 2021.
UN Decade on Family Farming 2019-2028	Achieve globally diverse, healthy, and sustainable food and agricultural systems, and resilient communities free from hunger and poverty.	Unspecified	Launched by FAO in 2019
UNFCCC Nationally Determined Contributions (NDCs)	NDCs contain national policies, targets, and measures for achieving the climate goals in the Paris agreement. Countries share new or updated NDCs every five years starting in 2020.	Unspecified	Entered into force with the Paris Agreement in 2016. As of March 2020, 186 parties (185 countries plus the European Union) had communicated their first NDCs to the UNFCCC.
UN Sustainable Development Goals (SDGs)	Several SDGs are relevant for FLR and contain targets on ecosystem restoration. E.g., Target 15.2: End deforestation and restore degraded forests.	Unspecified	The voluntary targets were adopted by the UN General Assembly in 2015

FLR is a landscape approach, aiming to unite competing societal interests for restoring degraded forest land with triple focus on social, economic, and environmental values – many of which are dependent on water. The largest formerly forested areas in need of FLR in the world are often multifunctional landscapes that can be subjected to mosaic restoration (Figure 1). Multifunctional and mosaic landscapes are characterised by diversified and integrated types of land cover and uses, including natural forests, secondary forests, timber plantations, farmlands, agroforestry, farms, fields, crops, fallow areas, and small villages (Figure 2). The FLR intervention consequently needs to recognise the interconnections between people, nature, and water, especially in places where productive land uses – such as forestry, agriculture, and mining – compete with environmental and biodiversity goals.

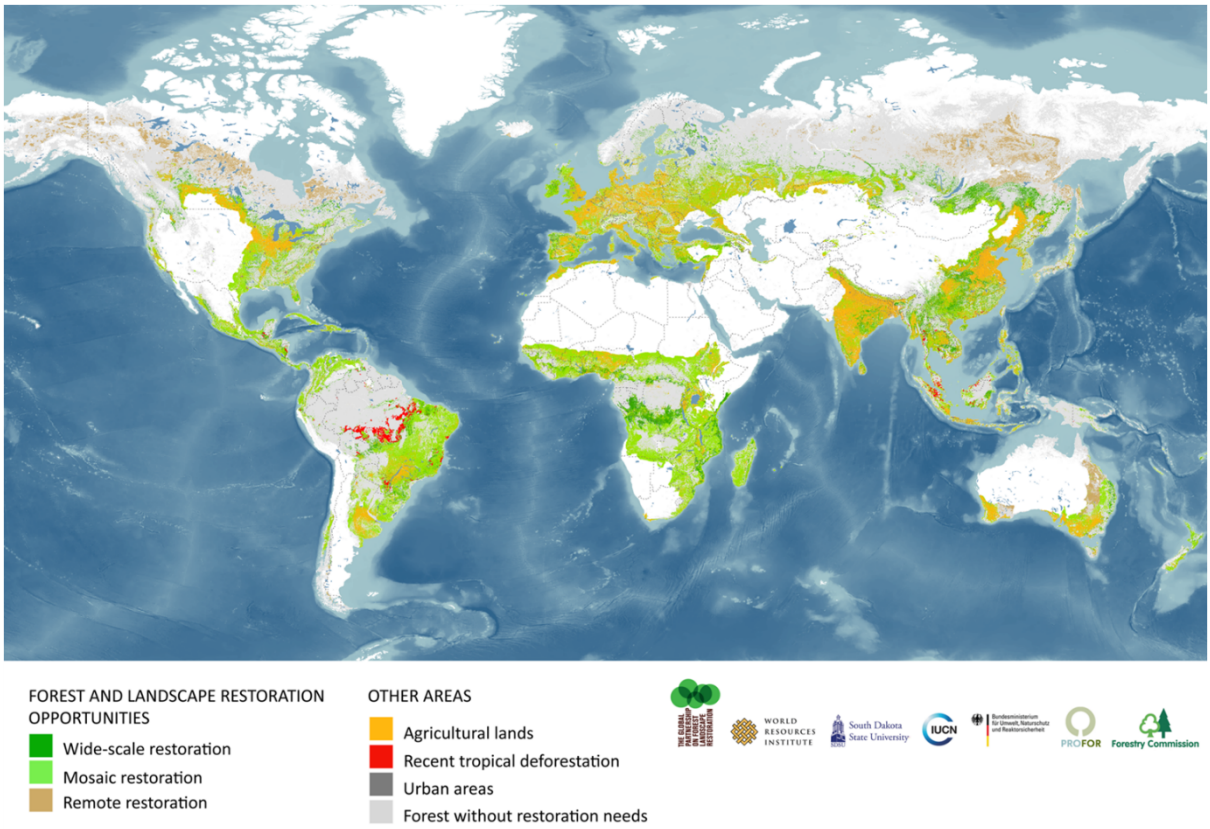


Figure 1. Global status of forest and landscape restoration opportunities, i.e., indicating where restoration initiatives are needed and can bring benefits to ecosystems and humans. Source: (World Resources Institute, 2014).

For up-to-date information on restoration projects and where they are located, access Restor (https://crowtherlab.com/restoration/) that is a science-based open data mapping platform to share ecological information and support and connect the global restoration movement.

Mosaic landscapes offer a great variety of ecosystem services and thereby potentially covering many, often competing interests of different stakeholder groups. Restoring such areas can involve changes across old growth and logged forests and on-farm trees in combination with other land uses, including agroforestry, plantations, smallholder agriculture, and human settlements. For water-smart FLR, water needs to be integrated in FLR initiatives and planned for in FLR projects to ensure that all important aspects of water are considered, both as a limiting factor as well as a service. Today, this is often not the case.

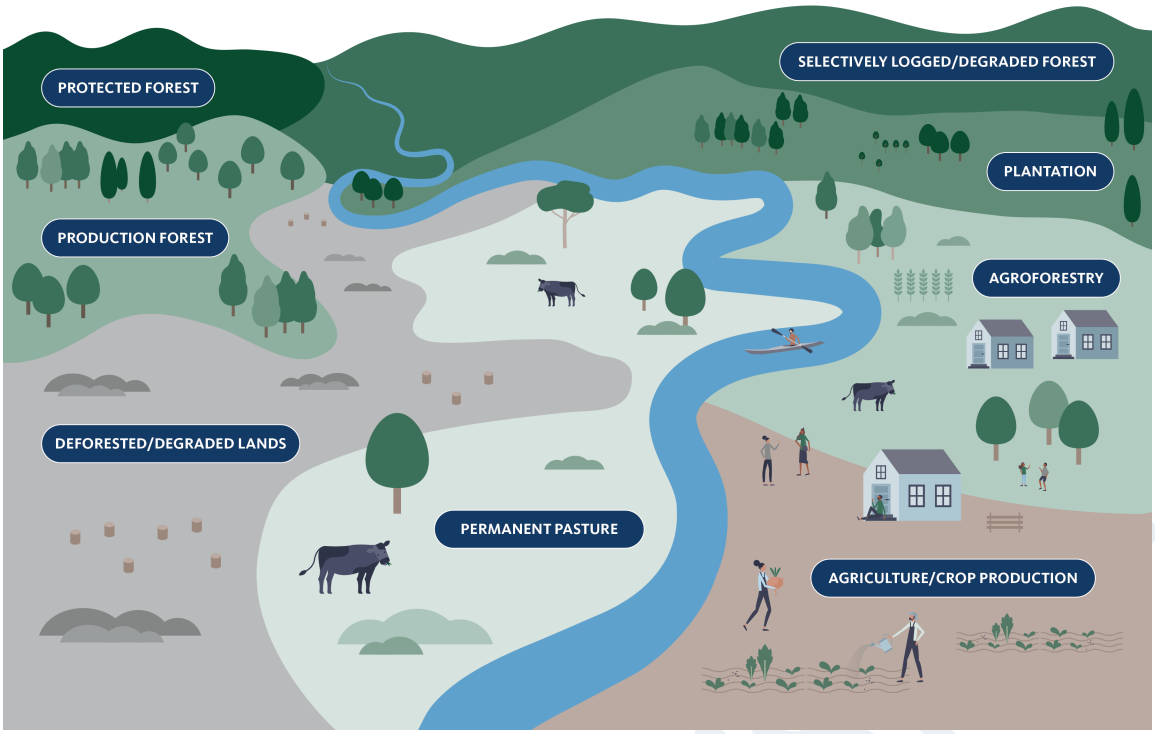


Figure 2. Multifunctional and mosaic landscape.

The water challenge in forest and landscape restoration

Human activities and climate change threaten ecological functionality and associated water-related ecosystem services, including food and wood production and provision of habitats for biodiversity, as well as climate regulation. Deforestation and forest and landscape degradation affect both blue and green water quality and quantity (see Figure 3 and Box 1), can cause impaired water flows downstream, reduced precipitation down-wind and biodiversity loss, and reduce climate change mitigation and adaptation opportunities, and have negative effects on people's livelihoods. Moisture recycling, infiltration and groundwater recharge are under threat from processes that increase water risks in the form of too little, too much or too dirty water, affecting the potential for landscape restoration. This results in increased risks to local communities that rely on functional ecosystems and ecosystem services for their livelihoods, as well as increased risks to water supply to adjacent urban areas. Impaired water flows also reduce the production of natural resources and raw materials that industries and economies in rural and urban areas rely on (Gustafsson et al., 2019).

To limit the risk of water becoming a constraining factor in multifunctional forest landscapes, it is vital to be aware of the drivers of deforestation and degradation, such as unsustainable forestry and agriculture, poverty, climate change and urban development. One way to address these societal challenges systematically and holistically is through a landscape approach. However, in general, landscape approaches need to better integrate hydrological processes to ensure the long-term sustainability, resilience and multifunctionality of forest landscapes to meet the targets of the Sustainable Development Goals (SDGs) 1 on No Poverty, 6 on Water, 13 on Climate Action and 15 on Life on Land (Ingemarsson et al., 2022; Tengberg et al., 2021). There is also a need to address policy and governance challenges related to the forest-water nexus. For example, current climate policies are often limited to targets aimed at reducing greenhouse gas emissions to increase carbon storage. There is a risk that single-goal local-scale restoration efforts to increase carbon storage may

affect the hydrological cycle and impair other ecological functions. As an example, restoration initiatives may use fast-growing exotic tree species for efficient carbon sequestration, but those species are often water demanding and risk outcompeting native species which may cause negative effects on local water availability and biodiversity. Furthermore, planting trees in water-stressed areas may also pose a risk for the success of the project, as there might not be enough water available for the trees to grow.

To reduce negative effects, it is important to use a holistic and integrated approach in restoration initiatives, and accounting for impacts on the water cycle is an efficient way to widen the scope. Placing water at the centre when discussing forest-landscape-climate interactions will ensure that more balanced measures can be promoted through policies that integrate these different elements using a systems approach (Creed & van Noordwijk, 2018).

The earth's freshwater resources can be divided into green-water resources available to plants through rain, evapotranspiration and soil moisture, and blue-water resources available in lakes, rivers, wetlands, groundwater, glaciers, and impoundments e.g., dams. There are also grey-water resources from domestic and industrial activities. Together the blue, green, and grey water flows are creating the water cycle (Falkenmark & Rockström, 2006) (see Figure 3 and Box 1).

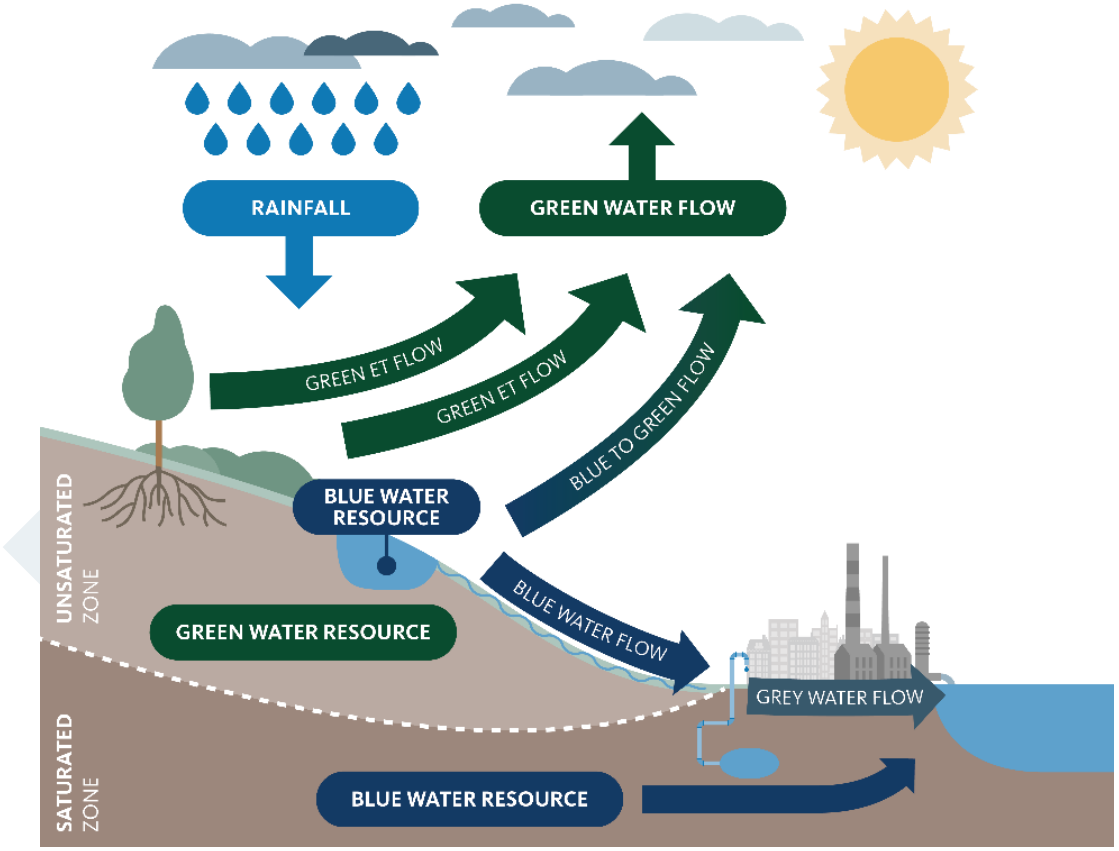
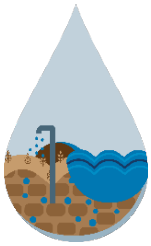


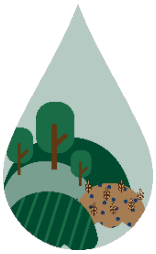
Figure 3. The water cycle. The water cycle can be divided into three types of freshwater on earth: 1) Blue water is surface and groundwater (e.g., rivers and lakes, groundwater and the water frozen in glaciers and the polar ice caps) 2) Green water includes precipitation, plants transpiration and soil moisture (water found in rain, soil and plants) 3) Grey water is polluted water from domestic or industrial activities Source: SIWI adapted from (Falkenmark & Rockström, 2006).

Box 1. Blue, Green and Grey water



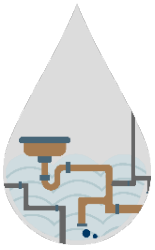
What is blue water?

Blue water is found in lakes, rivers, and reservoirs. It can be seen in wetlands, or it can be pumped from below surface aquifers. Available blue water is used for many purposes, including drinking water and irrigation. Blue water is "recharged" by precipitation, either as rainfall or snowmelt.



What is green water?

Green water is the water available in the soil for plants and soil microorganisms. It is the water absorbed by roots, used by plants, and released back to the atmosphere through the process of transpiration. Green water can also leave the soil and plant surfaces through evaporation or subsurface runoff. Green water in the form of atmospheric moisture from transpiration and evaporation is sometimes called rainbow water.



What is grey water?

Grey water (also called wastewater) refers to water that has been used by cities, households, agriculture, and industries and may contain some impurities. Grey water is usually treated and discharged but can in some situations be used to supplement green water.

Source: SIWI

The forest-water nexus

Links between forest and water – the forest-water nexus – play an important role in FLR (see Figure 4). Forests are critical for water quality and quantity since they filter pollution and sediment particles and improve infiltration into the soil. Forests can also reduce flooding and landslides as they reduce runoff velocity and timing and the tree roots help locking the soil particles in the ground. The forest canopy, foliage layer, root system and modification of soil structure can also prevent erosion by reducing the sediment input to watercourses. Forest can be water consumers, since an increase in the number of trees often leads to higher evapotranspiration. Forests and reforestation can also have a positive impact on water availability as they can "pump" atmospheric moisture from the ocean over continents.

Key factors influencing the impacts of FLR on water resources:

- **Area**: Important for certain interactions (e.g., interception of precipitation).
- **Tree stand age**: Water consumption of young tree stands is usually much higher compared to older stands. The positive effects of trees on the water regime only become apparent after a certain age.

- **Tree species**: Slow-growing native tree species and mixed trees have better water use efficiency.
- **Tree density**: Optimal tree cover is site specific. E.g., a medium tree density has been shown to be most suitable in the dry areas of West Africa.
- Other factors that are important to consider is **location in the landscape**, as well as **current and previous land use practices**.

Identification of FLR implementation scenarios will also be supported by a research project funded by the Swedish Research Council for Sustainable Development (FORMAS) that will (1) design forest-based mitigation scenarios in close collaboration with stakeholders, (2) quantify the resilience and sustainability of the biosphere integrity of forest-based climate mitigation measures, (3) analyse the local and remote effects of hydroclimatic adaptation, and (4) holistically assess the social-ecological resilience of forest-based climate change mitigation measures. More information is provided on the following link (reformit.org).

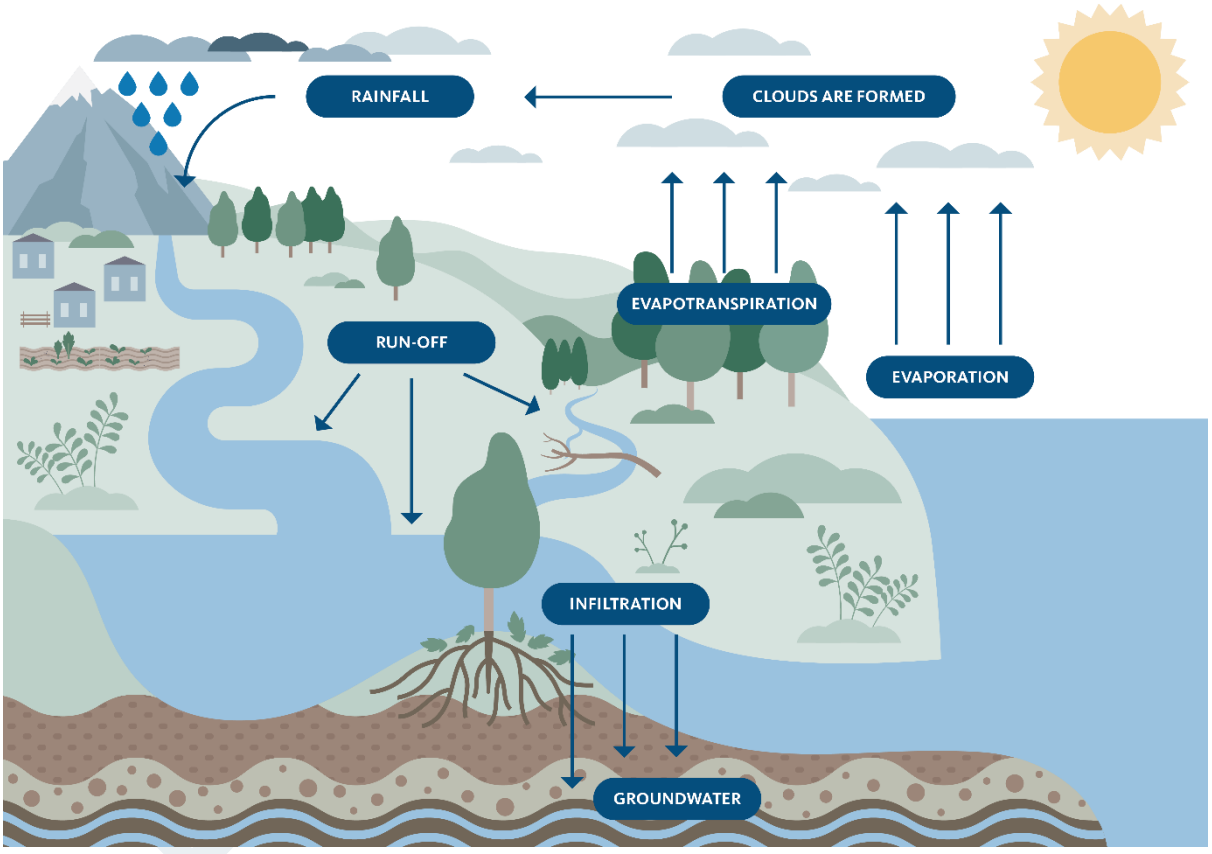


Figure 4. The forest-water nexus, illustrating the hydrological cycle through a landscape. Source: SIWI.

Forests and trees provide a range of ecosystem processes, functions and services (see Box 2) that will be discussed more in depth in the next section in Module 1. FLR interventions need to consider possible trade-offs between different ecosystem services important for water and food security, and the long-term resilience and sustainability of forest landscapes and their social ecological systems.

Box 2. Ecosystem service definitions.

Ecosystem services: contributions of ecosystem structure and function—in combination with other inputs—to human well-being.

Ecosystem processes: changes or reactions occurring in ecosystems; either physical, chemical, or biological; including decomposition, production, nutrient cycling, and fluxes of nutrients and energy.

Ecosystem structures: biophysical architecture of ecosystems; species composition making up the architecture may vary.

Ecosystem functions: intermediate between ecosystem processes and services and can be defined as the capacity of ecosystems to provide goods and services that satisfy human needs, directly and indirectly.

Ecosystem service trade-offs: The way in which one ecosystem service responds to a change in another ecosystem service.

Source: (Crossman et al., 2013)

2. The W-FLR Tool

The W-FLR Tool objective and outputs

The W-FLR Tool is designed to support water-smart FLR during the UN Decade of Ecosystem Restoration, and beyond, and to help achieve the targets of the Bonn Challenge of restoring 350 million ha of land by 2030 as well as other relevant restoration goals and commitments (Table 1). The W-FLR Tool is composed as a handbook with six modules, with the overall objective to assess water risks and opportunities, and mainstream water into FLR-relevant plans and initiatives. The method can be used to incorporate water perspectives in the planning phase of new FLR initiatives, but also to ensure that water is adequately considered in existing and ongoing interventions. The output of the W-FLR method is an assessment and identification of water-relevant ecological functions, associated ecosystem services, sectors, and stakeholders to consider in W-FLR, including priority actions for W-FLR related to: 1) policy mainstreaming; 2) capacity development; and 3) implementation, as well as types of indicators to integrate into participatory monitoring and evaluation systems for the targeted landscape. The results of the assessment will be compiled into a roadmap with next steps for a W-FLR initiative to become water-smart. Based on the assessment, the road map will indicate whether priority actions and next steps should involve policy mainstreaming, capacity development and/ or implementation. The W-FLR Tool thus takes you to the stage where you are ready to start identifying how to implement water-smart FLR on the ground using existing tools and best practice databases.

The tool's main target groups are sectors, organisations, agencies, and practitioners involved in FLR or other relevant landscape interventions at national, sub-national, and local level. The tool addresses water risks and opportunities, while ensuring that the intervention is participatory, inclusive, and transparent. It includes steps that guide the participants on how to identify the required stakeholders, how to improve institutional arrangements and with this the quality of W-FLR governance.

Why the need for a W-FRL tool?

The W-FLR Tool closes the implementation gap between integrated water and forest management approaches. To this end, the W-FLR Tool builds on a range of existing tools related to resilient landscapes that SIWI Swedish Water House has engaged with in different projects and programmes together with partners such as the Food and Agriculture Organization of the United Nations (FAO), the Swedish Forest Agency, the International Union for Conservation of Nature and Natural Resources (IUCN), etc. (see Box 3). These include tools for monitoring effects of land management practices on water (FL-WES) and the vulnerability of riparian areas (BT) – that have water as an important entry point. Other tools, such as Role-Playing Games (RPGs) can have water as a focus, but it depends on the context. However, a closer look at FLR tools, such as the Restoration Opportunities Assessment Methodology (ROAM), the Toolkit for Ecosystem Service Site-based Assessment (TESSA), etc., reveal that these tools do not address water risks in the landscape, but rather use other entry points for FLR, such as carbon storage/sequestration and biodiversity conservation. Moreover, other water-relevant tools focus on agriculture (e.g., Aqueduct) as well as on downstream and coastal issues (e.g., Source-to-Sea, S2S). Thus, the W-FLR tool helps bridging the gap between water and forest management approaches.

There are several best practices databases for different types on land management, such as the Framework for Ecosystem Restoration Monitoring Registry (FERM) that among others include the World Overview of Conservation Approaches and Technologies (WOCAT) database. These databases can include many relevant practices for water-smart FLR, especially in drylands, but do not have water as a search criterion. This manual will help you implement Water-smart FLR, by identifying which ecosystem services to target, which in turn will guide the selection of best practices. The tools and databases in Box 3 are further described in other relevant sections in the handbook.

Box 3. Examples of tools relevant to W-FLR

FAO/SIWI e-learning course on forest-water nexus

Standards of practice to guide ecosystem restoration – A contribution to the United Nations Decade on Ecosystem Restoration 2021–2030, launched in 2024

FAO Forest and Landscape Water Ecosystem Services (FL-WES)

Blue Targeting (BT) – Riparian forest management

Water Tracker for National Climate Planning – ensuring that water resilience is integrated into national climate plans

The Water Footprint Assessment Tool

WET-Ecoservices tool – Assessing wetlands and riparian areas ecosystem services

Toolkit for Ecosystem Service Site-based Assessment (TESSA)

Restoration Opportunities Assessment Methodology (ROAM)

WWF Water Risk Filter

Aqueduct – Identify and evaluate water risks around the world

The Action Platform for Source-to-Sea Management (S2S Platform)

Framework for ES Restoration Monitoring Registry (FERM)

The World Overview of Conservation Approaches and Technologies (WOCAT)

International Principles and Standards for the Practice of Ecological Restoration (the Standards)

Role Playing Games

The W-FLR Tool approach and method

The W-FLR Tool and method is organised into a handbook with six modules that will help you assess water risks and opportunities in FLR together with relevant stakeholders, and to identify response options/solutions to these risks to strengthen water governance and actions on the ground. The assessment of water risks in FLR as well as possible response options and solutions will be based on a participatory assessment with key sectors and FLR actors, which will vary with the scale and scope of the W-FLR initiative or project. The modules will be implemented in two phases, the preparatory phase and the workshop phase (see Figure 5).

The preparatory phase involves three modules and will be undertaken by a core team in charge of the W-FLR initiative. The decisions made and material compiled in this phase are necessary preparations for the next phase. The second step, **the workshop phase**, involves organising a workshop with key stakeholders identified in Module 3 to identify priorities and readiness for W-FLR in a participatory and inclusive manner. The time necessary for completing each module and task, especially in the preparatory phase, will vary due to the flexibility of the tool. Large and complex restoration initiatives will require more time compared to smaller and less complex initiatives. We recommend that you invest some time in each task, without delving too deeply into details.

As a control function, the initiating task of the workshop is to give the participants of the workshop a chance to discuss and validate the results from the preparatory phase. This phase can also include identification of different types of indicators for monitoring W-FLR. All information from the previous tasks will be compiled into a roadmap for water-smart FLR. This is where the tool stops, but a subsequent step could involve organisation of a final workshop with key policy and decision makers to present the road map to ensure buy-in and financial support for W-FLR.

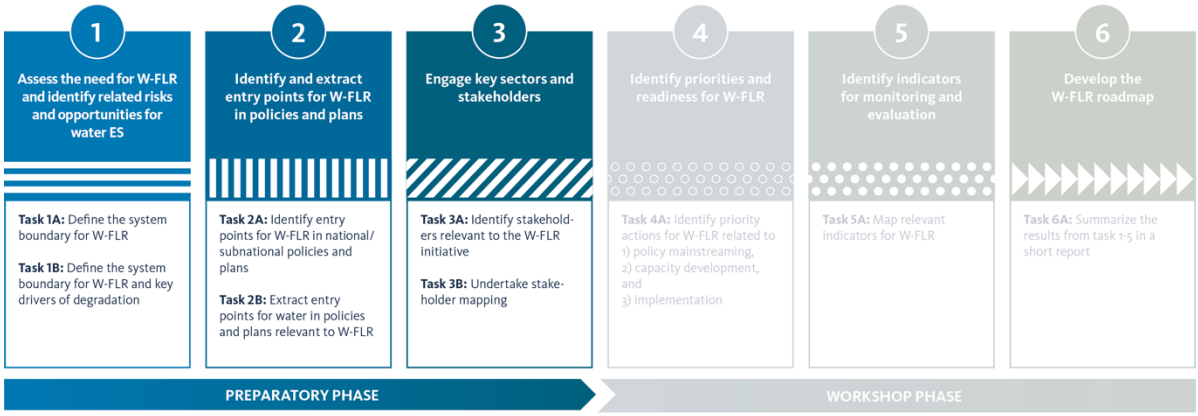
Examples will be provided throughout the handbook to assist planners and policymakers in the tasks. The examples build on pilot W-FLR cases in Benin, Ethiopia and Laos.

Support throughout the W-FLR process

The W-FLR Tool is designed so that a local project team can work through the W-FLR process without assistance, other than the input from the relevant stakeholder identified in the process. The idea is that the tool process should be practical and user-friendly, and that the tool users should not need expert opinions to complete the different tasks. However, if you are in need of more support, you can reach out to the W-FLR Helpdesk for guidance on how to apply the tool and on implementation of W-FLR related to issues such as identifying where in the landscape tree plantation would be most beneficial, spacing of trees, and species selection based on assessments of local water risks.

Figure 5. Flowchart summarising the W-FLR method and process.

3. W-FLR handbook modules – the preparatory phase

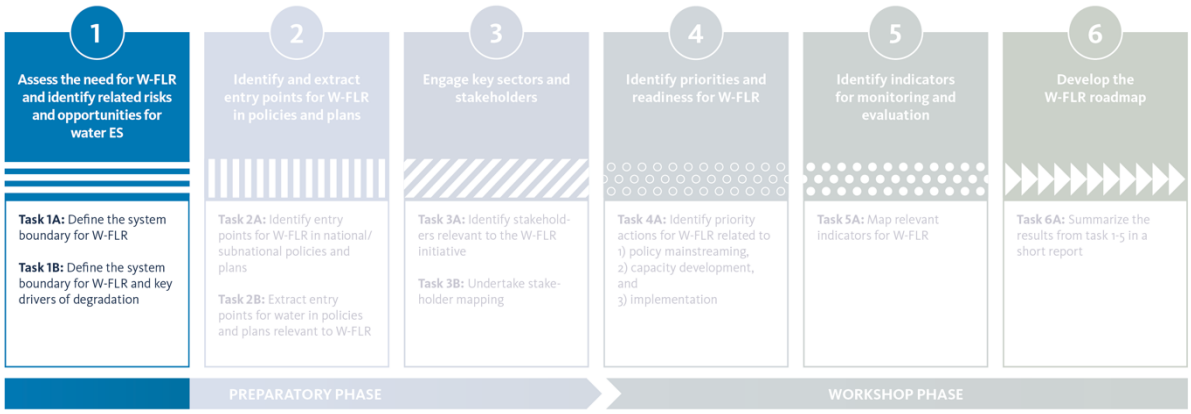


The first three modules of the process are part of the Preparatory Phase. During this phase, your W-FLR team or working group will develop background knowledge and material to ensure the best possible outcome of the second phase, the Workshop Phase. The preparatory steps involve an assessment of the need for W-FLR at national/sub-national level and a mapping of related risks and opportunities for water ecosystem services (Module 1); identification and selection of entry points for water-smart FLR in policies and plans (Module 2); and engagement of key sectors and stakeholders (Module 3).

Validation of results

The results from the Preparatory Phase will be presented to and discussed with the stakeholders participating in the workshop in the second phase. The validation of these results is a key step in the process, since the relevance of the outcomes reached at the end of the process are highly dependent on an accurate description of the contexts described in the first phase.

Module 1: Assess the need for W-FLR at national/sub-national level and identify related risks and opportunities for water ecosystem services



Objectives

- Identify and define the system boundary of the FLR intervention.
- Identify key drivers of degradation and barriers to restoration within the system boundary.
- Identify WES at risk within the system boundary.

Why is this important?

- To define the natural hydrological boundaries for the FLR intervention, to identify water-risks to ecosystem services, as well as in following modules identify relevant stakeholders, sectors and policies to consider.
- To map the key drivers of degradation as well as potential barriers to restoration, to tailor restoration interventions that address these causes of degradation.
- To define water ecosystem services within the hydrological boundaries and to identify and understand the risks to these water ecosystem services.

Task 1a. Define the system boundary for W-FLR and key drivers of degradation

The system boundary in water-smart FLR should factor in the hydrology of the landscape and consider its natural hydrological boundaries, such as a river basin, a watershed/catchment, riparian areas, source water areas, groundwater aquifers, etc. It is necessary to account for aspects related to both land and water governance and management.

This can be challenging, since there are different definitions and traditions to factor in. For instance, landscapes are defined based on both natural characteristics (rivers, landscape formation vegetation, climatic conditions, etc.), administrative borders such as municipalities, counties etc, and socio-economic factors – for example by the local residents and the different ways in which they perceive and demand to use existing natural resources. In contrast, physical water boundaries cannot be limited to administrative criteria such as regional or district boundaries. Water flows through landscapes, crossing borders, which

may encompass upstream-downstream user conflicts due to water scarcity or impacts on environment and social-economic conditions.

There is also a need to consider the interface with other systems and flows in and out of the system through for example moisture exchange with the atmosphere.

It is important to note that there may not be an evident system boundary for your intervention, and that you should identify the natural boundary most useful for your case.

Examples of water-related system boundaries:

River basin - A river drainage basin is an area of land where all flowing surface water converges to a single point, such as a river mouth, or flows into another body of water, such as a lake or the ocean. A basin is often separated from adjacent basins by natural landscape boundaries, such as ridges and hills. The term "basin" often describes a large watershed of a named river.

Watershed/catchment - A watershed is an area of land that drains water into a specific waterbody, for example rivers or lakes. A watershed is a multiscale concept with no fixed spatial scale – it comes in all sizes. It describes the basin that is influencing a stream or river network above a certain point in the landscape. Watersheds are nested, i.e., many small watersheds are contained within the watersheds of larger downstream rivers or other bodies of water such as lakes and deltas.

Source-to-sea system - A source-to-sea system is the land area that is drained by a river system, its lakes and tributaries (the river basin), connected aquifers and downstream recipients including deltas and estuaries, coastlines and near-shore waters, the adjoining sea and continental shelf as well as the open ocean. A source-to-sea system can also be defined at a larger scale to include a sea and its entire drainage area, which may include several river basins.

Source water area - Source water refers to sources of water (such as rivers, streams, lakes, reservoirs, springs, and ground water) that provide water to public drinking-water supplies and private wells. The sources can include surface water (e.g., rivers, streams, lakes, springs, reservoirs), ground water (e.g., aquifers) and recycled or reused water.

Riparian area - A riparian zone or riparian area is the interface between land and water, and occur along the edges of rivers, streams, lakes, and other water bodies. The area, including its soil and vegetation, is directly influenced by permanent water and differ from surrounding uplands. Examples of riparian areas are streambanks, riverbanks, and flood plains.

Coastal zone - A coastal zone is the interface between land and ocean. It is defined as the part of the land affected by its proximity to the sea (influence of marine processes), and the part of the sea affected by its proximity to the land (influence of terrestrial processes). Mangroves and coastal wetlands are examples of important ecosystems in the coastal zone.

Groundwater aquifer - Groundwater aquifers are underground bodies of permeable rock or sediment that are saturated with groundwater. Groundwater enters the aquifer when precipitation seeps through the soil. The water can move through the aquifer and resurface via springs and wells. Groundwater can be divided into shallow and deep groundwater.

Practical Task 1a: Define the system boundary for W-FLR and key drivers of degradation

Please define the system boundary for the W-FLR intervention, based on the information of landscapes and system boundaries provided above. Optional complementary information on the system boundary can include region, population, population density, surface and volume. Try to briefly describe the hydrology of the area. Enumerate the key drivers of landscape and forest degradation (see Figure 6 below). Drivers can be categorised in their respective sectors, e.g. forest, landscape, water resources (see example). Finally, identify the potential barriers to restoration and enabling opportunities for restoration.

Go to Task 1a in Appendix 1 to do the task.

Example: Benin case study

Identify the W-FLR system boundary and key drivers of degradation	
System boundary	Head of the Mekrou watershed, a sub-basin of the Niger River, located in the Atacora department and in the commune of Kouandé, straddling two arrondissements of the commune, namely Birni and Orou-Kayo. Population (2023) :Birni = 19,196 ; Orou-Kayo = 24,209 Kouandé population density = 37 inhabitants/ km2 Surface area: 36,316 ha
Ecological and hydrological description	Head of the Mekrou watershed is a hydrological unit categorized as highly vulnerable.
	Dirtiness/turbidity of water (In a study carried out by the European Commission's Joint Research Group, 45.8% of people questioned in Benin considered this to be the main problem with water supply), in view of taste, color and odor.
	Irregular water supply with water shortages during the dry season
	Deforestation/ degradation of forest resources, potentially affecting groundwater reserves
Key drivers of forest and landscape degradation	Extreme intra- and inter-annual hydro-climatic variability creating complex challenges to deal with due to the majority of the basins being transboundary. The deterioration in rainfall observed over the last twenty years is fundamentally disrupting all human activities, with adverse consequences for the fragile ecosystems of the Mekrou watersheds.
	Agriculture: - Conversion of wooded areas to crops - Uncontrolled expansion of agricultural and pastoral areas - Extensive, rudimentary, shifting cultivation, modern and plough-based farming - Clearing of land for yam cultivation - Uncontrolled use of phytosanitary products
	Livestock : - Overgrazing - Total pruning - Absence of transhumance corridors and grazing areas - Grazing areas not secured
	Water : - Silting/siltation of watercourses, sedimentation, pollution of the river due to human activity, progressive drying up of resources - Use of prohibited fishing gear - Poor water management and distribution practices

	Forestry : - Tree burning/deforestation - Hunting - Late bush fires - Carbonization
	Natural events : - Wind and water erosion due to winds, floods and heavy rains - Soil impoverishment, soil collapse, drought, sea-level rise
	High population growth accelerating the degradation of resources and the ecosystem services they provide
Potential barriers of forest and landscape restoration	Lack of cross-border coordination/cooperation between countries and players
	Lack of a strategy for resilience and adaptation of the forestry sector to climate change, lack of an adequate conservation strategy for biodiversity, forests and protected areas.
	Illegal logging and lack of sustainable management of forests and protected areas
	Weak promotion of agroforestry and large-scale forest plantations
	A population growth rate of 3.3% per year
	Growing demand for wood energy and land: nearly half of the country's energy needs are met by firewood and charcoal for cooking.
	The wood energy value chain employs around 200,000 people nationwide, or almost 2% of the population.
	Weak institutional coordination and synergy between national and local community responses. Non-application of texts by Beninese populations, absence of implementing decrees for certain laws. Lack of consideration of gender, endogenous adaptation knowledge and migration in relation to climate change.
	Lack of knowledge about climate change in water management
	Lack of funding for consultation mechanisms.
Enabling opportunities for forest and landscape restoration	The water authorities of Benin, Burkina and Niger, as well as the Niger Basin Authority (NBA), have expressed their interest in developing a cooperation framework for the Mekrou basin, involving stakeholders at all levels.
	Investing more resources to facilitate the collection and analysis of reliable data for a better understanding of local realities and harmonious, sustainable development in the basin.
	Cross-border, inter-communal and sustainable management of ecosystems in the context of global environmental change => Cross-border cooperation to promote regional integration as an engine of growth
	Plan for the installation of players in the basin and the planning of their activities
	Strengthening the information system needed to avoid conflicts of use of the resource
	Set up a database and information system for effective knowledge management.
	Capacity-building and participation of the local population in the environmental management of the Mékrou River.
	To improve water quality, set up water monitoring and control systems.

Task 1b. Identify water ecosystem services at risk within the system boundary

Whitin a system boundary, nature provides many services that human society depends on. These ecosystem services depend on different ecological processes and functions, and trade-offs may occur where a landscape provides multiple functions or services. Ecosystem services can be divided into provisioning, regulating, supporting and cultural services that provide many invaluable benefits to people (Hassan et al., 2005). Some ecosystem services are difficult to value economically. These include cultural services, such as aesthetics, recreation or sacred places and natural bodies such as sacred rivers and forests (Tengberg et al., 2012). To fully address the potential of a W-FLR initiative, it is important to adopt a holistic approach that considers the entire range of ecosystem services, including non-monetary and social values. Ecosystem services are affected by drivers of change in the landscape related to population pressure, changes in harvest and resource consumption, changes in land use and cover, and climate change. These changes in the landscape in turn impact the hydrology of the landscape (see Figure 6).

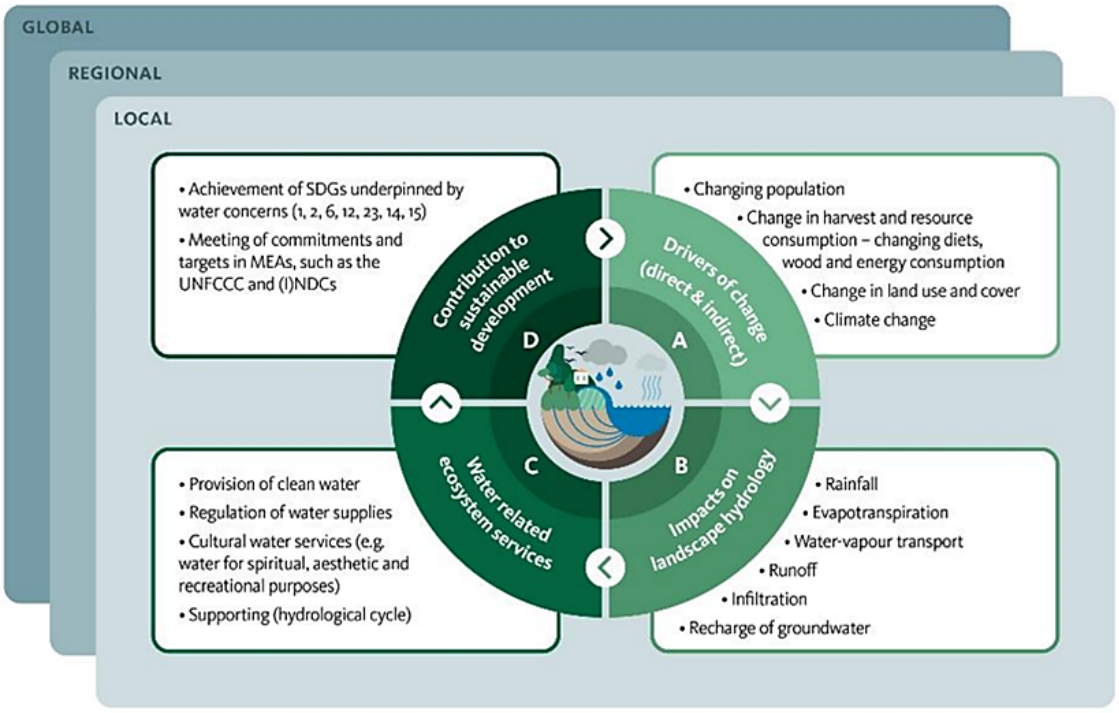


Figure 6. Conceptual framework for water ecosystem services in landscapes. Source: (Tengberg et al., 2021).

A range of ecosystem services are explicitly linked to the water cycle that we in this manual call "water ecosystem services" (see Figure 7). These water ecosystem services are listed in Table 2, together with the ecosystem process that support each service. The W-FLR Tool entry point to water ecosystem services is based on a wide landscape perspective where all ecosystem services that are linked to water are included. Water-related services delivered by ecosystems include providing clean drinking water, regulating water flows and flood events, and creating opportunities for water-based recreation and cultural practices. Water ecosystem services can also contribute to mitigating climate change by enhancing carbon sequestration and storage below and above ground, and by providing habitat for biodiversity, including native plants and animals (Ingemarsson et al., 2022; Tengberg et al., 2021).

Water ecosystem services relevant to W-FLR can also be instrumental in reducing poverty in rural areas, provided that there are clear incentives for the local population to manage the land sustainably. Sustainable management of forests and trees as well as restoration of degraded landscapes have the

potential to provide a range of ecosystem services that can support local livelihoods (Hassan et al., 2005). Incomes can be generated from timber, fibres, bioenergy, and non-timber forest products (NTFPs) such as fruit, fodder, and honey, as well as from agriculture. A stable supply of clean water can be ensured through an optimal tree cover and planting of trees along streams and rivers. Payment for ecosystem services could support forest and landscape restoration where short-term income from forest and tree products is small or non-existent (Fernandes et al., 2022).

Figure 7. Water ecosystem services. The figure illustrates the many ecosystem services provided by productive and well managed multifunctional landscapes. Many of these ecosystem services are water related. Source: SIWI.

Table 2. Synthesis of water-related ecosystem services. Source: (Tengberg et al., 2021).

Ecosystem services	Ecosystem processes
Supporting ecosystem services	
Supporting hydrological cycle	Transpiration and evapotranspiration.
	Canopy interception.
	Hydraulic redistribution, moving water from moist to dry soil through plant roots.
	Plants play a part in hydrological cycles by controlling water runoff.
	Release of volatile organic compounds contributing to: • intensification of rainfall and an overall cooling effect by blocking incoming solar energy. • secondary organic aerosol condensing atmospheric moisture.
	Trees recharge atmospheric moisture and influence cloud formation.

	Vegetation helps to regulate climate by cycling vast amounts of water and maintaining the gaseous composition of the atmosphere.
	Terrestrial moisture recycling.
	Precipitation recycling.
	The biotic pump theory – precipitation in continental interiors from atmospheric circulation driven and maintained by large, continuous areas of forest starting from the coastline.
	Arial rivers – cross-continental transport of atmospheric moisture affecting downwind water availability.
Supporting nutrient cycling	Forest and vegetation support biogeochemical (nutrient) cycling in four components: the atmosphere; the pool of available nutrients in the soil; organic materials (living and dead); minerals in soils and rocks.
Supporting soil formation/quality	Tree roots and soil organic matter from litter inputs improve soil structure, enhance aggregate stability and promote faunal activity.
	Organic matter in soil affects saturated hydraulic conductivity by slowing down water movement.
Supporting biodiversity	Hydrology as a driver of biodiversity, supporting primary production, carrying capacity and niche formation.
	Water as a connector linking organisms and supporting pollen and propagule dispersal.
	Habitats that safeguard fisheries and biological diversity.
Provisioning ecosystem services	
Provision of freshwater	Tree density influence groundwater recharge.
	Tree species influence water yield.
	Tree age influence water yield.
	Nutritional water productivity, i.e., 'crop per unit volume of water'.
Provision of food and medicines	Ecosystems provide the conditions for growing and harvesting food and extracting medicines.
Provision of wood, fibre and fuel	Ecosystems provide raw materials for construction, production and fuel including wood, biofuels and plant oils.
Regulating ecosystem services	
Regulate water flow	Water retention capacity.
	Stream-flow regulation.
	Increased infiltration from tree roots and enhanced levels of soil organic matter.
	Increased infiltration capacity reduces soil evaporation losses.
	Fog, mist and cloud water capture, i.e., condensation on plant surfaces.
Nature-based water purification and wastewater treatment	Trees filter precipitation and reduce sedimentation into water courses.
	Reduce pollutants entering water courses.
	Natural and constructed wetlands remove pollutants.
	Fast-growing tree species are planted to filter wastewater.
Climate regulation	Carbon sequestration in soil.

	Carbon sequestration in above ground and below ground vegetation.
	Regulating local temperature through evapotranspiration.
Cultural ecosystem services	
Heritage value and cultural identity	Landscape-related "memories" from past cultural ties, mainly expressed through characteristics within cultural landscapes.
Spiritual experiences	Holy or spiritual places important to spiritual or ritual identity, e.g. River Ganges in India, sacred forest groves, sacred plants or animals.
Wellness, recreation and (eco)tourism	Pleasure, comfort, discovery and socialisation that takes place in leisure in nature and observing natural elements.
Education and research	Climate, topography, water cycle or soil and biota used for education and research.
Aesthetic appreciation and inspiration	Visual perception of ecosystems and landscape.
	Lakes and rivers represented in songs.

Practical task 1b: Identify water ecosystem services at risk within the system boundary

The next step is to identify water ecosystem services at risk within the system boundary. To this end, as ecosystem processes are interlocked in the ecosystem services, you will focus on ecosystem processes which will, ultimately, reflect the status of ecosystem services.

The aim of the task is to identify which ecosystem processes are at risk due to ecosystem degradation (see Table 2 or Table 4. Task: Water ecosystem services table). Assess the ecosystem processes at risk, based on your knowledge, to be able to prioritize actions for restoration. This assessment is qualitative (no measurement required) and can be adjusted during the application of the tool.

Mark the degree of risk to the ecosystem processes as follows in the table:

- Low risk
- Intermediate risk
- High risk

Tips:

1. Start by using your own expert knowledge of the status of the restoration area. Note that this is a qualitative assessment.
2. If necessary, turn to local populations or forest/landscape/water resources experts at hand to gather information on the current status of ecosystem processes.
3. If you still wish for more help with the assessment, please turn to the W-FLR Help Desk which can guide you.

Go to Task 1b in Appendix 1 to do the task.

Example: Ethiopia case study (to be finalised)

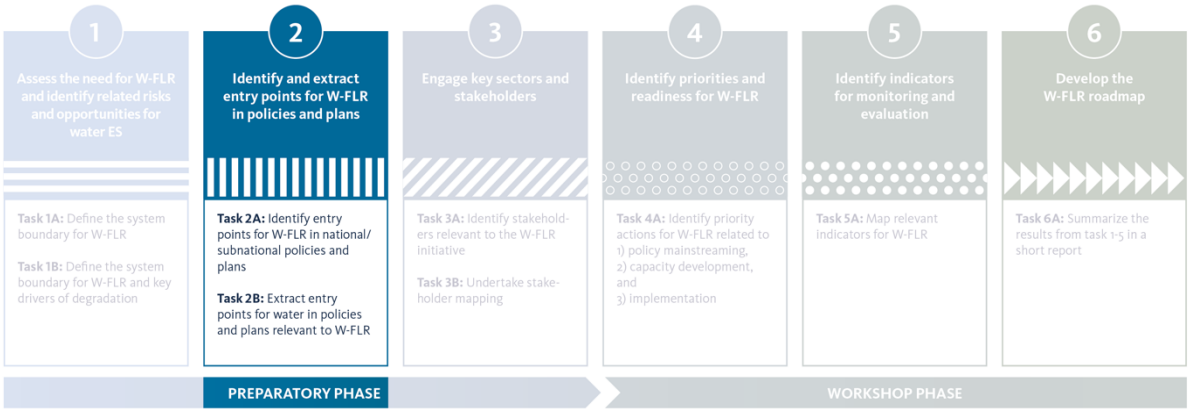
Ecosystem services	Ecosystem processes	Task 1b: Current status of water ES	Task 2b: Addressed in relevant plans and policies
Supporting ecosystem services			
Supporting hydrological cycle	Transpiration and evapotranspiration.		
	Canopy interception.		
	Hydraulic redistribution, moving water from moist to dry soil through plant roots.		
	Plants play a part in hydrological cycles by controlling water runoff.		
	Release of volatile organic compounds contributing to: • intensification of rainfall and an overall cooling effect by blocking incoming solar energy. • secondary organic aerosol condensing atmospheric moisture.		
	Trees recharge atmospheric moisture and influence cloud formation.		
	Vegetation helps to regulate climate by cycling vast amounts of water and maintaining the gaseous composition of the atmosphere.		
	Terrestrial moisture recycling.		
	Precipitation recycling.		
	The biotic pump theory – precipitation in continental interiors from atmospheric circulation driven and maintained by large, continuous areas of forest starting from the coastline.		
	Arial rivers – cross-continental transport of atmospheric moisture affecting downwind water availability.		
Supporting nutrient cycling	Forest and vegetation support biogeochemical (nutrient) cycling in four components: the atmosphere; the pool of available nutrients in the soil; organic materials (living and dead); minerals in soils and rocks.	High	
Supporting soil formation/ quality	Tree roots and soil organic matter from litter inputs improve soil structure, enhance aggregate stability and promote faunal activity.	High	
	Organic matter in soil affects saturated hydraulic conductivity by slowing down water movement.	High	
Supporting biodiversity	Hydrology as a driver of biodiversity, supporting primary production, carrying capacity and niche formation.	High	
	Water as a connector linking organisms and supporting pollen and propagule dispersal.	High	

	Habitats that safeguard fisheries and biological diversity.	High	
Provisioning ecosystem services			
Provision of freshwater	Tree density influence groundwater recharge.		
	Tree species influence water yield.		
	Tree age influence water yield.		
	Nutritional water productivity, i.e., 'crop per unit volume of water'.		
Provision of food and medicines	Ecosystems provide the conditions for growing and harvesting food and extracting medicines.	Inter-mediate	
Provision of wood, fibre and fuel	Ecosystems provide raw materials for construction, production and fuel including wood, biofuels and plant oils.	Low	
Regulating ecosystem services			
Regulate water flow	Water retention capacity.		
	Stream-flow regulation.		
	Increased infiltration from tree roots and enhanced levels of soil organic matter.	High	
	Increased infiltration capacity reduces soil evaporation losses.	High	
	Fog, mist and cloud water capture, i.e., condensation on plant surfaces.		
Nature-based water purification and wastewater treatment	Trees filter precipitation and reduce sedimentation into water courses.	Inter-mediate	
	Reduce pollutants entering water courses.		
	Natural and constructed wetlands remove pollutants.		
	Fast-growing tree species are planted to filter wastewater.		
Climate regulation	Carbon sequestration in soil.	High	
	Carbon sequestration in above ground and below ground vegetation.	High	
	Regulating local temperature through evapotranspiration.	High	
Cultural ecosystem services			
Heritage value and cultural identity	Landscape-related “memories” from past cultural ties, mainly expressed through characteristics within cultural landscapes.		
Spiritual experiences	Holy or spiritual places important to spiritual or ritual identity, e.g. River Ganges in India, sacred forest groves, sacred plants or animals.		
Wellness, recreation and (eco)tourism	Pleasure, comfort, discovery and socialisation that takes place in leisure in nature and observing natural elements.		

Education and research	Climate, topography, water cycle or soil and biota used for education and research.		
Aesthetic appreciation and inspiration	Visual perception of ecosystems and landscape.		
	Lakes and rivers represented in songs.		

Comments (Task 2b):
The analysis confirms the critical situation of several water ecosystem services in the Lake Chamo catchment, with nutrient cycling, biodiversity, and freshwater provision facing the highest risks.

Module 2: Identify and select entry points for water-smart FLR in policies and plans



Objectives

- Identify water ecosystem services that ministries and/or agencies are targeting in their official documents.
- Based on this identification, identify and select entry points in existing policies and plans most relevant and most achievable in your W-FLR intervention.
- Identify lead coordinating institution and national priorities related to the W-FLR intervention.
- Identify potential financing/funding sources for the W-FLR intervention.

Why is this important?

- To get clear indications on how to align your W-FLR project or initiative to national/sub-national policies and plans, to ensure that it is working towards already set goals.
- Identifying national priorities will help engaging key policy makers and decision makers from different sectors as well as other stakeholders with interests in, or influence on, how landscapes are managed – and can build high-level support for W-FLR. Water-smart FLR is not only important for water flows and quality, but also for reaching productivity, conservation and climate goals in restoration projects and strategies.
- There may be opportunities to mobilise resources by linking the intervention to funding mechanisms for Multilateral Environmental Agreements, which can aid further development implementation of your W-FLR initiative.

Task 2a. Identify potential entry points for W-FLR in national/subnational policies and plans

Before making detailed plans for the W-FLR intervention, it can be of great support to examine national, regional, district, basin and catchment policies and plans that can be of relevance. Looking at national (or sub-national) assessments will provide the contextual framework for enabling conditions for potential restoration strategies within a country. In Task 2a, you will therefore map what entry points (objectives/ measures/ actions/ project and programmes; water ecosystem service and ecosystem processes; responsible

ministries/agencies) related to natural water resources and associated sectors are mentioned in existing plans and policies which may have impacts on the W-FLR intervention.

What documents to look in?

This task should be a rapid screening of the most relevant plans and commitments. The mapping may include official government policies and strategies on land use, conservation, restoration etc., that both explicitly and indirectly address restoration and FLR. The latter may also focus on biodiversity, climate change, land degradation, etc., since water-smart FLR is not only important for water flows and water quality, but also for reaching conservation, sustainable use, productivity and climate goals in restoration projects and strategies. Which documents are most useful will be highly country-specific. Still, be prepared to invest some time into this task.

Commitments relevant to W-FLR could for example be identified in:

- UNFCCC NDCs – Nationally Determined Contributions, especially in priority interventions related to ecosystem management, etc.
- UNFCCC NAPs – National Adaptation Plans
- CBD NBSAPs – National Biodiversity Strategies and Action Plans
- UNCCD NAPs – National Action Programmes to Combat Desertification
- FLR – Forest and Landscape Restoration plans
- IWRM – Integrated Water Resources Management plans/River basin plans/Watershed plans
- Other development plans as well as international FLR commitments (see Table 1)

Tips:

- Water consideration and the forest-water nexus should be the main elements driving the review.
- Based on the consultation of local experts, review the **five most relevant** national, regional and/ or local plans.
- The NDCs are a good start for identifying entry points in documents. Most NDCs address commitments from a national perspective, so depending on your system boundary this might require you to look further for the recognition of sub-national commitments, risks, and opportunities. IWRM plans and basin/watershed plans are useful for restoration efforts reliant on local catchments and interactions. For countries with a developed NAP, further entry points might be found by looking at potential synergies within forestry and water targets.
- Information required in this task can be found in different sections of the documents as water is an inherent element of multiple sectors. Type of information to look for:
    - Objectives, measures, actions, projects and programs related to water and/or the forest-water nexus
    - Water ecosystem services and processes
    - Responsible national ministries and agencies (if this information is missing in the documents, it can be adjusted in the workshop phase)

Practical task 2a: Identify potential entry points for W-FLR in national/subnational policies and plans

- We suggest that you follow these steps:
  1. Review the table of contents in the documents (to see which sections are relevant)
  2. When reviewing, use the concepts addressed in Table 2 (see also Table 4. Task: Water ecosystem services table" to collect objectives/ measures/ actions/ projects/ programs, water ecosystem services/ processes and responsible ministries/ agencies at once.
     - *Note that ecosystem processes might not be mentioned as detailed in the national documents, as they are in Table 2 and Table 4, or they may be addressed using a different type of wording. Therefore, remain flexible when you map water ecosystem services in the documents, but be careful to not add personal interpretations.*
  3. Use search words to be more efficient in the review process (see a non-exhaustive list below).

Examples of search words: water, hydro(logy), flood, drought, IWRM, water security, forest(s/ry), restoration, ecosystem services, specific words to your system boundary (e.g.., river basin, watershed), land degradation, plantation, Forest and Landscape restoration, FLR, agroforestry.

Go to Task 2a in Appendix 1 to do the task.

Example: Laos case study

Type of policy or plan		Comments
UNFCCC NDC	Commitments or measures in plan	
	Unconditional NDC: 34% reduction in emissions from deforestation and forest degradation compared to baseline scenario achieved in 2020 target by 2030. Conditional NDC: Increase forest cover to 70% of land area (i.e. to 16.58 million hectares). Through conservation, sustainable management of forests, buffer zones of national parks and other preserves, and enhancement of forest carbon stocks. 1. Strengthen water resource information systems for climate change adaption. 2. Manage surface water, groundwater and wetland for climate change resilience. 3. Increase water resource infrastructure resilience to climate change, including through nature-based solutions.	
	Responsible national ministry or agency	
	Department of Climate Change of the Ministry of Natural Resources and Environment, using data provided by the Ministry of Agriculture and Forestry	
	Water ecosystem service and processes in document	
	Regulating water flow Water retention capacity, stream-flow regulation and increased infiltration.	
	Carbon sequestration in soil as well as above ground and below ground vegetation.	

CBD NBSAP	Commitment or measures in plan	
	Action 5.1.1 (d) Establish policy and guidelines for the application of the concepts of Payment for Ecosystem Services (PES) and Reduction of Emission from Deforestation and forest Degradation (REDD+). Action 1.2.2 (a) Formulate national wetlands inventory and strategy. Management plans and substantive funding are in place to enforce biodiversity protection in at least 10 National Protection Areas, 5 PPAs, 3 protection forests and 2 corridors.	
	Responsible national ministry or agency	
	Action 5.1.1 (d): Ministry of Agriculture and Forestry (MAF), Department of water resources, MoNRE, Ministry of Energy and Mines, Ministry of finance, DIC (MPI). Action 1.2.3 (a): Ministry of Natural Resources and Environment, MRC	
	Water ecosystem service and processes in document	
	Supporting biodiversity Restoration and rehabilitation of habitats that safeguard fisheries and biological diversity.	
UNFCCD NAP	Commitments or measures in plan	
	Forestry priority: 1.Continue the slash and burn eradication programme and permanent job creation program. 2.Strengthen capacity of village forestry volunteers in forest planting, caring and management techniques as well as the use of village forests. Water priority: 1. Awareness raising on water and water resource management. 2. Mapping of flood-prone areas. 3. Establish an early warning system for flood prone areas and improve and expand meteorology and hydrology networks and weather monitoring systems. 4. Strengthen institutional and human resource capacities related to water and water resource management. 5. Survey underground water sources in drought prone areas. 6. Study, design and build multi-use reservoirs in drought prone areas. Study, design and build multi-use reservoirs in drought prone areas.	
	Responsible national ministry or agency	
	Ministry of Agriculture and Forestry (MAF), Forest Resources Conservation Department and Forest Inventory and Planning Centre. Meteorological and Hydrological Departments	
	Water ecosystem service and processes in document	
	Provisioning freshwater and food/materials Tree density influence groundwater recharge. Tree species and age influence water yield.	
	Regulating water flow Water retention capacity, stream-flow regulation, and increased infiltration.	

Task 2b. Extract entry points for W-FLR relevant policies and plans

Task 2b is based on your findings in Task 1b, where water ecosystem services at risk within the system boundary were defined, and Task 2a, where you identified ecosystem services and processes considered in national and sub-national policies and plans.

The objective of this task is to combine results from Task 1b and Task 2a to identify the type and status of water ecosystem services and processes that are mentioned in the different policies and plans collected in Task 2a.

Note that some ecosystem services and processes you have identified as at risk (in Task 1b) may not be mentioned in the commitments or plans you are investigating (in Task 2a). In that case, actions are needed for policy mainstreaming (see Module 4) to ensure that water ecosystem services are considered in commitments, policies and plans.

This task will help you to identify the entry points for the water ecosystem services that are most relevant and most achievable in your W-FLR intervention. Remember to use the perspective of your system boundary. Many of the policy documents will focus on a national perspective, while your restoration initiative probably needs to be adapted to regional and local scales.

Practical task 2b: Extract entry points for W-FLR relevant policies and plans

Use "Table 4. Task: Water ecosystem services table" and report in the column “Task 2b: Addressed in relevant plans and policies” what plans consider water ecosystem services. Make an overall comment analysing and linking Task 1b and Task 2b.

Tips:
First, the overall comment must reflect on the composition of the policies and plans:

- Type of water ecosystem services (supporting, provisioning etc…) that is the most represented in policies and plans.
- Total amount of water ecosystem services addressed in policies and plans.
- Risk average of water ecosystem services considered in policies and plans.

Second, the comment should focus should be on type of water ecosystem services that are underrepresented in policies and plans and are at risk.

Go to Task 2b in Appendix 1 to do the task.

Example: Ethiopia case study

Ecosystem services	Ecosystem processes	Task 1b: Current status of water ES	Task 2b: Addressed in relevant plans and policies
Supporting ecosystem services			
Supporting hydrological cycle	Transpiration and evapotranspiration.		
	Canopy interception.		
	Hydraulic redistribution, moving water from moist to dry soil through plant roots.		
	Plants play a part in hydrological cycles by controlling water runoff.		
	Release of volatile organic compounds contributing to: • intensification of rainfall and an overall cooling effect by blocking incoming solar energy. • secondary organic aerosol condensing atmospheric moisture.		
	Trees recharge atmospheric moisture and influence cloud formation.		
	Vegetation helps to regulate climate by cycling vast amounts of water and maintaining the gaseous composition of the atmosphere.		
	Terrestrial moisture recycling.		
	Precipitation recycling.		
	The biotic pump theory – precipitation in continental interiors from atmospheric circulation driven and maintained by large, continuous areas of forest starting from the coastline.		
	Arial rivers – cross-continental transport of atmospheric moisture affecting downwind water availability.		
Supporting nutrient cycling	Forest and vegetation support biogeochemical (nutrient) cycling in four components: the atmosphere; the pool of available nutrients in the soil; organic materials (living and dead); minerals in soils and rocks.	High	Soil Erosion and Nutrient Loss in Ethiopia, World Bank CRGE Strategy LDN Strategy National Soil Conservation Strategy
Supporting soil formation/ quality	Tree roots and soil organic matter from litter inputs improve soil structure, enhance aggregate stability and promote faunal activity.	High	Land Degradation in Ethiopia: Challenges and Opportunities (UNCCD) CRGE Strategy LDN Strategy
	Organic matter in soil affects saturated hydraulic conductivity by slowing down water movement.	High	Land Degradation in Ethiopia: Challenges and Opportunities (UNCCD)

Supporting biodiversity	Hydrology as a driver of biodiversity, supporting primary production, carrying capacity and niche formation.	High	
	Water as a connector linking organisms and supporting pollen and propagule dispersal.	High	NBSAP CRGE Strategy
	Habitats that safeguard fisheries and biological diversity.	High	NBSAP CRGE Strategy
Provisioning ecosystem services			
Provision of freshwater	Tree density influence groundwater recharge.		
	Tree species influence water yield.		
	Tree age influence water yield.		
	Nutritional water productivity, i.e., 'crop per unit volume of water'.		
Provision of food and medicines	Ecosystems provide the conditions for growing and harvesting food and extracting medicines.	Inter-mediate	CRGE Strategy National Agricultural Policy
Provision of wood, fibre and fuel	Ecosystems provide raw materials for construction, production and fuel including wood, biofuels and plant oils.	Low	Ethiopia's Forest Cover Changes: Trends and Drivers (World Resources Institute) CRGE Strategy National Forestry Policy
Regulating ecosystem services			
Regulate water flow	Water retention capacity.		
	Stream-flow regulation.		Flood Risk and Vulnerability Assessment in Ethiopia (UN-Habitat)
	Increased infiltration from tree roots and enhanced levels of soil organic matter.	High	CRGE Strategy LDN Strategy
	Increased infiltration capacity reduces soil evaporation losses.	High	CRGE Strategy LDN Strategy
	Fog, mist and cloud water capture, i.e., condensation on plant surfaces.		
Nature-based water purification and wastewater treatment	Trees filter precipitation and reduce sedimentation into water courses.	Inter-mediate	CRGE Strategy National Water Policy
	Reduce pollutants entering water courses.		
	Natural and constructed wetlands remove pollutants.		
	Fast-growing tree species are planted to filter wastewater.		
Climate regulation	Carbon sequestration in soil.	High	Ethiopia's Climate Change Adaptation Plan CRGE Strategy NDC NAP

	Carbon sequestration in above ground and below ground vegetation.	High	Ethiopia's Climate Change Adaptation Plan CRGE Strategy NDC NAP
	Regulating local temperature through evapotranspiration.	High	Ethiopia's Climate Change Adaptation Plan CRGE Strategy NDC NAP
Cultural ecosystem services			
Heritage value and cultural identity	Landscape-related "memories" from past cultural ties, mainly expressed through characteristics within cultural landscapes.		
Spiritual experiences	Holy or spiritual places important to spiritual or ritual identity, e.g. River Ganges in India, sacred forest groves, sacred plants or animals.		
Wellness, recreation and (eco)tourism	Pleasure, comfort, discovery and socialisation that takes place in leisure in nature and observing natural elements.		
Education and research	Climate, topography, water cycle or soil and biota used for education and research.		
Aesthetic appreciation and inspiration	Visual perception of ecosystems and landscape.		
	Lakes and rivers represented in songs.		

Comments (Task 2b):
The analysis confirms the critical situation of several water ecosystem services in the Lake Chamo catchment, with nutrient cycling, biodiversity, and freshwater provision facing the highest risks.

Module 3: Engage key sectors and stakeholders

Objectives

- Identify and map stakeholders relevant to the FLR initiative, which you will invite to the Workshop Phase.
- Ensure representation of all stakeholder groups, including women, youth and indigenous people, and organisations directly affected by the FLR initiative in the Workshop Phase.

Why is this important?

- Forest restoration must be adapted to local conditions in everything from soil, hydrology, and native tree species to land tenure regulations and social structures.
- To fully understand the capacity, potential, and limitations of local conditions, it is helpful to involve a broad range of actors, stakeholders and sectors in the planning of the W-FLR initiative. This includes representatives from local communities and public interest groups, local non-governmental organisations and private companies operating in the selected landscape, and local government representatives.
- To be successful and sustainable in the long-term, the restoration initiative needs acceptance and support from the people who are directly affected by it, including women, youth and indigenous people. Local communities can play an important role in the planning process by ensuring that local traditions and knowledge are taken into consideration.

Task 3a. Identify stakeholders relevant to the W-FLR initiative

In this task, the aim is to identify which stakeholders (organisations/ companies/ ministries/ local groups/ etc.) to involve in the W-FLR initiative, by using a human rights-based approach (see Box 4). For sustainable and long-term change, it is necessary to ensure that all relevant stakeholders are involved in the process of developing a common vision. Consider involving stakeholders at all levels (national/sub-national/district/local) that are relevant for creating change within the system boundary. Ensure inclusivity by involving local communities, indigenous groups, women, and youth in the planning process. It is important for the sustainability of the initiative that the stakeholders involved are positive to the initiative and engage with constructive problem-solving minds.

Equally important as identifying the necessary sectors, ministries and agencies, is to find the right persons within these entities. Sometimes it is better to include deeply knowledgeable topic experts than top-executives, who may not know the technical possibilities but have prestigious positions to defend. In subsequent stages the included representatives will know best how to persuade the decision makers of their organisations.

Box 4.

Human rights and a human rights-based approach

A key element of any successful FLR initiative is to respect and protect the rights of the people affected by it. This can be achieved by applying a human rights-based approach (HRBA). The human rights system is adopted under international law by the United Nations, and it applies to every human being, regardless of nationality, gender, religious conviction, ethnic origin or any other such attributes. Human rights serve in parallel to other (domestic law) rights systems, such as property rights (land ownership, usage rights, etc.), water rights (permit to abstract water, to discharge wastewater, drill a well, build a dam, etc.), permits for forest clearance, plantation, diversion of forest land, etc., as well as nature conservation area regulations. In 2022, the UN adopted the human right to a clean, healthy, and sustainable environment which may be of high importance for W-FLR initiatives.

HRBA is especially important for poor and marginalized groups who often are disproportionately affected by water-related problems. Applying a human rights-based approach is important when growing water scarcity requires difficult prioritisations. It can help prevent a vicious cycle where the poor are at risk of falling further and further behind since they tend to be disproportionally affected by climate change and environmental degradation.

The main purpose of the HRBA is to further the realization of human rights, with the desired outcome to empower all people – girls and boys, women and men, old and young – to claim their human rights (as rights holders) and to increase the capacity of those who are obligated to respect, promote, protect, and fulfil those rights (as duty bearers). The HRBA checklist below can be used to help empower people – not least the most marginalized – to participate in decision-making that concerns them and to hold accountable those who have a duty to act on or refrain from infringing on human rights. By considering the HRBA during all phases of your FLR intervention, it is possible to avoid discriminatory practices that would hinder and undermine human rights.

HRBA checklist

The Swedish Development Agency (Sida) uses the letters in P.L.A.N.E.T as checkpoints to consider and promote human rights in FLR. Each keyword represents one important principle of the human rights concept.

Participation: Is there active and meaningful participation available for all relevant stakeholders in the FLR intervention, including opportunities for participants to influence the formulation of problems, planning and implementation? Are there follow-up workshops and evaluations for improving future programs?

Linking to human right instruments: Does the FLR intervention include links to human right instruments, such as laws, treaties, and systems?

Accountability: Who are the duty bearers in forest restoration activities on local, district and national level? Do they have the necessary knowledge, mandate, resources, and willingness to ensure their human rights obligations? Are the rights holders capable of holding governments to account?

Non-discrimination: Are women, elderly persons, indigenous peoples, minorities, disabled, and other vulnerable groups considered in the FLR intervention? How can discrimination actively be counteracted?

Empowerment and capacity development: What capacity do duty bearers have to fulfil their obligations? What capacity do the rights holders have to claim their human rights? How can the ability of stakeholders to actively participate in the FLR intervention be strengthened?

Transparency: Is information available in an accessible way to duty bearers and rights holders? Can they attend and observe meetings and processes where issues that affect them are discussed?

Practical Task 3a: Identify stakeholders relevant to the W-FLR initiative

Fill in stakeholders you identify as relevant to the W-FLR initiative.

Go to Task 3a in Appendix 1 to do the task.

Example: Laos case study

Stakeholder sectors	Specify
National level	
National ministries and regulatory agencies	Forestry Department
Non-Governmental Organisations (NGOs)	WWF
Universities and research institutes	Faculty of Biology, National University of Laos
Regional/sub-national level	
Basin organisations	
Regional bureaus/Councils	
Local/district level	
District authorities	Forestry Department

Local communities	Nonghoy Village
	Napho/Thakhaen villages
Private sector	
Value chain actors (Producers, processors, marketers, etc.)	Mekong Timber Plantation

Task 3b. Undertake a stakeholder mapping

In this task you will classify the actors that are relevant in your W-FLR initiative according to interest and influence, based on the RAPID Outcome Mapping Approach (ROMA), By knowing who has the **influence** to make change and who has the **interest** to make change you can identify how to engage with the different categories of actors. Make sure to involve the stakeholders that are affected by the W-FLR initiative, identified in Task 3a.

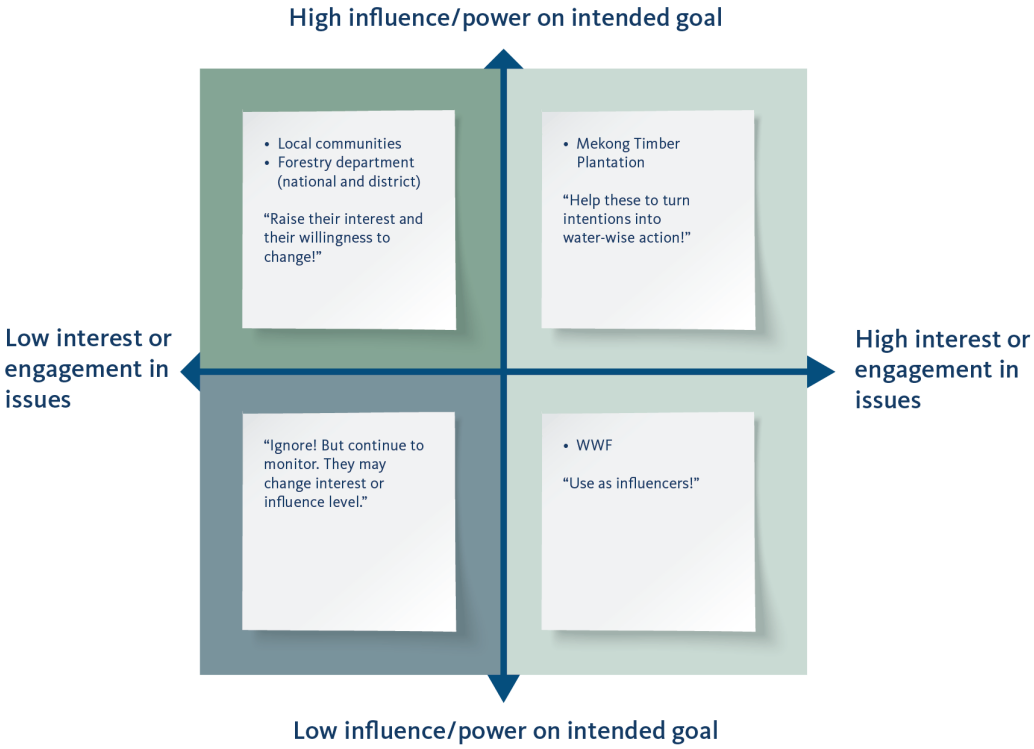
- Upper left box: Actors with **high influence/power but low interest** are crucial for the change process to happen and should be targeted to develop their interest or capacity.
- Upper right box: Actors with **high interest and high influence/power** can be teamed up with in partnerships to work towards the intended goal.
- Lower right box: Actors with **high interest but low influence** can be used as influencers to raise the interest among actors with low interest and high influence.
- Lower left box: Actors with **low interest and low influence/power** can often be ignored. However, keep monitoring them to notice any potential changes in future interest or influence.

Practical Task 3b. Undertake a stakeholder mapping

Place the stakeholders you identified in task 3a in the box relevant for each stakeholder.

Go to Task 3b in Appendix 1 to do the task.

Example: Laos case study



4. W-FLR handbook modules – the workshop phase

The process is now entering the Workshop Phase, and it is time to plan and invite the relevant stakeholders identified and mapped in Module 3 to a workshop.

Why organise a workshop?

During the workshop the stakeholder group will work together to identify priorities and readiness for W-FLR (Module 4), identify relevant indicators for a monitoring and evaluation system for the W-FLR initiative (Module 5), and develop the W-FLR Road map (Module 6). The focus of the workshop is to create a shared understanding of the necessity for water-smart FLR among participants. Participants will share their perspectives and knowledge of opportunities for restoration, as well as current obstacles, barriers, and potential solutions.

How to organise a workshop?

When planning a workshop, it can be of help to make these considerations:

- If possible, the workshop should take place in person. The facilitated dialogue and forming of relationships between participants are key for a successful workshop.
- Make sure you have a space or venue big enough for the amount of people that will participate, as well as room for presentations and group work.
- Consider and decide on how much time will be allocated for the workshop. This can vary from 2-3 days, depending on system boundary, capacity and sectors of the stakeholders, etc.
- Prepare materials needed such as papers, pens, sticky notes, tape, etc. It can also be of use to have a wall or board to display the material produced (such as notes or mind maps) during the workshop.
- Provide invited participants with the results from the Preparatory phase (Module 1-3) ahead of the workshop, so they can familiarise themselves with the material and share their comments with the facilitator ca 2 weeks before the workshop. This is essential for validation of the results from the Preparatory phase.

- If the workshop is taking place online, make sure to use an app/program that allows smooth interaction between participants, for example break out rooms, online whiteboard, etc.
- It is also important to allocate sufficient time to introduce and conclude the workshop, where participants are informed of the objective and can reflect on the outcomes of the workshop.

The agenda for the workshop can vary depending on participants, scope of the project, etc. However, below is a suggested program for the workshop:

1. Welcome and introduction of all participants. (add suggested time for each point)
2. Give a brief introduction to the objective of the W-FLR project and what outcomes you want to achieve with the workshop.
3. Validate the results from Module 1-3 by discussing them with the invited participants.
4. Include a short break if necessary.
5. Introduce Task 4 in Module 4. If the group is more than 6 people, it can be a good idea to break it up into smaller groups of 3-5 people.
6. Let the group(s) work on Task 4. It can be helpful to provide materials such as paper, pens, and sticky notes, for the group to brainstorm and compile their ideas.
7. If participants have discussed in smaller groups, let them briefly present their key ideas and conclusions.
8. Do step 5-7 again for Module 5 (Optional) and Module 6. Include short breaks if necessary.
9. Facilitate a general discussion on participants results from Module 4-6. Summarise the outcomes and ask the group if there is anything else to be added, that has not already been brought up.
10. Inform participants on next steps.

Who to invite?

Based on the results of Task 3b, invite the stakeholders that have high interest and/or high influence in the project. The number of people invited will vary from case to case, and can range from, for example, 5-20 people.

Main objectives

The main objective of the workshop is to create a shared understanding among participants on the necessary steps for water-smart FLR. This includes:

- Module 4: Identifying priority actions for capacity development, mainstreaming and implementation, to ensure the readiness of the FLR intervention.
- Module 5 (Optional): Identifying indicators for monitoring and evaluation (M&E), to ensure that the W-FLR project is implemented correctly and performing as expected.
- Module 6: Develop the Water-smart FLR Road map by compiling the results from Modules 1-5.

Workshop outcome

After the workshop, you will have initiated relationships with relevant stakeholders that can aid successful implementation of your W-FLR project. You will have an overview of information needed for future water-smart decisions in the FLR project.

Module 4: Identify priorities and readiness for water-smart FLR

Objectives

Assess the readiness of the W-FLR initiative by identifying priority actions to make FLR more water-smart within your system boundary in three major domains:

1. **Policy mainstreaming** – water needs to be integrated and reflected in policy instruments and plans relevant for W-FLR.
2. **Capacity development** – key stakeholders need to understand the benefits of FLR and to have capacity to identify how they can engage in W-FLR at different levels.
3. **Implementation on-the-ground** – identifying how to implement W-FLR on the ground using existing tools and best practice databases.

Why is this important?

- For water-smart FLR to be viable in the long term, there needs to be a conducive enabling environment and supportive policies in place that integrate water in relevant plans and budgetary commitments. If this is not the case, the readiness for W-FLR is low and **policy mainstreaming** for decision makers at national, regional and/or local level should be a priority.
- **Building institutional and technical capacity** among the identified stakeholders at relevant level(s) is also required to design W-FLR interventions and monitoring systems that consider water. Building this capacity is necessary before implementation of water-smart FLR can start at scale.
- **Implementation** of the restoration initiative should only start when policy mainstreaming and capacity development is sufficient. Still, the methodology of this task can also improve the effectiveness and longevity of existing and ongoing restoration initiatives that lack support from national, regional and local decision makers and capacity among stakeholders.

Task 4a. Identify current state and priority actions for your W-FLR intervention

The main aim of the W-FLR Tool is to assess readiness for water-smart FLR in your restoration initiative, and to ensure that the correct measures have been taken to implement an effective and long-lasting restoration intervention. This may not be the case if mainstreaming of water in relevant policies and plans for FLR has not taken place or if overall capacity in integrating water into FLR is low. However, the W-FLR methodology can also improve the effectiveness and longevity of existing and ongoing restoration

initiatives, by providing a methodology to ensure support from national, regional and local decision makers and capacity among stakeholders. Also, small pilots or demonstrations of implementation of W-FLR could be started in parallel with policy mainstreaming and capacity building interventions. Below follows some guidance on how to identify priorities for the different domains and already available tools that could be used in this process.

1. Identify priorities for mainstreaming of water in policy and plans relevant to FLR

A first step in mainstreaming water in FLR-relevant national/sub-national policies and plans is to invite stakeholders from relevant sectors to the W-FLR workshop. Tasks 2a, 3a and 3b above give an indication of who to invite, based on where there is a need to better integrate water into existing plans and policies relevant to W-FLR within different sectors and planning instruments, such as NDCs, NBSAPs, IWRM plans and NPAs. There are several good examples of integrated approaches that mainstream water into policies and plans, such as the landscape approach, the Source-to-sea approach and the NDCs (Ingemarsson et al., 2022, chapter 9).

With respect to IWRM that has water as the main entry point for planning, there can be a need to instead mainstream FLR into basin and watershed plans. Below is an example of how the landscape approach and FLR have been linked to IWRM policy and planning in Ethiopia. The key is to recognise and assess all relevant ecosystem services provided by different ecosystems and land uses within the river basin system boundary. It is important to link participatory land-use planning with basin and sub-basin planning to maintain the provision of critical ecosystem services from different land uses. This includes the provision of food, energy, and freshwater; the regulation of hydrological flows; the carbon and nutrient cycles; and cultural services, such as recreation and tourism. This approach is being demonstrated in the Ethiopia Rift Valley Lakes Basin and its four sub-basins of endorheic lakes where deforestation is one of the key drivers of loss of water ecosystem services (Mekuria et al., 2021) and landscape degradation and associated sedimentation threatens most of the lakes (see Figure 8).

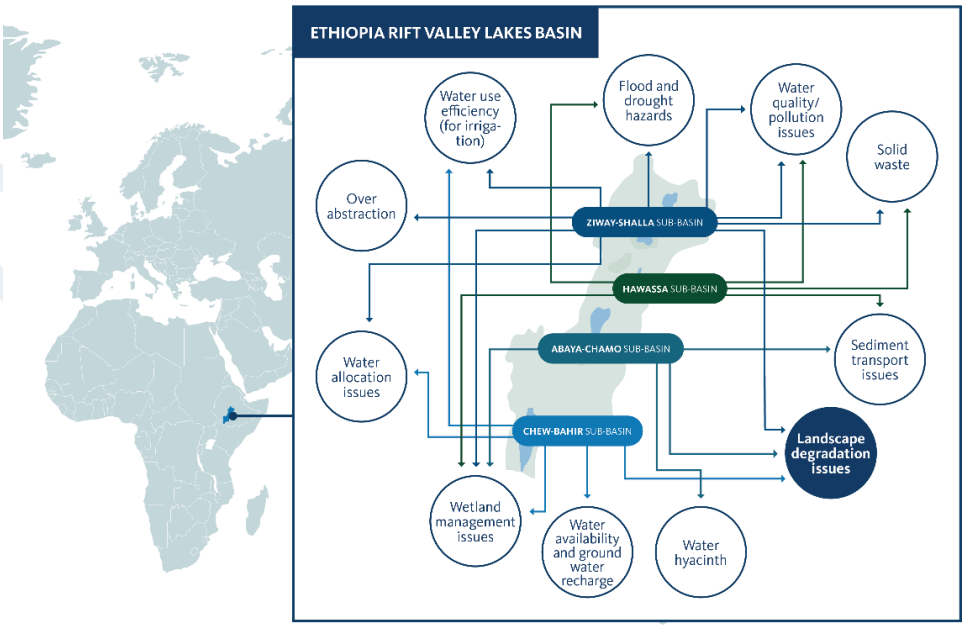


Figure 8. Key challenges in the Ethiopia Rift Valley Lakes Basin and its four sub-basins of endorheic lakes. Landscape degradation issues are affecting three out of four sub-basins. Source: SIWI

Learn about integrated approaches:

More information about integrated approaches can be found in the webinar: Unpacking freshwater's role: Joint climate action through integrated approaches

The webinar explores in what ways integrated approaches, that account for the interconnections between freshwater and climate mitigation, are necessary to achieve water-wise climate mitigation. A brief summary of chapter 9, "Achieving climate mitigation through integrated and cross-sectoral approaches", is held, followed by presentations on the Source-to-Sea approach and Integrated Water and Landscape Management for water-wise climate mitigation measures.

One way of ensuring a water-sensitive approach to climate adaptation and resilience in national climate plans (both NDCs and NAPs) is the Water Tracker for National Climate Planning. The tool is a diagnostic guide aimed at strengthening national climate plans and turning climate commitments into effective, bankable investments that meet national and global climate targets. The goal is to help countries self-assess and strengthen water resilience in their national climate plans.

2. Identify priorities for capacity development in W-FLR

Identifying priorities and readiness for water smart FLR also involves assessing capacity development needs of stakeholders. This is based on the stakeholder analysis conducted in Module 3, where stakeholders with low interest or awareness, but with high influence were identified (Task 3b). Capacity development in water and FLR can be a first step in engaging them, using for example the FAO/SIWI e-learning course on forest-water nexus that provides an overview of forest and water relationships to create an understanding of the impacts of changing landscapes on water resources.

3. Plan for the implementation of W-FLR

When you have conducted the necessary activities for mainstreaming water in policy and plans relevant to FLR and developing the W-FLR capacity of stakeholders, it is time to start planning the implementation of W-FLR. There are many tools that can give useful support when you are planning the implementation. Depending on the ecology and hydrology of your restoration area, as well as the identified water risks that you are targeting, there are different tools and databases of best practices that can give valuable insights to

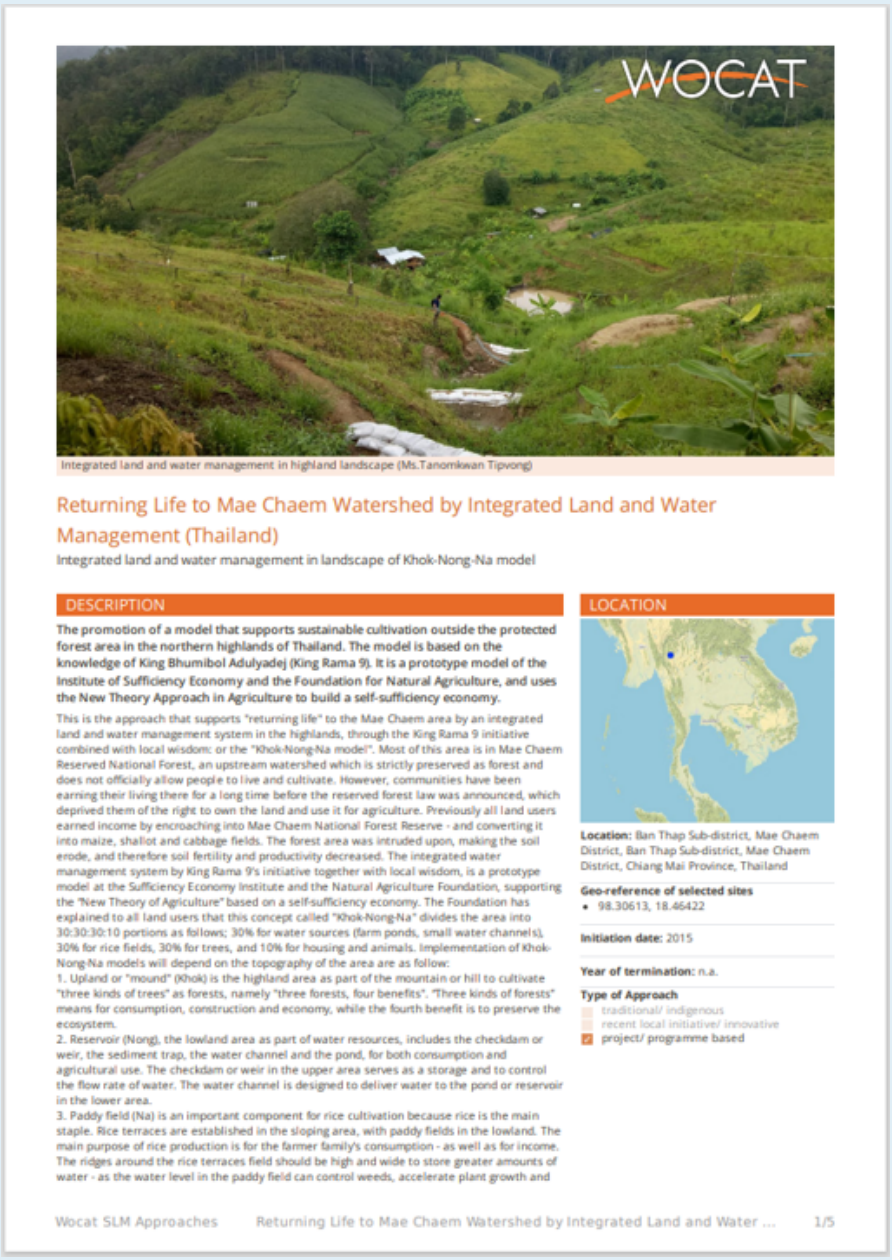
your planning. Start by familiarising yourself with existing tools to see if they can help you to solve the specific water challenges in your FLR intervention. Relevant tools include:

- Blue Targeting (BT) is a tool for best management practice (BMP) for forestry along small streams. The tool was originally developed by WWF Sweden in cooperation with the forestry sector. It was constructed for small streams (width approx. <10 m) in boreal and Scandinavian conditions. However, by changing the in-data, the tool can be adapted to streams in other biomes. The main objective of the tool is to identify the right measure at the right place to the right extent (Henrikson, 2018). Since 2017 BT is in operational use by the Swedish Forest Owners Association when developing forest management plans. Swedish companies with large forest areas have implemented BT at a landscape level in pilot studies. It has also been adapted for Baltic States and Russia and is being tested to be used in Brazil.
- The Water Footprint Assessment Tool can assist in assessing the water footprint (WF) of a product by estimating the total volume of freshwater used to produce the product (le Roux et al., 2017). WF accounting divides water consumption into blue water use, which includes water from rivers, dams and underground sources, and green water use, which includes water stored in the soil and available for vegetation growth (see Box 1 for more info about blue and green water). It is based on relatively simple calculations by considering the runoff fractions from certain land uses to become blue water available within a catchment or basin.
- WET-Ecoservices tool is developed for South Africa and provides quick ecosystem service assessments of wetlands useful for decision makers, governments, planners, consultants, and educators (Rebelo et al., 2019). The first step is to classify the wetlands into hydro-geomorphic types, such as seep, valley-bottom, floodplain, and depression. It assesses 15 ecosystem services using scores from 0 to 4 based on questionnaires that have been developed for each ES. Scores are based on field observations or easy-to-do measurements, calculations and information from literature, databases, and expert knowledge.
- Tool kit for Ecosystem Service Site-based Assessment (TESSA) emphasises the importance of comparing estimates for alternative states of a restoration site (for example, before and after conversion to agriculture) so that decision-makers can assess the net consequences of such a change, and the benefits for human well-being that may be lost through the change or gained by conservation (Neugarten et al., 2018). It requires primary data collection including vegetation surveys, soil sampling, and stakeholder consultations, and can therefore be time consuming depending on the context.
- Restoration Opportunities Assessment Methodology (ROAM), developed by the International Union for Conservation of Nature and Natural Resources (IUCN) and the World Resources Institute (WRI), involves a stepwise and iterative application of a series of analyses to identify the best set of FLR opportunities applicable to a specific area (Hanson et al., 2015). Important steps include stakeholder prioritisation of restoration interventions, restoration opportunities mapping, economic modelling, and validation, followed by cost-benefit carbon modelling using relatively simple tools, such as the EX-Ante Carbon-balance Tool (EX-ACT), diagnostic of presence of key success factors, and finance and resource analysis.

Another tool for ensuring W-FLR is to identify relevant cases of implementation in best practices databases. One good source of best practices is the World Overview of Conservation Approaches and Technologies (WOCAT), introduced in Box 3 WOCAT is a database where you can search for sustainable land and forest management and restoration practices, while also gaining experiences for

subsequent scaling up (see example in Box 5). Best practice examples can also be useful in communication with relevant stakeholders to illustrate the methodology and benefits of water-smart FLR. WOCAT and other relevant databases can be found on the Framework for Ecosystem Restoration Monitoring (FERM) platform, developed by FAO and partners under the UN Decade on Ecosystem Restoration. FERM serves as a platform to monitor, collect, and disseminate good restoration practices from around the globe.

Box 5. An example of a water-smart FLR best practice case from Thailand, found in the WOCAT database.



Practical Task 4a: Identify current state and priority actions for your W-FLR intervention

Together with workshop participants, identify priority actions for W-FLR related to 1) policy mainstreaming, 2) capacity development, and/ or 3) implementation, to gain an overview of the readiness for W-FLR within your system boundary. The task should be based on the results and facts compiled from Module 1-3, including water ecosystem services at risk and the aim of the project, as well as participants experiences, knowledge and suggestions.

Tips:

- Depending on the results from the preparatory phase, priority actions may not necessarily integrate within the three scales but rather focus on one in particular.
- Actions must follow a holistic approach to also preserve ecosystem services that are at low risk.

If most of your priority actions fall within the mainstreaming domain, the readiness for W-FLR is low. In the case of low readiness for FLR, policy mainstreaming activities with key sectors could be combined with targeted capacity building and demonstration of W-FLR at a smaller scale. It can be useful to identify a best practice example within a watershed or forest landscape to help illustrate W-FLR to other stakeholders while also gaining experiences for subsequent scaling up.

If most of your priority actions fall within the capacity development domain, the readiness is moderate. If the readiness is moderate, priority should be put on capacity development of technical staff in key sectors and multiple levels to prepare for scaling out of W-FLR from demonstrations to larger areas.

If most of your priority actions fall within the implementation domain, the readiness for W-FLR is high. If the readiness is high, the focus should be on identifying and implementing water-smart FLR actions on the ground. At that stage, the focus should be on enhancing water ecosystem services through water-smart implementation techniques e.g., choosing nursery and planting practices suitable for the ecosystem, ensuring an optimum tree cover, and using tree species that are adapted to the local environment and hydrology.

Go to Task 4a in Appendix 1 to do the task.

Example Laos case study:

Task 4a: Priority actions	Mainstreaming of W-FLR	Capacity development in W-FLR	Implementation of W-FLR	Task 5a: Indicators
Action 1	To effectively manage the water and water resources, Government of Lao need clear responsibilities among the MONRE line agencies including central, provincial and district level. Mainstreaming of W-FLR in the Water Resources Law and finalise the new National Water Resources Strategy toward 2025.			
Action 2		Stakeholder meetings with and capacity development towards local communities, farmers, women's groups, etc.		
Action 3			Apply the Blue Targeting tool in riparian areas; use WOCAT to search for best practices	

Module 5: Identify indicators for monitoring and evaluation

Objectives

- Identify types of indicators to integrate into participatory monitoring and evaluation systems for the FLR initiative.

Why is this important?

- It is essential to ensure that W-FLR projects are implemented correctly and performing as expected so that the intended benefits can be achieved – this is done through a monitoring and evaluation (M&E) system.

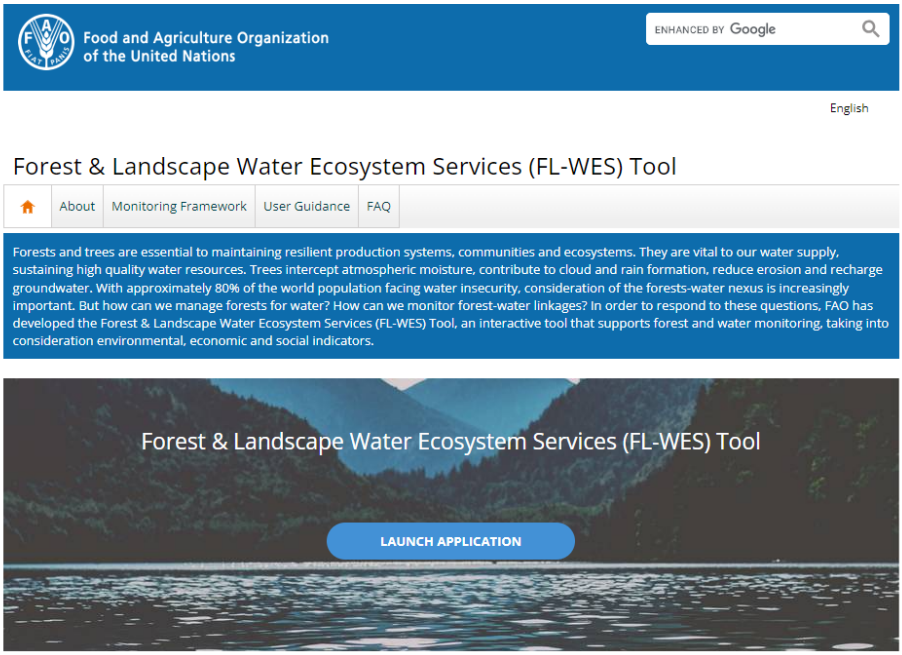
Task 5a. Map relevant indicators for W-FLR

- An M&E system is a support to evaluate that project resources are used efficiently and effectively which often is a requirement from donors/financing institutions. To increase the probability for the solutions to be implemented, it is important to ensure that the W-FLR intervention is a participatory process where all relevant stakeholders are included.

- Different types of indicators are relevant for the three categories of FLR interventions:
  - » **Policy mainstreaming** – indicators that describes the integration of the forest-water nexus in relevant policies and plans (e.g. number and type of policies and plans, cross-sectoral coordination mechanism, type of FLR measures recommended, etc.).
  - » **Capacity development** – indicators that describe number and type of stakeholders that have capacity to engage in W-FLR in different sectors and at different levels in implementation and M&E.
  - » **Implementation on-the-ground** – number and type of W-FLR practices implemented on a given area of land and number of local beneficiaries disaggregated by gender, etc.

The Forest and Landscape Water Ecosystem Services (FL-WES) tool (FAO) is designed to increase our understanding of forest-water interactions and ensure that they are taken into account in policy and management decisions. The FL-WES tool can assist the user in selecting the most relevant forest-water

indicators and monitoring methods based on factors such as context, management, budget, resources, and technical expertise.



Note that our entry point to water ecosystem services is based on a wider landscape perspective compared to the FL-WES tool. Therefore, there may be sub-indicators relevant for your W-FLR initiative in all the indicator categories listed in the FL-WES tool, and not only the category "Water-related Ecosystem Services. In addition to the FL-WES tool, FAO is also providing relevant information on how to monitor FLR in the FAO e-learning course Monitoring Forest and Landscape Restoration. To ensure inclusiveness and diversify the data, we recommend using Citizen science (see Box 6). Linking the assessment to geospatial data through e.g. remote sensing and water balance modelling tools can also support you in determining water risks and water balance.

Setting-up community-based monitoring requires properly outlining and following a series of steps. Further reading on the topic is provided by the SIWI/IWMI Training Manual on Hydrological Impacts of Watershed Management.

Box 6. Citizen science, and local and indigenous knowledge

Citizen Science (CS) is an approach where non-scientists are actively involved in generating new scientific knowledge. CS is about co-generation of knowledge and interactive learning exchange. It brings citizens into the democratic dialogue to answer questions such as: How to better capture and understand local experiences, concerns, and solutions to water challenges? How to support local implementation to reach specific water related targets? How to link these actions to relevant governance structures and adaptive governance? CS methods are not the standard way data is collected in the field of water. Data variables commonly collected include precipitation, streamflow, water quality, and water use. In scientific programs, expensive instruments are often used to collect these data, with no accessibility for local citizens. All these variables can be also collected using quite simple, cheap instruments,

including buckets and timers, and given the opportunity, CS can contribute with certain tools/methods to develop new ways of collecting data.

Figure 9 below gives an example of the steps involved hydrological monitoring using citizen science in Ethiopia.

Figure 9. Steps involved in hydrological monitoring using citizen science. Source: SIWI adapted from (Haile & Tengberg, 2021)

Practical Task 5a: Map relevant indicators for W-FLR

Based on Task 4a, identify measurable indicators for your priority actions related to policy mainstreaming, capacity development, and/or implementation using one or several of the M&E tools and approaches discussed above.

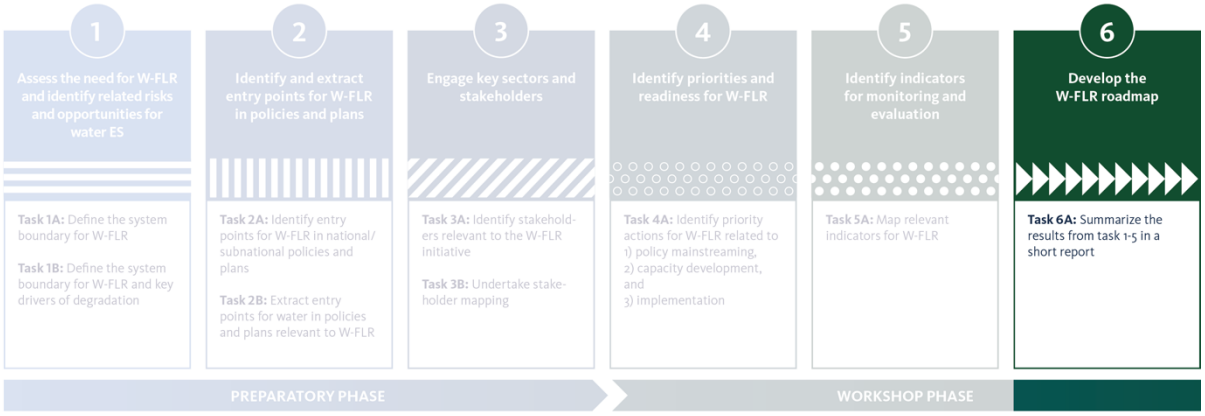
The FL-WES tool, mentioned above, can assist the user in selecting the most relevant forest-water indicators and monitoring methods. Log in to the FL-WES tool and complete the Guidance survey. Based on the results in the survey, it will be possible to identify relevant indicators and variables that can be used to monitor the priority actions in Task 4 above. There may exist other tools that are more relevant for a specific W-FLR intervention.

Go to Task 5a in the Appendix to do the task.

Example Laos case study:

Task 4a: Priority actions	Mainstreaming of W-FLR	Capacity development in W-FLR	Implementation of W-FLR	Task 5a: Indicators
Action 1	To effectively manage the water and water resources, Government of Lao need clear responsibilities among the MONRE line agencies including central, provincial and district level. Mainstreaming of W-FLR in the Water Resources Law and finalise the new National Water Resources Strategy toward 2025.			• Agreed roles and responsibilities in FLR among line agencies. • Coordination mechanism for FLR/W-FLR. • National Water Resources Strategy in place and integrates FLR
Action 2		Stakeholder meetings with and capacity development towards local communities, farmers, women's groups, etc.		• Number of stakeholders with strengthened capacities in W-FLR disaggregated by gender.
Action 3			Apply the Blue Targeting tool in riparian areas; use WOCAT to search for best practices	• W-FLR Interventions in riparian areas identified. • Best practices for W-FLR implementation in the landscape identified.

Module 6: Develop the W-FLR roadmap



Objectives

- Develop a road map that will indicate whether priority actions and next steps should involve policy mainstreaming, capacity development and/ or implementation.
- Take you to the stage where you are ready to start identifying how to implement water-smart FLR on the ground using existing tools and best practice databases.

Why is this important?

- The purpose of the report is to create an overview of the results compiled in the different W-FLR Modules, so that this information can form the basis for future water-smart decisions in FLR.
- The report can also be used to share results with the stakeholder group for continued collaboration on integrating water into FLR in relevant sectors and plans, building capacity of key stakeholders, and implementing joint water-smart FLR initiatives on the ground.

Task 6a. Summarise the results from modules 1-5 in a short report

At the end of the workshop, the results from the W-FLR method will be compiled into a roadmap, in the form of a short report. This report will provide results from the assessment of water ecosystem services to consider (Module 1) as well as their current integration into policy and practice (Module 2), entry points for how water can be integrated into relevant policies and plans (Module 2), key sectors and stakeholders to involve and influence (Module 3), priority actions related to policy mainstreaming, capacity development and implementation (Module 4), and, optionally, indicators for monitoring and evaluation (Module 5). Synthesise the results in a report as shown in Task 9 below.

Practical Task 6a: Summarise the results from Task 1-5 in a short report

The W-FLR report will have the following headings:

1. Water ecosystem services to consider and as well as their current integration into policy and practice

2. Entry points for how water ecosystem services can be integrated into relevant policies and plans

3. Key sectors and stakeholders to involve and influence

4. Priority actions related to policy mainstreaming, capacity development and implementation

5. Indicators for monitoring and evaluation

Go to Task 6a in Appendix 1 to do the task.

5. Next steps

With your W-FLR Roadmap, you should now have a clear idea of where to start integrating water into your restoration initiative. Below are some suggested next steps that are not covered in detail by this manual but are essential to ensure that the W-FLR Roadmap is implemented.

- Circulate the report to all W-FLR workshop participants that contributed with knowledge and inputs in phase 2 above.
- Present the W-FLR report to key policy and decision makers.
- Organise a workshop and invite key sectors identified as important in W-FLR and where action is needed related to policy mainstreaming, capacity development and/or implementation of W-FLR on the ground.
- Identify existing tools and best practice databases that could be used in implementing the road map.
- Mobilise resources to implement W-FLR actions.

Identifying sources of funding for the different actions in the roadmap can be done in different ways. Policy mainstreaming can often be financed through existing sector budgets once there is awareness about the importance of including water in FLR-related activities. Capacity development could be funded by a wide range of sources and normally requires less funding than the implementation stage. Funding for capacity development and implementation could be accessed through both multilateral and bilateral mechanisms. Especially climate finance has an important role to play, as W-FLR could support both climate change adaptation and mitigation (see Box 8). Market-based instruments, such as payments for ecosystem services (PES) and Public-Private Partnerships (for e.g. establishment of tree nurseries) could also be considered.

Box 8. Climate finance for W-FLR

A number of financial mechanisms can be accessed to mitigate as well as to adapt to climate change in mosaic landscapes, with a focus on water. Here are some examples:

The Global Environment Facility (GEF), financial mechanism of the Rio Conventions, was set up in 1991 to fund the incremental costs of addressing global environmental problems related to climate change, biodiversity loss and land degradation. In addition, it has also evolved to fund costs related to international waters, and persistent organic pollutants. It has increasingly supported integrated programs across two or more environmental issues and sectors to foster synergies and address more drivers of environmental change (Tengberg & Valencia, 2018). The new GEF cycle will seek to promote a green, blue, and resilient recovery, and create pathways to an equitable, nature-positive, and carbon neutral world (Global Environment Facility & World Bank Group, 2021).

The **Least Developed Countries Fund (LDCF)** helps recipient countries to address their short-, medium- and long-term resilience needs and reduce climate change vulnerability in priority

sectors, including the water sector, and ecosystems. LDCF support helps countries implement National Adaptation Programs of Action (NAPAs). It also supports the implementation of National Adaptation Plans (NAPs), and the Least Developed Countries work program under the UNFCCC. The LDCF, along with the **Special Climate Change Fund (SCCF),** is mandated to serve the Paris Agreement. Both funds are managed by the GEF. The SCCF provides support to the adaptation needs of Small Island Developing States (SIDS), and also facilitates the creation of strong, climate-resilient economies and communities by helping countries address a range of barriers, including: limited access to climate-resilient technologies and infrastructure; limited institutional capacity to foresee and manage climate risks; low engagement by the private sector, including small and medium-sized enterprises and entrepreneurs, for developing and providing adaptation solutions; and lack of access to finance from public sources and to markets for adaptation solutions.

The **Green Climate Fund (GCF)** was established at COP16 in Cancun in 2010 as the new primary climate finance mechanism by the Parties of the UNFCCC. The GCF funds both climate change mitigation and adaptation as well as cross-cutting interventions that combine the two. It is guided by an objective to promote a paradigm shift towards low-emission and climate-resilient development pathways (Green Climate Fund, 2021).

In addition to GEF and GCF, the 1997 Kyoto protocol set up a **Clean Development Mechanism (CDM)**. Article 12 defines a CDM whereby high-income countries (Annex 2 countries) earn certified emission reductions through projects implemented in low-income countries. However, since CDMs are not an instrument under the Paris Agreement, the mechanism is currently phased out. Instead, a new central mechanism will take its place under **Article 6.4** of the Paris Agreement once its rules and regulations have been adopted.

The Adaptation Fund (AF) was established in 2001 to finance concrete adaptation projects and programs in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change. The AF is financed with a share of proceeds from the CDM project activities and other sources of funding. It has been decided that the Adaptation Fund shall serve the Paris Agreement and once the share of proceeds becomes available under Article 6, paragraph 4, of the Paris Agreement, the Adaptation Fund shall no longer serve the Kyoto Protocol.

Some Land-Use, Land-Use Change and Forestry (LULUCF) projects can also access funding through **Reduce Emissions from Deforestation and forest Degradation in developing countries (REDD+)**. REDD+ is recognised in Article 5 of the Paris Agreement, where parties reiterated encouragement to implement REDD+ activities and that these should be an integral part of climate action. Challenges to implementation of REDD+ on-the-ground include problematic policy design processes, limited engagement with local communities, and that limited access to water and land among poorer households in REDD+ schemes can raise pressure on protected forests (Duchelle et al., 2018).

Thus, the GEF, GCF and the AF serve the Paris Agreement and fund priority projects in developing countries related to both mitigation and adaptation identified in **Nationally Determined Contributions (NDCs).** NDCs are non-binding national plans highlighting climate actions, including climate related targets for greenhouse gas emission reductions as well as policies and measures governments aim to implement in response to climate change.

At COP28 climate change conference in Dubai, a formal decision was taken to establish a **Loss and Damage Fund** to support developing countries to deal with loss and damage from climate change. The fund aims to provide financial assistance to nations most vulnerable and impacted by the effects of climate change. Loss and damage refer to the negative consequences that arise from the unavoidable risks of climate change, many of which can be relevant for W-FLR like prolonged heatwaves, desertification, and extreme events, such as bushfires, floods and droughts.

A number of countries have pledged funds to the Loss and Damage fund, for example, the host nation of COP 28, the United Arab Emirates, pledged $100 million, as has Germany, while the EU has pledged €25 million and the United States $17.5 million. There remain many unclarities regarding e.g. what types of losses and damages that should be covered, and how the funds will be administered and paid out. These are central issues to sort out for the fund to be able to function fully.

There are also numerous bilateral mechanisms and foundations that could provide finance for implementation of W-FLR that could be identified on a case-by-case basis.

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Appendix 1.

Practical tasks manager

Task 1a. Define the system boundary for W-FLR and key drivers of degradation

In Task 1a, please define the system boundary for the W-FLR intervention, based on the information of landscapes and system boundaries provided above. Optional complementary information on the system boundary can include region, population, population density, surface and volume. Try to briefly describe the hydrology of the area. Enumerate the key drivers of landscape and forest degradation (see Figure 6). Drivers can be categorised in their respective sectors, e.g. forest, landscape, water resources. Finally, identify the potential barriers to restoration and enabling opportunities for restoration. Fill in you're answers in "Table 3. Task: System boundary" below.

Table 3. Task: System boundary

Identify the W-FLR system boundary and key drivers of degradation	
System boundary	
Ecological and hydrological description	
Key drivers of forest and landscape degradation	
Potential barriers of forest and landscape restoration	
Enabling opportunities for forest and landscape restoration	

Task 1b. Identify water ecosystem services at risk within the system boundary

In this task you will identify water ecosystem services at risk within the system boundary. To this end, as ecosystem processes are interlocked in the ecosystem services, you will focus on ecosystem processes which will, ultimately, reflect the status of ecosystem services.

The aim of the task is to identify which ecosystem processes are at risk due to ecosystem degradation (see Table 2 or Table 4. Task: Water ecosystem services table). Assess the ecosystem processes at risk, based on your knowledge, to be able to prioritize actions for restoration.

This assessment is qualitative (no measurement required) and can be adjusted during the application of the tool.

Mark the degree of risk to the ecosystem processes as follows in the table:

- Low risk
- Intermediate risk
- High risk

Table 4. Task: Water ecosystem services summary

Ecosystem services	Ecosystem processes	Task 1b: Current status of water ES	Task 2b: Addressed in relevant plans and policies
Supporting ecosystem services			
Supporting hydrological cycle	Transpiration and evapotranspiration.	Risk	
	Canopy interception.	Risk	
	Hydraulic redistribution, moving water from moist to dry soil through plant roots.	Risk	
	Plants play a part in hydrological cycles by controlling water runoff.	Risk	
	Release of volatile organic compounds contributing to: • intensification of rainfall and an overall cooling effect by blocking incoming solar energy. • secondary organic aerosol condensing atmospheric moisture.	Risk	
	Trees recharge atmospheric moisture and influence cloud formation.	Risk	
	Vegetation helps to regulate climate by cycling vast amounts of water and maintaining the gaseous composition of the atmosphere.	Risk	

	Terrestrial moisture recycling.	Risk	
	Precipitation recycling.	Risk	
	The biotic pump theory – precipitation in continental interiors from atmospheric circulation driven and maintained by large, continuous areas of forest starting from the coastline.	Risk	
	Arial rivers – cross-continental transport of atmospheric moisture affecting downwind water availability.	Risk	
Supporting nutrient cycling	Forest and vegetation support biogeochemical (nutrient) cycling in four components: the atmosphere; the pool of available nutrients in the soil; organic materials (living and dead); minerals in soils and rocks.	Risk	
Supporting soil formation/ quality	Tree roots and soil organic matter from litter inputs improve soil structure, enhance aggregate stability and promote faunal activity.	Risk	
	Organic matter in soil affects saturated hydraulic conductivity by slowing down water movement.	Risk	
Supporting biodiversity	Hydrology as a driver of biodiversity, supporting primary production, carrying capacity and niche formation.	Risk	
	Water as a connector linking organisms and supporting pollen and propagule dispersal.	Risk	
	Habitats that safeguard fisheries and biological diversity.	Risk	
Provisioning ecosystem services			
Provision of freshwater	Tree density influence groundwater recharge.	Risk	
	Tree species influence water yield.	Risk	
	Tree age influence water yield.	Risk	
	Nutritional water productivity, i.e., 'crop per unit volume of water'.	Risk	
Provision of food and medicines	Ecosystems provide the conditions for growing and harvesting food and extracting medicines.	Risk	
Provision of wood, fibre and fuel	Ecosystems provide raw materials for construction, production and fuel including wood, biofuels and plant oils.	Risk	
Regulating ecosystem services			
Regulate water flow	Water retention capacity.	Risk	

	Stream-flow regulation.	Risk	
	Increased infiltration from tree roots and enhanced levels of soil organic matter.	Risk	
	Increased infiltration capacity reduces soil evaporation losses.	Risk	
	Fog, mist and cloud water capture, i.e., condensation on plant surfaces.	Risk	
Nature-based water purification and wastewater treatment	Trees filter precipitation and reduce sedimentation into water courses.	Risk	
	Reduce pollutants entering water courses.	Risk	
	Natural and constructed wetlands remove pollutants.	Risk	
	Fast-growing tree species are planted to filter wastewater.	Risk	
Climate regulation	Carbon sequestration in soil.	Risk	
	Carbon sequestration in above ground and below ground vegetation.	Risk	
	Regulating local temperature through evapotranspiration.	Risk	
Cultural ecosystem services			
Heritage value and cultural identity	Landscape-related "memories" from past cultural ties, mainly expressed through characteristics within cultural landscapes.	Risk	
Spiritual experiences	Holy or spiritual places important to spiritual or ritual identity, e.g. River Ganges in India, sacred forest groves, sacred plants or animals.	Risk	
Wellness, recreation and (eco)tourism	Pleasure, comfort, discovery and socialisation that takes place in leisure in nature and observing natural elements.	Risk	
Education and research	Climate, topography, water cycle or soil and biota used for education and research.	Risk	
Aesthetic appreciation and inspiration	Visual perception of ecosystems and landscape.	Risk	
	Lakes and rivers represented in songs.	Risk	
Comments (Task 2b):			

Task 2a. Identify potential entry points for W-FLR in national/subnational policies and plans

Map what entry points (objectives/ measures/ actions/ project and programmes; water ecosystem service and ecosystem processes; responsible ministries/agencies) related to natural water resources and associated sectors are mentioned in existing plans and policies which may have impacts on the W-FLR intervention.

We suggest that you follow these steps:

1. Review the table of contents in the documents (to see which sections are relevant)
2. When reviewing, use the concepts addressed in Table 2 (see also Table 4. Task: Water ecosystem services table" to collect objectives/ measures/ actions/ projects/ programs, water ecosystem services/ processes and responsible ministries/ agencies at once.
   Note that ecosystem processes might not be mentioned as detailed in the national documents, as they are in Table 2 and Table 4, or they may be addressed using a different type of wording. Therefore, remain flexible when you map water ecosystem services in the documents, but be careful to not add personal interpretations.
3. Use search words to be more efficient in the review process (see a non-exhaustive list below).

Examples of search words: water, hydro(logy), flood, drought, IWRM, water security, forest(s/ry), restoration, ecosystem services, specific words to your system boundary, i.e., river basin, watershed etc…, land degradation, plantation, Forest and Landscape restoration, FLR, agroforestry.

Type of policy or plan		Comments
	Commitments or measures in plan	
	Responsible national ministry or agency	
	Water ecosystem service and processes in document	
	Commitment or measures in plan	
	Responsible national ministry or agency	
	Water ecosystem service and processes in document	

	Commitments or measures in plan	
	Responsible national ministry or agency	
	Water ecosystem service and processes in document	
	Commitments or measures in plan	
	Responsible national ministry or agency	
	Water ecosystem service and processes in document	

Task 2b. Extract entry points for W-FLR relevant policies and plans

Task 2b is based on your findings in Task 1b, where water ecosystem services at risk within the system boundary were defined, and Task 2a, where you identified support for water ecosystem services in national and sub-national policies and plans.

The objective of this task is to combine results from Task 1b and Task 2a to identify, the type and status of water ecosystem services that are mentioned in the different policies and plans collected in Task 2a.

Please go back to "Table 4. Task: Water ecosystem services summary", that you used for Task 1b above and fill in the column furthest to the right for Task 2b.

Task 3a. Identify stakeholders relevant to the W-FLR initiative.

In this task you will map relevant sectors and stakeholders by making a list that covers all stakeholders relevant to your W-FLR intervention. Include actors that have influence on and/or are interested in the restoration, but also stakeholders that are affected by it. "Table 6. Task: Stakeholders" below is not an exhaustive list, and it may be that there are other additional stakeholders that should be involved.

Table 6. Task: Stakeholders

Stakeholder sectors:	Specify:
National level	
National ministries and regulatory agencies (e.g., Forestry, Agriculture, Environment, Climate, Energy, Water – see Task 3)	
Non-Governmental Organisations (NGOs)	
Universities and research institutes	
Certification schemes	
Other:	
Regional/sub-national level	
Basin organisations	
Regional bureaus/Councils	
Other:	
Local/district level	
District authorities and their technical agencies (e.g. agricultural extension)	

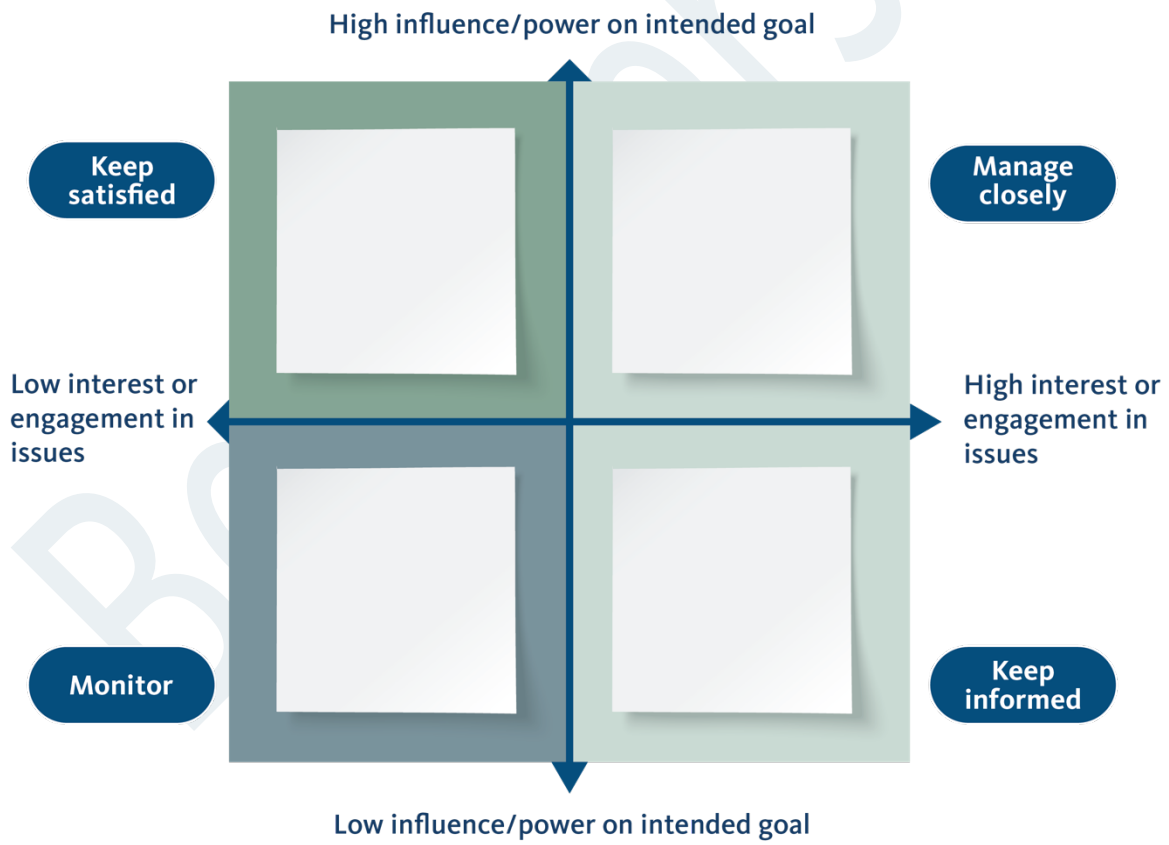
Local communities	
Women associations	
Youth associations	
Indigenous groups	
Water user associations	
Forest/smallholder associations	
Farmer cooperatives	
Locally active NGO's	
Other	
Private sector	
Value chain actors (Producers, processors, marketers, etc.)	
Local plantation companies	
Other:	

Task 3b: Undertake a stakeholder mapping

Use Figure 10. 'Task: Stakeholder mapping' below, which is based on the RAPID Outcome Mapping Approach (ROMA), to classify the actors that are relevant in your W-FLR initiative according to interest and influence. By knowing who has the **influence** to make change and who has the **interest** to make change you can identify how to engage with the different categories of actors. Make sure to involve the stakeholders that are affected by the W-FLR initiative, identified in Task 3a.

- Upper left box: Actors with **high influence/power but low interest** are crucial for the change process to happen and should be targeted to develop their interest or capacity.
- Upper right box: Actors with **high interest and high influence/power** can be teamed up with in partnerships to work towards the intended goal.
- Lower right box: Actors with **high interest but low influence** can be used as influencers to raise the interest among actors with low interest and high influence.
- Lower left box: Actors with **low interest and low influence/power** can often be ignored. However, keep monitoring them to notice any potential changes in future interest or influence.

Figure 10. Task: Stakeholder mapping



Task 4a: Identify current state and priority actions for your W-FLR intervention

Together with workshop participants, identify priority actions for W-FLR related to 1) policy mainstreaming, 2) capacity development, and/ or 3) implementation, to gain an overview of the readiness for W-FLR within your system boundary. The task should be based on the results and facts compiled from Module 1-3, including water ecosystem services at risk and the aim of the project, as well as participants experiences, knowledge and suggestions. Fill in the columns for mainstreaming, capacity development and implementation in "Table 7. Task: Actions and indicators" below.

Tips:

Depending on the results from the preparatory phase, priority actions may not necessarily integrate within the three scales but rather focus on one in particular.

Table 7. Task: Actions and indicators

Task 4a: Priority actions	Mainstreaming of W-FLR	Capacity development in W-FLR	Implementation of W-FLR	Task 5a: Indicators	Task 5a: Responsible entity
Action 1					
Action 2					
Action 3					
Action 4					

Task 5a. Identify indicators for monitoring and evaluation

Based on Task 4a, identify measurable indicators for your priority actions related to policy mainstreaming, capacity development, and/or implementation using one or several of the M&E tools and approaches discussed above.

The FL-WES tool, mentioned above, can assist the user in selecting the most relevant forest-water indicators and monitoring methods. Log in to the FL-WES tool and complete the Guidance survey. Based on the results in the survey, it will be possible to identify relevant indicators and variables that can be used to monitor the priority actions in Task 4 above. There may exist other tools that are more relevant for a specific W-FLR intervention.

Please go back to "Table 7. Task: Actions and indicators", that you used for Task 4a above and fill in the column furthest to the right for Task 5a.

Task 6a: Summarise the results from Task 1-5 in a short report

The W-FLR report will have the following headings:

1. Water ecosystem services to consider and as well as their current integration into policy and practice

2. Entry points for how water ecosystem services can be integrated into relevant policies and plans

3. Key sectors and stakeholders to involve and influence

4. Priority actions related to policy mainstreaming, capacity development and implementation

5. Indicators for monitoring and evaluation