



Drylands Natural Resources Centre is a cooperative, community-based organization that trains and coordinates over 400 dryland farming families in managing their natural resources, restoring ecosystems, and generating income through agroforestry.

Background

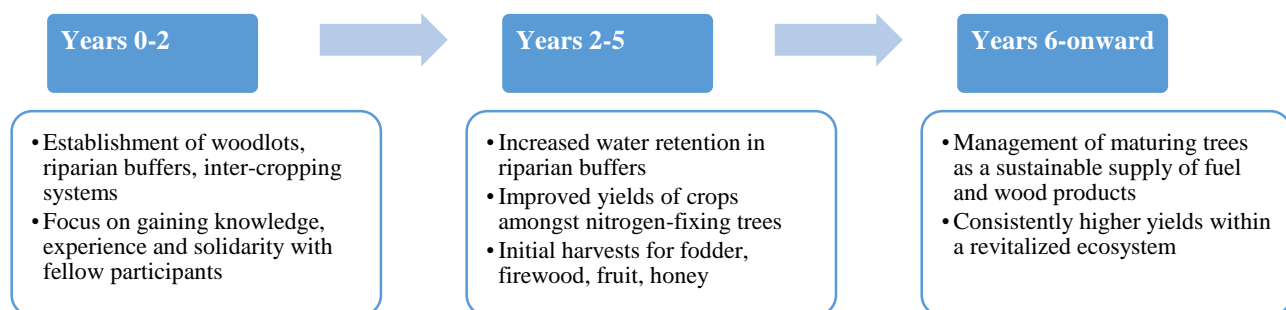
Founded and led by Kenyan national, Nicholas Syano, Drylands Natural Resources Centre (DNRC) equips subsistence farmers in drylands to restore their degraded lands and address the challenges of deforestation, falling crop yields, and climate change. As demand for firewood has increased with population pressure and as agricultural productivity has declined due to climate stress, farmers have been forced to over-exploit their farmland and adjacent forests. These lands have historically stabilized regional soil and water features. The result is soil erosion, nutrient depletion, and diminished water tables—a vicious cycle of environmental degradation and declining agricultural productivity.

DNRC aims to flip these climate-based feedback loops from negative to positive. DNRC delivers an ambitious program of long-term community engagement, in which families restore their land through the application of agricultural and agroforestry best practices that increase crop yield, improve soil and water resources, and generate valuable tree products.

“My own mother and sisters face great hardship because of the extreme firewood shortage and are forced to pay great prices or travel long distances to obtain it. The nearby streams have dried up and the frogs I used to listen to have disappeared. It is all connected. We need to stop this destruction of our habitat and our community” – Nicholas Syano

DNRC currently works with 430 families (about 3,000 people), 90% of which are women-led, across 11 village community groups led by an elected chairperson, eight of which are currently women. Participating farmers are provided with saplings on credit at a subsidized rate from DNRC’s tree nursery, where indigenous drought-resistant tree saplings are grown. To be eligible, farmers must have completed DNRC’s education program, developed an agroforestry plan, and made necessary preparations for receiving saplings. Information and learnings are shared through regular trainings at DNRC’s demonstration farm, focus groups, farm visits, and educational programs run via women’s groups, schools, and youth clubs.

DNRC’s core agroforestry and energy program progresses according to the following timeline:





In addition, the DNRC's agroforestry program is complemented by the following initiatives:

- Income generation: tree and agricultural product marketing and supply chain support via DNRC-coordinated cooperatives
- Addressing water scarcity: 57 rainwater cisterns (10,000-liter capacity) have been installed to provide a secure, long-term source of potable water for approximately 800 people (75% of which are children)
- Enhancing food security: kitchen vegetable gardens feed visitors and staff and provide a demonstration tool for the community, and DNRC works with six schools where students established "food forests"
- Developing small businesses: provide ongoing training in business principles, for selling farm produce and for women-made baskets and other traditional items like beads and carving, which also serves to preserve and employ indigenous knowledge

Impact

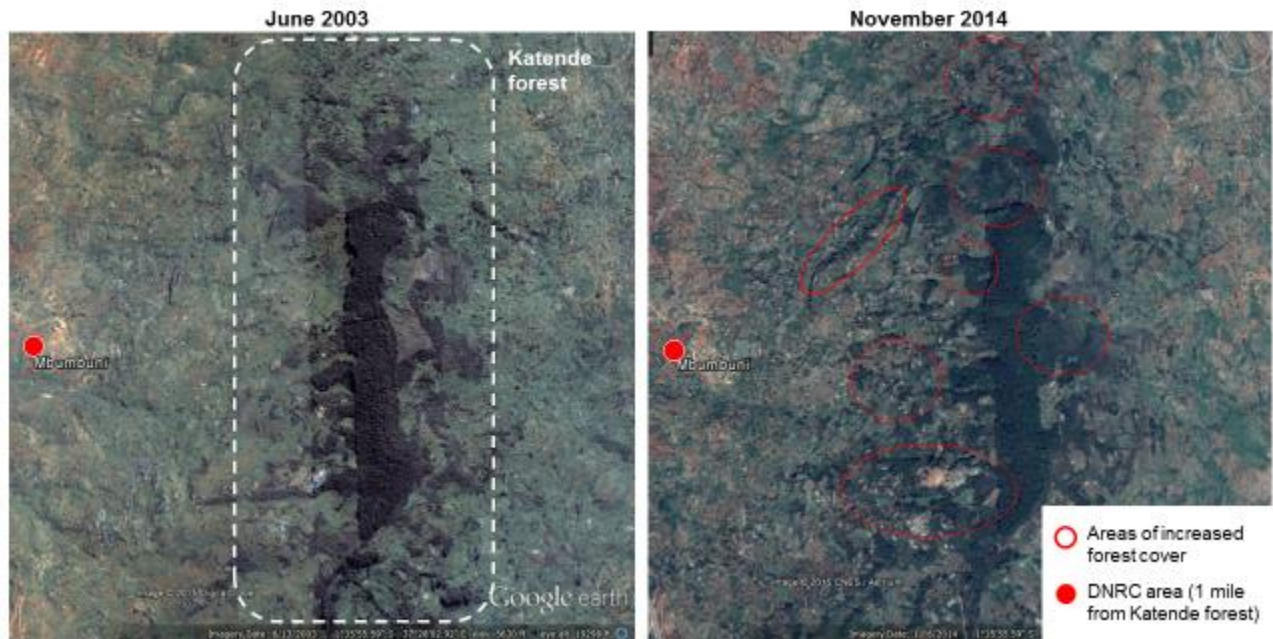
To date, DNRC has planted over 300,000 trees. The survival rate is around 80%, despite frequent droughts. Costs are very low at USD\$10 per person reached and 10 cents per tree planted. DNRC sells surplus saplings to the larger community, which provides revenues for DNRC and contributes to regional reforestation.

DNRC's macro-impact over the years is evident in the expansion of the nearby Katende forest area. Formally under government protection, illegal logging for timber and firewood was prevalent in the past, but now the forest appears to be expanding. DNRC likely contributed to this outcome as farmers now have woodlots for sustainable production of firewood on their farms, thereby disincentivizing "poaching" wood from this protected forest.

How DNRC creates ecological and conservation values

- Bio-diversity and wildlife: there has been an increase in pollinators, beneficial insects, reptiles, birds, and small mammals
- Ecologically-friendly agricultural practices: intercropping and bio-pesticides reduce synthetic input usage
- DNRC's nursery has over 25 different species of trees that are well adapted to semi-arid conditions in eastern Africa and have several beneficial uses (food, shelter, medicine, fuel, water, etc.)
- DNRC's extensive seed bank of locally-collected varieties is valuable from a tree conservation and diversity standpoint, as well as the local knowledge about propagation and sapling care
- Supporting regional reforestation by selling trees to the broader community

Satellite imagery of the Katende forest area – before and after



How DNRC builds resilience and reduce vulnerability to climate impacts

- Building healthy soils and ecosystems which produce more consistent long-term yields and are more resilient to drought and other climate stresses (i.e., pests, crop diseases)
- Income generation for women enhances food security and helps absorb shocks in crop yields
- Water-conserving agricultural practices like water micro-catchments, cover crops, and tree holes treated with biochar
- Water cisterns to increase water availability
- Sustainable firewood and charcoal production from woodlots to reduce deforestation and protect the forests critical to micro-climates and water resources
- Supporting regional reforestation by selling trees to the broader community

Scaling the model

DNRC has learned a great deal over the years about agroforestry and permaculture in semi-arid East Africa through the process of selecting, raising, and monitoring the survival rates and attributes of 100,000s of trees of twenty different native species. This knowledge is critical as there are few institutions committed to supporting dryland communities in combating desertification, drought, and other climate stresses. DNRC is developing what the United Nations identifies as lacking: practical strategies for resource management; more active and environmentally-responsible participation in markets; and bridging the gap between science and development practice.



Knowledge-sharing and research efforts will be the basis of future policy activities that can help scale the program. To this end, DNRC has hosted visits from local government and research institutions and is working to generate peer-reviewed academic publications using the data DNRC have collected. Nicholas Syano is completing his PhD research in Natural Resource Management on DNRC's impact at the University of Nairobi. DNRC has existing relationships with the University of Wisconsin (USA), University of Virginia (USA), and Wageningen University (Netherlands). DNRC also partnered with the Permaculture Research Institute of Kenya (PRI-Kenya), an organization promoting permaculture research and practices, to share learnings across Kenyan NGO and community projects.

To this end, DNRC seeks to build partnerships that will help it refine and scale our model across similar dryland communities in Kenya, East Africa, and beyond.



Founder Nicholas Syano with family



Training at demonstration farm



50,000 saplings in DNRC nursery



1-metre vegetable garden program





Training of boys from local school



Community party



Agroforestry training in outdoor classroom