

**ICRAF SCALING UP INITIATIVE IN TABORA AND SHINYANGA REGIONS:
An Overview**

by

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1.0. Introduction

International Centre for Research in Agroforestry / World Agroforestry Centre (ICRAF) Agroforestry Research Project started in Tabora and Shinyanga in 1986 and 1991 respectively. This was in response to the massive environmental degradation due to deforestation efforts that were geared to the eradication of tse tse flies and quelea birds in Shinyanga region and for tobacco curing in Tabora region. Other problems included declining soil fertility and shortage of dry season fodder for domestic animals.

ICRAF Tanzania project is part of the Southern Africa Development Community (SADC) 'Agroforestry Project for Sustainable Rural Development in the Zambezi Basin', funded by CIDA and covers 5 countries namely Malawi, Tanzania, Zambia, Zimbabwe and Mozambique. Phase II of the project commenced on April 1 2001 and will end on March 31, 2006. The goal of project is to improve living standards of small scale, resource poor farmers by increasing agricultural production and conserving the environment through scaling up adoption of agroforestry technologies and innovations in the Zambezi Basin.

2.0. Location

The project previously was located in two regions at Lubaga centre, 4 km from Shinyanga Town Shinyanga Region and Tumbi Agricultural Research Institute 16 km from Tabora town along Tabora-Urambo road. The SADC/ICRAF project main office is now located at the Zonal Irrigation Office, Kilimatinde road in Tabora Town and has a sub-field office at The Agricultural Research Institute (ARI) Tumbi 16 km from Tabora town along Tabora-Urambo road. The project focal areas for scaling up in Tanzania are Uyui (Tabora rural), Nzega and Igunga districts in Tabora Region, and Shinyanga rural in Shinyanga Region.

3.0. Implementation

The project is implemented in Shinyanga and Tabora Regions by ICRAF, in collaboration with Ministry of Natural Resources and Tourism through Tanzania Forestry Research Institute, Tabora Centre and Ministry of Agriculture and Food Security through the Agricultural Research and Development Institute, Tumbi, other partners include World Vision Tanzania, Sokoine University of Agriculture (SUA), Tanzania Women Leaders in Agriculture and Extension (TAWLAE), Association of Tobacco Traders in Tanzania (ATTT) and District councils of Uyui, Tabora municipality, Nzega and Igunga districts in Tabora Region, and Shinyanga rural in Shinyanga Region.

4.0. Purpose of scaling up

The goal of scaling up is to reach farming families in Tanzania with agroforestry technologies in order to improve food security, eradicate rural poverty and enhance environmental resilience in the region. The purpose is "scale up" to increase the adoption of diversified and improved agroforestry solutions to reach a much wider group of resource poor farmers with a particular emphasis on women farmers at least (40%). The project works directly with farmers and policy makers, in addition the project pursues strategies which "scale out" agroforestry adoption by training, supporting and networking with partner organizations that undertake complementary work on their own, through;

- Creating sustainable networks for dissemination of agroforestry innovations and linking with others working on HIV/AIDS, gender, water and education throughout the region;
- Improving the policy framework for adoption of agroforestry;
- Improving farmer experimentation and participation in agroforestry development, with a special focus on involving women;
- Create sustainable seed delivery systems for agroforestry; and
- Improving the marketing of agroforestry products and services so that greater socio-economic benefits can be derived.

It is anticipated that this will lead to the adoption of agroforestry practices by at least 100,000 farmers across Tanzania by the end of this project period in 2006.

The agroforestry (AF) options being promoted are that

- Contribute to food security
- Improving nutrition
- Alleviation of poverty
- Sustain the environment

Strategy for scaling up

- Identification of constraints in scaling up AF
- Establishment of strategic linkages (*public, private sector and civil society partnerships*)
- Capacity building.
- Resource mobilization.

What are we scaling up

- Rotational woodlot and boundary planting using leguminous trees such as *Acacia polyacantha*, *Acacia nilotica*, *Leucaena* spp, *Acacia crassicarpa*, *Acacia leptocarpa*, *Acacia julifera* and non-leguminous trees such as *Azadirachta indica*.
- Improved fallows using *Sesbania sesban* and *Tephrosia vogelii*, *Tephrosia candida*, *Gliricidia sepium*.

- Improved *ngitiri* (a traditional in-situ pasture conservation system) in agro-pastoral societies of Shinyanga rural and Igunga.
 - Relay cropping
 - Mixed intercropping
- Fodder banks using *Gliricidia sepium*, *Acacia angustissima*, *Leucaena pallida*, *Centrosema pubescens*, *Macrotyloma axillare* and *Macroptilum atropurpureum*.
- Indigenous fruit trees and medicinal trees domestication
- Product development, through the Processing of indigenous and exotic fruits.

Where are we scaling up?

The scaling up areas are the districts of Igunga, Nzega, Uyui, Tabora municipality in Tabora region and Shinyanga rural in Shinyanga region. These districts have 252,004 households with a population of 1,491,242.

Criteria used to select scaling up areas?

These areas were selected due to the prevailing problems of low soil fertility, fuelwood scarcity, deforestation and land degradation. Secondly, the presence of willing collaborating partners, previous agroforestry work and the potential for agroforestry interventions resulting into positive impacts.

What is our guideline to scaling up?

- The national agroforestry strategy for Tanzania and scaling up strategy for Tabora region are guiding our scaling up operations.
- Agroforestry Project for Sustainable Rural Development in the Zambezi Basin, Project Implementation Plan (PIP) for Phase II.
- The agroforestry interventions in these areas include training, participatory planning, exchange visits, establishment of demonstrations, provision of inputs, e.g. seeds, product development and linking farmers to markets.
- We are targeting, farming households, local leaders, teachers in primary and secondary schools, religious leaders, agricultural extension officers, ministry of natural resources, ministry of education personnel, policy makers, and our partners.

The main environmental problems in Shinyanga and Tabora regions.

- Deforestation of natural woodlands due to expansion of farming land, coupled with indiscriminate cutting of trees for tobacco curing and uncontrolled bush fires.
- Severe land degradation due to poor farming practices, resulting in soil erosion.
- Dry season fodder shortage, due to large number of livestock resulting in overgrazing.
- Low farm productivity, due to declining soil fertility.
- Fuelwood shortage.
- Rapidly increasing human population.

Some characteristics of the scaling up sites, in Tabora and Shinyanga regions

Variable	Igunga	Nzega	Tabora municipality	Uyui	Shinyanga rural*
Area (km ²)	4490	9225	1092	14,340	8906
Rainfall (mm)	600-800	700-1000	700-1000	700-1000	450-900
Soil types	Sandy (<i>ferric acrisol</i>)	Sandy (<i>ferric acrisol</i>)	Sandy (<i>ferric acrisol</i>)	Sandy (<i>ferric acrisol</i>)	Shallow red clay (<i>Eutric cambisol</i>) Shallow black cotton soils (<i>vertisols</i>)
Main crops	Maize, Sorghum Millet	Maize	Maize	Maize&Tobacco	Maize, rice, ground nuts, sorghum, cotton, millet
Villages	96	134	24	93	208??
Households	51,176	73,579	38,566	43,166	45,517
Population	325,547	417,097	188,808	282,272	277,518

*Shinyanga rural will be split into two districts.

Why use partners in scaling out?

Agroforestry technologies are knowledge intensive; they require a holistic approach in their transfer. The farmers normally have a wide array of demands that cannot be solved by agroforestry alone. In order to solve some of the farmers needs, there is need to build partnerships among a range of stakeholders and ensure that farmer's interests are taken care of. Mechanisms that enable researchers, government extension officers and partners NGOs and private enterprises are needed to disseminate these technologies.

Why partnerships and networking?

- Organisations rarely achieve their development goals on their own, partnership facilitate the achievement of the goals when efforts and resources are pulled together.
- It enhances organisation learning as it enables sharing of information, skills, experiences, lessons and opportunities.
- Local and national capacities are built, which increases the sustainability of programmes and projects.
- The overall efficiency of scaling up the use of AF technologies and innovations is increased.

Who are our partners?

We are collaborating with the following partners:

- Ministry of Natural Resources and Tourism.
- Hifadhi Ardhi Shinyanga (HASHI).

- Ministry of Agriculture and Food Security- National Agricultural Extension Project (II) – Shinyanga region.
- Ministry of Agriculture and Food Security- National Agriculture Extension Program – Tabora region.
- Tanzania Forestry Research Institute (TAFORI).
- Tumbi Agricultural Research Institute.
- Tabora Development Foundation Trust (TDFT)
- Sokoine University of Agriculture-Faculty of Forestry and Nature Conservation.
- World Vision Tanzania, Nzega.
- Tanzania Women Leaders in Agriculture and Extension (TAWLAE).
- Catholic Church (CARITAS) Shinyanga.
- Moravian Church in Western Tanganyika (Development Projects Department) – Tabora.
- VI Agroforestry Project Musoma.
- VI Agroforestry Project Mwanza.
- Association of Tobacco Traders in Tanzania (ATTT).
- AFRICARE.
- Mogabiri Extension and Training Centre.
- Buhemba Rural Agricultural Training Centre (BRAC)
 - District councils of Uyui, Tabora municipality, Nzega, Igunga, Shinyanga rural.
 - Tabora NGO Cluster (HIV/AIDS).
 - Small Scale Industry Development Organisation (SIDO).
 - MVIWATA (Network of farmer groups in Tanzania).
 - Ministry of Education in Nzega, Igunga, Uyui, Tabora municipality, Shinyanga rural.
 - Heifer project international.
 - Golden Pride Project (Resolute Tanzania Ltd).
 - PELUM Tanzania.

5.0. Achievements 2002-2003.

5.1. Planning with partners

- Conducted planning meeting with stakeholders in Uyui, Nzega, Igunga and Tabora municipality and produced scaling up plans for 2003 –2004. At these meetings major problems, potential solutions, species and technologies preferred were presented.
- In August 2003, we conducted sensitization meetings on agroforestry activities in the following villages, Ndono, Isila, Ibiri, Ufuluma, Majengo, Ikongolo, Magiri, Isikiziya, Kigwa, Isenga, Inonelwa of Uyui and Tabora municipality, a total of 677 (475 men, 113 women) farmers attended these meetings. Most of the farmers were interested in soil fertility replenishment technologies.

5.2. Production of training and extension materials

Production of training guide in Swahili

- A draft-training guide in Swahili for Training of Trainers (TOT) "*Mwongozo wa mafunzo kwa viongozi wa vikundi vya wakulima*", is ready and is being tested, by TOT. So far 10 extension staff from Nzega have used this guide in their training of farmers. Plans are underway to test this guide in other districts and to finalize this training guide.
- Draft booklet on *Gliricidia sepium* in Swahili is now ready and being tested. Other booklets on *Acacia crassicaarpa*, *Moringa oleifera*, *Leucaena pallida* and *Sesbania sesban* are being developed.

Guides for tree management on farms

- We have produced a draft management guideline for *Acacia crassicaarpa* on farms, and finalizing the draft on Rotational woodlot manual.

5.3. Capacity building

Level 1. Training of change agents includes teachers and village leaders.

- Conducted training for 9-village extension facilitators (VEF) from world vision Nzega in April 2003, Tumbi.
- Conducted training of 326 community development facilitators (CDF) in Mwakalundi division in Nzega, April 2003.
- Conducted training of 225 farmers, teachers and local leaders trainers (10% women). For each village we selected 2 teachers (environmental and head teacher, and local leaders, the rest were farmers) each should train at least 10 farmers. Igunga July-August 2003.

Level 2. Direct farmer training and farmer groups.

- Conducted training in rotational woodlots and nursery establishment for 13 farmers from Urambo and Uliankulu primary cooperative societies in November 2002.
- Conducted training on agroforestry technology and processing for 32 members (5 women and 27 men) of Undomo Fisheries Cooperative Society and Isanzu ward in Nzega, in collaboration with Ministry of Natural Resources and Tourism.
- Conducted training on Agroforestry technologies and nursery management for, 8 (6 men, 2 women) members of Jitume group, at Izimbili, May 2003.
- Conducted training on budding and grafting for 36 farmers (26 male 10 female), from Tumbi, Mbola, Farm Nyamwezi, Igagala, Singidandogo villages, at Tumbi, June 2003.
- In collaboration with Tabora Municipal Council, conducted training of trainers course on fruit processing for 28 women. April 2003.
- In collaboration with HASHI conducted training for 9 farmers from Shinyanga in processing of indigenous and exotic fruits at Tabora.
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Level 3. Training of agriculture extension staff and partners' staff.

- Conducted training of 16 (14 men 2 women) agriculture extension officers from Uyui district, June 2003.

Level 4. Farmer to farmer training and exchange visits between farming communities.

- Farmer tours of on station and on farm exchange visits have been conducted in farmer's fields in Mpenge and Mbola and on station at Tumbi. 50 farmers (31 men and 19 women) participated in the exchange visits in the first quarter of 2003.
- In collaboration with World Vision and Education department Nzega and Igunga, 26 primary school teachers and 6 farmers trainers (1 from Nzega and 5 from Igunga), participated in a study tour to Shinyanga, and visit to MUVI WASHI, which is a network of farmers in Lubaga, involved in fodder banks and dairy animals.

Individual scientist training

- Mr. G. I. Nyadzi joined the University of Wageningen in the Netherlands in April 2000 for his Ph.D. studies. His work involves nutrient dynamics studies on the rotational woodlot technology at the ICRAF site in Tabora, Tanzania. He is now in the final stages of writing his Ph.D thesis.
- Mr. R. B. Msangi joined Sokoine University of Agriculture for his Ph.D. studies on utilisation of leguminous fodder browses by dairy cattle.

5.4. Establishment of Demonstration Plots

- We established 15 demonstration plots in schools, 3 demonstration plots on farmers fields in Igunga, Nzega and Uyui districts, and 2 demonstrations at Tumbi station. These are currently being used as centers for learning.

5.5. Sustainable germplasm supply

Establishment of seed orchards

- We have established seed orchards in Kipera (farmer), Tumbi (on station), Mbola (farmer) and Urambo (partner) using 10 Australian acacia species obtained from CSIRO in species screening trials. These species screening trials will be later rouged into seed orchards. Other seed orchards and seed production areas have been established in schools Nzega (5) Igunga (5), and Uyui (8) districts and farmers fields, Nzega (3), Igunga (1).

Procurement of seed

- 75.2 kg of seed were procured from the National Tree Seed Center, Morogoro. Species include: *Afzelia quanzensis*, *Albizia lebbeck*, *Acacia Senegal*, *Senna siamea*, *Acacia polyacantha*, *Grevillea robusta*, *Eucalyptus camaldulensis*, *Balanites aegyptica*, *Pterocarpus angolensis*.
- *Tephrosia candida* and *T. vogelli* seed were obtained from Chipata, Zambia and *T. candida* from Maseno, Kenya. These species will be tried in improved fallow plots in schools and farmers field in Nzega, Uyui, Tabora and Igunga districts, this season.
- To date 231.1 kg of seed have been procured from farmers. Species include: *Terminalia sericea*, *Albizia lebbeck*, *Acacia angustissima*, *Acacia crassicarpa*, *Vitex mombasae*, *Vitex doniana*, *Adansonia digitata*, *Flacourtia indica*, *Scelerocarya birrea*, *Securidaca longipedunculata*.

Seed distribution 2003-2004

- In July and August 2003, 135 kg of seed for high value timber trees, fuelwood species, improved fallow, fodder and fruit trees were distributed to 27 schools, 33 farmers and 25 farmers groups in Nzega district. Species included *Azalia quanzensis*, *Albizia lebeck*, *Acacia Senegal*, *Senna siamea*, *Acacia polyacantha*, *Grevillea robusta*, *Balanites aegyptiaca*, *Pterocarpus angolense*, *Terminalia sericea*, *Acacia crassicarpa*, *Acacia angustissima*, *Leucaena pallida*, *Gliricidia sepium*, *Sesbania sesban*, *Vitex doniana*, *Vitex mombasae*, *Sclerocarya birrea*, *Flaucortia indica*, *Adansonia digitata*, *Parinari curatelifolia*. The seed has been sown in the nurseries, for the next season's planting in November 2003.
- In August 2003, 144 kg of seed was of high value timber trees, fuelwood species, improved fallow, fodder and fruit trees were distributed to 18 primary schools, 197 farmers, 1 secondary school and 1 farmer group in Igunga district. Species included *Azalia quanzensis*, *Albizia lebeck*, *Acacia Senegal*, *Senna siamea*, *Acacia polyacantha*, *Grevillea robusta*, *Eucalyptus camaldulensis*, *Balanites aegyptiaca*, *Pterocarpus angolense*, *Terminalia sericea*, *Acacia crassicarpa*, *Acacia angustissima*, *Leucaena pallida*, *Gliricidia sepium*, *Sesbania sesban*, *Vitex doniana*, *Vitex mombasae*, *Sclerocarya birrea*, *Flaucortia indica*, *Adansonia digitata*, *Parinari curatelifolia*.

Nursery establishment

- In order to sustain availability of seeds and seedlings to farming communities, ICRAF has been encouraging and training farmers to establish their own nurseries. During 2002/2003 cropping season a mini survey of nursery operators was carried out in Uyui, Tabora and Igunga districts. It was found that 107 nurseries were operational, Uyui 30, Tabora municipality 36, Nzega 32 and Igunga 6. Most of these nurseries were located near water sources of wells and valley bottoms. Individual farmers or farmer groups, district councils and schools were managing these nurseries. Problems encountered in these nurseries include, lack of polythene tubes, lack of watering cans, damage of seedlings by chicken, rats, cutworms, caterpillars, grasshoppers and termites, fungal diseases, theft of seedlings, lack of water, saline water at some sources (Igunga), labour shortage during watering, poor germination of tree seed, lack of markets for tree seedlings and generally lack of technical know how. These nurseries have received tree seeds, and technical backstopping form ICRAF staff. We are planning to establish 1000 nurseries and also offer training in nursery establishment and management in target districts by 2006.

Seedlings planted this season

- During 2002-2003 seasons, 31,267 seedlings were distributed and planted in schools in Nzega 5, Uyui 8, Igunga 5 and farmers in Nzega 3, Uyui 72 and 1 Igunga and 2 farmer groups in Uyui.

5.6. Adaptive and applied research

Domestication of fruit and medicinal trees and product development

- The evaluation of Indigenous fruits and medicinal tree germplasm continues, these include range wide collections of germplasm of *Sclerocarya birrea* and *Strychnos cocculoides*.
- The evaluation of medicinal tree species continues, priority medicinal tree species include *Terminalia sericea*, *Albizia anthelmintica*, *Turraea fischeri*, *A. anthelmintica*, *Securidaca longipedunculata* and *T. Sericea*.
- Marketing of indigenous fruits and products continues, we have established collaboration with CP Wild of South Africa to improve the processing and marketing of the various products by women groups.

Diversifying agroforestry technology options

The following trials were initiated and continue on farm and on station.

- Evaluation of *Moringa oleifera* (Lam) (drumstick tree) under various agroforestry systems in Tabora, Tanzania
- Early Performance of Thirteen Provenances of Four Australian *Acacia* Species in Tabora, Tanzania
- Species elimination/screening trial for new introduced Australian acacias
- Evaluation of *Sesbania sesban*, *Acacia angustissima* and *Gliricidia sepium* for Improved fallows technology in Tabora and Uyui Districts, Tabora Region - Tanzania
- Influence on coppicing fallows of *Acacia crassicarpa*, *Acacia angustissima*, *Leucaena pallida*, and *Gliricidia sepium* on maize yield
- Nutrient and water dynamics in rotational woodlots in Tabora
- Patterns of variation in 15N natural abundance and nitrogen fixation in rotational woodlots
- Evaluation of three *Cajanus cajan* accessions for grain production and soil fertility improvement
- Evaluation of the effects of *Centrosema pubescens* and *Macrotyloma axillare* in fallows for soil fertility improvement and grain yield of a subsequent maize crop
- Intercropping pigeon peas [*Cajanus cajan* (L.) Mill spp.] with maize (*Zea mays* L.) for grain production and soil fertility improvement

Species diversification

- We are planning to provide schools and farmers with herbaceous legume species that have been found to grow well in Tabora region and that can be used in improved fallows and also have potential to provide quality fodder, *Centrosema pubescens*, *Macroptilum atropurpureum*, *Lab lab* spp (Mucuna), *Clitonia ternatea*, *Stylosanthes hamata*. Other species are *Tithonia diversifolia* to be used as green manure, especially in biomass transfer and Sun hemp (Maregea) for soil fertility improvement. These species will be promoted in schools and farmers fields as part of species diversification.

5.7. Resource mobilization

With partners

- In April 2003, we responded to a request to submit proposals to FARM Africa: We mobilized our partners (ART Tumbi, TAWLAE, SIDO, Districts Councils) and developed and submitted 7 concept notes. Our efforts did not go to waste as our

concept note on "*Introduction of indigenous fruits processing technology to rural community in Kibondo and Sikonge districts of Tanzania*" was accepted and a full proposal was requested for submission. The proposal was submitted to FARM Africa on 16 May 2003. This proposal has been accepted and is in its final stages to be funded to the tune of US\$50,000 dollars.

Farmers empowerment

- In March 2003, the Canadian High Commissioner to Tanzania visited the project sites in Nzega and Tabora. She was very impressed with our work. We submitted to her a concept note on Accelerating Impact of Agroforestry Technologies on Smallholder farmer livelihoods in Tanzania for possible funding. After this visit, a farmer Mr Hamza from Mbola went to Dar es Salaam and sought an audience with the Ambassador. Mr. Hamza accompanied by his local member of parliament met the ambassador. The ambassador promised them support if they could form a village association and advised them to come to ICRAF to help them organize themselves and write a proposal for funding. We have had meetings with Mr Hamza and we are helping him achieve his dream of getting funding for his village. This is what we call farmer empowerment, as the farmer took over and started resource mobilization by himself.

6.0. Constraints to scaling up

- Lack of adequate human and financial resources for agroforestry research and development activities.
- Lack of adequate dissemination channels
- Inadequate training of farmers and extension agents
- Inadequate coordination of research and development activities
- Lack of awareness among stakeholders and farmers
- Human and financial resources
- Very few partners, unreliable and incapable
- Long distance between sites
- Inadequate availability of quality germplasm
- Drought
- Policy conflicts

7.0. Sustainability

- Involvement of farmers in planning and implementation at grassroots
- Capacity building at all levels.
- Establishment of demonstrations in villages
- Training of farmers as trainers

8.0. Lessons learnt

- Continuous engagement with partners and continued planning
- Activities that generate income and diversification
- Need for farmer responsive technologies
- Working at grass root level
- Follow up

9.0. Future plans

- Forging stronger partnership
- Resource mobilisation
- Diversify options for farmers.
- Product quality improvement and marketing with CP Wild
- Formation of consortium for scaling up in Tanzania.
- Developing system of M+E and impact assessment
- Synthesis of experience