Northern Uganda Resilience Initiative (NURI)

Resilience Design (RD): lessons in infrastructure, water management and food forest activities

Northern Uganda Resilience Initiative (NURI) was a four-year programme (2019-2022) financed by Denmark's Ministry of Foreign Affairs as part of the Uganda Country Programme.

The aim of NURI was to enhance the resilience and equitable economic development in supported areas of Northern Uganda, including for refugees and refugee-hosting communities.

NURI was implemented in 13 districts in Northern Uganda and focused on three areas:

- Climate Smart Agriculture (CSA)
- Rural Infrastructure (RI)
- Water Resources Management (WRM)

Approximately 30% of activities were in refugee hosting areas.

NURI achievements, challenges and lessons gathered from implanting partners' reports, external assessments and learning and reflection workshops, are contributing to knowledge and learning on Resilience Design (RD), amongst other topics. This note aims to highlight lessons which are of interest to others implementing, or planning to implement, programmes integrating RD.

Integration of Resilience Design in NURI

RD is the planning and designing of the built environment to sustain under the probable impact from progressive climate change and episodic natural disasters.

In NURI the RD approach incorporated designs responding to the environment, hydrological behaviour within micro-catchments and the ecology of project areas. The aim being to contribute to reduced soil erosion, build healthy, water-retaining soils and regenerating local biodiversity for long-term landscape resilience and replenishment of natural resources.

Rural Infrastructure (RI) and Water Resource Management (WRM) activities under NURI aimed to improve farmers' access to markets and enhance the resilience of agriculture-related water infrastructure. Major activities implemented were the construction of community access roads, water structures including ponds and spring protection, food forests and tree growing, as well as upgrading local markets. Water activities were concentrated in eight micro-catchments selected by the Ministry of Water and Environment (MWE), and based on plans developed by the Upper Nile Water Management Zone (UNWMZ) under MWE.

A labour-intensive Cash-for-Work approach was used, wherever possible, offering opportunities for communities to earn income, as well as to form user groups for the maintenance of created assets.

NURI, through its implementing partner, Danish Refugee Council (DRC), piloted, tested, and adapted RD approaches to build climate-smart rural and water infrastructure. Implementation included draining water from roads into agricultural production, including permaculture garden demonstrations, and the introduction of Food Forests to replace the woodlot concept which was implemented in earlier programmes.

NURI worked with Parish Development Committees to revalidate Development Plans and prioritize projects suitable for implementation. Selected projects went through technical screening, and investment plans were developed and approved at the district level. Community groups were formed, with a large segment of youth (58%), trained and provided with tools. These groups participated in the implementation of 1,504 projects. Reduction in time and cost of transporting goods to market was reported by 86% of stakeholders.

RD was introduced during the second year of implementation, with training of relevant District Local Government (DLG) and project staff. Throughout implementation RD approaches were further tested and adapted. Many projects were interconnected, for example, with soil and water conservation linked to recharging springs, water from road drainage structures feeding into small dams, and dams built to protect roads from damage by heavy rain episodes.

Bapaa Spring, Terego District, Uganda

Resilience Design in infrastructure

Community Access Roads and Green Roads for Water

Resilience design includes road-water harvesting and management through bioswales, infiltration pits or silt traps, mitre drains, scour checks and tree and grass planting as appropriate. Also borrow pit management, and where possible conversion to water storage. Bioswales constructed to reduce flooding of roads provide fertile soils and moisture for permaculture. Bioswales also limit erosion on roadsides. There are examples of community replication of bioswales in their farmlands.

Food forests

Resilience design involves multi-species tree and shrub planting, including fibre, fuel, food, fodder, medicinal and nitrogen-fixing species. Food forests include soil and water harvesting and management with structures such as bioswales, infiltration pits/silt traps, smile berms and farmer-managed natural regeneration (FMNR) of trees on the site.

Protected Spring

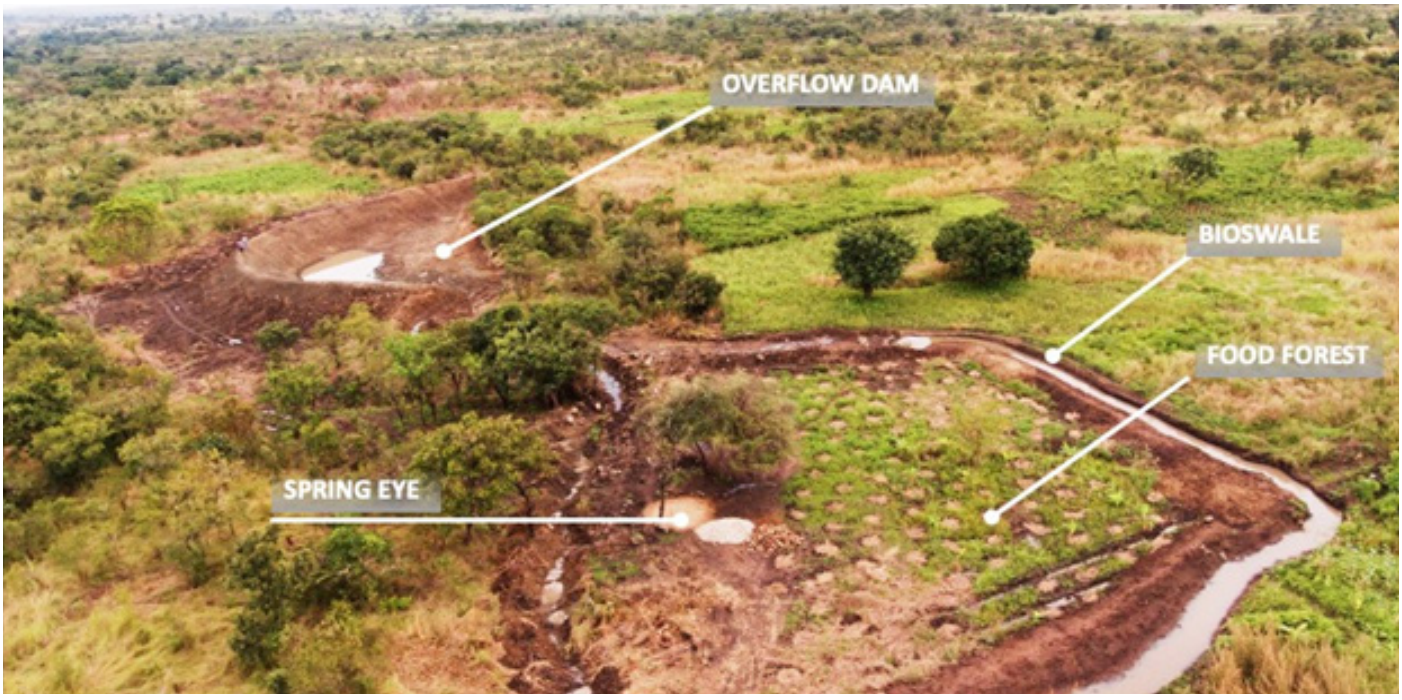
Protected springs are constructed at sites of natural springs, with sufficient water flow to justify investment in spring improvement. RD includes the establishment of water recharge systems, including bioswales and road water harvesting systems and infiltration pits/silt traps. Depending on the site, further interventions included stone-works such as check dams and one-rock dams as well as extensive planting of trees and ground cover to protect earthworks and stone-works.

Soil and Water Conservation Structures

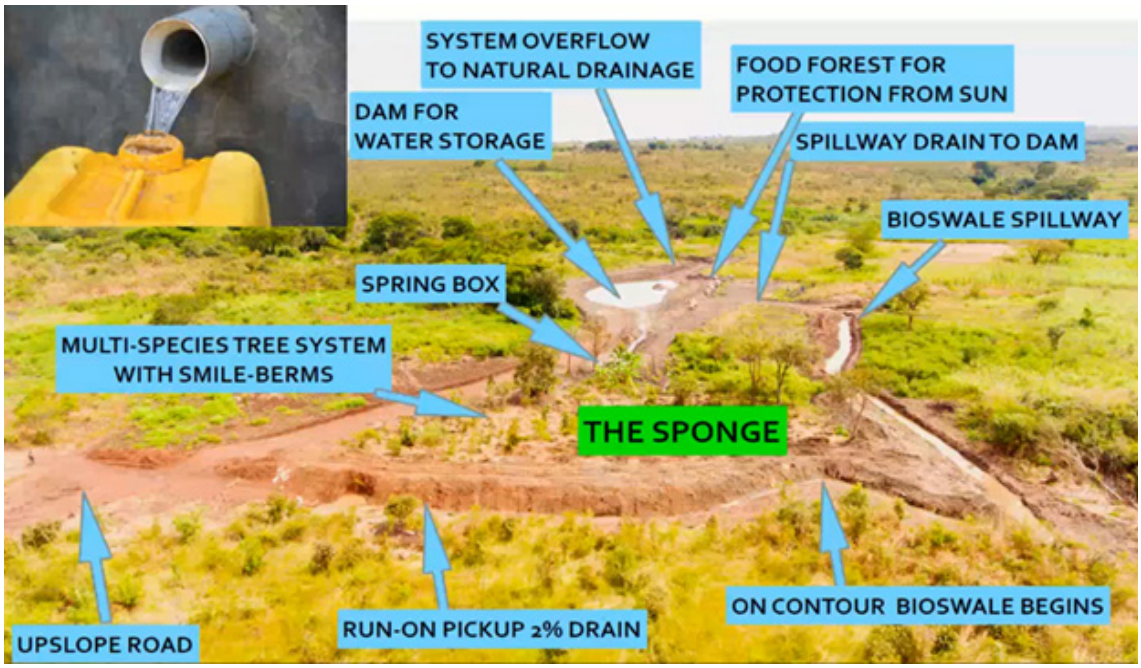
These were, in most cases, implemented as part of other WRM projects. Soil and water conservation structures include bioswales, infiltration pits, bench terracing, gully plugging, one-rock dams, slope management and tree and vegetation establishment. Soil and water structures also included riverbank restoration or protection, with RD in this case including training the river course, excavation of catch drains and bioswales, and planting of trees and deep-rooted vegetation to stabilize river embankments.

Water Ponds

RD includes excavation of ponds, extending catchment areas using bioswales, smile berms to encourage vegetation growth, and shallow infiltration pits and check dams, as well as protection of embankments through the establishment of trees, and deep-rooted grasses.



Spring/Ground Water Recharge – Water Management a round a spring source – Pakele Sub-County, Adjumani District, Uganda



Spring-Protection and Hydrological Recharge - Bapaa Spring, Terego District, Uganda

Lessons Learned

1. RD in rural infrastructure activities offers greater sustainability of infrastructure investments in the face of climate change. However, successful implementation requires substantial planning, technical and financial resources, as well as community engagement.
2. Implementation of RD required programme flexibility and adaptability, as by its nature, RD is context specific and is implemented in dynamic and unpredictable environments.
3. Time spent on community awareness of Resilience Design concepts and understanding, as well as integration of local interests and adaptations is important for ownership. Community ownership is a prerequisite for the maintenance of RD structures and vegetative interventions, including protecting sites from livestock and fire.
4. Almost all RD structures include tree growing, whether around dams, above protected springs or along roads. To ensure community engagement tree growth must take account of community interest and ensure ownership and user arrangements.
5. Community and local government participation in dialogue meetings prior to the start of activity implementation minimises land conflicts and complications during implementation. Land conflicts are the greatest risk to the implementation of projects, and most RD projects require land beyond the actual infrastructure, for example, for soil and water conservation structures.
6. Larger projects, combining a range of resilience design structures can have real impact on water holding capacity of the landscape, recharging water ecosystems, recharging springs and ponds, and reducing run-off and the destructive effects of surface water runoff to roads and landscape.
7. Infrastructure integrating RD is best implemented with a combination of construction equipment and community cash-for-work, and cannot realistically be implemented through cash-for-work alone.
8. Rural and water infrastructure activities integrating RD require sequencing of roll out, considering periods of rainfall, and the time needed to establish vegetation protecting the infrastructure from weather events and livestock.
9. Impacts of RD take time to establish and become apparent, and may appear after the end of the programme. Once established, however, the impact can continue to grow as natural resources regenerate. Community acceptance therefore requires investment in awareness creation, knowledge and understanding.
10. Actively targeting refugees when recruiting staff is highly appreciated and creates good will within the refugee community.

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