GREEN WEB AND DISTRIBUTED POND SYSTEMS

Table of Contents

Table of Contents **2**

The Living Vegetation Network Connecting Distributed Pond Systems **4**

1.1 Introduction 5

1.2 Purpose and Scope 7

1.3 Definition and Core Concept 8

1.4 Objectives 9

1.4.1 Strengthen Local Water Retention and Combat Desertification *9*

1.4.2 Restore Vegetation and Soil Function *9*

1.4.3 Connect Ecological Habitats *9*

1.4.4 Support Dryland and Rangeland Resilience *9*

1.4.5 Generate Measurable Scientific Evidence *9*

1.4.6 Support Wider Hydrological Security *9*

1.5 Ecological Design Principles 11

1.5.1 Native and Locally Appropriate Vegetation *11*

1.5.2 Multi-Layered Plant Communities *11*

1.5.3 Hydrological Compatibility *11*

1.5.4 Landscape Connectivity: Connecting Distributed Pond Systems into the Green Web *12*

1.5.5 Community Stewardship *13*

1.6 The Green Ring: Vegetation Around Each Pond 14

1.7 Green Corridors and Landscape Connectivity 16

1.8 Implementation at Multiple Scales 18

1.8.1 Site Level: The Green Ring *18*

1.8.2 Catchment and Landscape Level *18*

1.8.3 Regional Level *18*

1.8.4 Transboundary Level *19*

1.8.5 Global Level *19*

1.9 Priority Application Areas 20

1.9.1 Global Drylands *20*

1.9.2 Pasturelands and Rangelands *20*

1.9.3 The Proposed 43°–44° North Latitude Belt *20*

1.9.4 Other Suitable Ecosystems *21*

1.10 Relationship Between the Distributed Pond System (DPS) and the Green Web . 22

1.11 Relationship with the 0.01% Solutions Programme 23

1.12 Relationship with the Proposed Convention on Planetary Hydrological Security and Cryosphere Stability 24

1.12.1 The Potential Contribution to Cryosphere Stability *25*

1.12.2 Status and Relationship of the Proposed Initiatives *25*

1.13 Monitoring, Evaluation, and Learning 27

1.13.1 Monitoring Domains, Indicators, and Methods *27*

1.13.2 Establishing Baselines and Measuring Change *28*

1.13.3 Hydrological Accounting and Water-Balance Integrity *29*

1.13.4 Evaluating Green Rings, Green Corridors, and the Wider Green Web 29
1.13.5 Social Safeguards, Participation, and Data Governance 30
1.13.6 Learning, Reporting, and Adaptive Management 30
1.13.7 Core Principle 31

1.14 Ecological Safeguards and Risk Management 32
1.14.1 Site Assessment before Implementation 32
1.14.2 Protect Natural Hydrological Processes 33
1.14.3 Protect Existing Ecosystems and Native Biodiversity 33
1.14.4 Prevent Unintended Social and Land-Use Impacts 33
1.14.5 Risk Identification and Management 34
1.14.6 Avoidance, Modification, and Rejection of Unsuitable Interventions ... 35
1.14.7 Long-Term Maintenance and Adaptive Management 35
1.14.8 Governing Principle 35

1.15 Governance and Community Participation 37
1.15.1 Governance Principles 37
1.15.2 Local Governance and Community Participation 38
1.15.3 Roles of National Institutions 38
1.15.4 Scientific and Technical Institutions 39
1.15.5 Regional and Transboundary Coordination 39
1.15.6 International Cooperation and Institutional Relationships 40
1.15.7 Financing, Resource Mobilization, and Accountability 40
1.15.8 Conflict Resolution and Grievance Mechanisms 41
1.15.9 Capacity Development and Knowledge Exchange 41
1.15.10 Governance Development and Implementation Readiness 41
1.15.11 Governing Principle 42

1.16 Phased Implementation 43
1.16.1 Phase I — Scientific and Site Assessment 43
1.16.2 Phase II — Demonstration and Field Implementation 44
1.16.3 Phase III — Evaluation, Learning, and Refinement 44
1.16.4 Phase IV — Evidence-Based Replication and Expansion 45
1.16.5 Phase V — Network Coordination and Shared Learning 46
1.16.6 Decision Gates Between Phases 47
1.16.7 Financing and Institutional Readiness Across All Phases 47
1.16.8 Adaptive Implementation and the Principle of Evidence 48

1.17 The Living Pond: Hydrarch Succession and the Ecological Transformation of Distributed Pond Systems 49

1.18 Conclusion 50

The Living Vegetation Network Connecting Distributed Pond Systems

Document Status: Proposed international legal instrument

Reference Date: August 2026

Presented in connection with: The seventeenth session of the Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD COP17), Ulaanbaatar, Mongolia

Initiative originator: 0.01% Solutions–Green Web–Cryosphere Convention Initiative Team, on behalf of civil society

Document purpose: To establish a scientifically grounded policy rationale for developing an international framework dedicated to planetary hydrological security and cryosphere stability.

Important status clarification: CPHSCS is a proposed convention. This brief does not imply that the Convention has been adopted, that its proposed institutional bodies have been established, or that the United Nations, UNCCD COP17, or any government has formally endorsed it.

1.1 Introduction

The Green Web is a proposed global ecological network connecting Distributed Pond Systems through native vegetation and restored ecosystems. It comprises trees, shrubs, grasses, and other locally appropriate plant communities that link individual water-retention structures into ecological corridors across landscapes and watersheds and, where geographically and ecologically appropriate, across continents. While Distributed Pond Systems capture and retain rainwater, the Green Web connects these structures with the living systems that stabilize soil, support nutrient cycling and wildlife, store carbon, regulate local microclimates, reduce wind erosion and dust emissions, and sustain the communities that depend on and care for the land.

The Green Web is conceived as more than a vegetation-restoration initiative. Its central purpose is to propose a practical, interconnected approach to advancing the shared objectives of the three Rio Conventions: the Convention on Biological Diversity (CBD), the United Nations Convention to Combat Desertification (UNCCD), and the United Nations Framework Convention on Climate Change (UNFCCC). These conventions address different but closely interconnected dimensions of the global environmental crisis: biodiversity loss, land degradation and desertification, and climate change. Yet their objectives ultimately depend on the capacity to translate international commitments into coordinated, measurable, and sustained action across real landscapes. The Green Web proposes to help bridge this implementation gap by integrating distributed rainwater harvesting, water retention, native vegetation restoration, and ecological connectivity within a common framework.

The scientific rationale for this approach lies in the interdependence of water, land, vegetation, biodiversity, and climate. Declining soil moisture, land degradation, vegetation loss, and increasing pressure on terrestrial ecosystems can reinforce one another, weakening ecological resilience and the capacity of landscapes to recover from drought and other stresses. Research on planetary boundaries has identified the transgression of the boundary associated with green water—the water held in soils and available to plants—as a significant concern for the stability of the Earth system. Degraded drylands and rangelands can also contribute to wind erosion and long-distance dust transport. Where dust settles on snow and ice, it can reduce surface reflectivity and increase the absorption of solar energy, potentially accelerating melting. These connections demonstrate the importance of addressing land condition and water retention as part of a broader understanding of ecological and hydrological security.

The Green Web proposes to respond to these interconnected challenges by linking suitable water-retention structures with locally appropriate vegetation restoration and ecological connectivity. Distributed Pond Systems provide the water-retention foundation; Green Rings can support appropriate restoration around individual sites; Green Corridors can connect suitable habitats and restoration areas; and the Green Web represents the wider ecological network formed by these interconnected efforts. This approach is not a uniform planting model or a proposal to introduce ponds and trees into every landscape. It must be adapted to local ecosystems, water availability, land use, biodiversity, and community needs, with particular care to protect natural grasslands, wetlands, rivers, groundwater systems, and other ecologically important areas.

Within the three Rio Conventions, the Green Web offers a potential framework for mutually reinforcing action. In relation to the UNCCD, it can support land restoration, soil stabilization, and drought resilience. In relation to the UNFCCC, it can contribute to climate adaptation and, where measurable and sustained benefits are demonstrated, climate mitigation through carbon storage in vegetation and soils. In relation to the CBD, it can support native

vegetation recovery, habitat connectivity, and biodiversity conservation. These contributions are complementary but not automatic: their effectiveness must be demonstrated through scientific assessment, appropriate indicators, and sustained monitoring.

The Green Web is closely connected to The 0.01% Solutions—Flagship Implementation Programme, which proposes a coordinated approach to distributed rainwater harvesting and water retention across participating countries. The programme's guiding ambition is for countries to explore retaining a volume equivalent to 0.01% of annual precipitation through environmentally suitable measures. The Green Web complements this ambition by connecting water-retention sites with ecological restoration, helping to frame individual interventions as components of a wider landscape-level approach. The initiative envisages a global network of more than one million ponds and potential participation across the 197 countries referenced in the programme. These figures represent proposed ambitions, not established international commitments or verified implementation outcomes; their feasibility and appropriate scale require scientific assessment, national planning, and stakeholder consultation.

The proposed concept is not confined to a single country or region. Its potential applications include global drylands, pasturelands and rangelands, and a proposed 43°–44° North Latitude Belt demonstration corridor across Eurasia and North America. These areas offer different contexts in which to investigate the relationship between water retention, land restoration, ecological connectivity, and community resilience. Their inclusion in the concept does not predetermine implementation: geographic boundaries, ecological suitability, participating countries, and the scale of any demonstration must be established through mapping, research, feasibility studies, and consultation.

The strategic significance of the Green Web lies in its ambition to move beyond fragmented projects and separately managed environmental interventions toward a more integrated approach to implementation. Rather than treating land degradation, biodiversity loss, water insecurity, and climate-related risks as isolated problems, it proposes to connect practical actions that may contribute to addressing them together. Its value will depend on evidence of actual ecological benefits, appropriate safeguards, transparent monitoring, sustainable financing, national ownership, and the participation of communities responsible for managing and sustaining the land.

The Green Web is therefore presented as a proposed contribution to scientific and policy dialogue, not as an already endorsed mechanism of the Rio Conventions. Its purpose is to explore how distributed rainwater harvesting, water retention, native vegetation restoration, and ecological connectivity can help translate shared international objectives into practical action. By connecting water, land, biodiversity, climate resilience, and communities within a common ecological framework, the Green Web seeks to strengthen the implementation of the three Rio Conventions and contribute to the protection and recovery of the living systems on which humanity depends.

1.2 Purpose and Scope

The Green Web is a proposed global ecological design and implementation framework that connects DPSs through native vegetation, restored soils, and ecologically appropriate corridors. Its purpose is to transform individual rainwater-harvesting and water-retention structures into interconnected, landscape-scale restoration systems that can contribute to the shared objectives of the three Rio Conventions: the CBD, the UNCCD, and the UNFCCC.

The Green Web recognizes that retaining rainwater is only one part of restoring hydrological function and strengthening ecosystem resilience. The surrounding land must also be capable of absorbing, retaining, and using water while supporting native vegetation, biodiversity, soil stability, and local livelihoods. Accordingly, the Green Web integrates distributed water retention with vegetation restoration, soil conservation, habitat connectivity, and community stewardship, seeking to connect practical action on land and water with broader objectives for biodiversity conservation, land restoration, and climate resilience.

The Green Web provides a common ecological design principle that can be adapted to different climates, landscapes, ecosystems, and national circumstances. Its proposed application encompasses drylands, pasturelands and rangelands, and other areas where water retention and ecological restoration are scientifically justified and environmentally appropriate. It complements the 0.01% Solutions—Flagship Implementation Programme by providing an ecological connectivity framework through which individual water-retention sites may become part of wider restoration networks.

The Green Web is not a single project, a standardized plantation model, or a physical water-transfer network. It is a proposed distributed living system implemented through locally appropriate interventions and connected by ecological function, shared scientific methods, and cooperation among participating countries, scientific institutions, communities, and other stakeholders. Its intended contribution is to help translate the shared objectives of the three Rio Conventions into coordinated, measurable action on the ground. The geographic scope, implementation scale, and ecological benefits of this approach must be established through scientific assessment, feasibility studies, appropriate safeguards, and ongoing monitoring.

1.3 Definition and Core Concept

The Green Web is the living ecological network connecting Distributed Pond Systems through native plant communities, restored ecosystems, and ecologically appropriate corridors. It is the ecological connectivity component of a proposed integrated approach to rainwater harvesting, water retention, and landscape restoration, intended to contribute to the shared objectives of the three Rio Conventions.

Each pond functions as a local water-retention node within the wider landscape. Around it, a site-appropriate community of grasses, shrubs, herbs, and, where ecologically suitable, trees can help stabilize soil, support habitats, regulate local water movement, and strengthen ecosystem resilience. Vegetated corridors connect suitable sites and pond clusters across the surrounding landscape, extending ecological connectivity beyond individual pond boundaries. Together, these elements can help integrate water-retention infrastructure with broader efforts to restore degraded land, conserve biodiversity, and strengthen climate resilience.

The Green Web comprises two complementary components:

1) **Green Rings:** Site-specific vegetation and ecological restoration zones surrounding individual ponds, designed according to local soil, water availability, terrain, native ecosystems, and habitat requirements.
2) **Green Corridors:** Ecologically appropriate connections between ponds, pond clusters, and restoration areas, designed to strengthen habitat connectivity and landscape-level ecological functions while respecting natural drainage patterns and existing ecosystems.

Together, Green Rings and Green Corridors connect individual water-retention measures into a broader ecological network. Their configuration will vary according to local environmental conditions; connectivity does not require continuous tree cover or the conversion of naturally open grasslands into wooded areas.

The central principle is that water-retention infrastructure and ecological restoration should be planned together from the beginning. Vegetation is not merely decorative landscaping added after pond construction; where appropriate to the ecosystem, it is a functional component of the restoration design. By integrating water retention with native vegetation, soil conservation, and ecological connectivity, the Green Web proposes a practical means of linking local interventions with wider landscape-restoration objectives and the implementation goals of the three Rio Conventions.

1.4 Objectives

The Green Web has six principal objectives that collectively support ecological restoration, sustainable water retention, the prevention of desertification, and the proposed integrated implementation of the three Rio Conventions.

1.4.1 Strengthen Local Water Retention and Combat Desertification

Support rainwater harvesting and the retention of water as close as practicable to where it falls, rather than allowing avoidable runoff to carry it away from the land where it could support soil moisture, vegetation, and ecosystem recovery. Through Distributed Pond Systems and complementary land-based water-retention measures, the Green Web seeks to make rainfall a resource for restoring degraded landscapes. By retaining suitable amounts of water, improving soil infiltration and moisture retention, and supporting the recovery of native vegetation, this approach can help reduce land degradation, strengthen drought resilience, and combat desertification. All interventions must be adapted to local hydrological conditions and respect environmental water requirements, downstream flows, and existing water users.

1.4.2 Restore Vegetation and Soil Function

Re-establish appropriate native plant communities, improve ground cover, stabilize vulnerable soils, and reduce erosion. Integrate vegetation restoration with rainwater retention to help maintain soil moisture and restore ecological functions, while respecting the characteristics and restoration requirements of different ecosystems.

1.4.3 Connect Ecological Habitats

Develop suitable Green Rings and Green Corridors that support wildlife movement and improve connectivity between fragmented habitats. Strengthen ecological networks through locally appropriate vegetation and habitat restoration without converting naturally open ecosystems or compromising existing biodiversity.

1.4.4 Support Dryland and Rangeland Resilience

Integrate rainwater harvesting and water-retention measures with sustainable pasture management, native forage recovery, and the protection of pastoral livelihoods. Promote approaches that improve the capacity of drylands and rangelands to withstand drought and recover from degradation while recognizing local communities, livestock-dependent livelihoods, and existing land-use systems.

1.4.5 Generate Measurable Scientific Evidence

Monitor changes in rainfall retention, soil moisture, vegetation, soil condition, biodiversity, and socioeconomic conditions to evaluate effectiveness and guide adaptive management. Establish appropriate baselines, measurable indicators, and transparent reporting to distinguish demonstrated outcomes from anticipated benefits and inform future implementation.

1.4.6 Support Wider Hydrological Security

Contribute to landscape restoration and water-cycle resilience by integrating rainwater harvesting, distributed water retention, soil conservation, and native vegetation recovery. Strengthen understanding of the relationships among rainfall, runoff, soil moisture,

vegetation, land condition, and ecosystem resilience without assuming that every site will produce the same hydrological or climatic effects.

Collectively, these objectives establish the Green Web's central approach: capture and retain suitable rainwater where it falls, restore the land's capacity to absorb and hold moisture, and reconnect water-retention sites through native vegetation and ecological restoration. By reducing avoidable water loss from landscapes, supporting vegetation recovery, and strengthening soil stability, this integrated approach seeks to address important drivers of desertification while contributing to biodiversity conservation, climate resilience, and the shared objectives of the three Rio Conventions.

1.5 Ecological Design Principles

The Green Web is designed around the principle that DPSs and ecological restoration must be planned as complementary components of a single landscape-level approach. Rainwater harvesting and retention provide local water resources, while appropriate vegetation and soil restoration help stabilize the surrounding land and create the ecological connections through which individual sites can become part of a wider network. The following principles guide the design and development of this network.

1.5.1 Native and Locally Appropriate Vegetation

Plant selection must reflect the ecological zone, soil characteristics, rainfall patterns, groundwater conditions, salinity, temperature, and existing vegetation. Native species should be prioritized where scientifically and ecologically appropriate. Invasive species, unsuitable exotic species, and plants requiring unsustainable supplemental irrigation should be avoided.

Vegetation selection must be determined through local ecological assessment rather than a universal planting list. The objective is to establish plant communities that can survive under local conditions, contribute to soil and ecosystem recovery, and support the gradual development of ecological connections between Distributed Pond Systems. The composition and density of vegetation around each pond and along potential corridors must reflect the natural characteristics of the landscape.

1.5.2 Multi-Layered Plant Communities

The Green Web must not be reduced to tree planting. Depending on the ecosystem, its vegetation may include grasses, herbs, shrubs, trees, and biologically active soil crusts. Each component can contribute distinct functions to the restoration of the land surrounding Distributed Pond Systems.

- Trees, where suitable: Provide shade, wind protection, habitat, and biomass storage.
- Shrubs: Help stabilize soil, provide habitat, and support forage where appropriate.
- Grasses and herbs: Establish ground cover, reduce erosion, and contribute organic matter to the soil.
- Root systems: Bind soil, create pathways that can support infiltration, and contribute below-ground biomass.
- Soil biological communities: Support nutrient cycling, soil structure formation, and the functioning of restored ecosystems.

Not every layer is appropriate at every location. In natural grasslands and some drylands, maintaining or restoring open native vegetation may be more beneficial than introducing trees. The purpose is to recover ecologically appropriate plant communities, not to maximize tree cover or vegetation density irrespective of local conditions.

1.5.3 Hydrological Compatibility

Vegetation must be selected and managed in accordance with local water availability and the hydrological conditions of each site. Planting and restoration activities should not create excessive water demand, deplete groundwater, damage wetlands, or compromise downstream water requirements.

Distributed Pond Systems are intended to retain suitable rainwater near where it falls, while surrounding vegetation helps the land stabilize, absorb, and use available moisture where local conditions permit. However, the presence of a pond does not automatically make water-intensive vegetation appropriate. Plant selection, restoration density, and maintenance must account for rainfall variability, evaporation, infiltration, groundwater interactions, and ecological water requirements.

The objective is to improve ecological function and strengthen the land's capacity to retain moisture, not to maximize vegetation density regardless of hydrological consequences.

1.5.4 Landscape Connectivity: Connecting Distributed Pond Systems into the Green Web

Landscape connectivity is the defining principle that transforms individual Distributed Pond Systems into a wider Green Web. Each pond initially functions as a local water-retention node, with its surrounding restoration area forming a potential ecological connection point within the landscape. Once the appropriate vegetation around individual ponds has been established, the restored areas can be connected progressively through Green Corridors comprising locally suitable grasses, herbs, shrubs, trees where appropriate, and other native vegetation communities.

This process begins with the ecological restoration of the land immediately surrounding each pond. Green Rings provide site-specific vegetation and restoration zones that help stabilize the soil, support suitable habitats, and strengthen local ecological functions. As restoration progresses, the locations, condition, and ecological requirements of neighboring sites can inform the design of corridors connecting individual ponds, pond clusters, and other suitable habitats. These corridors extend restoration beyond the boundaries of individual ponds and help create a connected ecological network across the wider landscape.

The connection does not require every pond to be physically joined to another pond by a continuous strip of vegetation, nor does it require water to flow between all sites. Rather, the DPSs become connected through ecological relationships established by appropriately restored vegetation, soil, and habitats. Depending on local conditions, these connections may support wildlife movement, native plant communities, soil stabilization, reduced wind erosion, and other ecological functions. Corridor design must reflect terrain, catchments, land use, target species, habitat requirements, and the natural distribution of ecosystems.

At landscape scale, the process follows a progressive sequence: retain suitable rainwater through DPSs; restore appropriate vegetation around individual ponds; connect suitable restoration areas through Green Corridors; and develop the resulting network into the Green Web. The network may expand as additional ponds and restoration sites are established, but its configuration must be guided by ecological suitability rather than a predetermined requirement for uniform or uninterrupted vegetation.

Connectivity should therefore be achieved through appropriate native vegetation and habitat management, not through uniform planting across all land types. Naturally open grasslands, wetlands, rivers, existing forests, and other sensitive ecosystems must retain their ecological integrity. Where a corridor would cause damage or provide little ecological benefit, alternative alignments or other forms of habitat connectivity should be considered.

Through this approach, the Green Web provides the ecological connectivity layer that links distributed water-retention infrastructure with broader landscape restoration. It allows individual interventions to be planned as parts of a potentially larger network, while ensuring

that their actual contribution to ecological connectivity and restoration is assessed and monitored.

1.5.5 Community Stewardship

Local communities, pastoralists, Indigenous Peoples, and other land users should participate in the selection, design, establishment, maintenance, monitoring, and evaluation of Green Rings, Green Corridors, and associated Distributed Pond Systems.

Community participation is essential because ecological connectivity depends not only on initial planting or construction but also on the long-term management of restored land. Grazing practices, seasonal livestock movements, access to water, land-use rights, maintenance responsibilities, and local livelihoods can all influence whether restoration areas survive and whether corridors remain functional over time.

Traditional and local knowledge should complement scientific assessment, with appropriate consent and safeguards for community-held information. Restoration planning should recognize local knowledge of rainfall, vegetation, soils, wildlife, and land-use patterns while ensuring that communities are meaningfully involved in decisions affecting their lands and livelihoods.

The Green Web should therefore be developed as a living ecological network sustained through cooperation between communities, scientific institutions, public authorities, and other participating stakeholders. Its long-term success depends on establishing not only suitable vegetation around individual ponds and between restoration sites, but also the local capacity and shared responsibility required to protect and maintain those connections.

1.6 The Green Ring: Vegetation Around Each Pond

The Green Ring is the site-level ecological component of the Green Web. It establishes appropriate vegetation and habitat zones around each DPS, integrating local rainwater retention with soil stabilization, vegetation recovery, and surrounding land restoration. Each Green Ring serves as a potential ecological connection point from which suitable vegetation and habitat corridors can extend toward neighboring restoration sites and other DPSs.

The Green Ring is designed to help retain the ecological benefits of rainfall and water harvesting within the surrounding landscape. Appropriate vegetation can stabilize pond banks and nearby soils, improve ground cover, support biodiversity, and contribute to habitat formation. Depending on local conditions, it may also help reduce wind erosion and provide suitable conditions for native plant communities. These benefits depend on ecological suitability, water availability, appropriate management, and the long-term survival of the vegetation.

A possible Green Ring design may include the following functional zones:

Inner Zone—Pond Edge: Appropriate wetland or moisture-tolerant vegetation where the pond's water regime and local ecosystem support it. Potential functions include bank stabilization, filtration of sediment, and habitat provision. Species and planting arrangements must be selected according to water-level fluctuations, water quality, and local ecological conditions.

Middle Zone—Local Restoration Area: Native grasses, herbs, shrubs, and other suitable plant communities selected to stabilize soil, establish ground cover, support biodiversity, and improve local ecological function. The composition should reflect the natural vegetation of the site rather than follow a uniform planting model.

Outer Zone—Landscape Transition: Existing or restored vegetation suited to the surrounding ecosystem, helping integrate the pond's restoration area with the wider landscape. Depending on local conditions, this zone may contribute to wind protection, soil conservation, habitat provision, and the gradual transition between the pond area and adjacent land.

Connecting Zone—Ecological Corridor: Where ecologically appropriate, native vegetation or managed habitat extending from the Green Ring toward nearby restoration areas, suitable habitats, or other pond clusters. These connections help transform individual Green Rings into components of the wider Green Web. Their alignment and composition should reflect terrain, natural vegetation, land use, and the ecological requirements of relevant species.

These zones are functional design categories, not mandatory rings of fixed width or distance. Their dimensions, composition, and placement must be established through site assessment, considering topography, soil, rainfall, pond hydrology, groundwater conditions, existing vegetation, biodiversity, and land use. Some zones may overlap, while others may be unnecessary at particular sites. In naturally open grasslands and other sensitive ecosystems, maintaining existing native vegetation, supporting natural regeneration, and improving grazing management may be preferable to planting additional trees or introducing new vegetation types.

Establishing a Green Ring is the first step toward connecting DPSs through the Green Web. Once suitable vegetation and habitat conditions have been restored around individual ponds, ecological assessment can identify opportunities to connect neighboring Green Rings

through Green Corridors. Over time, these connections can link individual ponds and pond clusters into a broader ecological network. This does not require every pond to be physically connected by continuous vegetation; rather, connectivity should be established wherever appropriate through functioning habitats and locally suitable ecological links.

The Green Ring therefore serves both a local and a wider purpose: it supports restoration around an individual water-retention site while providing a potential foundation for landscape-scale ecological connectivity. Together, appropriately designed Green Rings and Green Corridors form the living ecological structure of the Green Web, linking distributed rainwater harvesting and water retention with the broader objectives of land restoration, biodiversity conservation, and climate resilience.

1.7 Green Corridors and Landscape Connectivity

Green Corridors connect individual Green Rings, Distributed Pond Systems, and other suitable restoration areas across a landscape. They provide the connecting ecological component of the Green Web, extending restoration beyond individual ponds and enabling locally appropriate vegetation and habitats to form a wider network. Corridors may follow natural drainage lines, degraded land, riparian areas, existing vegetation strips, or suitable habitat connections, provided their alignment is supported by ecological assessment and does not compromise existing ecosystem functions.

The establishment of Green Corridors builds on the restoration of vegetation around individual ponds. Once Green Rings have been established, surrounding land can be assessed to identify opportunities for connecting suitable sites through native vegetation recovery, soil stabilization, habitat restoration, and appropriate land management. These connections may link neighboring ponds, clusters of DPSs, and existing natural habitats, gradually expanding ecological connectivity across the landscape. The resulting network does not depend on every pond being physically connected to every other pond; it depends on establishing ecologically meaningful connections where local conditions support them.

Depending on their location, design, and ecological condition, Green Corridors may serve several complementary functions:

- Soil conservation: Reduce soil exposure and erosion in selected areas through appropriate vegetation cover and land management.
- Wildlife movement: Support the movement of native wildlife between suitable habitats.
- Habitat connectivity: Improve connections between fragmented habitats and restoration areas.
- Vegetation continuity: Strengthen the continuity of native ground cover and plant communities where ecologically appropriate.
- Forage recovery: Support the recovery of native forage where compatible with biodiversity conservation, sustainable grazing, and ecosystem objectives.
- Coordinated restoration: Provide a landscape-level framework for planning, implementing, and monitoring interconnected restoration activities.

Green Corridors must be designed according to terrain, soil conditions, rainfall, hydrology, existing vegetation, land use, habitat requirements, and community needs. They should respect natural drainage and avoid obstructing rivers, concentrating damaging runoff, disturbing sensitive habitats, introducing invasive species, or restricting established pastoral mobility. Their design must also preserve the ecological character of naturally open grasslands and other ecosystems that do not benefit from additional tree cover.

Corridor development may involve planting native species, encouraging natural regeneration, restoring degraded ground cover, protecting existing vegetation, or improving land-management practices. In some locations, maintaining an existing vegetation strip or protecting a naturally functioning habitat may provide greater ecological value than establishing a new planted corridor. Consequently, the Green Web does not prescribe a uniform width, composition, or planting density for all corridors.

The relationship between Green Rings and Green Corridors is central to the Green Web concept. Green Rings establish the local ecological foundation around individual ponds; Green Corridors connect suitable restoration areas beyond those sites; and the combined network creates opportunities for landscape-scale ecological connectivity. Through this

progressive process, Distributed Pond Systems can become components of a broader restoration framework that integrates rainwater harvesting and water retention with soil conservation, biodiversity, and climate resilience.

The Green Web is therefore not a requirement to plant a continuous strip of vegetation between every pond. It is a framework for identifying and establishing ecological connections where scientific evidence, local conditions, and community priorities support them. Its purpose is to connect individual restoration efforts into a coherent landscape-level approach that can contribute to the shared objectives of the three Rio Conventions while preserving the ecological integrity and sustainable use of the land.

1.8 Implementation at Multiple Scales

The Green Web is designed for implementation across interconnected spatial scales, from individual ponds to catchments, landscapes, regions, transboundary ecological systems, and a proposed global network. Each scale builds on the preceding one, linking local rainwater harvesting and ecological restoration with broader coordination, scientific assessment, and cooperation. The objective is to connect locally adapted interventions through shared ecological principles without imposing a uniform design on different environments.

1.8.1 Site Level: The Green Ring

At the individual pond, the Green Web integrates water-retention infrastructure with native vegetation, soil protection, and habitat management. The Green Ring establishes the local ecological foundation around each DPS, helping stabilize surrounding land and support appropriate vegetation recovery. Where ecological conditions permit, restoration areas can provide starting points for connections to nearby habitats and other pond sites through Green Corridors.

Site-level implementation must reflect local rainfall, soil, terrain, water availability, native ecosystems, and land use. Its effectiveness should be assessed through indicators appropriate to the site, including vegetation establishment, soil condition, water retention, and potential ecological impacts.

1.8.2 Catchment and Landscape Level

At catchment and landscape scales, pond clusters, Green Rings, Green Corridors, and other restoration areas are planned in relation to rainfall, terrain, surface runoff, soil characteristics, existing ecosystems, land use, and downstream users. This scale allows individual interventions to be assessed as parts of a wider hydrological and ecological system rather than as isolated projects.

Catchment planning is essential to determine where water retention is appropriate, understand how water moves through the landscape, and assess cumulative effects. It helps avoid double counting retained water, overstating benefits, or transferring ecological harm from one location to another. Planning must account for evaporation, infiltration, groundwater interactions, environmental water requirements, and downstream flows, as relevant to each site.

At this scale, the Green Web develops through the coordinated placement and management of suitable restoration areas and ecological connections. The objective is to strengthen landscape function while maintaining the integrity of existing ecosystems and the needs of local communities.

1.8.3 Regional Level

At the regional level, implementation connects suitable landscapes through coordinated restoration priorities, compatible monitoring methods, scientific cooperation, and shared knowledge. Participating areas can exchange information on native vegetation, rainwater harvesting, soil restoration, drought resilience, and approaches to maintaining ecological connectivity.

Regional coordination can also help identify common environmental pressures, compare restoration outcomes, and establish consistent methods for assessing progress.

Shared principles and indicators should enable comparison without disregarding differences in climate, ecosystems, water availability, and national circumstances.

1.8.4 Transboundary Level

Where ecological systems, watersheds, habitats, or dust-source areas extend across national borders, countries may cooperate on research, restoration planning, dust-source assessment, biodiversity connectivity, and the exchange of monitoring data. Such cooperation can help align complementary activities across connected landscapes while respecting national sovereignty, applicable law, and the rights and interests of affected communities.

The proposed North 43°–44° Latitude Belt demonstration corridor is one potential area for further investigation. Any transboundary corridor must be independently mapped, scientifically reviewed, and developed through consultation with relevant national authorities, scientific institutions, local communities, pastoralists, and other stakeholders. Its boundaries, participating countries, ecological priorities, and feasibility must be established through evidence and consultation rather than assumed in advance.

1.8.5 Global Level

At the global level, the Green Web is proposed as a network of locally adapted ecological restoration systems associated with The 0.01% Solutions—Flagship Implementation Programme. Its ambition is to connect distributed rainwater harvesting and water-retention initiatives with native vegetation restoration, soil conservation, and ecological connectivity across participating countries.

The global network would consist of many distinct ecological systems rather than one continuous belt of vegetation. Individual countries and regions would determine appropriate interventions according to their hydrological conditions, ecosystems, land-use systems, and development priorities. The common framework would be provided by shared ecological principles, scientifically appropriate indicators, transparent reporting, and cooperation among participating countries and institutions.

At this scale, the Green Web proposes a practical approach to strengthening implementation of the three Rio Conventions: the Convention on Biological Diversity, the United Nations Convention to Combat Desertification, and the United Nations Framework Convention on Climate Change. By connecting local restoration activities with wider scientific cooperation and measurable objectives, it seeks to help translate shared international commitments into coordinated action on the ground.

Across all scales, implementation must remain evidence-based, locally appropriate, and subject to ecological safeguards and monitoring. The progression from individual Green Rings to connected Green Corridors, coordinated landscapes, regional cooperation, and a proposed global network provides the organizing structure of the Green Web. Its success should be assessed by demonstrated ecological and hydrological outcomes, the sustainability of restored systems, and the quality of cooperation—not solely by the number of ponds established or the geographic area included.

1.9 Priority Application Areas

The Green Web is intended as a transferable ecological design and implementation concept that can be adapted to different landscapes according to their hydrological conditions, ecological characteristics, restoration needs, and community priorities. Its initial areas of application are proposed on the basis of the potential to integrate rainwater harvesting, water retention, native vegetation recovery, and ecological connectivity. All proposed locations require site-specific assessment to determine whether these interventions are appropriate and beneficial.

1.9.1 Global Drylands

Drylands are a potential priority because rainfall can be limited, variable, or concentrated into short periods, while land degradation and vegetation loss can weaken the capacity of landscapes to retain soil moisture. Where scientifically and ecologically appropriate, interventions may combine rainwater harvesting, DPSs, native vegetation recovery, soil conservation, and protection against erosion.

The Green Web approach seeks to retain suitable rainfall near where it falls, improve the condition of the surrounding land, and connect restored sites through appropriate vegetation and habitat corridors. These measures may help strengthen drought resilience and combat desertification by supporting soil stability, moisture retention, and vegetation recovery.

Site selection must distinguish areas where water retention can support ecological restoration from those where interventions could damage natural dryland ecosystems, alter important drainage patterns, deplete groundwater, or disrupt existing water flows. Restoration must follow local ecological conditions and avoid assuming that every dryland requires additional ponds, tree planting, or increased vegetation density.

1.9.2 Pasturelands and Rangelands

In pasturelands and rangelands, the Green Web may integrate water-retention measures with native forage recovery, sustainable grazing, erosion control, and habitat protection. Appropriate rainwater harvesting and soil-restoration measures can support efforts to improve land condition and resilience while maintaining the ecological functions on which pastoral livelihoods depend.

Implementation should account for seasonal livestock movement, customary land use, pastoral livelihoods, and local governance. Pond construction and vegetation establishment must not create unjustified barriers to access, interfere with established pastoral mobility, or concentrate grazing pressure around water points in ways that cause further land degradation. Where necessary, site design should incorporate grazing management, distributed access, and community-agreed maintenance arrangements.

The objective is to connect water retention and ecological restoration with sustainable rangeland management, ensuring that the Green Web supports both ecosystem recovery and the communities that depend on these landscapes. Restoration methods must remain appropriate to the natural characteristics of each pastureland or rangeland, including the conservation of naturally open grassland ecosystems.

1.9.3 The Proposed 43°–44° North Latitude Belt

The 43°–44° North latitude belt is proposed as an initial demonstration corridor for investigating selected Green Web principles across different landscapes. It could provide a

framework for examining how Distributed Pond Systems, Green Rings, Green Corridors, and native vegetation restoration may be adapted and coordinated across suitable sites in different geographic and ecological settings.

The corridor's boundaries, participating countries, ecological rationale, and suitability must be verified through geographic analysis, scientific review, hydrological assessment, and stakeholder consultation. Latitude alone does not establish ecological connectivity or demonstrate that the entire belt functions as one hydrological system. The proposed corridor must therefore be treated as a research and demonstration concept rather than a predetermined continuous restoration zone.

In Mongolia, potential demonstration sites may be assessed in relation to the proposed Gobi Green Zone and other suitable landscapes. Any specific selection of aimags, soums, pond numbers, restoration corridors, or implementation phases requires a defined site inventory, baseline data, feasibility assessment, and consultation with relevant authorities and communities. Lessons from verified demonstration sites could inform subsequent implementation in other suitable areas.

1.9.4 Other Suitable Ecosystems

The Green Web may also be adapted to other landscapes where distributed water retention and ecological connectivity are scientifically justified and environmentally appropriate. Potential applications must be determined by local conditions rather than by applying a uniform dryland model to every ecosystem.

In each case, the design should reflect natural vegetation, soil properties, rainfall, surface and groundwater processes, biodiversity, land use, and the needs of local communities. Forests, wetlands, natural grasslands, and other sensitive ecosystems may require different restoration approaches, including protection of existing ecological functions rather than the construction of ponds or introduction of additional vegetation.

Across all priority application areas, the guiding principle remains consistent: retain suitable rainwater where it falls, restore the land's capacity to retain moisture, and connect appropriate restoration sites through functioning ecological networks. Through this locally adapted approach, the Green Web seeks to support efforts to combat desertification, restore degraded land, conserve biodiversity, strengthen climate resilience, and contribute to the shared objectives of the three Rio Conventions.

1.10 Relationship Between the Distributed Pond System (DPS) and the Green Web

The Distributed Pond System and the Green Web are complementary components of the proposed 0.01% Solutions—Flagship Implementation Programme. The DPS provides the local water-retention infrastructure, while the Green Web connects suitable pond sites with vegetation restoration, soil protection, and ecological connectivity across the surrounding landscape.

Distributed Pond System. Provides decentralized structures for collecting and retaining suitable rainwater close to where it falls. Their location, design, capacity, and operation must be determined through site-specific hydrological, engineering, and ecological assessments.

Green Web. Integrates DPS sites into a broader ecological network through Green Rings around individual ponds, Green Corridors between suitable restoration areas, native vegetation, and habitat connections adapted to local ecosystems.

Combined system. Coordinates rainwater harvesting and retention with soil conservation, vegetation recovery, and ecological connectivity at appropriate site, catchment, and landscape scales. The objective is to strengthen the land's capacity to retain moisture and support ecological recovery while safeguarding natural water flows, biodiversity, and the needs of local communities.

A DPS can perform a water-retention function without a Green Web. However, where ecological conditions permit, the Green Web adds a landscape-restoration dimension by connecting individual water-retention sites with wider land-recovery and habitat objectives. Conversely, vegetation restoration can contribute to the Green Web even in areas where pond construction is unsuitable.

The relationship is therefore complementary rather than dependent: the DPS provides the water-retention component, while the Green Web provides the ecological integration component. Their coordinated application should be guided by local conditions, scientific evidence, and measurable outcomes rather than by fixed assumptions about the number of ponds or the extent of vegetation cover.

Neither component, alone or in combination, automatically guarantees groundwater recharge, increased rainfall, climate stabilization, or cryosphere recovery. Any such outcomes must be assessed separately through appropriate scientific methods, baseline data, and long-term monitoring. Implementation must also account for evaporation, infiltration, downstream water requirements, ecological water needs, and potential effects on existing water users and habitats.

Together, the DPS and the Green Web establish a proposed practical framework for linking rainwater harvesting, land restoration, and ecological connectivity while ensuring that water-retention interventions remain hydrologically responsible and ecologically appropriate.

1.11 Relationship with the 0.01% Solutions Programme

The 0.01% Solutions—Flagship Implementation Programme establishes the overall implementation framework and proposed programme-level ambition for distributed rainwater harvesting and water retention. Within this framework, the Green Web provides the ecological design and connectivity component, linking suitable water-retention sites with native vegetation, soil restoration, and habitat management.

The relationship between the programme's principal components is defined as follows:

- 0.01% Solutions Programme: Establishes the overall implementation ambition, coordination framework, and proposed global approach to distributed rainwater harvesting and water retention.
- Distributed Pond System: Provides decentralized infrastructure for collecting and retaining suitable rainwater close to where it falls, subject to hydrological, engineering, and ecological assessments.
- Green Web: Integrates appropriate DPS sites into a broader ecological network through Green Rings, Green Corridors, native vegetation, and ecosystem restoration adapted to local conditions.
- Monitoring and Evaluation: Assesses implementation progress, water-retention performance, ecological outcomes, environmental and social effects, and the long-term sustainability of interventions.

These components are intended to function as an integrated implementation framework. The programme establishes the ambition; the DPS provides the water-retention infrastructure; the Green Web connects water retention with ecological restoration; and monitoring and evaluation provide the evidence needed to assess performance, identify risks, and guide adaptive management.

The proposed global pond network and annual water-retention ambition are planning targets, not verified achievements or guarantees of available water volumes. Their feasibility must be established through transparent hydrological accounting, scientific assessment, and country-level planning. National and local targets should reflect rainfall patterns and variability, catchment characteristics, evaporation and infiltration rates, existing water uses, ecological water requirements, downstream impacts, implementation capacity, financing, and long-term maintenance.

Accordingly, the 0.01% Solutions Programme should not be interpreted as a uniform requirement to construct a predetermined number of ponds in every country. It is a proposed global ambition to be translated into context-specific, scientifically justified, and measurable actions. The Green Web strengthens this approach by ensuring that suitable water-retention interventions are considered alongside land restoration, biodiversity protection, and ecological connectivity.

Together, the programme and its components provide a proposed pathway for connecting global ambition with locally appropriate implementation, while requiring that reported progress be based on verified results, environmental safeguards, and transparent monitoring.

1.12 Relationship with the Proposed Convention on Planetary Hydrological Security and Cryosphere Stability

The Convention on Planetary Hydrological Security and Cryosphere Stability is a proposed international legal instrument intended to provide a framework for international cooperation on planetary hydrological security and cryosphere stability. Within the broader Ecological Pax Mongolica framework, the proposed Convention seeks to advance scientific cooperation, shared understanding of hydrological interdependence, and the development of appropriate international approaches to safeguarding the water systems and cryospheric processes upon which societies and ecosystems depend.

The Green Web and the 0.01% Solutions—Flagship Implementation Programme are conceived as potential practical contributions to this broader objective. They address the relationship between rainwater retention, land restoration, ecosystem connectivity, and hydrological resilience through locally adapted interventions. Rather than treating water retention as an isolated infrastructure activity, the proposed approach integrates it with the condition of soils, native vegetation, habitats, and the wider landscape.

Within this proposed architecture, the respective roles are as follows:

1. Proposed CPHSCS—International Cooperation Framework. The Convention is intended to provide the broader international framework for cooperation on planetary hydrological security and cryosphere stability. Its potential development would require scientific assessment, consultation among relevant stakeholders, institutional consideration, and an appropriate international legal process. The Green Web and the 0.01% Solutions Programme may inform relevant discussions by providing practical concepts, implementation experience, and evidence from suitable demonstration areas. They do not, by themselves, establish the Convention's legal principles, obligations, or institutional arrangements.

2. 0.01% Solutions Programme—Practical Implementation Framework. The Programme proposes to organize distributed rainwater harvesting and water-retention activities around a programme-level ambition, supported by country-specific planning, feasibility assessment, coordination, and monitoring. Its purpose is to translate the broader ambition of strengthening hydrological resilience into practical activities whose feasibility and outcomes can be evaluated. The proposed annual water-retention target must remain a planning ambition until its baseline, methodology, hydrological accounting, and environmental implications have been verified.

3. Distributed Pond System—Local Water-Retention Infrastructure. The Distributed Pond System provides the proposed physical component for collecting and retaining suitable rainwater close to where it falls. Pond locations, dimensions, capacities, and operating arrangements must be determined through site-specific assessment of rainfall, terrain, catchment characteristics, soil conditions, ecological requirements, downstream water needs, and engineering feasibility. The objective is not to maximize water storage regardless of consequences, but to identify locations where retention can provide demonstrable benefits without unacceptable ecological or social harm.

4. Green Web—Ecological Integration and Landscape Connectivity. The Green Web complements the DPS by connecting suitable water-retention sites with native vegetation, soil restoration, habitat management, and ecologically appropriate corridors. Green Rings around individual ponds and Green Corridors between suitable restoration areas can help integrate local interventions into wider landscape-restoration efforts. This component is intended to ensure that water-retention infrastructure is considered within its ecological setting rather than as a collection of isolated structures. Implementation must respect naturally open

ecosystems, existing watercourses, biodiversity, customary land use, and the needs of local communities.

5. Scientific Monitoring and Evaluation—Evidence and Adaptive Management. Scientific monitoring provides the essential link between the proposed international objectives and actual environmental outcomes. Baseline assessments, measurable indicators, transparent reporting, and long-term observation are needed to determine whether interventions retain water effectively, improve soil moisture or vegetation condition, reduce land degradation, support biodiversity, or strengthen drought resilience. Monitoring should also identify unintended consequences, including excessive evaporation, altered runoff, impacts on groundwater or downstream users, and damage to sensitive ecosystems. Findings should guide the continuation, modification, scaling, or discontinuation of particular interventions.

6. Demonstration Projects and Knowledge Exchange—Potential Contributions to International Cooperation. Where appropriate, demonstration areas could provide opportunities for researchers, public institutions, local communities, and participating countries to examine different approaches to distributed water retention and ecological restoration. Comparable methods and transparent reporting could support the exchange of scientific knowledge across different climatic and ecological settings. Any proposed regional or transboundary application would require geographic and hydrological analysis, consultation with affected communities and relevant authorities, and respect for national sovereignty and applicable law. Demonstration results should be documented before they are used to justify replication elsewhere.

1.12.1 The Potential Contribution to Cryosphere Stability

The relationship between the Green Web, distributed rainwater retention, and cryosphere stability requires particular scientific care. The cryosphere includes glaciers, ice sheets, snow cover, sea ice, and permafrost, each governed by distinct physical processes and regional conditions. Land restoration and improved water management may contribute to wider environmental resilience, but these benefits cannot automatically be translated into a demonstrated effect on glaciers, snow cover, or other cryospheric components.

Potential connections must therefore be investigated through region-specific scientific research. Relevant questions may include whether changes in land cover and soil condition influence dust generation and transport, whether dust deposition affects the reflectivity and melting of snow or ice, and whether restoration interventions produce measurable changes in relevant hydrological processes. Such relationships must be established through appropriate observations, modelling, and independent assessment. The Green Web should not be presented as a direct mechanism for increasing snowfall, reversing glacier loss, or stabilizing the cryosphere without supporting evidence.

The proposed CPHSCS could provide a broader international context in which such research questions are considered alongside hydrological security, climate-related risks, land degradation, and ecosystem resilience. The Programme and Green Web could contribute implementation experience and field evidence where their activities are relevant, while remaining distinct from the Convention’s prospective legal and institutional framework.

1.12.2 Status and Relationship of the Proposed Initiatives

The relationship described in this section represents the intended conceptual and implementation architecture of the initiative. CPHSCS remains a proposed international legal instrument; its inclusion in this framework does not imply adoption, ratification, entry into

force, or formal endorsement by governments, the United Nations, or any international convention or institution. Similarly, the proposed relationship does not establish that the 0.01% Solutions Programme or the Green Web has been formally incorporated into CPHSCS.

Any future institutional relationship would depend on the development and consideration of the Convention through appropriate processes, the decisions of relevant stakeholders, and the availability of credible scientific evidence. The proposed Programme and Green Web may be developed and evaluated as practical initiatives in their own right, without presuming the future legal status or outcome of CPHSCS.

The intended sequence is therefore scientific inquiry, practical demonstration, transparent evaluation, knowledge exchange, and consideration of appropriate international cooperation. Evidence from implementation may help identify effective approaches and limitations, inform future policy discussions, and clarify where international coordination could add value. It should not be treated as proof of results that have not yet been measured or as a substitute for the legal processes required to establish an international convention.

Ultimately, the proposed relationship connects three complementary levels of action: CPHSCS as the intended international cooperation framework; the 0.01% Solutions Programme as the proposed implementation framework; and the DPS and Green Web as complementary approaches to local water retention and ecological restoration. Scientific monitoring provides the evidence base across these levels. Together, they offer a potential pathway for connecting hydrological-security objectives with practical, locally appropriate, and measurable action, while ensuring that claims about wider climate and cryosphere benefits remain proportionate to the available evidence.

1.13 Monitoring, Evaluation, and Learning

The Green Web requires a scientifically credible monitoring, evaluation, and learning framework capable of distinguishing implementation activities from measured ecological outcomes and longer-term environmental and social impacts. The framework should establish whether interventions are implemented as planned, whether they produce measurable benefits, whether unintended effects arise, and under what conditions particular approaches may be effective, require modification, or should not be replicated.

Monitoring and evaluation should be integrated into the design and implementation of the Green Web from the outset. Baseline conditions must be documented before interventions begin, and indicators should be selected according to local ecosystems, hydrological conditions, project objectives, available resources, and the duration required to detect meaningful change. Where feasible, monitoring should use comparable reference sites, repeated measurements, and independent scientific review to help distinguish intervention effects from natural variability and wider climatic influences.

1.13.1 Monitoring Domains, Indicators, and Methods

The following framework identifies potential monitoring domains, illustrative indicators, and appropriate methods. The final selection of indicators and measurement protocols should be determined through site-specific scientific and technical assessment.

Monitoring domain	Potential indicators	Possible methods
Vegetation and restoration	Native vegetation cover; species composition; plant survival; regeneration; biomass; vegetation condition; presence of invasive species	Field surveys; permanent vegetation plots; photographic records; remote sensing; repeated vegetation assessments
Soil condition	Soil moisture; soil organic carbon; soil structure; infiltration capacity; surface crusting; erosion; soil stability	Soil sampling; field measurements; infiltration tests; erosion monitoring; laboratory analysis
Rainfall and water retention	Rainfall amount and variability; pond water levels; inflows; outflows; storage duration; overflow; withdrawals; estimated evaporation and seepage	Rain gauges; water-level loggers; field observations; storage measurements; hydrological monitoring; water-balance assessments
Groundwater	Groundwater levels and seasonal trends; groundwater quality where relevant; evidence of recharge; changes in nearby wells or springs	Monitoring wells; groundwater-level measurements; hydrogeological assessments; groundwater-quality sampling; appropriate recharge-estimation methods
Biodiversity and habitat connectivity	Species presence; habitat condition; native species diversity; habitat continuity; wildlife movement where measurable; ecological barriers and disturbances	Habitat surveys; transects; camera traps where appropriate; species monitoring; remote sensing; landscape-connectivity analysis
Microclimate and	Air and surface temperature;	Weather stations; temperature

surface conditions	relative humidity; soil-surface conditions; local variation in temperature and moisture	and humidity sensors; data loggers; standardized field measurements
Land degradation and erosion	Exposed soil; erosion features; sediment movement; vegetation loss; changes in land condition; signs of desertification-related processes	Field assessments; erosion plots; sediment measurements; repeat photography; satellite imagery; geospatial analysis
Livelihoods and community outcomes	Forage availability; access to water and grazing areas; community participation; effects on pastoral mobility; household costs and benefits; perceived changes in land condition	Community monitoring; household surveys; participatory assessments; interviews; consultation with affected land users
Implementation and governance	Sites assessed; interventions completed; maintenance performed; monitoring coverage; participation and consultation; compliance with environmental safeguards; reported adverse effects	Project records; field inspections; maintenance logs; stakeholder consultations; independent implementation reviews

These indicators are illustrative rather than mandatory universal requirements. Not every site will require every indicator, and some outcomes may not be measurable within a short project period. Monitoring plans should therefore prioritize indicators that directly correspond to the intervention's objectives and can be measured reliably over an appropriate period.

1.13.2 Establishing Baselines and Measuring Change

Each implementation site should have a documented baseline describing its initial hydrological, ecological, and relevant social conditions. Depending on the intervention, this may include rainfall patterns, existing pond or water-body conditions, soil moisture, vegetation cover, land degradation, groundwater levels, habitat characteristics, and current patterns of water use and land access.

Measurements should be repeated at intervals appropriate to local conditions and the expected rate of change. Seasonal variation, droughts, unusually wet years, grazing pressure, land-use changes, and other external influences should be recorded where relevant. Where feasible, comparison sites or other suitable methods should be used to assess whether observed changes are reasonably attributable to the intervention.

Evaluation should distinguish among three levels of performance:

Implementation outputs: Activities completed, such as sites assessed, ponds constructed or rehabilitated, Green Rings established, corridors restored, and monitoring systems installed.

Measured outcomes: Observable changes, such as increased native vegetation cover, improved soil condition, reduced erosion, or verified changes in water-retention performance.

Longer-term impacts: Sustained changes in land degradation, drought resilience, ecosystem condition, biodiversity, or community well-being that require longer observation and careful assessment of contributing factors.

The number of ponds constructed, hectares treated, or corridors designated should not, by itself, be treated as evidence of ecological success. Reporting should demonstrate the difference between activities completed, outcomes measured, and impacts supported by sufficient evidence.

1.13.3 Hydrological Accounting and Water-Balance Integrity

Water accounting is a central requirement because the programme's purpose is to capture and retain suitable rainwater close to where it falls. Monitoring must distinguish between water stored in ponds, water retained temporarily in soil, water that infiltrates into deeper layers, verified groundwater recharge, and runoff delayed or redirected by an intervention. These quantities represent different hydrological processes and must not be counted repeatedly as if they were separate volumes of newly available water.

Where appropriate, site-level water balances should account for rainfall, catchment inflows, changes in stored volume, withdrawals, evaporation, seepage, overflow, and other relevant gains or losses. Estimates should state their assumptions, measurement periods, uncertainties, and limitations. Water retained at one point should not automatically be reported as additional basin-wide water availability, particularly where retention changes the timing or quantity of downstream flows.

Monitoring should also consider environmental water requirements, existing water users, groundwater-dependent ecosystems, wetlands, rivers, and the needs of downstream communities. A water-retention intervention should be modified or discontinued where evidence indicates unacceptable impacts or where its benefits cannot justify its hydrological, ecological, or social costs.

Claims concerning groundwater recharge must be supported by suitable hydrogeological evidence. Likewise, any claims that the Green Web improves regional rainfall, stabilizes the climate, or contributes directly to cryosphere recovery require separate evidence appropriate to the processes and geographical areas concerned. Such benefits should not be inferred solely from pond construction or vegetation establishment.

1.13.4 Evaluating Green Rings, Green Corridors, and the Wider Green Web

Monitoring should assess the performance of each ecological component as well as the combined landscape system.

At the Green Ring level, evaluation may examine native plant establishment, soil condition, vegetation survival, erosion, and the relationship between restored areas and the pond's hydrological setting. Indicators should reflect the ecosystem concerned rather than impose a uniform vegetation structure on every site.

At the Green Corridor level, evaluation may examine vegetation continuity where appropriate, habitat condition, native species presence, erosion control, and evidence of improved ecological connectivity. The assessment should recognize that some ecosystems are naturally open and that functional connectivity does not always require continuous tree cover or uninterrupted vegetation.

At the Green Web level, evaluation may consider whether individual restoration sites contribute to a functioning landscape network, whether ecological connections are maintained, and whether the combined interventions produce measurable benefits beyond those observed at individual sites. Landscape-scale assessment should also identify cumulative effects, disconnected restoration areas, invasive species, barriers to wildlife

movement, and possible conflicts with grazing, customary land use, or existing ecological processes.

Remote sensing and geospatial analysis can help assess changes across large areas, but they should be combined with field verification where necessary. Satellite observations alone may not establish species composition, groundwater recharge, biodiversity outcomes, or the causes of observed environmental changes.

1.13.5 Social Safeguards, Participation, and Data Governance

Monitoring and evaluation should incorporate the perspectives and legitimate interests of communities affected by implementation. This is particularly important in pastoral and rangeland areas, where water infrastructure, vegetation restoration, or corridor designation may influence seasonal livestock movement, grazing access, livelihoods, and customary land use.

Community participation should support the identification of locally relevant indicators, documentation of changes, reporting of unintended consequences, and review of proposed corrective measures. Participation should be meaningful and appropriately supported; it should not substitute for technical monitoring or transfer monitoring responsibilities to communities without adequate resources.

Data collection and sharing must comply with applicable law and respect privacy, informed consent where required, community rights, and Indigenous data-governance principles. Sensitive information concerning people, livelihoods, land use, species locations, or culturally significant areas should be handled appropriately. Data-sharing arrangements should clarify access, ownership or control where applicable, permitted uses, confidentiality, and the responsibilities of participating institutions.

1.13.6 Learning, Reporting, and Adaptive Management

Monitoring should support continuous learning rather than function solely as a reporting obligation. Findings should be reviewed periodically by implementing organizations, relevant authorities, participating communities, and qualified scientific specialists. Independent review is encouraged, particularly for major environmental claims, groundwater-recharge estimates, landscape-scale outcomes, and proposed replication across different ecological regions.

Monitoring results should inform decisions to continue, adapt, expand, or discontinue interventions. Where results are inconclusive, the programme should identify the remaining uncertainties and determine whether further data collection or scientific investigation is justified. Where adverse effects are identified, corrective action should be documented and followed by further assessment.

Reports should clearly distinguish measured observations, modelled estimates, interpretations, and projected benefits. They should disclose relevant methods, data limitations, uncertainty, and any material adverse findings. Comparisons between countries or sites should use sufficiently consistent definitions and measurement methods to avoid misleading conclusions, while allowing indicators to be adapted to local conditions.

The proposed 0.01% Solutions Programme and Green Web may use common core indicators for comparability, supplemented by national and site-specific indicators where necessary. Global reporting should aggregate results only where the underlying data are sufficiently compatible and should avoid double counting water volumes, restored areas, or ecological outcomes across overlapping projects.

1.13.7 Core Principle

The credibility of the Green Web depends on demonstrating not merely that interventions have been implemented, but whether they produce measurable, durable, and ecologically appropriate results. A robust monitoring, evaluation, and learning framework must therefore connect implementation records with hydrological accounting, ecological assessment, social safeguards, transparent reporting, and adaptive management.

The governing principle is that what is implemented must be documented, what is claimed must be measured or appropriately qualified, and what is replicated must be supported by evidence of suitability and performance. Through this approach, the Green Web can develop as a scientifically accountable implementation concept whose methods and ambitions are refined in response to observed results rather than assumed benefits.

1.14 Ecological Safeguards and Risk Management

The Green Web must be designed and implemented according to the principle that water retention, vegetation restoration, and ecological connectivity must produce demonstrable benefits without causing unacceptable harm to existing ecosystems, hydrological processes, or local communities. The construction of a pond, establishment of a Green Ring, or designation of a Green Corridor does not automatically constitute ecological restoration. Poorly planned interventions may alter natural drainage, reduce downstream water availability, damage wetlands, disturb habitats, introduce invasive species, increase grazing pressure, or place additional demands on scarce water resources.

Ecological safeguards and risk management must therefore be integrated into every stage of implementation, from site selection and feasibility assessment to construction, restoration, operation, maintenance, monitoring, and, where necessary, modification or removal. The approach should be precautionary, evidence-based, proportionate to the scale and potential consequences of each intervention, and adapted to local ecological and social conditions.

1.14.1 Site Assessment before Implementation

Before any pond, vegetation-restoration area, or ecological corridor is established, the proposed site should undergo a proportionate assessment addressing the following considerations:

- Rainfall and catchment hydrology: Assess rainfall amount, seasonality, variability, runoff patterns, catchment boundaries, flood conditions, and the likely effects of water retention on downstream flows and adjacent areas.
- Soil, terrain, and engineering suitability: Examine soil characteristics, infiltration, erosion susceptibility, slope, geological conditions, structural stability, and the suitability of proposed pond designs and associated infrastructure.
- Existing vegetation and habitat sensitivity: Identify native plant communities, natural grasslands, wetlands, riparian habitats, wildlife habitats, and other ecologically sensitive areas that could be affected by construction, planting, grazing changes, or altered water flows.
- Surface-water and groundwater conditions: Establish relevant baseline conditions and assess potential effects on rivers, streams, springs, wetlands, groundwater-dependent ecosystems, and existing water supplies. Groundwater-recharge benefits must not be assumed without appropriate hydrogeological evidence.
- Downstream users and environmental water requirements: Identify existing users and ecological dependencies, including the water requirements of downstream communities, pastoralists, wetlands, rivers, and other ecosystems.
- Community land use, access, and livelihood needs: Assess customary land use, seasonal grazing routes, livestock access, local water needs, cultural values, and potential effects on livelihoods and community well-being.
- Long-term maintenance and climate-related risks: Determine the capacity to maintain the intervention, its vulnerability to droughts, floods, extreme temperatures, sediment accumulation, erosion, and other foreseeable risks, and the arrangements needed for long-term monitoring and corrective action.

The depth of assessment should be proportionate to the intervention’s size, location, potential environmental effects, and uncertainty. Sites presenting substantial ecological or

hydrological risks may require detailed technical studies and specialist review before a decision is made.

1.14.2 Protect Natural Hydrological Processes

The Green Web should support responsible rainwater harvesting and retention close to where suitable rainfall occurs, without treating all runoff as water that should be captured. Runoff can sustain downstream ecosystems, replenish wetlands and floodplains, support groundwater systems, and provide water for existing users. Its ecological and social functions must therefore be considered before interception or storage is proposed.

Pond location, design, capacity, and operation should be based on catchment-specific assessment. Interventions must not obstruct natural watercourses, create unacceptable flood risks, redirect water onto neighbouring land, or substantially reduce flows required by downstream communities and ecosystems. Potential evaporation losses, seepage, overflow, sedimentation, and changes in the timing and distribution of runoff should be assessed where relevant.

Where the available evidence is insufficient to establish whether a proposed intervention is hydrologically appropriate, implementation should be deferred until the uncertainty has been adequately addressed. Water-retention targets must not override environmental water requirements or justify construction in unsuitable locations.

1.14.3 Protect Existing Ecosystems and Native Biodiversity

The Green Web should prioritize the restoration of degraded land and the protection of existing ecological functions. Intact or highly sensitive ecosystems should not be disturbed merely to increase the number of ponds, expand vegetation cover, or create visually continuous green corridors.

Vegetation restoration must be based on the ecological characteristics of each site. Native species and locally appropriate plant communities should be prioritized, with attention to soil, rainfall, temperature, natural regeneration, and the needs of local wildlife. Invasive species and plants with inappropriate water requirements should be avoided.

The programme must recognize that not all landscapes should become forested or densely vegetated. Naturally open grasslands, steppe ecosystems, deserts, wetlands, and other ecosystems have distinct ecological structures and functions. In such areas, restoration may involve protecting existing vegetation, improving soil condition, supporting natural regeneration, controlling erosion, or managing grazing rather than planting trees.

Green Rings and Green Corridors should consequently be designed as ecologically appropriate restoration and connectivity measures, not as uniform planting templates. Their form, composition, and extent should follow the requirements of the ecosystem concerned.

1.14.4 Prevent Unintended Social and Land-Use Impacts

Ecological restoration and water-retention infrastructure may affect how communities use land and water. The Green Web should therefore incorporate meaningful consultation with affected communities and assess the potential implications for pastoral mobility, seasonal grazing, livestock access, customary land use, household water supplies, and existing livelihoods.

Ponds, fencing, planted areas, and designated corridors should not unnecessarily obstruct livestock movement, restrict access to essential resources, or create new conflicts

over land and water. Where interventions could affect customary use or community access, alternatives should be considered and appropriate safeguards established in consultation with affected stakeholders.

Community participation should continue throughout implementation and monitoring. Mechanisms should be available for reporting concerns, recording adverse effects, resolving disputes, and requesting corrective action. Participation does not replace applicable legal requirements, environmental assessment, or the responsibilities of implementing organizations.

1.14.5 Risk Identification and Management

Each proposed intervention should include a risk assessment identifying foreseeable hazards, the likelihood and potential severity of their consequences, appropriate preventive measures, and arrangements for monitoring and response.

Risk category	Potential risks	Possible safeguards
Hydrological	Reduced downstream flows; altered drainage; excessive evaporation; unsuitable water retention; changes in flood patterns	Catchment assessment; water-balance analysis; appropriate design and operating rules; monitoring of downstream conditions
Soil and terrain	Erosion; slope instability; sediment accumulation; structural failure; damage during construction	Geotechnical and soil assessment; erosion-control measures; engineering review; regular inspection and maintenance
Ecological	Habitat disturbance; wetland damage; loss of natural grassland; invasive species; disruption of wildlife movement	Sensitive-area screening; native-species selection; habitat protection; ecological monitoring; avoidance or redesign of harmful interventions
Groundwater and water quality	Unverified recharge assumptions; changes in groundwater availability; contamination; adverse effects on springs or groundwater-dependent ecosystems	Hydrogeological assessment; baseline monitoring; water-quality controls where appropriate; independent verification of recharge claims
Social and livelihood	Restricted grazing access; disruption of pastoral mobility; competition for water; unequal distribution of benefits; land-use conflict	Community consultation; assessment of customary use; access arrangements; transparent decision-making; grievance and corrective-action mechanisms
Climate and operational	Drought; extreme rainfall; flooding; heat; infrastructure deterioration; inadequate maintenance	Climate-risk assessment; resilient design; maintenance planning; monitoring; contingency and response procedures
Governance and evidence	Inadequate baseline data; overstated benefits; inconsistent reporting; double counting; insufficient accountability	Standardized methods where feasible; transparent reporting; uncertainty disclosure; independent review; auditable monitoring records

Risk assessments should be updated when new evidence emerges, site conditions change, or monitoring identifies unexpected effects. Safeguards must be practical and enforceable within the capacity of the implementing institutions and participating communities.

1.14.6 Avoidance, Modification, and Rejection of Unsuitable Interventions

The preferred approach is to avoid ecological and social harm before attempting to mitigate it. Where potential risks are identified, site selection, design, scale, or operating arrangements should first be modified to prevent or reduce those risks.

A proposed intervention should be relocated, redesigned, postponed, or rejected where assessment indicates that anticipated harm would outweigh its expected benefits, where essential ecological or social requirements cannot be protected, or where critical uncertainties remain unresolved. Existing interventions should also be modified or discontinued when monitoring demonstrates unacceptable adverse effects.

In certain cases, the most appropriate contribution to the Green Web may be the protection of an existing ecosystem rather than the construction of a pond or the establishment of new vegetation. The absence of infrastructure should not be interpreted as a failure where ecological assessment demonstrates that intervention would be unsuitable.

Where damage has already occurred, corrective measures should be proportionate to the impact and informed by ecological and technical assessment. Depending on the circumstances, these may include restoring natural drainage, removing invasive species, repairing erosion, modifying pond operations, reopening essential access routes, or rehabilitating affected habitats.

1.14.7 Long-Term Maintenance and Adaptive Management

Ecological safeguards must extend beyond construction and initial planting. Ponds, restored areas, and corridors require appropriate maintenance, periodic inspection, and monitoring to determine whether they continue to function as intended. Responsibilities for maintenance, funding, access, monitoring, and corrective action should be identified before implementation begins.

Monitoring results should inform adaptive management. Where an intervention produces the intended benefits without unacceptable adverse effects, continued operation or carefully assessed replication may be appropriate. Where results are mixed, the design or management approach should be reviewed. Where substantial harm occurs, corrective action or discontinuation should take precedence over meeting numerical implementation targets.

Replication across regions must not be based solely on success at a single demonstration site. Differences in rainfall, terrain, soils, ecosystems, water availability, land use, and community needs must be considered before transferring a design or management model to another location.

1.14.8 Governing Principle

The Green Web is intended to connect distributed rainwater retention with land restoration and ecological connectivity. Its credibility depends on demonstrating that these activities are appropriate to the places in which they are implemented and that their benefits are assessed alongside their potential costs and risks.

The governing principle is therefore: protect what is ecologically intact, restore what is degraded where restoration is appropriate, retain suitable rainwater where it can be done responsibly, and reject interventions that create unacceptable harm.

By embedding precaution, scientific assessment, community participation, transparent monitoring, and adaptive management into implementation, the Green Web can pursue its ecological objectives without assuming that more ponds, more planting, or greater infrastructure coverage necessarily produce better environmental outcomes.

1.15 Governance and Community Participation

The Green Web is intended to operate through locally appropriate, country-led, and participatory implementation arrangements that reflect national priorities, ecological conditions, institutional mandates, and the needs of affected communities. Its governance approach should connect scientific knowledge, public institutions, local experience, and practical implementation while ensuring that decisions concerning land, water, vegetation, and ecological restoration are transparent, accountable, and consistent with applicable law.

Because the Green Web is a proposed initiative rather than an established international governance mechanism, its institutional structure, decision-making procedures, financing arrangements, participation rules, and reporting obligations must be developed and agreed through appropriate processes. The framework should not presume that a single governance model will be suitable for every country or ecosystem. Instead, it should establish common principles and adaptable procedures that allow national and local institutions to determine how implementation can be undertaken responsibly within their respective jurisdictions.

1.15.1 Governance Principles

The governance of the Green Web should be guided by the following principles:

- Country-led implementation: National authorities and relevant institutions should determine priorities, implementation arrangements, and the relationship with existing national policies and programmes.
- Local participation: Communities, land users, pastoralists, and other affected stakeholders should have meaningful opportunities to contribute to decisions that may affect their land, water access, livelihoods, and environment.
- Scientific and technical integrity: Site selection, water-retention design, vegetation restoration, and ecological connectivity should be informed by appropriate scientific assessment and technical expertise.
- Transparency and accountability: Responsibilities, financing, selection criteria, implementation progress, monitoring results, and identified risks should be documented and reported through agreed procedures.
- Ecological responsibility: Governance decisions should protect natural ecosystems, respect environmental water requirements, and prevent interventions from causing unacceptable ecological or social harm.
- Equity and inclusion: Participation and the distribution of benefits and burdens should take account of the circumstances of affected groups, including pastoral communities and people whose livelihoods depend directly on land and water resources.
- Subsidiarity and appropriate decision-making: Decisions should be made at the most appropriate level, with local matters addressed locally wherever possible and broader coordination undertaken when regional, national, or transboundary effects require it.
- Adaptive management: Governance arrangements should permit decisions to be revised in response to monitoring results, scientific findings, changing conditions, and community feedback.

These principles are intended to provide a common foundation without replacing national legal frameworks, existing institutional mandates, or the rights and responsibilities of affected communities.

1.15.2 Local Governance and Community Participation

Local governance is central to the practical operation of the Green Web because decisions concerning individual ponds, Green Rings, Green Corridors, and restoration sites directly affect the surrounding landscape and its users.

At the local level, governance arrangements should clearly identify who is responsible for site selection, preliminary assessments, construction oversight, vegetation management, grazing arrangements where applicable, maintenance, monitoring, and the resolution of disputes. Responsibilities should be established before implementation begins and should be proportionate to the scale and complexity of each intervention.

Local authorities, community organizations, land users, scientific specialists, and implementing partners may contribute according to their mandates, knowledge, and capacities. Their respective roles should be documented so that responsibility for decisions, maintenance, monitoring, and corrective action is not left ambiguous.

Community participation should begin during the identification and assessment of proposed sites, rather than only after project designs have been completed. Consultation should provide opportunities to identify local water needs, customary land uses, seasonal livestock movements, sensitive habitats, existing resource conflicts, and practical maintenance requirements. Local knowledge can complement scientific assessment by identifying seasonal changes and historical conditions that may not be captured by short-term field observations.

Where appropriate, communities may participate in establishing monitoring priorities, documenting vegetation and land-condition changes, reporting damage or unintended consequences, and reviewing the results of interventions. Such participation should be supported by accessible information, adequate resources, and clear procedures for communicating concerns to the responsible institutions.

Community involvement must not be treated as a substitute for legal compliance, technical assessment, or the duties of implementing organizations. Nor should participation be interpreted as automatic consent to changes in land use, water access, or customary practices. Applicable rights, consultation requirements, and decision-making procedures must be respected.

1.15.3 Roles of National Institutions

At the national level, relevant government institutions may provide policy direction, regulatory oversight, technical coordination, and integration with existing programmes relating to water resources, land restoration, agriculture, pastoralism, biodiversity, climate adaptation, and rural development.

National governance arrangements should identify the competent authorities and clarify their respective responsibilities. Depending on the national context, these may include institutions responsible for water management, environmental protection, land administration, agriculture, disaster-risk reduction, scientific research, local government, and public finance.

National coordination may support the establishment of technical guidance, site-assessment procedures, environmental safeguards, monitoring indicators, data standards, and reporting requirements. It may also help ensure that the selection and design of DPS sites are compatible with catchment management, national water policies, land-use planning, and existing environmental obligations.

The Green Web should complement rather than duplicate existing institutions and programmes. Before new bodies or procedures are established, participating countries should assess whether existing institutional arrangements can fulfil the necessary functions. Any new coordination mechanism should have a clearly defined mandate, appropriate resources, and accountability arrangements.

Country-level implementation targets should be based on documented needs and feasibility rather than allocated solely through a uniform global formula. National authorities and relevant stakeholders should consider rainfall variability, water availability, ecological conditions, financial and technical capacity, maintenance requirements, and the likely distribution of benefits and risks.

1.15.4 Scientific and Technical Institutions

Scientific organizations, universities, research institutes, and qualified technical specialists can contribute to the scientific integrity of the Green Web by supporting baseline assessments, hydrological analysis, ecological design, monitoring, evaluation, and the interpretation of results.

Their potential responsibilities may include developing or reviewing assessment methods, evaluating the suitability of proposed sites, identifying ecological sensitivities, establishing appropriate indicators, and examining the effectiveness and limitations of different interventions. Scientific institutions may also assist with training, technical guidance, data interpretation, and the development of comparable methodologies across participating areas.

Scientific advice should remain distinguishable from policy decisions and project implementation responsibilities. Research findings, assumptions, uncertainties, and methodological limitations should be documented transparently. Independent review is particularly important where claims concern groundwater recharge, basin-scale water availability, climate-related benefits, or potential contributions to cryosphere stability.

The proposed initiative should not assume that the same technical design or ecological outcome can be reproduced across different countries. Scientific cooperation should instead support the adaptation of methods to local conditions and the identification of circumstances in which particular interventions are unsuitable.

1.15.5 Regional and Transboundary Coordination

Regional coordination may support the exchange of technical experience, compatible monitoring methods, shared learning, and cooperation among neighbouring jurisdictions facing related ecological or hydrological challenges. It may be particularly relevant where land degradation, dust transport, habitat connectivity, drought risks, or water systems extend beyond administrative boundaries.

Regional arrangements should clarify their geographical scope, participating institutions, objectives, and procedures for sharing information. Where transboundary watercourses or shared ecosystems may be affected, coordination should take account of applicable international and national law, existing agreements, and the interests of relevant communities and authorities.

Any proposed geographical corridor, including the 43°–44° North latitude-belt concept, would require scientific justification, geographic and ecological mapping, consultation, and agreement on the practical scope of cooperation. A shared latitude range alone does not establish that locations form a connected hydrological or ecological system.

Regional cooperation should therefore be based on demonstrated common interests and appropriate evidence rather than an assumption that all sites within a broad geographical belt require the same interventions.

1.15.6 International Cooperation and Institutional Relationships

At the international level, participating organizations may contribute to scientific cooperation, technical guidance, knowledge exchange, capacity development, and the dissemination of implementation lessons. Common principles and reporting approaches may help make results more comparable while allowing countries to retain responsibility for national priorities and implementation decisions.

The Green Web is intended to complement relevant international environmental objectives, including those associated with the three Rio Conventions: the UNCCD, the UNFCCC, and the CBD. Its potential contribution lies in connecting suitable rainwater-retention interventions with land restoration, biodiversity protection, and climate-resilience efforts where measurable benefits can be demonstrated.

This proposed relationship does not imply formal endorsement, adoption, or institutional incorporation by any of these conventions or their governing bodies. Any formal partnership, reporting arrangement, or institutional relationship would require the appropriate authorization and agreement.

The proposed relationship with the CPHSCS should likewise remain clearly defined as prospective. CPHSCS is a proposed international legal instrument, and the Green Web should not be represented as an officially adopted component of the Convention. Potential future cooperation would depend on the development of the relevant institutional and legal arrangements.

International cooperation should strengthen implementation capacity and scientific understanding without displacing national decision-making or imposing uniform requirements on countries with different ecological, economic, and institutional circumstances.

1.15.7 Financing, Resource Mobilization, and Accountability

Effective governance requires realistic arrangements for financing and maintaining interventions throughout their intended operational life. The cost of the Green Web extends beyond initial construction or planting and may include feasibility studies, environmental assessments, community consultation, land preparation, monitoring, maintenance, restoration of damaged areas, and corrective measures.

Potential financing arrangements may include national and local public resources, international cooperation, research grants, philanthropic support, and other lawful sources consistent with the objectives and safeguards of the initiative. The availability of any particular source of financing must be assessed rather than assumed.

Funding arrangements should clarify eligibility, selection criteria, the responsibilities of implementing organizations, financial reporting, maintenance obligations, and the treatment of environmental and social risks. Where appropriate, financial support should be linked to documented implementation milestones and credible monitoring rather than to the number of ponds or the extent of planting alone.

Accountability procedures should make it possible to identify who approved an intervention, who implemented it, who is responsible for maintenance, how results were

measured, and what action was taken when problems arose. Financial and performance reporting should be sufficiently transparent to support public confidence and independent scrutiny while respecting applicable confidentiality and data-protection requirements.

No site should be approved solely because funding is available or because a numerical target remains unmet. The suitability of the intervention and its expected environmental and social consequences should remain the primary considerations.

1.15.8 Conflict Resolution and Grievance Mechanisms

Differences may arise over site selection, land access, water allocation, grazing arrangements, environmental effects, maintenance responsibilities, or the distribution of project benefits. Governance arrangements should provide accessible procedures for raising concerns, reviewing complaints, resolving disputes, and documenting corrective action.

Where possible, concerns should be addressed through early consultation and dialogue among affected parties. More formal procedures may be required where disputes involve legal rights, competing resource uses, or significant environmental harm. Such procedures must be consistent with applicable law and should not replace competent judicial, administrative, or other legally established mechanisms.

A grievance mechanism should clarify how concerns can be submitted, who is responsible for reviewing them, how decisions are communicated, and how follow-up action is monitored. Appropriate safeguards should protect individuals who raise concerns from retaliation and ensure that vulnerable or less-represented groups can participate meaningfully.

Lessons from complaints and disputes should inform future site selection, project design, consultation procedures, and risk management.

1.15.9 Capacity Development and Knowledge Exchange

The quality of implementation depends on the capacity of institutions and communities to assess, manage, and monitor interventions. Capacity-development activities may therefore include training in rainwater harvesting, hydrological assessment, native vegetation restoration, soil conservation, ecological monitoring, data management, maintenance, and community engagement.

Training should be adapted to local requirements and delivered in accessible formats. Where appropriate, practical demonstration sites can support learning by showing how design decisions, maintenance practices, and ecological safeguards operate under actual conditions.

Knowledge exchange should include both successful approaches and documented limitations or failures. Sharing unsuccessful results is important for identifying unsuitable practices, reducing repeated mistakes, and avoiding the transfer of interventions into ecosystems where they may cause harm.

Common guidance should be periodically reviewed as new scientific evidence, monitoring results, and implementation experience become available.

1.15.10 Governance Development and Implementation Readiness

Before implementation at scale, the proposed initiative requires agreement on its institutional responsibilities, decision-making procedures, financing arrangements, participation rules, monitoring requirements, and reporting obligations. These arrangements should be developed through consultation with relevant national institutions, scientific organizations, local authorities, communities, and potential implementation partners.

A practical governance framework should identify, at minimum:

1) The responsible institutions and their respective mandates.
2) The procedures for site selection, feasibility assessment, approval, and environmental safeguards.
3) The roles of communities and affected land and water users in consultation and implementation.
4) The arrangements for financing, procurement where applicable, construction, operation, and long-term maintenance.
5) The scientific methods, monitoring indicators, data-governance rules, and reporting procedures.
6) The mechanisms for independent review, grievance resolution, corrective action, and adaptive management.
7) The criteria for evaluating results and determining whether interventions should be continued, modified, expanded, or discontinued.

These arrangements should be proportionate to the scale and risks of the proposed activities. Initial implementation may be more appropriately undertaken through carefully selected demonstration sites and phased programmes, allowing governance procedures to be tested and refined before wider replication is considered.

1.15.11 Governing Principle

The Green Web is intended to connect local action with national coordination, scientific cooperation, and potential international collaboration. Its governance must ensure that these connections strengthen implementation without weakening accountability, overriding local needs, or presuming institutional authority that has not been formally established.

The governing principle is that implementation should be country-led, informed by science, shaped through meaningful community participation, transparent in its responsibilities, and accountable for its results.

Through clearly defined roles, appropriate financing, inclusive decision-making, effective safeguards, and continuous learning, the proposed Green Web can develop a governance approach capable of supporting responsible implementation while respecting national sovereignty, applicable law, ecological integrity, and the rights and interests of affected communities.

1.16 Phased Implementation

The Green Web is intended to develop through a phased implementation process that moves from scientific assessment and carefully selected demonstrations to evaluation, evidence-based replication, and coordinated network development. This approach recognizes that ecological restoration and water-retention interventions must be tested under actual environmental conditions before they are expanded across different landscapes, regions, or countries.

Implementation should proceed progressively, with each phase producing documented outputs and evidence to inform the next stage. Progression between phases should depend on defined readiness criteria, including technical feasibility, environmental suitability, community participation, institutional capacity, financing, and the results of monitoring and evaluation. The phases provide a common planning framework but may be adapted to national circumstances, provided that ecological safeguards and evidence requirements are maintained.

1.16.1 Phase I — Scientific and Site Assessment

The first phase establishes the scientific, hydrological, ecological, technical, and social foundations for implementation. Its purpose is to identify where distributed rainwater harvesting and ecological restoration may be appropriate, determine where interventions should be avoided, and establish the baseline information required to assess subsequent results.

Activities should include:

- Establishing baseline information on rainfall, catchment hydrology, soil conditions, vegetation, biodiversity, land degradation, and relevant water resources.
- Identifying and assessing potential sites for the Distributed Pond System (DPS), including the suitability of terrain, soil, catchment characteristics, and proposed storage arrangements.
- Assessing native vegetation, existing habitats, ecological sensitivity, and opportunities for establishing Green Rings and ecologically appropriate Green Corridors.
- Evaluating potential effects on downstream water flows, groundwater-dependent ecosystems, wetlands, existing water users, and environmental water requirements.
- Consulting local authorities, communities, pastoralists, land users, scientific organizations, and other relevant stakeholders.
- Identifying land-use constraints, customary practices, maintenance requirements, climate-related risks, and potential environmental or social conflicts.
- Defining measurable indicators, monitoring methods, data-management procedures, and preliminary evaluation criteria.

Phase I output: A scientifically informed site-selection and feasibility framework, documented baselines, preliminary designs, risk assessments, and a monitoring plan for candidate demonstration sites.

Sites should proceed to implementation only where the available evidence supports their suitability and the principal risks can be adequately managed. Where information is insufficient, further investigation should precede construction or restoration activities.

1.16.2 Phase II — Demonstration and Field Implementation

The second phase involves implementing selected demonstration sites to test the proposed relationship between distributed rainwater retention, Green Rings, Green Corridors, and wider ecological restoration.

Demonstration activities should be designed around local conditions rather than a single standardized model. Different configurations may be tested where justified, including variations in pond design, vegetation-restoration methods, soil-conservation measures, and corridor arrangements. The purpose is to establish which approaches are suitable for particular ecological and hydrological settings and under what conditions they may be effective.

Activities should include:

- Implementing approved DPS sites in accordance with technical specifications and environmental safeguards.
- Establishing Green Rings using native and locally appropriate vegetation or other suitable restoration measures.
- Developing Green Corridors where ecological assessments demonstrate that connectivity measures are appropriate.
- Establishing maintenance arrangements, monitoring systems, and clearly assigned operational responsibilities.
- Recording construction and implementation costs, resource requirements, maintenance needs, and community participation.
- Monitoring water levels, retention duration, vegetation establishment, soil condition, biodiversity, and other indicators selected for each site.
- Documenting adverse effects, implementation difficulties, unexpected outcomes, and corrective measures.

Demonstration sites should be sufficiently documented to permit meaningful evaluation. Where feasible, the design should incorporate reference sites or other appropriate comparison methods to help distinguish intervention effects from natural variability and external influences.

Phase II output: Operational demonstration sites with documented designs, implementation records, baseline-linked monitoring data, maintenance arrangements, and preliminary evidence concerning benefits, limitations, and risks.

Successful construction alone should not be considered proof of success. Demonstration sites must be evaluated according to their actual performance and ecological suitability.

1.16.3 Phase III — Evaluation, Learning, and Refinement

The third phase evaluates the results of demonstration activities and uses the findings to refine technical designs, implementation procedures, safeguards, and monitoring methods.

Evaluation should compare observed conditions with established baselines and, where feasible, reference sites. It should distinguish implementation outputs from measurable

outcomes and longer-term impacts, while accounting for seasonal variation, climatic conditions, uncertainty, and other factors that may influence results.

Activities should include:

- Assessing water-retention performance through appropriate hydrological measurements and water-balance accounting.
- Evaluating changes in native vegetation, soil condition, erosion, habitat quality, and other relevant ecological indicators.
- Examining social outcomes, including effects on water access, grazing, livelihoods, community participation, and the distribution of benefits and burdens.
- Reviewing construction costs, operational requirements, maintenance performance, and long-term financial feasibility.
- Identifying design limitations, environmental risks, unintended effects, and conditions under which interventions may be unsuitable.
- Reviewing monitoring methods, data quality, indicator definitions, and reporting procedures.
- Obtaining independent scientific or technical review where appropriate.

Revising design guidance, implementation standards, and decision-making criteria in response to the evidence.

Where results are inconclusive, further observation or targeted research may be required. Where significant adverse effects are identified, the appropriate response may be to redesign, relocate, reduce the scale of, or discontinue the intervention.

Phase III output: An evaluation report, revised technical and ecological guidance, refined monitoring procedures, documented lessons, and evidence-based criteria for determining whether replication is justified.

This phase is essential to prevent the automatic transfer of approaches that may have worked in one location but are unsuitable under different conditions.

1.16.4 Phase IV — Evidence-Based Replication and Expansion

The fourth phase considers extending demonstrated approaches to additional suitable locations and, where appropriate, other participating countries. Expansion should be guided by the evidence generated through earlier phases and should proceed through country-led plans reflecting national priorities, local ecosystems, available resources, and institutional capacity.

Replication does not mean copying an identical pond design or planting arrangement everywhere. It means applying verified principles and adapting implementation methods to the environmental, technical, social, and legal conditions of each new location.

Activities should include:

- Identifying new sites through documented feasibility assessments and environmental screening.
- Preparing national, regional, or local implementation plans with clearly defined objectives, responsibilities, financing, and monitoring arrangements.
- Adapting DPS designs, Green Rings, and Green Corridors to local rainfall patterns, terrain, soils, native vegetation, and ecological functions.

- Ensuring appropriate consultation with affected communities and land users before implementation.
- Establishing adequate financing, maintenance capacity, and institutional arrangements for long-term operation.
- Applying common core indicators where suitable while retaining locally relevant measures.
- Evaluating each expansion stage before approving further scaling.
- Publishing implementation results, including limitations, adverse effects, and uncertainties.

Independent review should inform decisions to replicate approaches with potentially significant environmental or social consequences. A practice should not be considered suitable for wider application solely because it was implemented successfully or produced positive results at one demonstration site.

Phase IV output: Country-led and locally adapted implementation plans, additional sites meeting agreed feasibility criteria, and progressively stronger evidence concerning the transferability and limitations of different approaches.

Expansion should remain conditional on demonstrated performance, adequate resources, and compliance with ecological and social safeguards.

1.16.5 Phase V — Network Coordination and Shared Learning

The fifth phase focuses on coordinating participating sites within and across administrative boundaries and national borders. The purpose is to develop a connected implementation and learning framework through compatible monitoring, ecological planning, knowledge exchange, and transparent reporting.

The concept of a network should be understood at two complementary levels. First, the Green Web represents ecological relationships among suitable restoration sites, native vegetation, habitats, and landscapes. Second, programme coordination connects participating institutions and sites through shared methods, information exchange, and common learning arrangements. These two forms of connection are related but distinct: administrative or digital coordination does not itself establish ecological connectivity.

Activities should include:

- Establishing compatible monitoring indicators, data definitions, reporting formats, and quality-assurance procedures where feasible.
- Sharing scientific findings, technical guidance, implementation experience, and lessons from both successful and unsuccessful interventions.
- Coordinating ecological restoration across suitable landscapes and catchments, including areas where habitat connectivity or land degradation extends across administrative boundaries.
- Supporting regional scientific cooperation and, where appropriate, transboundary consultation.
- Maintaining transparent records of implementation progress, environmental outcomes, expenditure, and identified risks.
- Periodically reviewing cumulative effects, gaps in ecological connectivity, and opportunities for improved coordination.
- Updating technical guidance and programme priorities in response to new evidence and changing environmental conditions.

Transboundary cooperation should be undertaken only through appropriate consultation and arrangements consistent with national sovereignty, applicable law, existing agreements, and the rights and interests of affected communities. A proposed geographical corridor should not be treated as an established ecological or hydrological network until its relevant connections have been assessed.

Phase V output: A coordinated framework for participating sites and institutions, supporting shared learning, compatible monitoring, transparent reporting, and evidence-informed ecological planning.

Network development should strengthen local implementation and scientific cooperation without creating an assumption that every site must be physically connected or managed through a single centralized structure.

1.16.6 Decision Gates Between Phases

Movement from one phase to the next should be based on documented readiness criteria rather than predetermined dates or numerical construction targets.

Transition	Principal decision criteria
Phase I to Phase II	Site suitability established; baseline information available; technical feasibility assessed; affected stakeholders consulted; material risks identified and manageable; monitoring plan prepared
Phase II to Phase III	Demonstration activities documented; maintenance and monitoring operational; sufficient observations available to begin evaluation
Phase III to Phase IV	Results reviewed; performance and limitations documented; safeguards demonstrated to be adequate; replication criteria established; financing and institutional capacity assessed
Phase IV to Phase V	Participating sites have appropriate governance and monitoring arrangements; data can be reported transparently; coordination provides a clear practical benefit; national and local participation is secured through appropriate processes
Continuation or further expansion	Monitoring supports continued suitability; adverse effects remain acceptable and manageable; maintenance and financing are adequate; corrective actions have been implemented where necessary

These criteria should be adapted to the scale and complexity of the activities. Some ecological outcomes may require several years of observation, and the absence of immediate measurable change should not automatically be interpreted as failure. Conversely, early positive results should not be treated as proof of long-term effectiveness without sufficient evidence.

1.16.7 Financing and Institutional Readiness Across All Phases

Financing, governance, community participation, and maintenance are cross-cutting requirements throughout the implementation process. They should not be deferred until expansion begins.

Each phase should identify the resources required for assessment, implementation, monitoring, maintenance, scientific review, and corrective action. Funding commitments should reflect the full anticipated life cycle of an intervention rather than only its initial construction costs.

Institutional responsibilities should be established before implementation, including responsibility for site approval, procurement where applicable, construction oversight, ecological safeguards, monitoring, data management, maintenance, and response to adverse effects. Community participation should continue throughout the process, with appropriate arrangements for consultation, reporting concerns, and reviewing results.

Where the necessary financing, technical capacity, governance arrangements, or maintenance resources are unavailable, implementation should be delayed, reduced in scale, or redesigned accordingly.

1.16.8 Adaptive Implementation and the Principle of Evidence

The five phases are intended to provide a structured but adaptable pathway rather than an inflexible sequence. Monitoring results may require a return to earlier assessment, additional research, redesign, or the discontinuation of an intervention. Some locations may be suitable for demonstration but not for expansion; others may benefit from ecological restoration without the construction of ponds.

The governing principle is that each phase should generate the evidence, capacity, and safeguards needed to justify the next. Implementation should expand only where the results support continued action and where the environmental, social, financial, and institutional conditions are adequate.

The success of the Green Web should therefore be assessed not simply by the number of ponds constructed, trees planted, corridors designated, or countries participating, but by the quality of implementation, the durability of measured outcomes, the protection of natural ecosystems, and the ability to learn and adapt.

Through phased assessment, demonstration, evaluation, evidence-based replication, and network coordination, the proposed Green Web can develop progressively while remaining accountable to scientific evidence, local conditions, and the long-term objective of linking responsible rainwater retention with ecological restoration.

1.17 The Living Pond: Hydrarch Succession and the Ecological Transformation of Distributed Pond Systems

What happens when rainwater is captured and held in a permanent pond is not simply the storage of water. It is the beginning of a biological process—one that transforms a constructed water-retention structure into a living ecological system. That process is hydrarch succession: the predictable, observable sequence by which a pond evolves from clear, nutrient-poor water, through progressively richer stages of submerged and floating vegetation, to a shallow, nutrient-dense marsh, and eventually into dry land.

This is not a failure of the pond. It is a sign that the pond is functioning as an ecosystem. The biological life that develops within it—phytoplankton, diatoms, aquatic insects, snails, crustaceans, amphibians, and the microscopic seed bank that survives drought and freeze in the sediment—is not incidental. It is the living machinery that cycles nutrients, decomposes organic matter, supports food webs, and sustains the ecological functions upon which the Green Web depends.

The scientific understanding of pond succession has direct implications for the design and management of Distributed Pond Systems. It tells us that a pond is not a static structure. It is a dynamic system with a lifespan. It tells us that sedimentation, eutrophication, and anoxia are not problems to be ignored but natural processes to be understood and managed. It tells us that the sediment of a pond is not waste but a biological time capsule—a seed bank that allows the ecosystem to reboot after drought.

It also tells us that a pond can be managed. The natural aging process can be slowed through aeration, dredging, vegetation management, and the design of inflow and outflow structures that control sediment and nutrient loads. The objective is not to prevent succession—that would be ecologically impossible and undesirable—but to manage it so that the pond remains a functioning water-retention and ecological restoration system for as long as possible.

Most importantly, the biology of the pond is the biology of the Green Web. The vegetation that surrounds the pond, the aquatic life within it, and the terrestrial life that colonizes it as it matures are all part of one interconnected ecological process. The pond is not separate from the landscape. It is a node in the landscape—a living component of the hydrological and ecological system that the Green Web is designed to restore.

When rainwater is captured and held in a permanent pond for a long period, it becomes more than a reservoir. It becomes a living laboratory. It becomes a microcosm of the broader ecological restoration that the 0.01% Solutions seeks to achieve. And it becomes a reminder that water, soil, vegetation, and life are not separate systems. They are one system. The pond is where that system becomes visible.

1.18 Conclusion

The Green Web is conceived as a living ecological network that connects suitable DPS sites through native vegetation, restored ecosystems, and ecologically appropriate corridors. Its central purpose is to integrate distributed rainwater harvesting and water retention with land restoration, soil protection, habitat connectivity, and community participation, transforming individual interventions into a coordinated approach to ecological recovery.

At its foundation, the Green Web recognizes that retaining suitable rainwater close to where it falls is most effective when considered alongside the ecological condition of the land that receives it. Ponds can provide decentralized water-retention infrastructure, while Green Rings and Green Corridors can support vegetation recovery, soil conservation, and ecological connectivity where local conditions permit. Together, these components offer a framework for connecting water-retention measures with the wider functions of landscapes and ecosystems.

The strength of the Green Web does not lie in uniform planting, the construction of the maximum possible number of ponds, or the assumption that identical interventions will produce identical results everywhere. It lies in applying common principles to diverse ecological settings, adapting designs to local hydrological and social conditions, protecting intact ecosystems, and measuring actual outcomes. Naturally open grasslands, wetlands, deserts, and other distinctive ecosystems must be managed according to their own ecological requirements rather than subjected to a single model of vegetation restoration.

Within the 0.01% Solutions—Flagship Implementation Programme, the Green Web is intended to provide the ecological integration component that connects distributed water-retention sites with broader restoration objectives. The Programme establishes the proposed implementation ambition; the DPS provides the decentralized water-retention infrastructure; and the Green Web connects suitable sites through ecological restoration and landscape connectivity. Monitoring, evaluation, and learning provide the evidence needed to assess performance, identify risks, and determine where interventions should be continued, modified, expanded, or discontinued.

Within the broader initiative associated with the proposed Convention on Planetary Hydrological Security and Cryosphere Stability, the Green Web may offer a practical approach relevant to hydrological security and ecosystem resilience. Its potential contribution must, however, be established through scientific assessment and demonstrated outcomes. The Green Web does not itself guarantee groundwater recharge, increased rainfall, climate stabilization, or cryosphere recovery, nor does its proposed relationship with CPHSCS imply that the Convention has been adopted or formally endorsed.

The realization of this vision will depend on scientifically sound site selection, responsible water accounting, ecological safeguards, adequate financing, long-term maintenance, transparent monitoring, and meaningful participation by the communities who live and work in these landscapes. Country-led implementation, cooperation among scientific and technical institutions, and the exchange of verified lessons can help ensure that the approach develops according to evidence rather than assumptions.

Ultimately, the Green Web is a proposal to connect water retention, land restoration, and ecological connectivity within a coherent, measurable, and locally adaptable framework. Its value will be determined not by the scale of its ambitions alone, but by its ability to demonstrate durable benefits while protecting natural ecosystems, respecting local communities, and avoiding unintended harm.

The guiding vision is to restore the land's capacity to receive, absorb, and retain moisture; reconnect suitable restoration areas; and strengthen the ecological foundations upon which communities and future generations depend.

Restoring Land. Restoring Hope. By Restoring Water.

The work begins with each suitable site—and grows through ecological connection.

THE 0.01% SOLUTIONS–GREEN WEB–CRYOSPHERE CONVENTION INITIATIVE TEAM