



Agroecology in Dryland Mosaic Landscapes

Technical Discussion Paper - IUCN 2025



INTERNATIONAL UNION FOR CONSERVATION OF NATURE



Contents

List of Acronyms.....	3
1. Introduction — what, why, for whom.....	4
2. Key findings from survey and pipeline	6
2.1 What the data says at a glance	6
2.2 Survey signals	7
2.3 What this means for practice (actionable takeaways).....	11
3. Practice pathways with embedded cases (how it works + where it works).....	12
3.1 Farmer-Managed Natural Regeneration.....	12
3.2 Soil–Water Harvesting (zai, half-moons/half-moons, bunds; sand dams where feasible)	12
3.3 Adaptive / Mobility-Based Grazing (incl. rotational resting).....	13
3.4 Native Grass Reseeding & Fodder Banks	13
3.5 Diversified Agroforestry / Forest Gardens	14
3.6 Bundle logic: how practices combine	14
4. Pipeline at a Glance + Success Snapshots	17
4.1 Most successful cases at a glance.....	17
4.2 Short spotlights (challenge → what was done → why it worked → why it scales)	17
5. Monitoring & Alignment — one evidence system for GBF-T2 / NDCs / LDN.....	19
6. Conclusion	20
Acknowledgements	20
References.....	21

List of Acronyms

AF	Adaptation Fund
AFR100	African Forest Landscape Restoration Initiative
AFSA	Alliance for Food Sovereignty in Africa
ANR	Assisted Natural Regeneration
CBD	Convention on Biological Diversity
CIFOR–ICRAF	Center for International Forestry Research – World Agroforestry
CSO	Civil Society Organisation
DFI	Development Finance Institution
DSL-IP	Drylands Sustainable Landscapes Impact Programme
FMNR	Farmer-Managed Natural Regeneration
GBF	Global Biodiversity Framework
GBF-T2	Global Biodiversity Framework – Target 2
GCF	Green Climate Fund
GEF	Global Environment Facility
GGW	Great Green Wall
GLF	Global Landscapes Forum
IK	Indigenous (and local) Knowledge
IUCN	International Union for Conservation of Nature
IYRP	International Year of Rangelands and Pastoralists
LDN	Land Degradation Neutrality
LDCF	Least Developed Countries Fund
MoU	Memorandum of Understanding
NAP	National Adaptation Plan
NBSAPs	National Biodiversity Strategies and Action Plans
NDC / NDCs	Nationally Determined Contribution / Nationally Determined Contributions
PELUM	Participatory Ecological Land Use Management
PMU	Project Management Unit
PRAIS / PRAIS4	Performance Review and Assessment of Implementation System (UNCCD) / 4th reporting cycle
QA	Quality Assurance
ToT	Training of Trainers
UNCCD	United Nations Convention to Combat Desertification
WWF	World Wide Fund for Nature



1. Introduction — what, why, for whom

Africa's drylands and grasslands face a tight knot of problems: recurrent droughts and erratic rains, depleted soils and vegetation, drying water points, blocked livestock corridors and unclear rights—all of which erode food and fodder security, spark conflict, and accelerate biodiversity loss. This survey asks how to overcome that knot in practice by identifying locally led bundles that can re-stitch multifunctional landscapes—linking cropland, communal rangelands, woodlands and water—so they work as one system again. This study is particular in its mosaic-scale lens, which tests and evidences the bundle logic—Farmer-Managed Natural Regeneration (FMNR) + soil-water works + adaptive grazing—and shows it only delivers when paired with recognised corridors/tenure and long-horizon, producer-level finance and smart policies.

Agroecology is the people-centred pathway we examine. It stitches mosaics into systems through locally rooted, knowledge-intensive practices—(FMNR), soil–water harvesting (zai/half-moons/bunds; sand-dams where feasible), adaptive/mobility-based grazing with mapped corridors and planned resting, native reseeding/fodder banks, and diversified agroforestry at farm edges—guided by Indigenous/traditional and scientific knowledge. By embedding these approaches in everyday farming and rangeland governance, agroecology regenerates ecosystems and livelihoods while advancing Land Degradation Neutrality (LDN), contributing to Nationally Determined Contributions (NDCs), and supporting Global Biodiversity Framework (GBF) implementation—one practical bridge across the Rio Conventions and a renewed social contract that centres dignity, equity and participation for pastoralists, smallholders, women and youth.

“Agroecology is more than an ecological solution — it is a platform for empowerment, equity, and resilience.”

— Participant, Regional Workshop on Agroecology, Kenya (2025)

Agroecology spans a wide spectrum of ecological and cultural practices—from rotational grazing and FMNR to water harvesting and Indigenous soil management. Yet many of these approaches remain undervalued in policy and financing systems. Transitions can involve short-term trade-offs, such as temporary yield declines or increased labour demands—often on women—but these can be managed through phased adoption, bridging finance, secure tenure in ways that tracks both costs and benefits.

This paper consolidates insights from a bilingual survey of 37 stakeholders from 20 African countries and a mapping of over 40 agroecology-aligned projects across Africa, complemented by high-impact case studies and lessons from the 2025 Kenya desertification preparatory workshop. It reflects a collective perspective from civil society, research institutions, governments, and local communities across the continent, rather than a single institutional view. Together, these findings demonstrate that agroecology is already delivering measurable ecological, social, and economic results—restoring degraded soils and vegetation, reconnecting rangeland corridors, and stabilising water and fodder—and provide a roadmap for scaling impact through coherent policy, inclusive governance, and sustained finance.

The analysis also draws on IUCN's experience in restoration and land management through initiatives such as the Drylands Sustainable Landscapes Impact Programme (DSL-IP), the Great Green Wall, Synthesis of Sustainable Agriculture Approaches and the Strengthening Civil

Society for Land Degradation Neutrality project, which link field evidence to policy and investment frameworks.

What is this paper—and for whom?

This technical discussion paper is for practitioners, member organisations, researchers, local government/extension teams, and implementation partners who operate in Africa's dryland and rangeland mosaic landscapes. It translates on-the-ground practice into replicable “how-to” bundles and links them to monitoring and scale strategies. It is not a policy pitch; that role sits with a separate policy brief.

The focus of the analysis is Africa's dryland/rangeland mosaics across the Sahel, Horn, East, Southern and North Africa, taking the mosaic itself—interfaces of cropland, communal rangeland, woody cover, water points and livestock corridors—as the unit of analysis. The spotlight is on locally led agroecology bundles observed in practice: FMNR, soil–water harvesting (zai/half-moons/bunds; sand dams where feasible) and adaptive/mobility-based grazing with resting/corridors, complemented by native reseeding/fodder banks and farm-edge agroforestry. Outcomes are assessed for ecosystem function/cover, water and fodder reliability, mobility/conflict, and livelihood stability and inclusion, using a single community logbook aligned to GBF-T2, NDCs and LDN/PRAIS.

Why now?

Two things converge: (1) growing field evidence across ~40 mapped projects and programmes; and (2) demand from practitioners for a concise “practice-and-evidence” synthesis that is directly usable in planning, extension and monitoring. The pipeline shows large, multi-country efforts (e.g., Sustainable Management of Dryland Landscapes, Burkina Faso) and farmer-led models (e.g., Regreening Africa; Trees for the Future) that demonstrate scalable results when practice bundles and enabling conditions are in place.

How to read this paper

Sections 2–4 present the survey findings and figures, the Barriers→Enablers matrix with brief research priorities, the practice pathways with embedded cases (including a Laikipia capstone), and a concise Pipeline-at-a-Glance; Section 5 sets out a single community-owned monitoring approach aligned to GBF-T2, NDCs and LDN; Section 6 provides the conclusion and immediate next steps for scale.

All quotes in the paper are anonymised to protect participants and enable candid, field-level testimony.

2. Key findings from survey and pipeline

This section is the bridge from concept to practice. It distils what the survey and project mapping show, so planners and implementers can choose the right bundles and enabling actions in dryland/rangeland mosaics.

Th begins with bilingual regional survey in which 37 organisations responded, spanning five roles: project implementation, advocacy, research, funding, and policy. This mix links on-the-ground delivery with evidence, voice, and resourcing—so findings reflect both practice and the systems that enable it.

It mirrors the dryland mosaic: implementers and communities in the field, advocates and researchers shaping learning, and funders/policymakers aligning rules and finance.

The survey results are also combined with a mapping of over 40 agroecology-aligned projects across Africa, forms the evidence base for this analysis. The portfolio draws from IUCN programmes, partner networks, and national focal points, spans community, CSO, and government-led initiatives.

2.1 What the data says at a glance

- **Bundles, not single fixes.** The most common, most effective pattern is a bundle: Farmer Managed Natural Regeneration (FMNR) + soil–water harvesting (zai/half-moons/bunds; sand dams where feasible) + adaptive/mobility-based grazing (planned resting/corridors); with native reseeding/fodder banks and diversified agroforestry where rangelands interface with farms.
- **Inclusion and Indigenous/traditional knowledge drive adoption.** Co-design with communities and customary institutions—grazing calendars, corridor pacts, FMNR pruning rules, species/seed choices, and water-structure siting—delivers higher uptake, better maintenance, and fewer disputes.
- **Enabling conditions decide outcomes.** Where access is secure (corridors recognised; tenure clarified) and finance is long-term (8–10 years), restoration and livelihood results are consistently stronger.
- **Barriers are predictable—and fixable.** The same three constraints recur: short funding cycles, blocked corridors/tenure ambiguity, and thin extension/market support.
- **Women & youth drive diffusion when financed directly.** Small grants/micro-procurement for nurseries, seed/grass enterprises, processing and restoration services accelerate uptake and spread between neighbours.
- **Simple, aligned, community-based monitoring works.** A single light-touch indicator set is enough to track progress and report to GBF-T2, NDCs, and LDN.

2.2 Survey signals

Agroecological Practices

Widespread Application: Agroecology is already practiced across African drylands using methods such as composting, water harvesting, agroforestry, intercropping, and farmer-managed natural regeneration. These techniques align with both ecological restoration and sustainable farming practices tailored to dryland conditions.

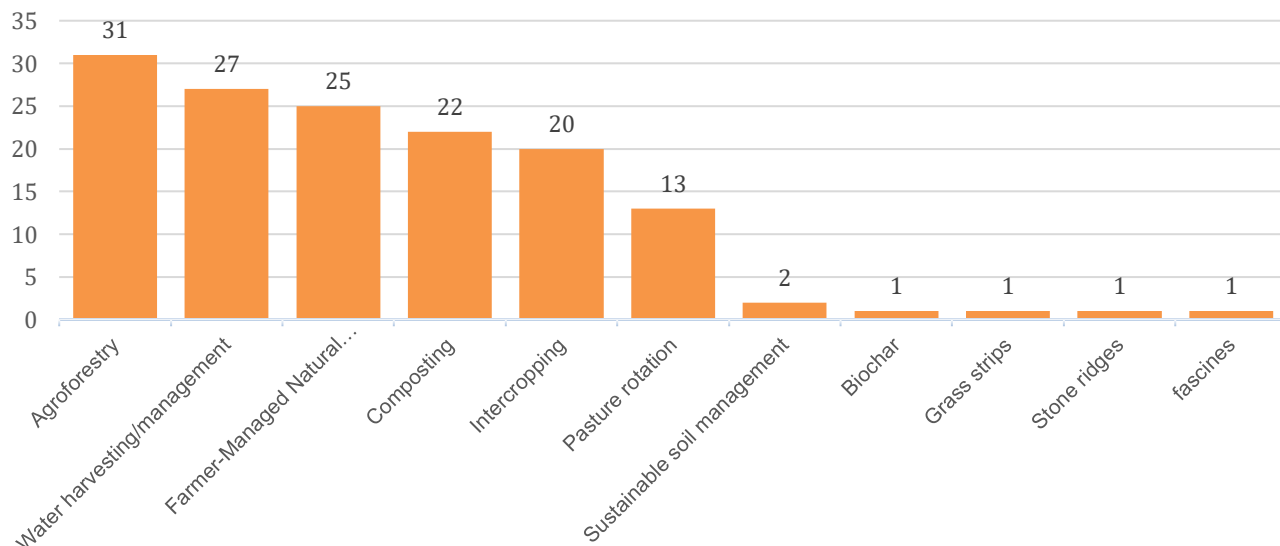


Figure 1: Most-used practices — *what's in play*. Practice popularity confirms the **bundle logic**—Water+Trees → Mobility/Reseeding → Agroforestry—rather than single fixes.

Persistent Systemic Barriers

The survey and project analysis revealed funding gaps, fragmented policies, weak extension systems, and lack of incentives as core limitations. Limited direct financing to communities and local organizations constrains innovation and scale; decentralized funding channels are critical for sustaining agroecological transitions. These barriers restrict the scalability and integration of agroecology into mainstream agricultural development. The most common were:

- **Community Engagement is Inconsistent:** While community involvement is often cited, most respondents noted limited participation in decision-making, and traditional knowledge is often sidelined. There's a strong call for mechanisms that embed local voices from project design to monitoring.

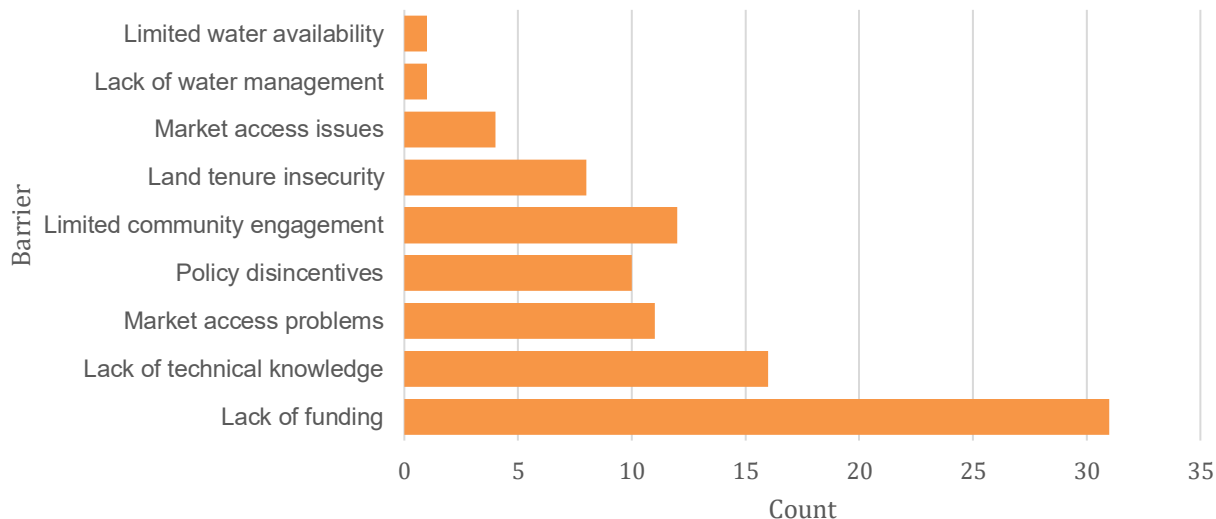
“Communities are not just participants — they are the architects of the transformation we seek.” — CSO representative, East Africa

- **Community Knowledge and Youth and Gender Gaps:** Barriers such as low literacy, limited access to extension services, and language constraints hinder community participation and the effective dissemination of agroecological knowledge. Scalable solutions must prioritize accessible and culturally relevant knowledge systems.

Despite being key actors, youth and women remain largely excluded from decision-making, access to land and resources, and formal agroecological training systems. Their inclusion is critical for innovation, sustainability, and scale.

“When women and youth lead, the land responds differently — it comes back to life.” — Women’s cooperative leader, Senegal

Figure 2: Barriers to scaling agroecology in dryland/rangeland mosaics: These are the binding constraints that stall



adoption and maintenance in drylands.

Rising Opportunities

A growing body of traditional and scientific knowledge, active local and regional networks (e.g., AFSA, Groundswell, PELUM), and increased donor and government attention present real openings for agroecology to gain traction. Global crises around food systems, biodiversity loss and climate change are creating pressure for systemic alternatives. Traditional and Indigenous practices such as Zai pits, semi-circular bunds, and collective grazing governance continue to provide adaptable models for resilience and should be formally integrated into national agroecology frameworks.

Climate and Biodiversity Co-Benefits: The Agroecology practices used by the communities reportedly enhance climate resilience, supports biodiversity conservation, and strengthens food and water systems — making it a cornerstone of ecosystem-based adaptation in drylands and grasslands.

Also, political frameworks such as the FAO’s 10 Elements of Agroecology, CBD’s Global Biodiversity Framework, the UNFCCC Koronivia process, and Africa’s AFR100 and Great Green Wall provide strong entry points for integrating agroecology — even when not explicitly named.

Mechanisms like the GEF, GCF, and donor-supported restoration funds offer growing opportunities to support agroecology through climate, biodiversity, and land degradation funding windows.

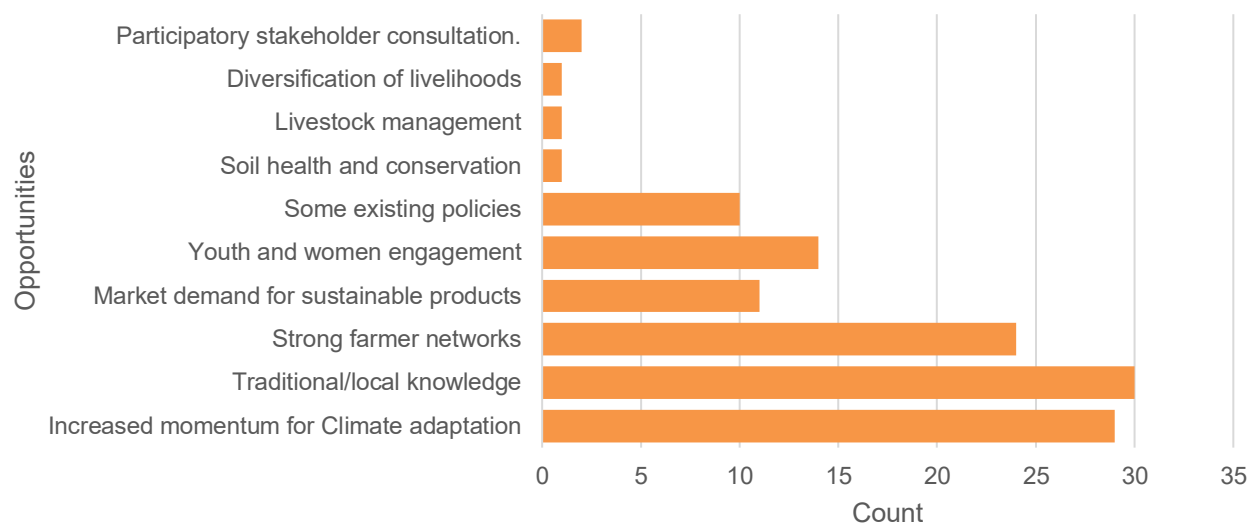


Figure 3: Opportunities that respondents identify as most effective for scaling: These are immediate levers programmes can pull; they align finance, practice, and social inclusion.

Barriers describe the causes; opportunities name the levers. The next step is to pair each cause with its matching lever. Briefly, here is an illustration of those pairings in a barrier→enabler matrix, validated by pipeline and survey cases.

Barrier (survey)	Why it persists	Enabler (actionable) — aligned to survey	Who acts (lead/support)	Track (simple indicators)
Lack of funding	Annual, fragmented cycles miss multi-season gains	8–10-year envelopes; bridge grants; blended finance; tap adaptation windows (NDC/NAP/AF/LDCF/G EF); ring-fenced micro-procurement for women/youth	Donors/DFIs; line ministries; PMU	% budget multi-year; # phases bridged; \$ tagged “adaptation/AE”
Lack of technical knowledge	Patchy skills on FMNR, grazing calendars, zai/half-moons sifting/pruning	Living Mosaic Labs; Training of trainers; farmer-to-farmer networks; IK co-production (species, pruning, calendars); soil-health toolkits; livestock management modules	Extension; CSOs; research partners; customary institutions	# labs; adoption rate; # Training of trainers active; % plans citing IK
Market access constraints	Early AE products lack buyers/working capital; slow payments	Public micro-procurement; minimum offtake MoUs; invoice-on-delivery ≤72h; light QA; link to buyers demanding sustainable	Procurers; local gov; buyers; women/youth groups	# contracts; procurement value; on-time payment (%);# buyer MoUs

		products; value-addition for diversified products		
Policy disincentives	Rules/subsidies penalise trees/mobility/soil-water works	By-law inserts (corridors, FMNR/tree rights); subsidy/permit realignment; leverage existing policies; align reporting to GBF-T2/NDC/LDN	Line ministries; counties/districts; focal points	# by-laws adopted; # policies leveraged; # pacts recognised
Limited community engagement	Designs bypass customary institutions & Indigenous knowledge	Participatory consultation; public pact drafts/calendars; paid community monitors; participation targets for women & youth	PMU; local gov; customary institutions; CSOs	# co-design meetings; participation (women/youth %); # pact renewals
Land tenure insecurity	Unclear rights block tree & mobility investments	Map/designate corridors & dry season reserves; access/compensation pacts; clarify tree/land rights in plans	Land agencies; counties; pastoral orgs	# active pacts; km mapped; # disputes resolved ≤30d
Water management & availability gaps	Scattered works; weak maintenance; unreliable points	Clustered zai/half-moons/bunds; sand-dam clusters (where feasible); pre-rains maintenance rota; pair water works with FMNR/cover crops	Implementers; communities; water depts.	% structures functional; infiltration proxy

Table 1: Barrier-Enabler matrix: *what to do, who leads, simple checks*

The matrix shows what blocks scale and the field-tested enablers that remove each block. Where evidence is thin, we flag priority research areas (1–5) to close the gap in real programmes. With both in hand, the next step is simple: apply the enablers now, use the research tags to learn fast, and organise delivery around the bundles.

1. Access & governance (mobility, tenure, pacts)

Corridors, reserves, and clarified rights are the pre-conditions for every rangeland/dryland practice to stick; without them, investments in water, FMNR, or reseeded unravel through conflict and overuse. Proving the governance payoff (fewer disputes, better dry-season fodder) unlocks by-law inserts and justifies programme spend at scale.

2. Practice bundles & context

Scaling hinges on knowing which combinations (zai/half-moons/bunds + FMNR + resting/reseeding) deliver the highest return per labour-hour in specific mosaics. Establishing simple thresholds and “what works where” guidance turns extension from generic advice into context-smart playbooks.

3. Finance & markets



Adoption is throttled by cashflow and buyer risk; fast micro-procurement payments and minimum-offtake MoUs directly remove both bottlenecks. Testing these levers shows whether they reliably raise delivery, retention, and inclusion—especially for women and youth enterprises.

4. People, dignity, identity & Indigenous knowledge (all-of-society)

Legitimacy from co-design with customary institutions is what sustains maintenance and lowers conflict; it's the social engine behind ecological results. Making dignity/agency visible—and linking it to upkeep and neighbour adoption—centres people and proves why agroecology strengthens the relationship between communities and their landscapes.

5. One evidence system (GBF-T2 / NDCs / LDN)

A single “mosaic narrative” that serves all three frameworks cuts reporting overhead and keeps programmes coherent from field to policy. Validating a few low-cost remote proxies lets teams track recovery between visits, making monitoring scalable without diluting community ownership.

2.3 What this means for practice (actionable takeaways)

Design for the mosaic, co-design with Indigenous and local Knowledge (4): plan cropland–rangeland–woodland–water–corridors as one system with customary institutions.

Secure access & mobility (1): map corridors/reserves, sign/renew pacts, add route services; anchor in by-laws/plans.

Use the bundle logic (2): Water+Trees → Mobility/Resting → Reseeding/Fodder → Agroforestry—adapt to context.

Finance time & inclusion (3): 8–10-year envelopes; ≤72-hour micro-procurement for women/youth; early buyer/offtake links.

Monitor once, reuse everywhere (5): one community-owned “mosaic narrative” that serves GBF-T2 / NDCs / LDN.



3. Practice pathways with embedded cases (how it works + where it works)

Each practice card explains the method, the challenge it solves in drylands/rangelands, and one concrete case from the pipeline/survey.

3.1 Farmer-Managed Natural Regeneration

What it is. Protecting and managing natural tree/shrub regrowth (marking stems, selective pruning/coppicing, spacing) on farms and pastures.

Challenge addressed. Degraded soils and low canopy/ground cover make crops and fodder unreliable; tree planting is costly and fails without moisture.

Why it works in drylands. FMNR rapidly restores shade, litter, roots and windbreaks at low cost, improving microclimate and infiltration—an on-ramp for other practices.

On-the-ground example (Burkina Faso – Sustainable Management of Dryland Landscapes). Farmers combined FMNR with zai and stone/earth bunds and then added diversified agroforestry on edges.

Enablers. Local by-laws clarifying tree/land rights; pruning skills in extension; community work parties; small tools accessible to women/youth.

Observed results. Canopy/ground cover up; infiltration improves; more stable yields on previously exhausted plots; time saved for fuel/fodder collection.

Scale conditions. Pair FMNR with soil–water harvesting in the first two seasons; embed pruning training of trainers in extension; recognise tree-user rights in local rules.

Quick metrics. Tree/shrub density (stems/ha); canopy cover (%); % plots with pruned/managed stems; fuel/fodder time saved.

Do / Don't. Do mark/protect stems and train pruning cycles. Don't default to seedling planting where natural regrowth potential is high.

*“Protecting and pruning the regrowth changed our soil before any new planting did.”
— Farmer, FMNR adopter (anonymised)*

3.2 Soil–Water Harvesting (zai, half-moons/half-moons, bunds; sand dams where feasible)

What it is. Micro-catchments/structures that slow runoff and store water (zai/half-moons/bunds), and—where hydrology permits—sand dams in ephemeral streams.

Challenge addressed. Erratic rainfall, high runoff and crusted soils cause crop failure and pasture die-off; scattered structures degrade without upkeep.

Why it works in drylands. Concentrates rainfall, boosts infiltration and soil moisture, creating “moisture islands” that lock in FMNR and reseeding benefits.

On-the-ground example (Drylands Development—DryDev). Zai/half-moons were installed in contiguous blocks, coupled with FMNR and simple value addition.

Enablers. Targeting/siting guides; community work parties; maintenance rota before rains; pairing with organic inputs (mulch/manure).

Observed results. Higher infiltration; steadier harvests on degraded fields; adoption spreads beyond pilot blocks.

Scale conditions. Cluster works, not scatter; budget maintenance as a deliverable; check hydrology and upstream agreements for sand dams.

Quick metrics. # and % functioning structures; simple infiltration proxy; yield/harvest stability



index.

Do / Don't. Do start on small contiguous blocks for quick wins. Don't build sand dams without hydrology and community agreements.

"We built half-moons in one block and kept them up before the rains—this time the water stayed."
— Community work-party organiser (anonymised)

3.3 Adaptive / Mobility-Based Grazing (incl. rotational resting)

What it is. Herd movement tuned to rainfall/forage with planned resting of key pastures; mapped/recognised livestock corridors and dry-season reserves; clear access/compensation pacts.

Challenge addressed. Blocked routes and unmanaged grazing concentrate pressure, trigger conflict and stall vegetation recovery.

Why it works in drylands. Spreads grazing pressure across space/time; enables rest-and-recovery cycles; reduces disputes; keeps rangeland function intact.

On-the-ground example (Kenya – Corridor pacts unlock grazing calendars). Communities mapped corridors/reserves, signed access/compensation pacts, installed water/vet/mediation waypoints, and paired resting with reseeding and half-moons; sand-dam clusters where feasible.

Enablers. Corridor/ reserve mapping; signed pacts; services on routes; by-law inserts in county/rangeland plans; community mediation committees.

Observed results. Dry-season fodder more reliable; disputes fall on segments covered by pacts; faster pasture recovery after rains.

Scale conditions. Legal recognition of corridors; simple drought triggers for earlier movement/rest; budget for route services.

Quick metrics. # active pacts; km mapped/kept open; dry-season fodder index (0–3); disputes resolved ≤30 days.

Do / Don't. Do co-design calendars with pastoral institutions; keep options flexible to rainfall. Don't fix routes rigidly or ignore compensation rules.

"With the pact posted, people know the rules. Herds move, pastures rest, and arguments don't last."

— Community mediator, grazing committee

3.4 Native Grass Reseeding & Fodder Banks

What it is. Reseeding degraded rangelands with adapted native grasses and establishing protected fodder banks (often time-bound enclosures).

Challenge addressed. Bare patches and weak seed banks reduce forage and make mobility/resting ineffective; purchased feed is costly.

Why it works in drylands. Restores grazing value and cover, buffering drought periods and supporting planned resting calendars.

On-the-ground example (Sahel/Kenya corridor buffers). Buffer strips and reserves along mapped corridors were reseeded; fodder banks set up near settlements.

Enablers. Local seed/grass enterprises (women/youth); enclosure enforcement; nearby water points; simple seed storage and small equipment.

Observed results. Faster ground-cover rebound; more stable dry-season forage; reduced pressure on fragile patches.

Scale conditions. Combine with mobility/resting; use locally adapted species; protect first full season.

Quick metrics. % ground cover; fodder biomass; # seed/grass lots delivered; area reseeded &



protected.

Do / Don't. Do time reseeding with rains and ensure rest. Don't reseed without fixing grazing pressure/mobility first.

*“Grass seed pays school fees; fodder banks mean we don't sell animals in a bad season.”
— Youth seed/grass entrepreneur*

3.5 Diversified Agroforestry / Forest Gardens

What it is. Integrating trees with crops and soil cover (mulch/hedgerows) on farm edges/homesteads to diversify food and income and protect soils.

Challenge addressed. Farm plots face wind/heat stress, poor soils and income volatility; seedling access and early-year risk slow adoption.

Why it works in drylands. Adds shade, organic matter and diversified products (fruits, oils, gums), improving resilience and cash flow.

On-the-ground example (Trees for the Future—Forest Gardens). Diversified agroforestry with mulching and simple market links; nurseries supply seedlings locally.

Enablers. Nursery supply; grafting/management skills; women/youth micro-procurement; buyer links.

Observed results. More diverse food/income; better soil cover; improved microclimate.

Scale conditions. Start with a small, adapted species palette; plan shade dynamics; link to local processing.

Quick metrics. Species count per plot; % soil cover; # nursery contracts; income diversification index.

Do / Don't. Do pair with water/cover in early seasons. Don't promote high-water exotics without testing.

*“The new tree line cuts wind and brings cash crops; we're not betting on one harvest anymore.”
— Agroforestry farmer*

3.6 Bundle logic: how practices combine

Practice bundles (from survey + pipeline):

- Water + Trees core: FMNR/assisted regeneration + soil–water harvesting (zai, half-moons, bunds; sand dams where feasible).
- Mobility & Pasture Recovery: adaptive/rotational grazing with mapped corridors and dry-season reserves, signed access/compensation pacts, route services (water/vet/mediation), plus native reseeding/fodder banks.
- Farm-edge Diversification: diversified agroforestry/forest-garden systems layered onto Water + Trees around homesteads and field edges.
- Seed and Restoration Enterprise: women- and youth-led nurseries, seed/grass enterprises, and restoration crews linked to micro-procurement and local buyers.

Making the right bundles work depends on co-design with communities and customary institutions so calendars, pact clauses, species/seed choices, and resting periods reflect Indigenous/traditional knowledge. Pastoralist organisations lead corridors, resting, and reseeding; smallholders lead FMNR and agroforestry; women and youth run nurseries, seed/grass, and restoration services;



local government and extension formalise by-laws, map corridors, and run monitoring; buyers commit to offtake; donors fund 8–10-year envelopes. Use one light indicator set aligned to GBF-T2, NDCs, and LDN to track cover, managed stems, functioning structures, active pacts, fodder condition, and women/youth procurement.

Case spotlight (how the bundles work together) — Laikipia, Kenya: community-led agroecology that stitches a dryland mosaic

Impact in one glance

Agroecology in Laikipia is restoring a fragmented dryland mosaic by pairing water-works (sand dams), mobility-based grazing pacts, grass reseeding and women-led enterprises that turn invasive cactus into value. Results include improved drought management, reduced conflict around access, and new income streams, with hundreds of households directly benefiting.

The challenge (context)

Laikipia's rangelands face recurrent drought, invasive cactus expansion, degraded pastures and pressure on corridors and dry-season reserves. The County's 2025–2029 Environment Action Plan explicitly calls for rotational grazing, pasture regeneration and community-led rangeland rehabilitation to curb overgrazing and restore function. Community reports also flagged *Opuntia stricta* invasion undermining grazing and livestock health.

The solution (the bundle in practice)

Water security: communities co-designed and built sand dams on seasonal rivers—locally led from planning to by-laws—creating reliable water for households and herds in dry spells.

Mobility & access: formal grazing agreements between group ranches and conservancies mapped use zones, set herd numbers and seasons, and created joint committees for dispute resolution; over 700 households have benefited, including drought-time arrangements that temporarily hosted ~4,000 animals.

Vegetation recovery: targeted **grass reseeding** (e.g., *Cenchrus ciliaris*, *Eragrostis superba*) on ~300 acres, coupled with planned resting, is bringing back forage and ground cover.

Women & youth enterprises: through the Laikipia Permaculture Centre and partners, groups now process invasive cactus into juice, jam and wine—shifting a rangeland problem into livelihoods for ~15 groups (~960 people) and creating marketable products.

Integrated grazing for habitat (adjacent exemplar): on Ol Pejeta Conservancy in Laikipia, rotational cattle grazing with mobile bomas is used as a habitat-management tool, restoring thousands of hectares while generating conservation revenue invested back into communities

What changed (evidence of results)



Access & peace dividends: coordinated movements and shared pasture/water reduced tensions, improved disease surveillance and vaccination, and strengthened ties between communities and ranches.

Rangeland function: reseeded blocks and managed rest are accelerating pasture recovery; mobile bomas create nutrient “hotspots” that kick-start grass regrowth and wildlife habitat.

Household incomes: invasive-cactus value-addition established local price points (e.g., jam/juice/wine) and plans for oil extraction, expanding income options for women and youth.

Conservation-livelihoods model: integrated livestock–wildlife management on OI Pejeta contributes ~USD 0.5–1.0 m net annually to conservation/community programmes, evidencing a financially viable pathway to keep rangelands productive and biodiverse.

Why it scales

This is the mosaic logic in action: water + trees (sand dams; FMNR on farm edges), mobility secured by pacts, and grass recovery (reseeding/rest), stitched to enterprise (women- and youth-led processing). It shows the three policy lenses seeing the same field change: GBF-T2 (ecosystem condition up), NDCs (climate risk down, productivity steadier), and LDN (degraded land trending to stable/productive).

“We turned a problem into a solution.” —food processing lead, on converting cactus into products (anonymised).

“Working with, rather than against, nature.” — OI Pejeta team on integrated grazing for habitat and income.

4. Pipeline at a Glance + Success Snapshots

This section is one place that shows the strongest pipeline cases, the bundles they used, and the specific enablers that made them work—so others can replicate at scale. These projects exemplify the transformative potential of agroecology in restoring Africa’s drylands and grasslands each offering unique lessons in scalability, community engagement, and integrated landscape management.

4.1 Most successful cases at a glance

Case (country/landscape)	Practice bundle	Why it worked (enablers)	Why it scales
Burkina Faso – Sustainable Management of Dryland Landscapes	FMNR + zai/stone/earth bunds; diversified agroforestry	8–10-year finance; local by-laws on tree/land rights; pruning skills in extension; community work parties	Low-cost “water + trees” core; rights clarity reduces disincentives; skills diffuse quickly via farmer networks
Drylands Development Programme (multi-country)	Zai/half-moons (clustered) + FMNR; micro-catchments; light value-addition	Contiguous siting; maintenance rota; pairing with organic inputs; simple field targeting	Modular works; quick visual wins; complements FMNR everywhere soils are crusted
Sahel/Kenya – Reseeding & fodder banks (corridor buffers)	Native reseedling in rested patches; time-bound exclosures; fodder banks near settlements	Women/youth seed/grass enterprises; enforcement of resting; nearby water points	Strengthens grazing calendars; creates local markets for seed/grass; buffers drought
Trees for the Future – Forest Gardens	Diversified agroforestry + mulch /cover on farm edges	Nursery supply; women/youth micro-procurement; coaching; buyer links	Diversifies food/income; quick household payoffs; easy to add to “water + trees” core
Regreening Africa (multi-country)	FMNR + simple soil cover/micro-catchments; farmer-to-farmer diffusion	Strong farmer networks; light toolkits; local rules on cutting/pruning	Proven rapid diffusion; minimal capex; aligns with policy and adaptation finance

Table 2: Pipeline at a glance — *where it works and why*:

4.2 Short spotlights (challenge → what was done → why it worked → why it scales)

Burkina Faso – SMDL (farm–pasture mosaics)

Challenge: degraded soils, runoff, low canopy/ground cover.

What was done: FMNR/ANR paired with zai and contour bunds; diversified agroforestry on edges.

Why it worked: long-horizon finance; local by-laws clarifying tree use; pruning skills in extension; organised labour windows.



Why it scales: “Water + trees” core is low-cost and repeatable; rights clarity removes policy disincentives; farmer networks spread FMNR.

DryDev (semi-arid smallholder systems)

Challenge: erratic rain, crusted soils, scattered, failing structures.

What was done: clustered half-moons/zai with maintenance rota; paired with FMNR and organic inputs; light value-addition.

Why it worked: contiguous siting and upkeep raised infiltration and yield stability.

Why it scales: modular works, fast visual wins, simple targeting tools applicable across drylands.

Sahel/Kenya – Reseeding & fodder banks

Challenge: bare patches and weak seed banks undermine grazing calendars; expensive purchased feed.

What was done: reseeded rested patches; time-bound exclosures; fodder banks near settlements.

Why it worked: women/youth seed/grass enterprises ensured supply; enforcement and water points made it stick.

Why it scales: strengthens corridor calendars everywhere; creates local enterprise; buffers drought.

Trees for the Future – Forest Gardens

Challenge: farm-edge heat/wind stress, poor soils, volatile income; seedling access.

What was done: diversified agroforestry with mulch/cover; nursery supply; women/youth micro-lots; buyer links.

Why it worked: quick household payoffs and better soil cover.

Why it scales: easy add-on to “water + trees”; replicable nursery + micro-procurement model.

Regreening Africa (multi-country)

Challenge: low tree cover; limited extension bandwidth; need for rapid diffusion.

What was done: FMNR with simple micro-catchments and farmer-to-farmer toolkits; local rules on pruning/cutting.

Why it worked: strong farmer networks and low cash requirements.

Why it scales: diffusion model is proven across countries; policy-friendly; links to adaptation finance.



5. Monitoring & Alignment — one evidence system for GBF-T2 / NDCs / LDN

“Photos and one page tell the story: cover is back, water points work, and we keep the pact. We report once, and it counts for all three.” — Community monitor, corridor/reserve

Why agroecology links nature and society across all three frameworks.

The bundles seen in our survey and pipeline—FMNR + soil-water harvesting, adaptive grazing with corridors/pacts, reseeded/fodder banks, and farm-edge agroforestry—restore ecosystem function (GBF-T2), cut climate risk and stabilise production (NDCs), and move land from degraded to productive states (LDN). At the same time, they renew the social contract with the land: mobility is recognised, pacts are co-signed, women and youth lead enterprises, and customary institutions co-govern resources. It is one set of field changes, and one civic process viewed through four lenses: nature, climate, land, and people.

One evidence stream, reported three ways (no parallel templates) + an all-of-society note.

Use a single, light, community-led “mosaic health” narrative built around the bundle in play:

- **Ecosystem condition (GBF-T2):** trees/shrubs managed (FMNR), grass cover recovering, corridors/reserves functioning, water points maintained.
- **Climate adaptation (NDCs):** harvests and fodder more reliable in dry spells; sand-dam/half-moon blocks buffer drought; disputes down so herds can move.
- **Land degradation neutrality (LDN):** bare/crusted areas brought back into use; runoff slowed; soils hold moisture; depleted plots producing again.
- **All-of-society (people, dignity, identity):** free, informed co-design with communities and customary bodies; recognised mobility as a way of life, not a problem; women & youth running nurseries, seed/grass and restoration crews with fair, on-time payment; conflict reduction through public corridor/reserve pacts; cultural continuity (e.g., grazing calendars, species and seed choices rooted in Indigenous/traditional knowledge); and local pride in visible recovery.

6. Conclusion

“We are restoring the land—and our way of life with it.” — Pastoralist & farmer joint committee

Agroecology in drylands works because it stitches mosaics into functioning systems—and because it re-stitches people and land. The survey and pipeline show the same bundle logic everywhere (FMNR + soil–water harvesting; adaptive/mobility-based grazing with mapped corridors and pacts; reseedling/fodder banks; diversified agroforestry) and they show who makes it work: pastoralists who keep herds moving under recognised rules, smallholders who manage trees and soil moisture, and women and youth who run nurseries, seed/grass enterprises, restoration crews and processing.

This is people-centred by design. Co-design with communities and customary institutions anchors calendars, pact clauses, and species/seed choices in Indigenous/traditional knowledge—giving measures legitimacy, reducing disputes, and protecting dignity and identity. When access is recognised (corridors and reserves mapped, tree and grazing rights clear) and finance is long-horizon with fast, fair payment, uptake accelerates, maintenance holds, and local pride grows alongside canopy cover and forage.

Agroecology therefore advances nature, climate, land—and society in one move: it restores habitat structure and connectivity (GBF-T2), stabilises production and buffers drought (NDCs), reverses degradation (LDN), and strengthens the social contract through recognised mobility, fair markets, and visible roles for women and youth. Evidence can stay simple and community-owned: a single seasonal mosaic narrative that captures land recovery and shared stewardship, reported once and reused across frameworks.

The next steps are clear: back locally led bundles, lock in access, fund for time, and centre people. Use the survey-aligned enablers to remove known blockers; replicate the strongest pipeline cases; and keep one evidence system that speaks equally to ecological recovery and human dignity. That is how agroecology scales—as an all-of-society project that repairs landscapes and relationships at the same time.

Acknowledgements

This discussion paper was developed with the support of the French Development Agency (AFD), whose commitment to sustainable land restoration and agroecological transformation in Africa has made this work possible.



References

- Oberč, B. P., & Arroyo Schnell, A. (2020). *Approaches to Sustainable Agriculture—Exploring the pathways towards sustainable food systems*. Gland/Brussels: IUCN.
- Convention on Biological Diversity (CBD). (2022). *Kunming–Montreal Global Biodiversity Framework*. Montreal: Secretariat of the CBD.
- UNCCD. (2017). *Scientific Conceptual Framework for Land Degradation Neutrality (LDN)*. Bonn: United Nations Convention to Combat Desertification.
- UNCCD. (2024). *Global Land Outlook—Thematic Report on Rangelands and Pastoralists*. Bonn: United Nations Convention to Combat Desertification.
- UNCCD. (2022). *PRAIS4 Reporting Manual (Performance Review and Assessment of Implementation System)*. Bonn: United Nations Convention to Combat Desertification.
- WWF. (2024). *Food Forward NDCs: Mainstreaming agroecology principles for food governance*. Gland: WWF International.
- Biovision Foundation; WWF; Global Alliance for the Future of Food; Alliance of Bioversity & CIAT. (2024). *Boost NBSAPs through Agroecology: A crucial approach to comprehensively meet KMGBF targets*. Zurich/Gland.
- CIFOR–ICRAF. (2025). *Regreening Africa—Project Brief*. Nairobi: CIFOR–ICRAF.
- Regreening Africa. (2022). *Kenya Country Overview (2017–2023)*. Nairobi: Regreening Africa.
- Trees for the Future. (2023). *Forest Garden—Technical Manual for Trainers*. Silver Spring, MD: Trees for the Future.
- World Bank. (2022). *Burkina Faso—Communal Climate Action and Landscape Management Project (P170482), Project Appraisal Document*. Washington, DC: The World Bank.
- Global Landscapes Forum. (2021). *Dryland Sustainable Landscapes Impact Program—White Paper*. Bonn: GLF.
- Global Alliance for the IYRP. (2024). *IYRP Newsletter—International Year of Rangelands and Pastoralists (2026) update*.