

Living Landscapes

Food, species, and the institutional middle scale

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Spiralweb Stewardship Association

ACCOUNTABLE KNOWLEDGE STEWARD

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LANGUAGE

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A source-based comparative inquiry into whether Spiralweb’s learning architecture can connect situated observation, professional evidence, institutional capacity and planetary knowledge without becoming a universal model or a programme for places. The paper can orient further conversation; it does not activate a field or speak on behalf of a place. See [Methods / Editorial Practice](#), [AI and human responsibility](#) and the [reading orientation](#).

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Summary

Food is neither the whole regenerative question nor an arbitrary sector. It is a **relational lens**. Where food is grown, distributed, and eaten, the connections between human need, soil, water, species, seed, labour, culture, economy, and the right to decide become concrete. The same lens also reveals its own limit: a threatened species or an irreplaceable habitat need not first prove its usefulness to humans.

The paper therefore does not investigate a choice between people and species, food production and nature, or local authority and planetary responsibility. It asks how concerns of different kinds and with different forms of authority can meet without becoming one calculation or one voice.

Local authority is fundamental, but it is not sovereign over relations that cross the field. The global extinction of a species, illegal trade, a severed migration corridor, or downstream pollution cannot be decided solely where the action takes place. Conversely, a global Red List, a national biodiversity strategy, or

a restoration target cannot by itself say what should be done on a particular field, in a canal, or by particular people. Neither scale automatically has the right to decide for the other.

The necessary connection can be read through five levels:

Observation → field → bioregion → national institutional habitat → planetary horizon — and back again as question, warning, right, possibility, and learning, not as unmediated command.

When a situated circle considers the next responsible movement, the Penguin Dashboard can offer a small shared reading surface. It keeps three questions separate: How is the living place doing? Can the people carrying the work continue? And can the relationships and governance carry the next step? The Dashboard supports judgement; it is not a measure of ecological quality, an aggregate score, or a substitute for biological methods. Section 5 develops this distinction.

International developments support this reading. Conservation has moved from isolated reserves and species lists towards connectivity, rights, restoration, landscapes, and coexistence.¹ The restoration field increasingly works with reference ecosystems and multiple degrees of intervention. IPBES connects biodiversity with water, food, health, climate, power, values, and institutions.² Agroecology, rewilding, conservation, and food sovereignty are drawing closer, but they are not becoming the same practice.

This matters because no harmonious whole can guarantee that all living beings flourish simultaneously in a particular habitat. Protecting a threatened native species may require controlling an introduced species. An agroforestry system can be species-rich without replacing a particular wetland. Trees may stabilise soil while reducing water yield; planting may damage ancient grasslands. Keeping plurality open therefore does not mean avoiding judgement. It means making its evidence, mandate, losses, reversibility, and uncertainty visible.

The five geographical readings do not present one model. Denmark makes the association’s own national and institutional location visible. Kitgum opens the question of productive savanna landscapes under drought pressure. Doukkala shows water’s hard limit and what oases teach about maintenance. Xochimilco shows how food practice, wetland, and a critically endangered species can be one conflict. Karachi shows why urban and coastal resilience cannot be reduced to rural agroforestry.

The paper’s distinctive contribution is therefore not a comprehensive map of the regenerative field, but a test of **the membrane’s epistemic work**: how situated signals can meet bioregional context, professional evidence, national law and institutional capacity, and planetary knowledge without moving local authority to a new centre. The existing Spiralweb corpus already carries the underlying ethics, epistemology, and governance. This paper examines whether it can preserve differences and make connections legible across five different places and the institutional ecologies around them.

1. One Living Field — Several Irreplaceable Concerns

The question can be drawn as an axis, but it should not be resolved by finding a convenient midpoint:

Pole	What the position protects	Risk if it stands alone
Human flourishing and local agency	Food, water, health, work, culture, rights, home, and self-determination	Other species become valuable only as utility or “ecosystem services”

Pole	What the position protects	Risk if it stands alone
Species viability, ecological function, and recovery	Viable populations, sufficient and connected habitats, genetic variation, ecological function, and the possibility of long-term recovery	People may be treated as disturbances, and conservation may legitimise displacement or coercion
Habitat and ecosystem integrity	Relationships, processes, genetic diversity, water, soil, succession, and connectivity	The concrete individual or locally threatened form of life may disappear in aggregate measures
The welfare of sentient individuals	Suffering, health, agency, and the possibility of species-typical life for animals affected by an action	Concern for individuals may obstruct necessary protection of populations, species, or habitats if conflicts are not addressed openly

Spiralweb’s First Spiral offers a decisive ethic here: every species carries value in itself; this irreducible value can be called *sacredness* without establishing a shared theology. “No species is collateral” is not a claim that every organism can be protected in every situation. It rejects the idea that a species’ irreversible disappearance can simply be offset by jobs, carbon, hectares, or a better aggregate index.³

The epistemic starting point is equally simple. Something changes in a body, a relationship, an institution, or a habitat and becomes perceptible. The signal is real as an event, but it is not automatically a true interpretation of the whole or a mandate to act. Moral Biology and *Knowing From the Ground* therefore distinguish between: *I noticed. I infer. I know. I remain uncertain.* An observation becomes more robust through repetition, comparison, professional inquiry, dialogue, material consequence, and willingness to revise.³

This is the membrane’s foundational movement in the paper. It rejects both the idea that an embodied or situated signal is merely raw data for a higher authority and the idea that the signal is itself a verdict. It must be able to pass into shared inquiry without losing its origin; external knowledge must be able to return without becoming an unmediated command. The concepts and examples that follow serve this movement — from signal through distinction and comparison to responsible action, return, and correction.

Continued existence is therefore a lower ethical boundary, not the paper’s positive ideal of nature. A species is not flourishing merely because its last individuals are still alive. The EU concept of favourable conservation status considers, among other things, natural range, population, suitable habitat, and future prospects. The IUCN Green Status goes further by asking whether a species is viable and ecologically functional across its indigenous range, and how far it remains from full recovery.⁴ In ordinary language, “flourishing” can gather this positive direction, but in a concrete inquiry it must be translated into relevant species, habitat types, ecological processes, scales, and time frames. Nor is “balance” a universal measure: living ecosystems are dynamic, and a responsible reference depends on a place’s ecological history and present conditions.

This is a **constitutional orientation**, not a rule of calculation. It states what must not become invisible. It does not automatically determine what to do when an invasive predatory fish threatens an endemic amphibian, when elephants destroy a household’s harvest, or when a protected area overlaps a people’s home. In such situations, at least five questions must remain open:

1. What life or relationship is threatened, and how certain is the assessment?
2. Who has the legal and legitimate mandate to decide?
3. Who bears the cost of protection?
4. Which actions are reversible, and which losses are irreversible?
5. What disagreement and what absent voice must remain in public memory?

This is not neutrality. It is disciplined plurality.

Where an intervention exposes sentient animals to substantial harm, their welfare must be assessed separately. A benefit to habitat or population does not remove the duty to justify the intervention, examine less harmful options, and limit suffering. Conversely, concern for individuals cannot by itself settle a conflict in which a species or ecosystem faces irreversible loss.⁵

2. Food as a Relational Lens

The global problem is not simply “too little nature” versus “too much agriculture”. It is a weakening of regenerative capacity in the systems on which both people and other species depend:²

- soil loses structure, organic matter, and biological activity;
- water is retained less effectively, polluted, or overused;
- habitats are fragmented and ecological communities simplified;
- parts of food production become more dependent on long value chains, capital, and external inputs;
- local labour and knowledge become invisible or economically unviable;
- decision-making power may move away from the people who must live with the consequences.

A functioning market can secure broad access to varied and affordable food. This is a real social capacity. It does not by itself tell us whether production maintains soil, water, and species, whether the producer can continue, or whether value remains connected to the local community. Individual consumers can choose, but purchasing alone cannot correct land ownership, subsidies, procurement systems, infrastructure, and concentration in the value chain.

Seven related concepts must therefore remain distinct:

Concept	What it makes visible	What it must not automatically mean
Food security	Stable access to sufficient, safe, and nutritious food	That the production base, working conditions, or local agency are therefore sustainable
Food sovereignty	Agency in relation to food, seed, land, water, knowledge, and modes of production	Self-sufficiency in everything or romanticisation of the local
Agroecology	A field of knowledge, practice, and movement connecting ecological processes with culture, rights, economy, shared learning, and food-system transformation	A technical toolkit or a recipe that can move unchanged between climates and cultures
Agroforestry	Deliberate integration of trees with crops and/or livestock in the same land-use and management system	An automatic guarantee of native biodiversity, water balance, social justice, or ecological integrity
Ecological restoration	Halting degradation and recovering ecological functions and integrity	Tree planting, a particular historical image, or maximisation of one indicator
Rewilding	Recovering self-organising processes, trophic relations, natural disturbance, connectivity, and greater ecological autonomy through passive or active measures	A people-free landscape, one historical baseline, or a rule that cultivated nature is always inferior

Concept	What it makes visible	What it must not automatically mean
Conservation and species protection	Continued existence, habitats, ecological relations, and irreversible risks	That local rights, livelihoods, and historical power relations become secondary

The concepts may overlap, but overlap must be discovered, not assumed. A food forest may be productive and species-rich while remaining a human-designed production system. An old oasis may sustain agrobiodiversity and culture while requiring intensive maintenance. A wetland may be helped most by less human management. An agricultural landscape may contain fields, hedgerows, streams, grazing areas, natural regeneration, and areas without production.

UNCCD connects land degradation and restoration with food systems, livelihoods, and resilience, while FAO and HLPE agroecological frameworks connect diversity, synergy, and resource efficiency with culture, co-creation of knowledge, social justice, and responsible governance. Agroforestry, by contrast, describes a form of land use and production that can contribute to agroecological transformation but can also be practised as a narrower production design.⁶⁷⁸ These frameworks support the connection, but they still do not determine which movement fits a particular place.

This produces a continuum of possible movements:

1. protect what already works;
2. remove a specific pressure or barrier;
3. assist natural regeneration;
4. restore particular habitats or processes;
5. cultivate within ecologically integrated systems;
6. build intensive production where need and carrying capacity make it responsible.

“Not doing” can be an active and responsible decision. So can deliberate cultivation. What matters is not a position on an ideological scale, but whether direction, consequence, maintenance, and the right to decide can be made open to examination.

3. How the International Field Has Shifted

There is no single global regenerative movement with a common theory. The following six shifts are central to the paper’s argument, but they are not an exhaustive history: agroecological, ecological, permacultural, biodynamic, restorative, rewilding, conservation, and other traditions continue to coexist, overlap, and disagree. In addition, many Indigenous and place-bound knowledge and practice systems should neither be reduced to one school nor subsumed under a shared Western taxonomy.⁹

The source base is itself uneven. International institutions, English-language publications, and what has already been digitised and made searchable are more readily visible than oral knowledge, local languages, everyday practice, and traditions that do not organise themselves under international technical terms. The paper therefore uses global frameworks as public points of connection and correction, not as a comprehensive hierarchy of valid knowledge. Absence from the bibliography is not absence from the living field.

3.1 FROM RESERVE TO CONNECTED LANDSCAPE

Classical conservation often worked through bounded national parks, reserves, and prohibitions. It has saved habitats and species, but it also carries a legacy of “fortress conservation”, in which local communities and Indigenous Peoples were displaced or criminalised. Criticism of this legacy has contributed to rights-based conservation, co-management, Indigenous and Community Conserved Areas (ICCAs), and recognition of other effective area-based conservation measures (OECMs). Target 3 of the Kunming–Montreal framework requires not only 30 per cent coverage, but ecological representation, connectivity, effectiveness, equitable governance, and respect for the rights of Indigenous Peoples and local communities.¹⁰

This is a real shift, but not a completed transition. An area can be registered as “protected” without adequate management, funding, connectivity, or justice. Spiralweb should therefore never translate a global area target directly into a local land claim.

3.2 FROM PREVENTING LOSS TO MEASURING RECOVERY

The IUCN Red List is the world’s most established shared assessment system for species extinction risk. Its strength lies in holding distributed expertise, common criteria, review, and publication together without making every observation the same. But risk is not recovery. The Green Status of Species was launched to assess how far a species is from full ecological recovery, what conservation has already achieved, how dependent the species is on continued action, and what future action could accomplish.¹¹

This matters to Spiralweb: a negative indicator and a positive direction require two different readings. A species ceasing to be critically endangered does not mean that it once again performs its ecological functions across its natural range.

3.3 FROM RESTORATION PROJECT TO RESTORATIVE CONTINUUM

The UN Decade on Ecosystem Restoration and the Society for Ecological Restoration describe a broad continuum: reduced pressure, improved management of production systems, rehabilitation, assisted natural regeneration, and ecological restoration proper. Recent standards of practice emphasise reference ecosystems, local conditions, monitoring, participation, and long-term maintenance.¹²

This means that “regenerative” is not a self-validating quality label, certification, or expert classification. Planting is not restoration merely because trees enter the ground. A productive system is not ecologically integrated merely because it is called agroforestry. In this paper, *regenerative* is a directional term that acquires professional and ethical substance only when a concrete claim names: what is expected to recover and what capacity is at stake; from which documented condition or reference; for what life and at what scale; through which actions; with which measured or experienced consequences; who carries the work and risk; and how the claim can be corrected or falsified.¹³

Rewilding sits on this continuum, but it is not simply another word for passive nature. The field ranges from removing pressure and allowing succession to active recovery of key species, natural disturbance, trophic relations, and connectivity. Its aim is greater ecological autonomy, not the absence of people as a universal ideal. Where people, livestock, and cultural practices are part of a landscape’s history, rewilding must therefore answer to ecological evidence, rights, animal welfare, and the chosen reference.⁹

3.4 FROM SINGLE SECTOR TO NEXUS

The 2024 IPBES Nexus Assessment treats biodiversity, water, food, and health in the context of climate change as interconnected systems. Its institutional point is as important as its ecological one: fragmented

governance creates solutions in one sector that transfer costs to another.¹⁴

This confirms food as a powerful lens for Spiralweb, but also shows its limitation. Food makes soil, water, species, labour, and nutrition concrete. It is not the overriding category to which everything else should be subordinated. The value of a threatened habitat need not pass through human nutrition in order to be real.

3.5 FROM BEHAVIOUR CHANGE TO TRANSFORMATIVE CHANGE

The IPBES Transformative Change Assessment identifies deeper drivers: the disconnection of people from and domination over nature and other people, the concentration of power and wealth, and the prioritisation of short-term individual and material gain.¹⁵ The regenerative field is therefore not only about better technique. It is also about ownership, law, subsidies, finance, narratives, and institutional time horizons.

This is precisely where Spiralweb should be cautious about becoming a programme. Programmes have funding periods, deliverables, target groups, and logics of expansion. Living processes follow rainfall, generations, species' lives, conflict, and unexpected shifts. A membrane can connect a local process with programme resources without making the programme the form of the field.

3.6 FROM EXPERT DATABASE TO DISTRIBUTED OBSERVATION

GBIF, eBird, iNaturalist, national atlases, satellites, eDNA, and local monitoring systems make it possible for an observation made within a few square metres to enter a larger understanding. But data are geographically, taxonomically, and socially uneven; GBIF itself emphasises the need to identify gaps and biases, including in Africa, Asia, and Latin America.¹⁶

A local observation is therefore **complete at its own scale, but not conclusive at every scale**. A bird seen in a field is real. The observation alone does not establish the population's status. A satellite may register green cover; it cannot simply determine whether that cover is native forest, plantation, invasive growth, or a socially viable system.

Nor does an open knowledge architecture mean that all field data should be open. Precise species locations, personal data, and Indigenous or locally governed knowledge may require restricted access. FAIR principles for findable and reusable data must here meet CARE principles of Collective Benefit, Authority to Control, Responsibility, and Ethics. The register should therefore retain who may grant access, who benefits, what risks sharing creates, and how interpretation returns.¹⁷

3.7 TWO ILLUSTRATIVE LANDSCAPE NARRATIVES — NEITHER EVIDENCE NOR TEMPLATE

The Loess Plateau and the Klamath are not selected as representative of global restoration work, as the two most important experiences, or as a comprehensive basis for comparison. Many other landscapes could have performed similar analytical work. They appear here because both can readily be told as large, bounded success stories, while their different waters, species, rights, forms of governance, losses, and time horizons make the simple story inadequate. Their function is methodological: to show what happens when a recognisable case is reopened through the paper's reading axes.

Loess Plateau, China. The World Bank watershed projects connected terracing, vegetation recovery, changes in grazing and cultivation, and investment in livelihoods across large parts of the Yellow River basin. They documented reduced erosion and sediment transport, as well as higher production and income.¹⁸ Later research also indicates that increased vegetation and forest cover in parts of the plateau may intensify water scarcity through greater evapotranspiration.¹⁹ Implementation also involved strong state direction, including restrictions on cultivation and grazing. The lesson is not to copy the Loess, but to read

the whole catchment, measure multiple consequences, and include the mode of implementation and local agency as part of the result.

Klamath River, United States. Removal of four dams was completed in 2024 and reopened almost 400 miles of habitat for salmon and other species. The process was made possible by decades of work by Tribes in the Klamath Basin together with public authorities and other actors.²⁰ For the Yurok, the river and fish are at once food, economy, culture, right, ecosystem, and spiritual relationship. Species recovery, food sovereignty, and political sovereignty are connected here without becoming the same thing. The Klamath thus shows another form of middle scale: a major technical intervention became possible through sustained territorial responsibility and institutional struggle, not because an external programme defined the field.

Set beside each other, the two examples do not compare who succeeded most. They show what may travel through the membrane: documented effects, warnings, questions, and institutional experience. Neither the project's legitimacy, the appropriate intervention, nor the meaning of the story can be transferred unchanged. Even a well-documented case remains a partial reading that other people, time frames, and consequences may reopen.

4. The Planetary Institutional Ecology

Spiralweb should not attempt to replicate the major actors. It should understand what functions they perform and where connections are broken.

Function	Examples	Strength	Typical blind spot	Possible relation to Spiralweb
Planetary condition	Planetary Boundaries, IPBES, IPCC	Sees interconnections, risk, and systemic drivers	Cannot derive local instruction from global models	Make planetary signals open to situated questioning
Species risk and recovery	IUCN Red List, Green Status, SSC, Key Biodiversity Areas	Shared criteria, expertise, and prioritisation	Many species are unassessed; data are uneven; local meaning may disappear	Protection flags, referral, and documented field observation
Treaty and national obligation	CBD/GBF, CITES, CMS, Ramsar, UNCCD, UNFCCC	Creates legal and political obligations	Implementation gaps, sectoral fragmentation, and weak local translation	Make relevant duties and authorities visible without exercising them
Restoration standards	SER, UN Decade, FAO	Reference, process quality, monitoring	May become project logic or certification form	Use as a corrective and a question, not as a universal template
Local and territorial governance	ICCAs, Indigenous organisations, local communities, user groups, farmers	Situated continuity, practical knowledge, and legitimate relationship	May lack legal recognition, finance, data, or access to appeal	Connection without organisational absorption
Distributed data	GBIF, eBird, iNaturalist, GEO BON, national systems	Many observations and global comparability	Bias, data sovereignty, species sensitivity, and false precision	Consent, access levels, local validation, and return of interpretation

The table shows why the planetary horizon should not become an independent decision stream in the field. Planetary institutions provide horizons, boundaries, categories, expertise, rights, law, and resources. The situated field provides lived consequence, observation, relationship, maintenance, and the possibility of correction. Spiralweb's role is to keep the connection legible.

Nor should this connection make restoration a general offset. Where loss can be avoided, or where species, habitat types, and ecological relations are irreplaceable, protection and harm prevention come before compensation. A documented gain in one place may be valuable without purchasing a right to irreversible loss elsewhere.²¹

5. From Observation to Planet — and Back

The proposed architecture has five levels and three directions of movement.

Level	What can be seen here?	Who may hold legitimate authority?	What must not be inferred automatically?
Pixel/observation	A species, soil moisture, damage, practice, photograph, voice	Observer, data steward, affected person	Population trend or causation from a single data point
Field/habitat	Relations among soil, water, species, people, labour, and management	Rights holders, hosts, users, relevant professionals	That the field alone can decide transboundary or legally protected matters
Bioregion	Catchment, coast, migration route, ecological connectivity, provisioning relation	Multiple fields, territorial bodies, municipalities, user and water systems	That administrative boundaries correspond to ecological boundaries
Nation	Law, Red Lists, budgets, land and water rights, authorities, NBSAP	State, courts, national professional authorities, federal/provincial units	That a national strategy has been implemented or is locally appropriate
Planet	Accumulated risk, Earth-system processes, global species and trade patterns	Treaty parties and international bodies within their mandates	A concrete local decision without translation and accountability

THREE MOVEMENTS

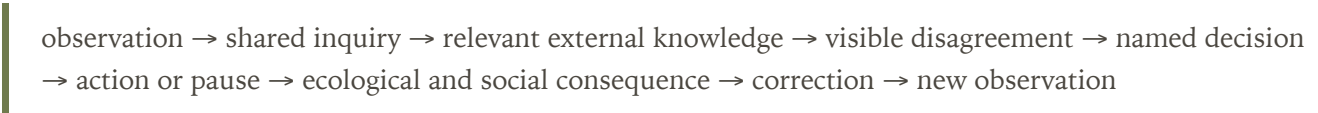
Upward: observations, stories, measurements, and uncertainty can be aggregated or connected. Provenance travels with them. What cannot be shared safely — for example, the precise location of a threatened species — is protected.

Outward and downward: global and national knowledge returns as relevant questions: Is a threatened species present? Is the area a corridor? Which authority carries responsibility? Which law applies? What comparable experience exists? This is not hidden instruction; it is better-informed judgement.

Across: fields can learn from one another's patterns without copying designs. Xochimilco's habitat filters may, for example, inspire a question about small protected refuges in another wetland, but they cannot be exported as a technique to Kitgum's savanna landscape.

THE RETURN LOOP

A full spiral is not “data in, recommendation out”. It is:



AI can assist with pattern recognition, translation, search, synthesis, and reminders. It cannot create consent, legal mandate, or moral responsibility. The further the synthesis zooms out, the more important traceability and the right of reply become.

THE ARCHITECTURE AROUND THE MOVEMENT

Spiralweb’s Glossary distinguishes concepts that often meet in this paper but perform different work:

Image	Function
The spiral	Learning that returns with a difference: a new observation can change the earlier understanding.
The web	Relationships, interdependence, and shared but differentiated responsibility.
The membrane	Boundary discipline governing what may pass, on what terms, and who may stop the movement.
The register	Memory, provenance, decisions, disagreement, consequence, and later correction.

Flow architecture directs attention to how knowledge, care, money, labour, responsibility, and risk actually move. *Friction* is not necessarily a failure in this flow. It may reveal overload, disagreement, or a protective boundary that should not be optimised away. The Penguin Dashboard is not a fifth image, but a small shared reading surface. The PG Ledger is one possible place-bound form of the register’s memory and traceability function. The Dashboard helps people read a present situation; the ledger can remember how the reading arose, what was decided, and what later answered back. Neither governs the field.

A READING AID, NOT A MEASURE OF NATURE

The Penguin Dashboard begins not with colours, but with three non-compensatory questions:²²

Stream	The recurring question
Land/Life	What is changing in soil, water, habitat, species, ecological function, or other locally relevant conditions of life?
Steward Viability	Can the people carrying the work continue without hidden sacrifice, exhaustion, insecurity, or unmet basic needs?
Governance/Commons	Are roles, mandates, decisions, participation, conflict, resources, and accountability clear enough for people to act together?

Only then can a named circle make a provisional reading of each stream:

Reading	Meaning	Responsible response
Green	The stream appears sufficiently stable for the current work.	Continue or consider the next step without treating the colour as automatic approval.
Yellow	Observed pressure, friction, or emerging instability requires attention.	Name the concern, make a bounded correction, and gather further observation where necessary.
Red	Ordinary continuation or expansion would expose the place, people, or governance arrangements to unacceptable risk.	Pause the affected action, protect against further harm, and conduct a named review. Stabilising support may continue.
Unknown	Evidence or standpoint is insufficient for a responsible colour reading.	Name the unknown. Unknown is not permission to proceed; serious or irreversible risk may require caution or pause.

There is no aggregate field colour and no average. A red reading does not become yellow because the other two are green. Nor is the colour a property of a species or habitat. It is a documented human working judgement with evidence, reader, date, uncertainty, and a path to correction. An observation is not an interpretation; an interpretation is not a colour; a colour is not an automatic decision; and a decision is not evidence that the interpretation was correct.

The Land/Life reading therefore cannot be generated from Spiralweb's general architecture alone. Where ecological condition, a threatened species, or a potentially irreversible loss is decisive, the reading must connect with relevant situated observations, reference ecologies, monitoring data, and biological expertise. The Dashboard must be able to detect the limits of its own knowledge and call for another method or standpoint.

At the same time, smartphones, open databases, and generative AI have lowered the practical threshold for citizens and small communities to document observations, examine sources, and maintain place-bound memory. This does not make a phone a laboratory or AI an authority. It makes a distributed public knowledge infrastructure more possible than it was a few years ago. Spiralweb's 13×13 prisms are an open questioning tool that holds 13 fields of perception and 13 fields of practice together without turning them into universal indicators. Observation is complete at its own scale, but can meet, challenge, and be corrected by other observations, professional knowledge, and lived consequence.

6. Five Different Readings

The readings that follow are not country reports. They show why national institutions are a necessary middle layer between field and planet. Nor do they have the same relational status. Denmark is the association's own institutional self-location. The other four readings arise from multi-year relationships and public field material, but their relationships, situated clarification, and operational maturity differ. The shared form makes differences comparable; it does not make the places the same.

To make the comparison consistent, the readings examine six recurring axes:

Reading axis	What the paper seeks to make visible
Living basis	Soil, water, habitats, species, ecological relations, and processes

Reading axis	What the paper seeks to make visible
Provisioning and lived life	Food, livelihoods, health, culture, and people's concrete dependence on the place
Change over time	Climate, seasons, species distributions, cultivation possibilities, thresholds, and reversibility
Institutional translation	How rights, knowledge, law, economy, and plans meet the concrete place
Labour and maintenance	Who carries time, care, risk, skill, and long-term operation
Evidence and correction	What is documented, inferred, unknown, contested, and open to correction

The axes are the paper's comparative tool, not a universal ontology. If a place's own concepts, relationships, or forms of knowledge do not fit them, the difference is a finding to be preserved and allowed to correct the architecture — not an irregularity to be translated away. A later situated reading must therefore also be able to add other axes, other names, and other linguistic or cultural distinctions.¹⁷²³

Each reading accordingly distinguishes four evidential positions: **documented now** in public or relational sources; **reasonable inference**, connecting the documentation without being directly demonstrated; **unknown or contested**; and **requires situated or professional verification** before operational use. The distinction is not a score. It prevents a well-documented national framework from appearing to document effects in a particular field.

The readings place public sources alongside Spiralweb's existing relational and field material. Co-creation requires different forms of knowledge to correct one another without becoming one voice or moving the right to decide. A sufficiently shared reference point concerning role, scope, resources, uncertainty, and return is the working minimum for beginning at all.

Before any of the four external readings is used operationally in a field, it should be offered to the nearest situated stewards or relevant knowledge holders in a usable language. Correction, disagreement, or rejection can be attached and versioned; silence is neither consent nor review. Public readers may send documented corrections to contact@spiralweb.earth.

6.1 DENMARK: SPIRALWEB'S OWN INSTITUTIONAL HABITAT

Denmark is not a fifth external field in this inquiry. It is the national institutional habitat in which the Spiralweb Stewardship Association is itself legally, democratically, and economically situated. Here the association cannot merely read national strategies from outside; its own constitution, fundraising, governance, working forms, use of AI, treatment of paid and unpaid labour, and capacity to receive correction are part of what is being tested.

The Danish corpus already exists. The Field Paper *Keeping the Land Alive* examines agricultural transition, stewardship, the living basis, and social economy. The open letters to the Danish National Church and to municipalities examine concrete institutional bridges around land, public responsibility, and local care. *Report 05 — The Steward's Journey v0.3.2* and the association's own stewardship conditions address how invitation, resources, roles, and responsibility can be held without becoming automatic field access or decision-making authority.

Self-location makes Denmark one situated reading, not the measure of the others. Agriculture, markets, nature management, municipalities, landowners, knowledge institutions, associations, and citizens encounter the same living landscape from different positions of responsibility, with different interests and

time horizons. The paper asks how their knowledge, decisions, labour, and consequences can become mutually visible. It does not infer ecological quality or legitimate management from a farm's size, ownership form, or position in the value chain.

The Danish landscape makes the middle scale concrete. The *Agreement on a Green Denmark* connects, among other things, nitrogen reduction, taking carbon-rich lowland soils out of production, afforestation, nature, and the aquatic environment. Twenty-three local green tripartite bodies work through 37 hydrological coastal-water groups, while municipalities carry regulatory and implementation responsibilities, and delivery depends extensively on voluntary agreements, grants, land purchase, and land consolidation.²⁴ A field, wetland, or afforestation area thus becomes part at once of a landowner's life, a municipal decision, a catchment, a national agreement, and European climate, water, and nature obligations. Here a single indicator — nitrogen or hectares, for example — may aid coordination while making other matters invisible if soil life, ecological quality, drinking water, maintenance, and local consequence do not travel with it.

Denmark also shows why Land/Life cannot be read from a general regenerative method. NOVANA and reporting under the Habitats Directive work with distribution, area or population, habitats, structure and function, and future prospects, among other factors. Danish research on nature indicators and area-based nature management uses signs of biodiversity, ecological condition, and change specific to place and habitat type.²⁵ The methods are themselves open to professional debate and cannot be transferred unchanged to Uganda, Morocco, Mexico, or Pakistan. But they demonstrate a principle the paper must respect: ecological quality requires a reference, a documented method, an appropriate timescale, and relevant expertise. Spiralweb's contribution is to connect such knowledge with situated experience, labour, governance, and consequence — not to replace it.

Climate adds a temporal dimension to all five readings. DMI's Climate Atlas translates climate models into a shared data basis for municipal planning, with indicators including temperature, precipitation, drought, cloudbursts, water level, and storm surge towards 2100.²⁶ At the same time, climate alters distribution, seasonal rhythms, and suitability for both cultivated and wild species. It thereby affects the food base, habitats, pollinators, pests, water conditions, and maintenance needs together.²⁷ A present ecological baseline therefore cannot be a frozen future target. It must be documented and correctable, and capable of holding several possible future conditions without allowing uncertainty to license any intervention whatsoever.

Denmark therefore does not demonstrate that the middle scale resolves conflict. It demonstrates that the middle scale exists: planetary change is translated into data, law, finance, spatial plans, and public infrastructure, which in turn meet different places and people. *Keeping the Land Alive* examines how this capacity can be read more fully without making Spiralweb a policy think tank. The relevant question is whether climate adaptation, land-use change, food, biodiversity, and care for concrete places can become mutually visible without one sector or programme taking over the whole.

Spiralweb's role is not to represent Denmark or instruct other states. From its own location around Copenhagen, the association participates as one small Danish part of a wider planetary process. It can learn from people and institutions already caring for living places, offer an open architecture, and test whether its own connections among knowledge, responsibility, and support actually hold. In Denmark too, collaboration must grow through recognition, relationship, and timing; shared values do not automatically create a shared field.

Labour and maintenance to be made visible: Who carries meetings, contact with landowners, applications, coordination, implementation, and multi-year care — and which parts are funded, unpaid, or situated between institutional budget lines?

Evidence status: National agreements, institutional structures, monitoring frameworks, agricultural statistics, and climate data are documented now.²⁸ Their possible relationship within Spiralweb’s architecture is a reasonable inference. Ecological and social effects in concrete Danish places remain unknown until investigated and require situated, democratic, and professional verification.

6.2 KITGUM, UGANDA: A SAVANNA AND AGRICULTURAL FIELD IN A NEW NATIONAL CONNECTION

Uganda’s NBSAP III 2025–2030 takes as its theme the sustainable use of biodiversity for inclusive value creation and emphasises climate resilience, financing, and community-led conservation.²⁹ The national agroforestry strategy, published in 2026, connects trees in agricultural systems with productivity, diversity, and ecosystem sustainability.³⁰ A national language now exists that can connect a small field in Kitgum with biodiversity, agriculture, climate, and public budgets.

But strategic language does not in itself create a living system. Kitgum lies within the agricultural and savanna landscape of the Acholi region, marked by seasonal rain, drought risk, household-based farming, the after-effects of conflict, and complex use and tenure conditions. Traditional shea parklands in northern Uganda show a historical form in which cultivation, grazing, and valuable trees coexist. They also show that a “tree landscape” may be sustained by rules governing harvest, regeneration, gendered labour, fire, and use — not planting alone.³¹

The desk reading opens: the possibility of a small experiment with nutrition, shade, ground cover, regeneration, and water around a concrete community. Whether it is relevant and, if so, how it should take form can only be decided with the people carrying the place and its consequences. Such a process might learn about survival through dry seasons, local species choices, divisions of labour, and the relationship between borehole water and ecological carrying capacity.

Institutional connections requiring local verification: Kitgum District Local Government, NEMA, agricultural, water, and forestry authorities, relevant research and agroforestry actors, and national biodiversity and seed systems. The precise institutional chain must be verified with the hosts; a national document is not an invitation.

Larger relations that may be relevant: dryland restoration, agroforestry, genetic diversity, pollinators, and climate risk. But the field should not be registered as “forest restoration” before the local reference ecology is known. Ancient African savannas and grasslands can be damaged by misplaced tree planting; an analysis of AFR100 projects has warned specifically against confusing open ecosystems with degraded forest.³²

A question for possible local correction: Which existing habitats, rare species, old trees, or spontaneous regeneration processes must a productive design not displace?

Labour and maintenance to be documented locally: Who carries watering, fire protection, regeneration, cultivation, harvest, and shared agreements through the seasons; how much time does this require; and which livelihoods make the work possible or impossible?

Evidence status: The national strategies and regional literature on shea parklands are documented now. Their relevance to a concrete field in Kitgum is a reasonable inference. The place’s reference ecology, species, use rights, division of labour, and water capacity are unknown or unresolved and require local and relevant professional verification.

6.3 DOUKKALA, MOROCCO: A PRODUCTIVE DRYLAND FIELD WITHIN A NATIONAL WATER CONFLICT

Morocco's national biodiversity strategy spans species and ecosystem protection, sustainable use, livelihoods, governance, knowledge, and behavioural change.³³ The Generation Green 2020–2030 agricultural strategy continues a strong national orientation towards modernisation and value chains, now with greater emphasis on human capital.³⁴ At the same time, water is not merely one sector among others. In Doukkala and the Oum Er-Rbia system, water quantity, distribution, quality, and salinity determine which regenerative ideas are materially credible at all.

Oases offer an important lesson, but Doukkala is not an oasis. Morocco's oasis systems reveal centuries or millennia of interplay among vegetation layers, microclimate, agrobiodiversity, water rules, maintenance, and culture. Their decline conversely shows that refined agroecological design does not survive if water institutions, labour, generational succession, and economy break down. As biocultural landscapes, their ecological condition cannot be cleanly separated from language, practice, access, institutions, and intergenerational knowledge. ANDZOA and new knowledge and agricultural-heritage initiatives make oases a national field of development and conservation, but they must not become a romantic model exported to every dry area.³⁵

The desk reading opens: the possibility of a long-term field for learning about water and soil around an existing farm: pomegranates, livestock, bees, reservoirs, ground cover, and possible multi-layer cultivation. Whether this is relevant must be decided within the relationship. The analytical test is not maximum biomass, but greater living capacity within a documented water and salt budget.

Institutional connections requiring local verification: agricultural authorities, the Oum Er-Rbia basin authority, environmental and biodiversity institutions, extension services, and relevant research environments. They may both provide knowledge and represent competing policy objectives: exports, food security, water savings, rural employment, and nature.

Larger relations that may be relevant: desertification, water scarcity, climate adaptation, agrobiodiversity, and GIAHS. Drip irrigation may improve field-level efficiency, but efficiency does not necessarily reduce total water use if cultivated area or water-intensive crops expand — a classic rebound also described in Moroccan water policy.³⁶

A question for possible local correction: Can the field document that greater biological production is not purchased through hidden over-pumping, salinisation, or displacement of water risk to others?

Labour and maintenance to be documented locally: Who tends irrigation, reservoirs, ground cover, animals, pruning, and repairs; and how are labour, water, and energy costs carried over time?

Evidence status: National strategies, GIAHS material, and research on rebound risk in water policy are documented now. Their relevance to the concrete farm and relational field is a reasonable inference. The actual water and salt budget, soil condition, species and ecological processes, use rights, and maintenance capacity are unknown and require local, hydrological, and agronomic verification.

6.4 XOCHIMILCO, MEXICO: WHEN A THREATENED SPECIES, A WETLAND, AND A FOOD PRACTICE ARE THE SAME CONFLICT

Mexico has an unusually strong national biodiversity infrastructure around CONABIO, research institutions, federal environmental authorities, and protected areas. Xochimilco is at once locally and federally regulated, a Ramsar wetland, a UNESCO World Heritage Site, and an FAO-recognised agricultural heritage system.³⁷ These many designations do not mean the system is secure. They show how many institutional layers meet in the same habitat.

The chinampa system is human-made, productive, and biocultural. It is not less “nature” because it requires maintenance. When canals, banks, ahuejote trees, soil, cultivation, and water are held together, the practice can support both food and wetland. When cultivation ceases or is converted to urban, tourism, and event functions, the habitat may disappear.

The axolotl brings the species dimension into sharp focus. It exists in the wild only in this system and is critically endangered. Water pollution, urbanisation, and introduced carp and tilapia place it under pressure. UNAM’s Chinampa-Refugio work protects small canals with filters, improves habitat, and connects this with agroecological chinampa management.³⁸ Species protection is not an added layer above food here; the species’ return depends in part on a particular practice of cultivation and maintenance becoming viable again.

The desk reading opens: the possibility that Spiralweb first learns from, and may support connections within, an existing local and institutional ecology. A parallel “Spiralweb programme” would be a step backwards. Possible contributions might include documentation, provenance, translation among chinamperos, research, and other institutions, or help making economic and ecological consequences legible.

Institutional connections requiring local verification: chinamperos and local organisations; Mexico City’s environment and water authorities; UNAM; CONABIO; and federal nature and cultural-heritage authorities. Each has a different mandate, and no single actor represents the whole field.

Larger relations that may be relevant: Target 4 on halting human-induced extinction, urban wetland restoration, invasive-species management, biocultural heritage, and genetic distinctiveness.

A question for possible local correction: Which actions are necessary now to avoid irreversible species loss, even while wider social and hydrological transformation takes longer?

Labour and maintenance to be documented locally: Who maintains canals, filters, refuges, and chinampas, manages introduced fish, and monitors water quality and axolotl — and which economic conditions make the work viable?

Evidence status: The area’s formal status, the axolotl’s threat status, and published research on Chinampa-Refugio are documented now. Spiralweb’s possible contribution as a documenting and connecting membrane is a reasonable inference. The current state of collaborative relationships, the mandate, the site boundary, and concrete ecological effects have not been established and require correction by chinamperos, researchers, public authorities, and other affected actors.

6.5 KARACHI, PAKISTAN: THE URBAN BIOREGION AND THE DIFFICULT CONNECTION OF SCALES

Pakistan’s NBSAP 2017–2030 connects biodiversity with ecosystem services, restoration, sustainable use, and equitable benefit sharing, but it predates the Kunming–Montreal framework; UNDP-supported work on updating the plan and national reporting is therefore important.³⁹ National climate policy requires ecosystem integrity and biodiversity protection, while Sindh Province holds decisive powers over forests, wildlife, coast, and land.⁴⁰

The 2025 Karachi Climate Action Plan connects heat, flooding, waste, air, water, mobility, and nature-based solutions, including mangroves.⁴¹ But a possible school or neighbourhood field is not a miniature of the entire city or the Indus Delta. Its responsibility may be highly concrete: shade, cooling, permeable soil, safe water, edible or useful plants, pollinator habitat, and a maintenance practice that survives holidays and changes in staff.

The mangroves around Karachi and in the Indus Delta also show why “plant trees” is insufficient. Freshwater flows, tides, wastewater, land reclamation, fishing, property development, and provincial governance shape the habitat. A large blue-carbon project may expand mangrove cover while raising questions about carbon rights, local access, and long-term governance. It should not be judged through a single narrative.

The desk reading opens: the possibility of a microhabitat for everyday resilience and learning that can show what an institution can actually care for. Whether it is relevant and what it should contain must begin with the host institution. Food may be part of the field, but is not necessarily its first or most important outcome.

Institutional connections requiring local verification: the host institution, Karachi Metropolitan Corporation, relevant Sindh authorities, the city’s utility and planning bodies, universities, and nature organisations. Institutional fragmentation is itself part of the field’s ecology.

Larger relations that may be relevant: megacity heat, urban biodiversity, coastal resilience, migratory birds, mangroves, and climate finance. The connection must begin with a precise site, or “Karachi” becomes an abstraction.

A question for possible local correction: Are land tenure, water access, and institutional responsibility secured for long enough that established life will not later be left without a home?

Labour and maintenance to be documented locally: Who can carry watering and care for soil, shade, and plants through heat, holidays, and staff change; and for how long are responsibility and resources actually secured?

Evidence status: National policies, the Karachi Climate Action Plan, and the wider mangrove and climate context are documented now. The connection between a possible microhabitat and the city’s institutional ecology is a reasonable inference. The concrete site, water, ownership, species, host capacity, and maintenance rhythm are unknown and require local, municipal, and relevant ecological verification.

7. The Tree on the Mountain: An Important Intuition That Must Be Tested

The intuition concerning trees on mountain ridges and slopes matters. Deforestation can increase erosion, sediment, rapid runoff pulses, landslides, and loss of local moisture. Mature native forests can increase infiltration and deep water storage, moderate high flows, and support low flows. But “more trees produce more water” is not a universal law.

Trees also use water. Systematic reviews often find lower total water yield following forest expansion or tree planting, while natural succession and mature native forest may have hydrological effects different from even-aged plantations.⁴² Outcomes depend on climate, soil, slope, species, age, previous vegetation, and the scale at which water is measured. In ancient savannas and grasslands, tree planting can harm native biodiversity and soil carbon dynamics.

Spiralweb should therefore not select one historical timeline as universal truth. Restoration works with **reference models**, not a mythical frozen past. A credible reference may draw on:

- present reference sites;
- historical maps, photographs, and archives;
- palaeoecology and soil and pollen records;

- local and Indigenous ecological knowledge;
- species distributions and ecological function;
- expected climate change;
- several possible future ecological conditions.

“Shifting baseline syndrome” reminds us that each generation may accept an already depleted nature as normal. But the opposite error is also possible: choosing a particular past without acknowledging that climate, species, and human presence have changed the space of possibility. SER standards therefore recommend reference ecosystems as composite and correctable models, not as a single historical photograph.⁴³

The tree intuition can thus become a useful hypothesis:

In places where deforestation has demonstrably weakened soil, water regulation, habitat, and local living capacity, protecting remnants, enabling natural regeneration, and restoring ecologically appropriate tree cover may be a key bioregional action. The hypothesis must be tested against the local reference ecology and a full water account — not against the number of trees planted.

8. Invasive Species and the Non-Harmonious Field

The word “invasive” is often used too loosely. At least four categories should be distinguished:

1. **Native species:** occurs within its historical or naturally expanded range.
2. **Non-native species:** moved through human activity; not necessarily harmful.
3. **Invasive non-native species:** spreads and causes documented ecological, social, or economic harm.
4. **Problematic population:** a native or non-native species whose local population or behaviour creates conflict; this does not make the species as such “wrong”.

The CBD’s narrower international definition describes a non-native species as invasive when its introduction or spread threatens biological diversity.⁴⁴ The broader harm formulation above makes social and economic effects visible, but it should not be used to label every unwanted or abundant species as invasive.

This matters in relation to sacredness. A species’ intrinsic value does not mean that every individual has a right to be everywhere, or that population control can never be legitimate. In Xochimilco, controlling carp and tilapia may be necessary to conserve the axolotl and the wetland’s endemic biota. On an island, rat control may save seabirds from extinction. Such actions involve real losses and must not be beautified. But inaction is also an action when it makes extinction likely.

A Spiralweb reading should therefore record:

- the precise species and population — not merely the label “invasive”;
- introduction history and certainty about causation;
- which species, people, and functions are affected;
- prevention before control;
- the least harmful effective method and a separate assessment of the welfare of affected individuals;
- law, mandate, and professional expertise;
- monitoring, stopping criteria, and unintended effects;

- dissent and residual ethical loss.

This is one example of why the platform should not join a camp, but must not dissolve an acute threat into endless process either.

9. What the Paper Claims — and Where Its Claims Stop

The paper's contribution can be summarised in five bounded claims:

The paper claims	The claim stops here
Food is a powerful relational lens , because soil, water, species, labour, culture, and economy meet materially within it.	Food is not always a place's first concern and cannot absorb the intrinsic value of a species or habitat.
Bioregional and national middle layers are necessary , because water, species, law, budgets, and infrastructure exceed the individual field.	A strategy, model, or administrative category does not in itself determine the situated direction.
Knowledge and questions can travel further than the right to decide , when provenance, scale, uncertainty, and the possibility of reply travel with them.	Documentation is not consent; connection is not mandate; a public name or document does not activate a field.
Multi-year relationships give the inquiry a real experiential basis , which can make desk readings more relevant and more open to response.	The relationships are not in themselves interviews, shared baselines, local review, representation, or evidence of achieved effects.
The 13×13 prisms and separate green–yellow–red–unknown readings can open a regulated inquiry , because they make questions, uncertainty, and stopping visible.	They are a provisional starting language, not universal ontologies, aggregate field ratings, species judgements, restoration recipes, or a Field Return.

These boundaries are part of the paper's substance. They allow questions and knowledge to move across scales without presenting a comparative reading as local mandate, shared decision, or documented effect.

THREE TESTS OPENED BY THE PAPER

The paper points towards three candidate hypotheses. They have not been introduced as new entries in the public hypothesis register and acquire status only through separate review:

1. **The bridge hypothesis:** When situated, bioregional, national, and planetary knowledge are connected with provenance and the right to decide is preserved, both local action and external categories become more correctable.
2. **The protection hypothesis:** When the risk of irreversible loss is given a visible stopping function, open process and local agency can coexist with urgent species and habitat protection.
3. **The return hypothesis:** When interpretation, resources, and consequence return through a documented loop, learning can be shared across places without making one place a model for another.

In any later activation, each hypothesis should be linked in advance to at least one observation capable of genuinely weakening it. Results should also be described with a visible degree of attribution: **observed after an action, plausibly connected to the action, or supported as a causal effect through an appropriate study design**. A PG Ledger can make sequence, decision, and correction traceable; it does not in itself prove causation.

10. Questions for a Future Situated Reading

The following circuit is an open starting set that a place may choose, rewrite, or reject according to its own hosts, purposes, and possibilities of documentation.

A. LIVING BASIS

- What is the place called by those who live and work here?
- Which species, populations, habitats, and ecological processes are known?
- What is threatened, abundant, introduced, unknown, or specially protected?
- Which observations are sensitive or should not be made public?

B. PROVISIONING AND LIVED LIFE

- How are food, livelihoods, health, culture, and everyday life connected with the place?
- Who are the hosts, rights holders, users, neighbours, and absent affected parties?
- Who receives possible benefits, and who bears risk or loss?

C. CHANGE OVER TIME

- Which seasonal patterns, historical losses, and ongoing changes can be observed?
- How might climate, species distributions, cultivation possibilities, and water conditions change?
- Which thresholds are approaching, what is reversible, and which reference is being used?

D. INSTITUTIONAL TRANSLATION

- Which local rules, customs, property relations, and conflicts exist?
- Which municipal, provincial, and national authorities hold a mandate?
- How do law, plans, finance, and international categories meet the concrete place — and where do they not?

E. LABOUR AND MAINTENANCE

- Who carries time, care, skill, coordination, and long-term operation?
- Where do water, seed, materials, energy, and money come from, and what makes the work viable?
- Which burdens are unpaid, hidden, or situated between institutional budgets?

F. EVIDENCE, DECISION, AND CORRECTION

- What is observed, inferred, unknown, or contested — and by whom?
 - Which concerns are non-compensatory, who decides, and who may stop, appeal, or correct?
 - Which observation could change the first hypothesis?
 - How do interpretation, resources, and consequence return to the field?
 - What may others learn without the site, knowledge, or actors being absorbed?
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11. Overall Assessment

First, the paper shows that food is a powerful but limited entry point. It makes human dependence on soil, water, species, labour, and institutions tangible. It can also conceal the intrinsic value of other forms of life if everything must be justified through nutrition, production, or markets. The food lens is therefore most useful when it can be changed by the living field it opens.

Second, there is no single regenerative direction for land. Protection, reduced pressure, natural succession, active restoration, rewilding, species recovery, and ecological cultivation can all be legitimate. They can also be wrong in a particular reference ecology. Direction must be tested against water, soil, species, maintenance, rights, and the people who must live with the consequences.

Third, local and planetary knowledge cannot be connected responsibly without middle scales. The bioregion makes water, coast, habitat, and migration connections visible. The national institutional habitat carries law, budgets, public authorities, research, rights, and routes of appeal. These layers shape what can be protected, financed, permitted, registered, and changed.

The five readings make the difference concrete. Denmark is the place where the association must itself be institutionally and democratically accountable. Kitgum cannot be read without savanna ecology, drought, household life, and national agroforestry and biodiversity conditions. Doukkala cannot be understood without water accounting, salinity, and the political economy around the Oum Er-Rbia. Xochimilco connects food practice, wetland, invasive-species management, and the risk of extinction of an endemic species. Karachi connects everyday resilience with the heat, water, coast, and institutional fragmentation of a megacity.

Together, the readings show a practical possibility: learning can travel further than the right to decide. What travels can retain provenance, scale, uncertainty, and the possibility of response. What returns can change both situated action and the external category. The provisional reading aid determines no answer; at most, it can make different conditions for continuing, investigating, or stopping visible without adding them together.

Where there is a risk of irreversible loss, openness of process must not become an excuse for inaction. Where mandate or knowledge is insufficient, urgency must not become an excuse for takeover. This is not a contradiction the architecture can dissolve, but a double obligation it must keep visible.

The membrane's work is the visible and correctable connection between different forms of knowledge, responsibility, and institutional capacity. It can function as a membrane only if it can both connect and say no. Its quality is shown not by how much passes through it, but by whether places, people, and more-than-human life become better able to flourish, respond, and change direction. One step is not a solution; it can be a truthful beginning.

Appendix: Connections to Spiralweb's Public Inquiry

The paper stands on its own, but forms part of a larger public and correctable inquiry. *The Living Field* carries Spiralweb's current position on partial knowledge, critical friendship, co-creation, and movement through the spiral. *Atlas of a Living Architecture* presents the wider conceptual architecture, while *The Spiral of Hypotheses* and the full working register make the current testable assumptions visible.

The nearest professional and methodological connections are *Planetary Boundaries as Ethical Constraint* on species' intrinsic value and non-compensation, *Knowing From the Ground* on situated knowledge and provenance, *From Climate Intervention to Bioregional Stewardship* on situated capacity and bioregional scale, and

Keeping the Land Alive on the Danish institutional and socioeconomic landscape. *Penguin Dashboard* and the PG Ledger carry the provisional regulatory and memory language to which this paper refers.

These connections do not make the texts one linear canon. They show where readers can pursue a question, check its origin, and encounter other parts of the same inquiry.

Notes

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 2. IPBES, *Nexus Assessment* and *Transformative Change Assessment*, both approved in 2024.
 3. Spiralweb, GP06, *Planetary Boundaries as Ethical Constraint*, particularly the sections on “No species is collateral” and sacredness; GP01, *Moral Biology*, on embodied signals as complete but fallible and not self-interpreting; and *Knowing From the Ground* on the distinction between the epistemic status of an observation and an exhaustive statement about reality.
 4. European Commission, *Habitats Directive*, on favourable conservation status and long-term recovery; IUCN, *Green Status of Species*, on viability, ecological function, indigenous range, and distance from full recovery.
 5. Palmer and Sandøe, “Wild animal welfare” (2022), and Palmer, Fischer, Gamborg, Hampton and Sandøe, *Wildlife Ethics* (2023), address tensions among individual welfare, populations, ecosystems, and management goals.
 6. UNCCD, *Global Land Outlook 2*, on land degradation, restoration, food systems, and livelihoods.
 7. FAO, *The 10 Elements of Agroecology*.
 8. HLPE, *Agroecological and other innovative approaches* (2019), gathers 13 agroecological principles and treats agroecology as transformation of food systems; FAO defines agroforestry as the deliberate integration of woody perennials with crops and/or animals in space or time.
 9. Perino et al., “Rewilding complex ecosystems” (2019), emphasise trophic complexity, natural disturbance, and dispersal; Carver et al., “Guiding principles for rewilding” (2021), describe rewilding as a continuum of scale, connectivity, and human influence. Newton et al. (2020) and Giller et al. (2021) likewise document that regenerative agriculture is used through multiple process- and outcome-based definitions and does not constitute one bounded school.
 10. CBD, Kunming–Montreal Global Biodiversity Framework, Target 3; Protected Planet, *Protected Planet Report 2024*; IUCN/ICCA material on OECMs and Territories of Life.
 11. IUCN, *Green Status of Species*. The method supplements the Red List with measures of recovery and conservation impact.
 12. FAO, SER and IUCN CEM, *Standards of Practice to Guide Ecosystem Restoration* (2024); UN Decade on Ecosystem Restoration, Ten Principles.
 13. Newton et al., “What Is Regenerative Agriculture?” (2020), map definitions based respectively on processes and outcomes; Giller et al., “Regenerative Agriculture: An agronomic perspective” (2021), call for precision about problem, object, mechanism, situated viability, and political-economic drivers.

14. IPBES, *Nexus Assessment: Summary for Policymakers* (approved December 2024; cited through the canonical DOI record).
15. IPBES, *Transformative Change Assessment: Summary for Policymakers* (2024).
16. GBIF, *Citizen Science* and material on geographical and taxonomic data biases.
17. Carroll et al., “The CARE Principles for Indigenous Data Governance” (2020). CARE stands for Collective Benefit, Authority to Control, Responsibility, and Ethics and complements the data orientation of FAIR principles.
18. World Bank, *The Loess Plateau Watershed Rehabilitation Project* (2004), including project outcomes and mode of implementation.
19. Ngaba et al., “Ecological restoration stimulates environmental outcomes but exacerbates water shortage in the Loess Plateau” (2022).
20. State of California, completion of removal of four dams and reopening of almost 400 miles of habitat (2024); Yurok Tribe, *Yurok and the Klamath River* (2011), on the river’s ecological, nutritional, economic, cultural, and rights-based significance.
21. IUCN, *Policy on Biodiversity Offsets* (2016), places offsets last in the mitigation hierarchy and excludes their use where residual losses cannot be offset; Maron et al. (2025) review the effectiveness and limits of offsets in a “nature positive” context.
22. *Penguin Dashboard: Legibility as Governance*, Report 04 v05, distinguishes three non-compensatory streams and Green, Yellow, Red, and Unknown as documented human readings; *The PG Ledger* distinguishes the current reading surface from the place-bound memory and provenance architecture.
23. Joint CBD and UNESCO work on the links between biological and cultural diversity describes nature and culture as mutually shaping. *Biocultural* is used here as a reading lens, not as a claim of one harmonious or unchanging local tradition.
24. Danish Agency for Green Land Conversion and the Aquatic Environment, *Conversion Plans, The 23 Local Green Tripartite Bodies, and Measures and Grant Schemes* (updated 2026). The sources describe targets, hydrological planning units, organisation, administrative responsibility, and forms of implementation; they do not in themselves document ecological or social effects.
25. NOVANA/Aarhus University, *What Are Structure and Function?*; Fløjgaard, Ejrnæs, Brunbjerg and Nygaard, *Indicators in Results-Based Support for Biodiversity Purposes* (DCE Technical Report no. 273, 2023). The sources show professional assessment forms; they do not establish a universal indicator set for Spiralweb.
26. DMI, *Climate Atlas*, a shared data basis for municipal climate-adaptation planning with projections towards 2100. Concrete outcomes vary by place, indicator, period, and emissions scenario.
27. IPCC, *Climate Change 2022: Impacts, Adaptation and Vulnerability*, Chapter 5, documents already observed shifts in the distributions, cultivation suitability, and seasonal rhythms of wild and cultivated species and consequences for food, livelihoods, and ecosystem services. The European Environment Agency, *European Climate Risk Assessment* (2024), similarly shows how climate affects ecosystems, food security, water, infrastructure, economy, and health through interconnected risks.
28. Statistics Denmark, “Number of farms has almost halved in 20 years” (2026): the number of agricultural and horticultural holdings fell by 48 per cent from 2005 to 2025, while the number of holdings of at least 400 hectares rose markedly.

29. Uganda NEMA, *National Biodiversity Strategy and Action Plan III 2025–2030*.
30. Uganda Ministry of Water and Environment, *Uganda National Agroforestry Strategy* (published January 2026).
31. Gwali et al., “Traditional management and conservation of shea trees (*Vitellaria paradoxa* subspecies *nilotica*) in Uganda” (2012). The study covers Uganda’s shea belt and traditional management forms; the example is used as regional learning, not as a species recommendation for Kitgum.
32. Parr et al., “Conflation of reforestation with restoration is widespread” (2024), on the risk of treating African savannas and grasslands as degraded forest, including within the AFR100 portfolio.
33. Kingdom of Morocco’s Clearing-House Mechanism under the CBD, *National Biodiversity Strategy*.
34. Moroccan Agency for Agricultural Development, *Generation Green 2020–2030*.
35. PROGREEN/Waha network and FAO work on oases and the dynamic conservation of agricultural heritage.
36. Molle et al., “Squaring the circle: Agricultural intensification vs. water conservation in Morocco” (2017). The analysis shows how efficiency gains from drip irrigation can be accompanied by intensification and reuse of saved water. The concrete effect in Doukkala must be measured, not assumed.
37. UNESCO, *Historic Centre of Mexico City and Xochimilco*; Protected Planet, Ramsar profile for *Sistema Lacustre Ejidos de Xochimilco y San Gregorio Atlapulco*; FAO GIAHS, *Chinampas Agricultural System in Mexico City*.
38. UNAM research on Chinampa-Refugio and evaluation of axolotl refuges; Maeda-Obregón et al. (2025) describe a fish fauna dominated by introduced carp and Nile tilapia, while Fernández et al. (2025) examine habitat connectivity among refuges.
39. Pakistan, *National Biodiversity Strategy and Action Plan 2017–2030*; UNDP Pakistan project for the NBSAP update and seventh national report.
40. Pakistan, *National Climate Change Policy 2021*.
41. Karachi Metropolitan Corporation/UNDP, *Karachi Climate Action Plan* (2025).
42. Jones et al., “Forest restoration and hydrology” (2022); Filoso et al., systematic review of forest restoration and water yield (2017). Effects vary by restoration form and context.
43. Society for Ecological Restoration, *International Principles and Standards for the Practice of Ecological Restoration*, third edition (2026), including the reference ecosystem principle; Alleway et al. (2023) on shifting baselines.
44. Convention on Biological Diversity, “What are Invasive Alien Species?” and Target 6 of the Kunming–Montreal framework.

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