

TAFORI NEWSLETTER

TAFORI Newsletter is produced twice a year. The following are abstracts from TAFORI Newsletter, Vol. 1-5. Full text of the articles can be obtained from the Director General.

Newsletter Volume 1 No. 2, 2000

1. **Mathias, S.C. 2000. Preliminary results for ex-situ gene conservation seed stands in Tanzania.**

Abstract

Ex-situ Gene Conservation seed stand trials were established in 1981/82 in isolated areas at Ruvu, Kwamkuranga, Buhindi and Urunwa, Tanzania. These trials received intensive silvicultural treatments in order to maximize quality of seeds, and were assessed annually to monitor survival, growth rate and seed yield.

Preliminary results reveal that most of the tree species tried in these ecological zones are growing well depending on site quality. Initial seed crop estimates show yield of about 50 kg/ha of *Eucalyptus tereticornis* seed at Kwamkiranga, 1.25 kg/ha for *Pinus caribaea* in all sites and 2.0 kg/ha of *Pinus patula* var. *tecunumanii* at Ruvu. The low production quantities are expected to change as the stands mature. This is subject to verification by future assessments.

2. **Mbwambo, L. 2000. The growth of Muninga *Pterocarpus angolensis* (Cuttings) in a tree increment plot at Ndala Tabora, Tanzania.**

Abstract

Miombo Woodlands are among major sources of valuable timber tree species in Tanzania. This type of forest supply logs to the saw milling and pit sawing industry. Muninga is one of such fine timber tree species. The Ndala Muninga tree increment plot was established in 1930 in mission grounds using cuttings.

Data collection was carried out sporadically and this paper presents an analysis done at the age of 62 years. Total basal area of 2.85m²/ha and mean diameters at breast height of 43.3 cm were recorded. Current annual increment varied from 0.061 m²/ ha (32 years) to 0.036 m²/ ha (58 years), corresponding mean annual increment varied from 0.072 to 0.036 m²/ ha.

3. **Mndolwa, M.A. 2000. Preliminary observation on nursery performance of *Dalbergia sissoo* under different potting mixtures at Kibaha, Tanzania.**

Abstract

The African blackwood tree *Dalbergia melanoxylon* (Mpingo) is ecologically and economically a very important component of much of African woodland. At up to US \$ 18,000 per cubic metre, timber from this species probably commands the highest price of any timber in the world. Poor management has made Mpingo woodlands face a considerable decline. The utilization of this species and consequent depletion of stocks has been closely linked to international demand primarily for musical instrument manufacture. Tanzania's Mpingo woodlands generally face this scenario.

The genus *Dalbergia* consists of 100 to 300 species distributed throughout the tropical and subtropical regions of the world. Some are shrubs or lianas, but most are trees. The best-known arboreal members of

the genus are commonly known as “rosewoods”. Native to Africa, South Asia, Southeast Asia, the Amazon and Central America, the rosewoods are highly valued timber species prized for furniture, penelling, carvings and musical instruments as well as construction timber and tool handles. Wood colour varies from black, brown, purple to red, orange or yellow. The wood is fragrant, elastic, durable and extremely strong (Roshetko and Westley, 1994).

As *D. sissoo* has relatively faster growth than *D. melanoxylon*, establishment of *D. sissoo* woodlots as a substitute for Mpingo would go over the problem of over exploitation. In 1993 two seed lots were imported from Nepal as a pioneering attempt.

4. **Msangi, T.H. 2000. Forest genetic resources of Tanzania.**

Abstract

Forest genetic resources of Tanzania occur in montane areas, lowland and wooded savanna and coastal areas. There are a number of species which are characteristic to each ecosystem and most of them have various uses. Such valuable tree species are heavily exploited but since some of them compare closely with industrial plantation species raised in the country, they should be included in afforestation programmes.

Antiaris usambarensis, for instance, attains 30 cm DBH in about 25 years; while *Khaya anthotheca* grows that big in only 21 while *Khaya anthotheca* grows that big in only 21 years. Thus saw-logs production from these species needs a rotation age of about 25 to 30 years. This is similar to that of pines and cypress from industrial plantations.

The current trend in the utilization of the resources is over exploitation of tree species which are popularly used for construction and fuelwood. The gene pool has more to offer but only about 270 tree species known) are generally used (Bryce, 1967, Iversen, 1991).

The qualities of the lesser marketable species must be documented and popularized as alternative tree species. The already threatened species should be propagated rapidly and introduced in plantations, farmlands, open gaps, arboreta and botanic gardens.

Newsletter Volume 2 No. 1, 2001

1. **Nshubemeki. L., Chamshama. S.A.O., Sabas.E. and Mhando. L. 2001. Forestry research in Tanzania: The way forward.**

Abstract

The question of sustainable management of forests and other related renewable resources is increasingly becoming a key concern in our daily lives since, it is clear than ever that the human race will continue to depend on these resources for survival. The challenge is therefore how to manage Tanzania’s forest resources as a national heritage on an integrated and sustainable basis to optimize their environmental, economic, social and cultural values. However, forest values go beyond national boundaries. The concerns expressed at the UNCED conference in Rio and subsequent international concerns on forests are just a few examples. National concerns on sustainable forest management (SFM) should lead to regional and finally, global efforts.

In this short brief, an attempt is made to point out some local forest research efforts towards supporting SFM in Tanzania.

2. Hamisy, W.C. 2001. Stem debarking on *Ocotea usambarensis* in Lushoto, Tanzania.

Abstract

Stem debarking by local people on *Ocotea usambarensis* in a trial plot established by recording the damaged trees and estimating the portion of the tree girth debarked. About 24 percent of the trees in a 0.64 ha. plot was barked. In the big tree class (>41 cm dbh), trees were more debarked than the middle dbh class (21 – 40). Smaller trees (1 – 20 cm) were least debarked. The proportion of debarking was between one – quarter to half girth. Bark closure was observed. However, bark wounding created the entry point for heart rot fungi, which in the long run may lead to rotting and ultimately dying of the effected trees. More research to quantify the actual impact of bark peeling on *O. usambarensis* in the Usambaras, and its planting on farmlands is recommended.

3. Hamisy, W.C and Mathias, S. 2001. Survival and growth of tree *Liquidambar styraciflua* provenances at Lushoto, Tanzania.

Abstract

A *Liquidambar styraciflua* trial involving provenances from Honduras, Guatemala and Mexico was established at Lushoto, Tanzania in 1987.

Thirteen years after planting, all provenances recorded over 50 per cent survival and mean height 18.3 and dbh 12.9 cm for the best provenances between the provenances in all the parameters assessed. As a result the Guatemala and Mexico provenances are recommended for planting in Lushoto. However, due to slow growth rate, the species may not attract preferences in plantation forestry and more research to examine its performance on the sites and for other end uses (on farm planting) is recommended.

4. Mbwambo, L and Mbwiga, G. 2001. Botanical survey in the miombo woodlands: A case of Urumwa and Igombe Forest Reserves, Tabora.

Abstract

A botanical survey was carried out in Urumwa and Igombe Forest Reserves between August 1998 and December 1999 as part of training for local collectors. A total of 68 plant specimens were collected and identified at species level. These species belonged to 32 different families. Two of the collected species, *Pseudolachnostylis maprounelifolia* (*Euphorbiaceae*) and *Diplorhynchus mosambisensis* (*Apocynaceae*) are endemic to the miombo woodlands of Southern Africa. Recommendation is made for an intensive botanical survey.

5. Mwihoneke, S.T. and Mwang'ingo, P.L. 2001. A note on the abundance of earthworms and myriapods in Lushoto Arboretum, Tanzania.

Abstract

Afforestation has been going on in Tanzania since 1950's. According to the tree seed ordering and distribution records at the Lushoto Silviculture Research Centre, seed of more than 600 tree species have been received and distributed in various part of the country. About 75 per cent of the tree species are exotics and out of these, the most commonly planted on large scale commercial plantations are *Pinus patula*, *Cupressus lusitanica*, *P. caribaea*, and *Tectona grandis*. Others include *Grevillea robusta*, *Acacia mearnsii* *Casuarina junghuhniiana*, *Casuarina cunninghamiana*, *Casuarina equisetifolia* and several *Eucalyptus* species notably *Eucalyptus saligna*, are also widely planted on farmlands using different agroforestry practices and combinations with agricultural crops.

In establishing, commercial plantations, large areas of natural forest were cleared and converted into dense plantations. The objective of this was to optimize wood production for pulp and paper mills, timber, poles, bark, etc. While converting natural forests into plantations no attention was paid to the possible impact of the various introduced tree species on biodiversity conservation including soil flora and fauna. This is because in those days, the subject of biodiversity conservation was not accorded widespread emphasis. Today, however, the subject is receiving greater emphasis in afforestation and agroforestry, since the role of many organisms (known and unknown) in the ecosystem has not yet been fully employed. Therefore, unguided interventions imply the possibility of losing some unidentified useful functions. It is therefore important now to carry out research on the role of afforestation and agroforestry tree species on biodiversity conservation.

Soil organisms play a significant role in maintaining the stability and normal functioning of the natural ecosystem. Earthworms for example have their beneficial effects on soil formation and fertility maintenance. They contribute in the decomposition of forest floor litter, hence releasing nutrients tied to various part of the plants. Their burrowing activities into the soil improve water infiltration capacity as well as aeration of the soil, which is important in the improvement of water balances and supply of air to the soil flora and fauna. Burrowing and mixing of soil also brings nutrients closer to plant roots; which is important especially for shallow-rooted agricultural crops. In this note, results of a pilot study at Lushoto Arboretum in the West Usambara Mountains are presented focusing on the abundance of earthworms and myriapods in trial plots of various tree species.

6. Mndolwa, M.A. 2001. Afforestation potentials of *Acacia mangium* in the Coastal lowlands of Tanzania.

Abstract

A sample of 400 trees was measured in four sample plots in a 2 ha stand of an eight year old *Acacia mangium* Willd. Planted at an escapement of 2.5 m x 2.5 m. Height and diameter (DBH) were taken at ages 1,2,3, and 8 years. The species had the highest mean height increment of 2.2 m at 3 years. The average mean diameter up to 4 years was less than 10 cm. At the time of assessment the species had reached mean diameter of 17.4 cm and mean height of 16 m and had good stem form suggesting the suitability of the species for afforestation for the provision of fuel wood and poles. However, more research need be conducted on the species compatibility with other tree and agricultural crops.

Newsletter Volume 2 No. 2, 2002

1. Machimu, Y. G. N. 2002. Information services at TAFORI.

Abstract

In institutions libraries are helpful information sources for researchers, technicians, extension workers and other stakeholders. The information provided by information services in whatever form must in the first place be appropriate and supportive.

Information Services at TAFORI Headquarters and Lushoto Centre got a boost in 1996 when a Finnish Government funded project (Forestry Research Support in Tanzania - FORST Project) was initiated. The FORST Project supported research activities and information services, among others. It strengthened the Information and Documentation Unit at Headquarters and upgraded the library at Lushoto Silviculture Research Centre. This note is aimed at informing potential users, what kind of information services TAFORI can offer.

2. **Msuya, T. S. 2002. Women and plant biodiversity conservation.**
3. **Msuya, T. S., Mndolwa M. A and Sabas, E. 2002. Comparison of indigenous and exotic fruits by number of species, consumption and preference: A case of communities around Ruvu North Forest Reserve, Tanzania.**

Abstract

Household interviews and field surveys were carried out in 4 villages surrounding Ruvu North Forest Reserve to determine the number of species, consumption and preferences of indigenous and exotic fruits. The villages were Msangani, Mwendapole, Yombo and Visiga. The interviews were conducted in 240 households selected at random. A total of 34 edible fruit plant species were identified out of which 15 were indigenous and 19 were exotic. The number of fruits consumed and preferred was also higher for exotics than indigenous fruits. Consumption was 69% and 35% for exotic and indigenous fruits respectively. Preference was 77% for exotic and 18% for indigenous fruits. The differences were mainly due to year round availability of exotic fruits and a general feeling that indigenous fruits are for the poor and children. Differences in number were also considered to have resulted from the tendency of communities adjacent to the Forest Reserve to plant different species and bigger numbers of individual species. Nutritive value of some indigenous fruits is known to be higher than that of exotics. There is a need to promote domestication of indigenous fruits in order to increase their consumption. Such promotion should be associated with ways and means of propagation and improvement.

4. **Mwang'ingo, P. L., Mwihoneke. S. T., Mathias, S. C. and Msuya., T.S. 2002. Growth performance and wood production of four provenances of *Grevillea robusta* at Lushoto Arboretum, Tanzania.**

Abstract

The growth performance of four provenances of *Grevillea robusta* was tested at Lushoto Arboretum, Tanzania. At the age of 7 years, assessment of breast height diameter, height, forking characteristics and wood production was made. The results indicate that provenances 17618 Rappvilles N.S.W Australia and 17611 Tyalgum N.S.W Australia performed the best in all parameters assessed in that order, while the local landrace performed the poorest. Further trials involving more provenances from its natural range and from different parts of Tanzania are recommended. Such trials should also be replicated over different ecological zones in Tanzania.

5. **Mwihoneke. S. T., Mathias, S. C. and Msangi, T.H. 2002. Growth performance of *Cedrela odorata* and *Cedrela mexicana*: Observations from a provenance trial at Longuza Tanzania.**

Abstract

A preliminary report on growth and productivity of *Cedrela odorata* and *C. mexicana* provenances based on thinning at the age of 30 years is given for a trial established at Longuza Forest Project in 1971. Results show that there is a significant difference between provenances in all growth parameters except production of merchantable volume. *Cedrela odorata* provenances from St. Mary District 17a in Jamaica followed by *Cedrela mexicana* from Chiquibil forest in Belize have the highest overall growth and productivity. It is concluded that the trial could provide seed and other germplasm. However, such trials need to be replicated in different sites/locations in order to select provenances that are adapted to varying environmental conditions.

6. **Msuya., T.S., Mndolwa M. A. and Mhando, M.L. 2002. Performance of two *Pinus Caribaea* and *P. Patula ssp tecunumanii* provenances in ex-situ gene conservation stands at Kibaha, Tanzania.**

Abstract

Ex-situ gene conservation stands of *Pinus caribaea* var. *hondurensis* provenance Allamicamba, *Pinus caribaea* var. *hondurensis* provenance Los limones and *Pinus patula ssp tecunumanii* provenances Yucul were established at Kibaha in 1981. At the age of 19 years the survival rate was 47, 41 and 9 percent for *P. caribaea* Allamicamba, *P. caribaea* Los Limones and *Pinus tecunumanii* Yucul provenances respectively. Diameter and height growth was highest in *P. patula ssp. tecunumanii*, which had mean diameter of 33.0 cm and mean height of 26 m. Since the three provenances were exposed to similar growth and management conditions, *P. caribaea* var *hondurensis* provenance Allamicamba has showed better adaptation to the site in terms of survival, height and diameter growth distribution though like the others had poor cone production. *P. caribaea* from Los Limones ranked second whereas *P. tecunumanii* provenance Yucul showed poorest adaptation. Weed competition, drought and forest fires are the leading limiting factors affecting provenance performance.

7. **Mathias, S. C., Msangi, T.H., Mushi, G., Shemkong'wa, A.S. and Magogo, N. 2002. Growth of various tree species in Mombo Arboretum.**

Abstract

Mombo Arboretum, located on the flat plains of West Usambara Mountains near Mombo town in Korogwe District, Tanga Region was established since 1956 with a number of hardwood and softwood tree species to study their growth on a dry scrubland and a riparian site. This paper gives the growth when established in a dry-scrubland or riparian site. In 1995, data collected on their survival and growth increment was collated. A total of 13 exotic tree species indicated survival counts above 50%, while 8 were indigenous. Results indicate further that on the drier site, three exotic species (*Peltophorum pterocarpum*, *Cordia dodecandra*, *Gliricidia sepium*) and one native species (*Tamarindus indica*) may be used for large scale planting - survival counts ranged from 76% to 88%. Two *Acacias* (*A. cyanophylla* and *A. tortilis*) looked promising for the arid zones because survival is 66% and 52% respectively. Additionally, phenological observations showed that *Peltophorum pterocarpum*, *Tamarindus indica*, *Albizia lebbek* and *Azadirachta indica* were evergreen throughout the year, which is an added value on the lowlands due to their excellent shade. Such species may be planted as ornamental trees along the road.

From the drier site, mean annual diameter increment (MAI) of about one centimeter (0.9 cm) was recorded from *Eucalyptus camaldulensis*, *E. saligna*, *Eucalyptus tereticornis* var. 'c' zanzibar and *E. sideroxylon*. However, survival rates were low. In the lower Arboretum or Riparian Forest Site, the most successful species in terms of survival are *Cordia dodecandra*, *Bombax rhodognaphalon*, *Pterygota mildebraedii* and *Dalbergia melanoxylon*. Some tree species registered MAI greater than 1.0 cm. (*Terminalia superba*, *Cedrela odorata*, and *Khaya anthotheca*) while others have medicinal values. *Buttydavya nysica* and *Azadirachta indica* being good examples. Mombo Arboretum may thus be viewed as a gene bank, a seed source, and a recreational area. It may be upgraded to a botanical garden.

Newsletter Volume 3 No. 1, 2003

1. **Msangi, T.H. 2003. The nine deadly sins of *Mesopsis eminii*.**
2. **Mgumia, F.H. 2003. Indigenous knowledge and vegetation classification: A case of the miombo woodlands in Tabora Region, Tanzania.**

Abstract

A study was conducted to document how the Nyamwezi classify miombo woodlands. Information was mainly collected through interviewing key informants and discussions using semi-directive interview. Based on local knowledge, the miombo woodlands are classified (in descending elevation) into five main categories, namely: Isenga, Mmanda, Kikungu, Mbuga and Kashauga. The criteria used for classification are type of soil and dominant woodland species. Based on this classification, different miombo types can be assigned to different land uses such as cropping, settlement and honey gathering and/ or beekeeping. The study suggests that the use of indigenous knowledge in evaluating exploitation of biodiversity and miombo woodlands be incorporated into empirically based research.

3. **Mwang'ingo, P. L., Lulandala, L. L. and Shellimoh, M. 2003. Influence of origin of stem cuttings and different levels of indole-3-butyric acid on the vegetative propagation of *Parinari curatellifolia*.**

Abstract

The effects of the origin of stem cuttings and different levels of IBA application on the rooting ability of stem cuttings of *P. curatellifolia* were examined at the Tanzania Tree Seed Agency, Iringa Zone using plant material collected from Sadani-Mufindi. The aim was to find out if further improvement in the rooting success could be achieved as an alternative or supplement to the use of seeds in propagating the species. The success with this technique can provide fast means in capturing the remaining superior gene pool of the species, which is endangered by massive clearing for agricultural land. Stem cuttings originating from the lower and upper portions of the shoot (Basal & terminal) were treated with seven different concentrations of Indole-3-Butyric Acid (IBA) as root promoter. The results revealed that cuttings originating from the basal portion and treated with 375 ppm of IBA application had high rooting percentage (41.3 percent), number of roots (5.4 roots per cutting) and root length (50.8 mm) respectively. It is recommended that basal portions of the shoots should be preferred when raising the species through stem cuttings. Investigations of other factors controlling the rooting performance of stem cuttings such as season in a year at which cuttings are collected and juvenility of the donor are recommended to improve what has been found out in this study.

4. **Mndolwa, M.A. and Bujiji, S.B. 2003. Local knowledge and Taungya farming concept: Some lessons from Ruvu North Forest Reserve, Kibaha, Tanzania.**

Abstract

A survey was conducted in March 2001 at Ruvu Fuelwood Pilot Project, which is situated within Ruvu North Forest Reserve. The Reserve is surrounded by communities involved in jointly managing and using forest resources there from. The objective of the survey was to examine the role of local knowledge in the taungya farming concept and practice with respect to Ruvu North Forest Reserve. A semi-structured questionnaire was administered to a randomly selected sample of 48 farmers. The survey showed that despite the fact that taungya is the hallmark of agroforestry, the term was new to over 90 percent of the

respondents. However, it was found that more than 95 percent of the respondents knew well in practice the principles guiding taungya farming system. The study further showed that farmers knew and earmarked a number of local tree species suitable for taungya system that have multipurpose uses (fruits, shade and medicinal values). As for exotic tree species, respondents ranked *Acacia mangium* high (50 percent) while *Senna siamea* was least preferred (3 percent) for the selected and planted trees. Farmers also identified agricultural crops suitable for the system. These findings indicate that local knowledge of tree and food crop species selection is a key factor in promoting successful establishment of taungya farming system.

5. **Mndolwa M., Msuya, T.S. and Chihongo, A.W. 2003. Is *Ficus benjamina* suitable for sawnwood production?**

Abstract

Ficus benjamina L. is native to India. It has small elliptic, acuminate leaves and pendent branches (Maithani *et al.*, 1987). The tree belongs to the same family Moraceae as *Milicia excelsa* (Welw.) Benth and Hook and *Artocarpus heterophyllus* Lam where the two are very good timber trees producing wood of high quality. It is a tropical and subtropical tree but common in humid and sub humid climate. *Ficus benjamina* is fast growing and very adaptable, with potential for afforestation programmes (Danaatmadja, 1990). It is an evergreen tree retaining deep green luxuriant foliage throughout the dry season. The tree has a thick bole, sometimes more than 1 m diameter (at 1.3 m) and the bole can go as high as 3 m. Its use in many parts of Tanzania has in many cases been limited to shade around homes and ornamental avenue planting. In other countries such as Singapore *Ficus benjamina* is a common tree grown near building bases (Wee, 1992). It is however discouraged from being planted closer to buildings since profuse superficial roots may destroy buildings.

The tree regenerates easily through cuttings. Cuttings from traditionally propagated stock have high rooting capacity up to 91 percent (Kristiansen, 1991). It is further reported that rooted cuttings from micro-propagated plants grow faster and produce more and longer lateral roots than rooted cuttings from traditionally propagated stock. The species can be raised from seed. Seed from canary yellow fruit show maximum germination (Maithani *et al.*, 1987).

Ficus benjamina has high potential as a medicinal tree (Maithan *et al.*, 1987) and its fruits extract has significant antibacterial activity (Mousa *et al.*, 1994). Many *Ficus* species are medicinally used as astringents, carminatives, stomachics, vermicides, antihelmintics and antidyenterics. In Tanzania *Ficus* species are generally solitary and no plantations have so far been established. Thus, wood from the species is not commonly used even in cottage industries. The species can be of value in increasing an array of timber producing trees. This note seeks to examine such a prospect.

Newsletter Volume 3 No. 2, 2003

1. **Malubi, E. 2003. TAFORI SACCOS LTD starts.**

Abstract

TAFORI Savings and Credit Co-operative Society Limited (TAFORI SACCOS Ltd.) was inaugurated by Hon. Stephen Mashishanga, Regional Commissioner, Morogoro on 30th September 2003. This short communication outlines the background to TAFORI SACCOS Ltd., what went on during the inauguration

day and what the society seeks to address. All TAFORI employees are called upon to join TAFORI SACCOS Ltd.

2. **Bakengesa, S., Banzi, F., Lulende, R., Maduka, S. and Chibwana, A. 2003. A successful agroforestry research and development initiative: A view from HASHI-ICRAF, Shinyanga, Tanzania.**

Abstract

A collaborative Agroforestry Research and Development Project was established in Shinyanga Region in 1991. The main partners were the International Centre for Research in Agroforestry (ICRAF - now the World Agroforestry Centre) and the Government of Tanzania through the *Hifadhi Ardhi Shinyanga (HASHI)* – Soil Conservation Project, Shinyanga). The main objectives of the project were to provide research support in agroforestry and to develop appropriate technologies and options to alleviate fuelwood scarcity, fodder shortages and declining soil fertility in the Sukuma agro-pastoral system. These will contribute to poverty reduction initiatives through enhancement of food production and increasing environmental resilience.

Research work started with on-station screening of species and provenances suitable for arid and semi arid areas followed by development of agroforestry technologies and evaluation of these technologies with farmers.

The technologies are rotational woodlots, boundary planting, improved fallows, fodder banks and improvement of *Ngitili*, which is a traditional approach to sustainable pasture management and utilization in the Sukuma agro-pastoral land use system.

In addition the project has been involved in domestication of threatened indigenous medicinal and fruits trees. Furthermore, there is a dissemination component to involve the existing extension and development institutions and organizations in order to promote agroforestry technologies. This is because emphasis is placed on community participation in agroforestry technology development evaluation and promotion.

3. **Zilihona, I.J.E. 2003. Are insects appropriate indicator taxa for biodiversity monitoring?**

Abstract

Insects are widely known as appropriate bioindicators for biodiversity monitoring. Their capacity in exhibiting responses to environmental perturbations over both ecological and microevolutionary time makes them as potential early warning indicators of environmental changes and thus appropriate measures could be taken sooner rather than later. However, selection criteria of indicator taxa have been highly debated. It has been observed that most of studies that have recommended use of indicator taxa have used taxa with little or no initial assessment of their efficacy as indicators. It is strongly argued that formal testing of robustness of insect indicator, and making recommendations for their use in detection and monitoring are steps necessary to improve the utility and credibility of terrestrial insects as bioindicators. Furthermore, it is recommended that a single species should not be used even if it is highly sensitive to the disturbances, since it may simply respond not because of disturbance, but due to an intrinsic feature of its population dynamics.

Key words: insects, biodiversity, indicators, monitoring

4. **Lulende, R. and Nyadzi, G. 2003. Above-ground biomass and volume models for Australian Acacias growth on- farm trials in rotational woodlots, Tabora, Tanzania.**

Abstract

Tabora Region, which is dominated by *miombo*, is experiencing a rapid rate of deforestation caused by shifting cultivation and indiscriminate cutting of trees for tobacco curing and domestic use. On realizing the significance and the existing deforestation taking place in the *miombo*, the SADC/ICRAF Project in collaboration with farmer's has focused attention to rotational woodlots to alleviate problems of fuelwood scarcity which has resulted in increasing pressure on *miombo* woodlands.

Australian Acacias are fast growing, produce more wood, less competitive to agricultural crops, grow on a variety of sites and soil types and produce more viable seeds (Boland 1989; Karachi *et al.*, 1997) hence are hypothesised to alleviate the problem of fuelwood shortage in the tobacco cereal landuse system in western Tanzania.

The predictions of yield from forest stands for tree crops grown under different management regimes and silvicultural practices previously were done by use of yield tables, which served as tools in calculating allowable cut in forests based on rotation age. Yield table development was based on continuous observations of stands over a full rotation. Such time series data required enormous input of time and labour measurements. They are also locally specific elsewhere and do not accommodate emerging changes of utilization standards based on tree parts allometrically. To overcome these problems models were used in combination with economic analysis tools, to enable resource managers make decisions on various management interventions which include optimum harvesting ages, planting densities, timing of thinning and even the evaluation of the role of different forestry environmental practices in forests (Brown *et al.* 1997). Despite the role of models in yield prediction in forest stands in rotational woodlots technology there are few models which have been developed in Tabora Region. This study therefore was carried out to develop biomass and volume models, estimate biomass and volume production for five-year old *Acacia crassicarpa*, *Acacia julifera*, *Senna siamea* and *Leucaena pallida* trees grown in rotational woodlots

5. **Mbwambo, L. 2003. Off-forest tree resources conservation and tree planting in selected villages in Tabora Region, Tanzania.**

Abstract

This study was conducted to find out indigenous tree species reserved and trees planted on farms for various purposes and the associated problems. Questionnaire survey involving five villages surrounding Urumwa Forest Reserve was conducted to generate descriptive statistics. Trees reserved on farms were: trees protected by occult laws, trees for various uses such as: shade, fruits, timber, poles, medicines, spiritual purposes and soil improvement. Furthermore, trees too big to cut are circumstantially reserved. Fruit tree protection and planting is the most conspicuous. Most respondents planted trees for similar reasons. More men claimed to plant more trees than women. Major tree planting constraints were drought, insects' damage, modest expertise, seed availability and fire. Lack of rights of exclusion, legal land and a tree tenure right does not seem to be a widely cited tree planting/protection problem. It is concluded that any successful tree planting and conservation programme in the *miombo* woodlands of Tabora need to address these issues.

6. **Msuya, T.S., Shilogile, E., Mndolwa, M. A. and Sabas, E. 2003. Potentials of joint forest management embracing agroforestry in improving the livelihood of communities adjacent to Forest Areas: Observation from Ruvu Fuel Wood Pilot Project, Tanzania.**

Abstract

A study aimed at assessing the potentials of Joint Forest Management (JFM) embracing agroforestry in improving livelihood of communities adjacent to forest areas was conducted in 2001 in Ruvu Fuelwood Pilot Project (RFPP). Primary data was collected through household interviews and Participatory Rural Appraisal (PRA). A total of 160 households (40 from each village) from Kongowe, Mwendapole, Mkuza and Msangani villages were randomly selected from the households holding RFPP plots for interviews and PRA exercise. Results indicated that, JFM embracing agroforestry has improved households' income as income per household generated by the project (RFPP) ranged from Tanzanian Shillings 39,000 – 144,000. The study also revealed that the households' income before the project was lower than income after introducing the project to respective households. JFM embracing agroforestry has also shown impact on food security. While agricultural crops harvested in the project area reflect direct contribution to food security, 60 per cent of the income earned from sale of forest products obtained through allowed access to forest trees had been used to buy food in food shortage periods. There is an indication of both negative and positive impacts on forest conservation two years after RFPP initiation. Positively, JFM has enhanced both natural and artificial regeneration of trees, while cutting trees and leaving some forestland bare has been observed to be negative impact to forest conservation. This calls for the need to monitor all activities taking place in the project site.

Newsletter Volume 4 No. 1, June 2004

1. **Zilihona, I. J.E., Nummelin, M. and Niemelä, J. 2004. Impoundment consequences of the Lower Kihansi Hydropower Plant on Arthropod communities: What have we learnt?**

Abstract

The effects of the Lower Kihansi Hydropower Plant on arthropods were studied in three habitats of the Kihansi Gorge before and after construction of the hydropower plant. Data were collected using pitfall traps. Results indicate that the spray zone habitat was affected considerably. Rarefaction analysis of collected samples indicated that the expected arthropod richness increased in the forest site and slightly decreased in the spray and riverine sites after commissioning of the plant. Furthermore, Shannon diversity and evenness indices increased in the spray and forest habitats while in the riverine site both indices decreased. Moreover, Students t-test indicated significant difference in arthropod diversities before and after commissioning, in spray ($P < 0.01$), forest ($P < 0.001$) and riverine ($P < 0.001$). Thus the effect of decreased waterfall spray as a consequence of the plant has variable effects on biota. However, long-term studies aimed at understanding the population dynamics of selected indicator taxa and how their distribution patterns are affected by changes in the ecosystem are highly recommended in order to achieve long-term management of biodiversity in the gorge. Furthermore, it is suggested that in order to enhance effective environmental impact assessment in Tanzania, policies that emphasize environmental impact assessment should have legislation backing. Tighter wording of legislations sealing all existing potential environmental loopholes should be addressed urgently.

2. **Shangali, C.F., Mwangi, P.L., Zilion, L.G.E., Mathias, S.C and Msangi, T.H. 2004. Growth performance of ten families of *Olea capensis* in the West Usambara Mountain, Tanzania.**

Abstract

Growth performance of ten 31 year old families of *Olea capensis* collected from Usa River Forest, Arusha were evaluated at Lushoto Arboretum. The aim was to screen the families and select a few good performers for large scale planting in the area. It was revealed that family No. 20 was the best in the terms of survival (69 per cent), height growth (15.2 m) and diameter (14.3 cm). Family No. 15 was the poorest in all aspects with a mean survival of 44 per cent, height of 11.7 m and diameter of 12.3 cm. The observed variation in growth performance could be attributed by differences in genetic plasticity of individual's trees, or to the variation in microhabitat from which the individuals were taken compared to the West Usambaras where they were planted later. As a step for further planting, family No. 20 is recommended. However, for the purpose of maintaining a broad genetic base, family 10, 13, 22 and 24 may also be included. Further to this other trials screening other provenances available in the country are needed because there is likelihood of finding good families.

3. **Mndolwa M. A. 2004. A further note on two provenances of *Dalbergia sissoo* at Kibaha, Tanzania.**

Abstract

Two provenances of *Dalbergia sissoo*, high rainfall (1200 mm) provenance (Koshi Tappu) and low rainfall (700 mm) provenance (Dhamisha Nepal) were established at Kibaha at an espacement of 2.5m x 2.5m. Trees received intensive maintenance to maximize growth and were assessed yearly to monitor survival and growth. Results from six year old trees indicated that high rainfall provenance had the highest survival of 96 per cent, average height of 3.1 m, Current Annual Increment (CAI) of 0.51 m and average DBH of 3.75 cm. The low rainfall provenance had survival of 59 per cent, average height of 2.3 m, CAI of 0.38 m and average DBH of 2.26 cm. In all six years the low rainfall provenance had the lowest Current Annual Increment. In the sixth year 34.5 per cent of the high rainfall provenance had the average DBH above 5 cm compared to only 19 per cent of low rainfall provenance. The high rainfall provenance started flowering in the third year. Planting high rainfall provenance along the coastal lowland is recommended along side with further testing of more provenances.

4. **Lulende, R., Nyadzi, G.I, and Malimbwi, R.E. 2004. Comparison of wood basic density and basal area for nitrogen fixing trees five years grown in rotational woodlot trials at Tabora, Western Tanzania.**

Abstract

The potential of rotational woodlots technology for provision of fuelwood for curing tobacco and other domestic use, increase in smallholder incomes and conserving the environment has been realized. An attempt was made to study wood density and basal area of *Acacia crassicarpa*, *A. julifera*, *A. leptocarpa*, *Leucaena pallida* and *Senna siamea* five years old grown in rotational woodlots in Tabora Tanzania. Wood samples were sampled from destructively harvested 84 sample trees. 36 trees (on-station) and 48 on-farm trial 3 trees for each tree species. The trial was a randomized block design, replicated seven times: three and four times on-station and four times on-farm trials. Wood disk sample of 2-cm thickness from each main stem were sampled from small, medium and large trees and crosscut at 30 %, 60 % and 90 % of the stem length. The basic densities of wood disk were calculated based on dry weight per unit volume. *A. leptocarpa* and *A. julifera* produced higher basic densities of 0.693 g cm⁻³ and 0.627 g cm⁻³ whereas *L. pallida* had the lowest density of 0.444 g cm⁻³. In both trials *A. crassicarpa* was the tallest (15.0 cm) whereas *L. pallida* was the shortest (4.0 cm). The basal area for the studied species in both

trials ranged from 0.63 to 4.67 m²ha⁻¹. The results indicate higher fuelwood value for these species, for provision of substantial fuel for curing tobacco and domestic use in the tobacco cereal landuse system.

Key words: *Nitrogen fixing trees, rotational woodlots, wood basic density, basal area, Tabora*

5. **Malubi, E. 2004. Accounting and its significance as an information system.**

Abstract

The late Sheik, Shaaban Roberts; puts it aptly, “*Biashara bila daftari hufa bila habari*”. Linking this with the current thrust of professional entrepreneurship, the sheik’s views need to be taken without reservation. In this context, *daftari* means accounting records.

Financial statements are prepared from accounting records. Whereas preparation of financial statements is the responsibility of professional accountants, their use extends across various groups of people (Meigs and Meigs, 1987). These include researchers, managers, government, tax authorities, money lenders and money borrowers.

The aim of this paper is to introduce accounting and its significance as an information system. The paper gives the definition of accounting, branches of accounting, accounting functions and basic financial statements. It goes further to explain accounting as an information system and the various user groups of financial statements. The paper concludes by emphasizing on the need for users to have a clue on the basic interpretation of basic financial statements.

Newsletter Volume 4 No. 1, October 2004

1. **Luhende, R., Maduka, S. M., Banzi, F., Bakengesa, S, and R Otsyina. 2004. Observations on domestication process of herbal tree species from the miombo woodlands under mixed stand at Lubaga, Shinyanga, Tanzania.**

Abstract

Trees are the main source of medicine for traditional healers and rural people in Shinyanga. Most people rely on herbs for treating various human ailments. However, the current rate of deforestation and the booming of urban and rural trade in traditional medicines are diminishing their supply in the *miombo*.

About two third of the total land area of Tanzania is predominated by the *miombo* woodlands. These forests are rich in flora and fauna of economic importance. About 60 per cent of the flora has been reported to have medicinal value (Clarke *et al.*, 1996). The effects of population growth, tsetse fly control and frequent annual forest fires have resulted in a gradual loss of these forests which used to have a good proportion and diversity of medicinal species (Otsyina *et al.* 1992). Further deforestation and extraction of medicinal plants from the *miombo* is envisaged to threaten their existence in the wild. This will consequently result to reduced supply and curtailment on their trade.

Results from ethnobotanical studies on indigenous knowledge and prioritization of medicinal plant species in Shinyanga indicate that there are about 300 herbal tree species used to treat over 100 human diseases (Dery *et al.* 1999). The top 10 priority medicinal species (PMTs) with their local Sukuma and Nyamwezi names are shown in Table 1.

These species were selected because they are frequently used and highly demanded to treat ailments. They are somewhat threatened and rare in the wild. Different medicinal plant parts of these species contain different natural chemicals and compounds (Iwu, 1993) these are used singly or in combination to treat different ailments. For example roots of *S. longipendunculata* are reported to cure malaria, vernal diseases and hernia, convulsions in children's and fever, leaves used to treat snake bites or mixed with water and salt to treat cough (Palgrave, 1990 and Mbuya *et al.* 1994).

Table 1: Botanical and local names of ten priority herbal species in Shinyanga Region

Botanical name	Local name(Sukuma/Nyamwezi)
<i>Acacia anthelmintica</i>	Mgada
<i>Combretum abbreviate</i>	Mlundalunda
<i>Combretum zeyheri</i>	Msana
<i>Erythrina abyssinica</i>	Mfutwambula/ Ng'wengwambula
<i>Erythrina bussei</i>	Mondo
<i>Terminali. fisheri</i>	Ningiwe
<i>Terminalia serisea</i>	Mzima/Njimya
<i>Securiolaca longipendiculata</i>	Nengonengo
<i>Zanha African</i>	Ng'watya/ Mkalya
<i>Zanha chalybeum</i>	Mlungulungu

To reverse the situation, HASHI / ICRAF in 1997 initiated a domestication programme of herbal trees in Shinyanga Region (Dery *et al.* 1999). The ultimate objective was to evaluate ways of integrating them into agroforestry systems. Information such as survival, growth, stem form and branching pattern are needed before recommending a tree for agroforestry system. However information on performance when cultivated outside their natural lands is missing. This study aims at contributing to availability of such information. This will improve on recommendations for suitability in agroforestry systems.

2. **Mndolwa M. A. 2004. A further note on two provenances of *Dalbergia sissoo* at Kibaha, Tanzania.**

Abstract

Two provenances of *Dalbergia sissoo*, high rainfall (1200 mm) provenance (Koshi Tappu) and low rainfall (700 mm) provenance (Dhamisha Nepal) were established at Kibaha at an espacement of 2.5m x 2.5m. Trees received intensive maintenance to maximize growth and were assessed yearly to monitor survival and growth. Results from six year old trees indicated that high rainfall provenance had the highest survival of 96 per cent, average height of 3.1 m, Current Annual Increment (CAI) of 0.51 m and average DBH of 3.75 cm. The low rainfall provenance had survival of 59 per cent, average height of 2.3 m, CAI of 0.38 m and average DBH of 2.26 cm. In all six years the low rainfall provenance had the lowest Current Annual Increment. In the sixth year 34.5 per cent of the high rainfall provenance had the average DBH above 5 cm compared to only 19 per cent of low rainfall provenance. The high rainfall provenance started flowering in the third year. Planting high rainfall provenance along the coastal lowland is recommended along side with further testing of more provenances.

3. **Msuya, T.S.; Mndolwa, M. and B.S. Shirima. 2004. Gender influence on tree seedlings performance in nurseries observations at Miswe Kibaha, Tanzania: Some interim observations.**

Abstract

A study on gender influence on seedlings performance was conducted in privately owned tree nurseries at Miswe Village, Tanzania. Two months after seed sowing/pricking out, female owned nurseries had more tree seedlings (650) than male owned nurseries (530). Seedling quality in female owned nurseries was superior – mean height, root collar diameter, and average survival rates were higher. Marital status also seems to influence seedlings performance in female owned nurseries. Nurseries owned by married women had fewer seedlings, of relatively poor quality in terms of seedlings' mean height, root collar diameter, and average survival rates compared to those owned by single women. There seems to be growing evidence that women involvement in tree seedling production is likely to improve seedling, and tree quality. More investigations focusing on this aspect are recommended.

Newsletter Volume 4 No. 2, 2004

1. **Kowero, G. 2004. The influence of major sectoral policies on forestry in Southern Africa: An overview.**

Abstract

Various policies, including national economic reforms and democratization pressures, are argued to have influenced and continue to shape the way communities relate to natural resources. These interactions have had contradicting impacts on the communities themselves as well as on their environment. The Center for International Forestry Research and its partners in southern Africa have over the recent past evaluated how some selected policies impact on local communities and industry, how their responses affect woodland resources development and management.

This text highlights findings from such work based on a review of the influence of agricultural, land, and forestry policies on forestry development in Malawi, Mozambique, Tanzania and Zimbabwe. The analysis is divided into three time periods that represent different economic regimes; namely, pre-colonial, colonial and post-independence periods. The latter is subdivided into two periods, namely the pre-economic reform and economic reform periods.

2. **Mbwambo, L., Nshubemuki, L., Chamshana, S. A.O and Sabas, E. 2004. The future of forestry research under forest management reforms in Tanzania.**

Abstract

The future of forestry research in Tanzania depends on the changes in the management of forestry and the forest sector. Forest research plans have to conform to these ongoing reforms. Partnership with stakeholders will enable research activities to go abreast with these developments. This entails a revisit of ongoing research activities.

3. **Campbell, B.M., Shackleton, S. and Wollenberg, W. 2004. Overview: Institutional arrangements for managing woodlands.**

Abstract

This text explores how natural forest resources are being managed at the local community level, in what is popularly known as community based natural resources management (CBNRM). Case studies were made on CBRM projects in Malawi, Tanzania and Zimbabwe, with additional material derived from another five countries. There are undoubtedly some notable successes in CBNRM. Emerging results from Babati in Tanzania, suggest that the shift of control from central government to local communities has seen a turn around in the resource base, from degraded and overused woodland to regenerating woodland with a set of rules governing use¹. CBNRM in Tanzania builds on the rather unique and favourable local situation in that decentralized government allows the village to own property in its own right as a corporate entity. For Malawi, success in the regulation of uses and users is not universally associated with any particular type of property rights regime¹. Communal property, private property and government property have all been associated both with success and failure – a simple one-to-one relationship between property regimes and outcomes is not apparent.

Despite the successes, we suggest that there is a fair degree of misplaced optimism about common property resource (CPR) systems¹. In investigating common property issues for woodlands in communal areas in Zimbabwe, where people rely heavily on woodland resources, we are struck by the numerous case studies showing a breakdown of local institutions for CPR management, and the lack of any emerging alternative institutions for such management. There are a number of contributing factors to this phenomenon, including the lack of an enabling policy environment, household strategies of poor people with few alternatives but to exploit woodlands unsustainably, marked and increasing differentiation of households within communities which places pressures on CPR institutions, lack of legitimate local institutions, and various features of the resources. There is not much evidence to suggest that moving the locus of governance closer to the people means that resource management is more cost-effective. Communities will need similar levels of inputs to those required by other stakeholders in order to effectively manage natural resources, and there will be considerable transaction costs.

We argue that the formal rule-based systems which form the cornerstones of proposed CPR systems are far removed from the current institutional systems, which are based on a complex of norm-based controls, the formulation and enforcement of which are steeped in subtle and elaborate processes. For example, resource use boundaries for local management remain a thorny question – while the literature espouses clear boundaries and clear user groups, in reality this is often impossible to achieve. We suggest that advocacy of CPR and CBNRM systems has to be tempered with critical analysis.

4. **Mbwambo, L., Nshubemuki, L. and Mhando, M.L. 2004. Preliminary results on the influence of stand manipulation techniques on species diversity in the miombo woodlands of Tabora, Tanzania.**

Abstract

Species diversity indices were determined for two sites subjected to five woodland management options in Tabora, Tanzania. Treatments are compared in the two sites in terms of species diversity and regeneration per species. The management options applied have influenced species diversity to some extent. There is increasing vegetation heterogeneity with time in treated plots as compared to no treatment plots. However these plots require further observations for concrete conclusions and recommendations.

5. **Mwanging' o, P.L., Msangi, T.H., Mhando, L. and Nshubemuki, L. 2004. Tree biotechnology in Tanzania: Application and future prospects.**

Abstract

The application of biotechnology in raising trees has recently been introduced in Tanzania as a further initiative to increase supply of wood resources and forest cover. The technology is expected to prove forestry as a productive and profitable venture, which can alleviate poverty, conserve the environment and increase the needed wood biomass. Being relatively new in the field of forestry in Tanzania, its introduction needed both financial and technical support. The Gatsby Charitable Foundation (GCF), UK is supporting its introduction, Mondi Forests technical backstopping and the International Service for the Acquisition of Agribiotech Application (ISAAA) facilitation. This paper highlights on the initiatives to bring and apply the biotechnology in raising trees in Tanzania, why have we opted to go for it, current progress and its future prospects.

6. **Mbwambo, L. and Mgumia, F. 2004. Joint Forest Management of Urumwa Forest Reserve, Tabora, Tanzania: Is role sharing opportune?**

Abstract

Assessment of community participation in Joint Forest Management (JFM) of Urumwa Forest Reserve in Tabora, revealed that, community participation is yet to effectively reach grassroots. A few villagers were aware of the new management interventions however awareness seems to be largely gender perverted towards men and village leaders. The village from where the respondents reside had a significant effect ($\chi^2=12.9$, $p<0.05$) on the awareness level. Lack of clear bylaws on land and tree ownership, utilisation and management of trees and woodlands compound the problem. More than half of the respondents did not know the existence of any bylaws in their villages. It is recommended that in empowering the communities to manage the woodlands adjacent to their villages, arrangements need be in place to ensure that the villagers are given and be made to know that they have been given certain ownership rights. Use by outsiders needs control. Modest attempts to do this mean continued exploitation since outsiders may be encouraging a misconception that the reserve is an open access.

7. **Nduwamungu, J., Kajembe, G.C., Malimbwi, R.E. and Mbilinyi, B.P. 2004. Miombo resources utilization dynamics and deforestation: A case of Kilosa District, Tanzania.**

Abstract

Most of the households in Kilosa District depend on natural products directly derived from the surrounding woodlands. The most important products include fuelwood, charcoal, timber, fruits, mushrooms, honey, thatching grass, fibres, bush meat, edible insects, medicines, litter (compost) and fodder. The degree of dependence upon these products varies from place to place and with social position in the village. Critical reduction of woodlands in the vicinity of villages is likely to cause hardship on the rural people whose survival is strongly linked to the free gifts of nature collected from the miombo woodlands. Currently, with the exception of the most populated and semi-arid ward of Gairo, the District still enjoys abundant woodland resources. However, serious over-exploitation is now reported to be taking place at varying degrees from place to place in the District. The process of deforestation or forest degradation was found to be complex and dynamic. On one hand, the poor households are struggling for their survival while others are engaged in degrading and depleting woodlands simply for selfish economic gains. In summary however, the study found that deforestation and forest degradation in Kilosa District appear to be triggered by the increasing number of licensed forest products dealers, trade of illegal timber and charcoal, lack of cheap alternatives to fuelwood, lack of training and alternative employment for

charcoal makers and sawyers, increasing human needs and deepening poverty, declining soil fertility in some areas, unavailability or high fertiliser prices and late bush fires. Any attempt to address the deforestation or forest degradation problem should first deal with these facets of the problem for it to be successful.

8. **Mialla, Y.S., Kajembe G.C., Malimbwi R.E. and Nduwamungu, J. 2004. Zonation as a way of enhancing sustainable forest management: The case study of Monduli - Mlimani Catchment Forest Reserve, Monduli District Tanzania.**

Abstract

Zoning of the forestland into specified management units is believed to be one way of enhancing sustainable forest management. Through participatory resource assessment, the Monduli-Mlimani Forest Reserve was surveyed and zoned into six forest zones namely Core zone (Catchments and Biodiversity), Amenity zone, Productive zone, Catchment zone, Biodiversity zone and Local use zone. Eighty one percent of the forest was classified as having both catchment and biodiversity values. Productive zone was about 13 per cent and local use zone was about 2 per cent of the forestland. The study recommends that each zone should have a detailed plan indicating how it should be managed. The plans are expected to influence and motivate local people to participate in sustainable forest management.

9. **Mndolwa, M., Mbwambo, L and. Msuya, T.S. 2004. A cautionary note on *Loranthus* threat to forest and afforestation activities: observation from Tabora Miombo Woodlands and Ruvu North Forest Reserve.**

Abstract

Loranthus infestation on *Pterocarpus angolensis* was observed in the miombo woodlands of Urumwa Forest Reserve in Tabora western Tanzania. This experience prompted another study to assess intensity of *Loranthus* (mistletoe) infestation on planted tree species at Ruvu North Forest Reserve (RNFR). Stands of *Gmelina arborea*, *Acacia mangium*, *Pithecelobium dulce*, *Senna siamea* and *Dalbergia sissoo* were quantitatively assessed for the parasitic shrub infestation. A general observations at Urumwa Forest Reserve in the miombo woodlands of Tabora showed that the famous *P. angolensis* (Mninga) species is highly affected by the parasitic shrub *Phragmanthera unsuiensis*. Results from RNFR showed that *G. arborea* was the most affected species with infestation intensity of 68% followed by *A. mangium* (36%), *P. dulce* (33%), *S. siamea* (33%) and least infested was *D. sissoo* (5%). The attack was mainly on bigger trees with over 16-cm diameter at 1.3 m above ground. The younger stand (four years old *A. mangium*) adjacent the 12 years old *A. mangium* was not affected by the shrub. The valuable timber species of the miombo *P. angolensis* is most likely to disappear due to *Loranthus* infestation on top of the current over-exploitation experienced in most natural forests of Tanzania. It is proposed that a detailed study be conducted in the miombo woodlands to establish the extent of the threat to this valuable timber tree species. *Loranthus* have shown negative effect on the afforestation programs for the Coastal Lowlands as trees planted by farmers around RNFR are the likely targets for this notorious shrub. Measures of reducing further infestations are discussed.

Newsletter Volume 5 No. 1, 2005

1. **Petro, R., Luoga, E. J. and Mndolwa, M. 2005. Natural regeneration of miombo tree species: A case of Kitulang'halo Forest Reserve Morogoro, Tanzania.**

Abstract

The study was conducted to compare and contrast natural regeneration by seedlings and resprouting of tree species in Kitulang'halo Forest Reserve in eastern Tanzania miombo woodlands. Data were collected using ten-concentric plots of radii 2m and 20m laid systematically in the reserve. It was observed that 63, 23 and 14 per cent of regeneration were from stump shoots, seedlings and root shoots respectively. Coppice shoots differed significantly from other types of regeneration. *Combretum molle* showed highest regeneration accounting for 18.1% of all 19 sampled species followed by *Dichrostachys cinerea* (16.4%). Five species were sprouting from roots and 12 species from stumps. Seven species were found to regenerate from seed only. Four species were found to regenerate from all types of regeneration. Eleven species were not found to regenerate. Fire was found to be the major limiting factor for vegetative and seedlings regeneration. *Jurbernardia globiflora* was seen to be more fire sensitive than other species. The trend of regeneration within Kitulang'halo Forest Reserve indicated generally a promising recruitment and in consequence a good regeneration trend.

2. **Msuya, T.S., Mndolwa, M.A., Sabas, E, and Kindo, A. 2005. Ruvu Fuel Wood Pilot Project: The contribution of forest research on its establishment and development; Including its peculiarity to similar projects in Tanzania.**

Abstract

The role of forest research in the establishment and development of Ruvu Fuelwood Pilot Project (RFPP) is given. The ultimate decision of applying Joint Forest Management (JFM) at RFPP was mostly based on research findings. Initially, intensive species and provenance trials were conducted, which included pine species (e.g. *Pinus oocarpa* and *P. caribae*), Eucalypts (e.g. *Eucalyptus microcorys*, *Eucalyptus melliodora*, *E. camaldulensis*, *E. grandis* x *tereticornis* and *E. grandis*), thornless Australian Acacias (e.g., *Acacia mangium*, *A. auriculiformis* and *A. crassicarpa*. was also on the list.), *Casuarina* spp, *Gliricidia sepium*, *Leucaena diversifolia*, *Calliandra calothyrsus*, Indigenous species like *Acacia. Polyacantha*, *Khaya anthotheca*, *Baffia kirkii* and *Azelia quanzensis* were included. JFM is a common management practice in different parts of Tanzania. However the JFM applied at RFPP is unique from other JFMs. It is recommended that viable cost-benefit sharing mechanisms between the stakeholders be sought so as to have sustainable management of the Ruvu Forest Reserve. Ways and means have to be developed to pass the accruing benefits from JFM to stimulate more participation. Possibilities for transferring the RFPP experiences to other areas with similar conditions are worth investigating.

3. **Luhende, R, and Nyadzi, G. 2005. Wood volume estimation of trees grown in rotational woodlots in the miombo ecosystem of Tabora, Western Tanzania.**

Abstract

The rotational woodlots technology is an Agroforestry intervention being practiced by a substantial number of farmers in Tabora region, western Tanzania. This study was done to estimate volume production of five-year old *Acacia crassicarpa*, *Acacia julifera*, *Senna siamea* and *Leucaena pallida* grown in rotational woodlots. The trials were laid in a Randomized Complete Block Design (RCBD) replicated seven times, three times for on-station and four times in farmers' fields. A total of 84 trees were sampled for volume estimation of standing trees in

rotational woodlots. Three sample trees in every plot representing diameter classes from small, medium and large trees were sampled, then sectioned into stem and branches, trimmed and crosscut into billets ranging from 1-2 m in length, measured for mid diameter and length which were converted to cross - section area for calculation of individual tree volumes by Huber's formula. Volume measured (V_m) from sampled trees derived from Huber's formula were compared to volumes estimated (V_e) from selected equations which were fitted to standing trees in each plot after bias tests and validation of best equations. Preliminary evaluation indicated that volume estimation was highest at on-farm trial ranging from 6 to 56 $m^3 ha^{-1}$ whereas on-station volume estimation was lower with values ranging from 8 to 39 $m^3 ha^{-1}$. All the trees grown in rotational woodlots are suitable for fuelwood production used for curing tobacco in the tobacco cereal land use system of Tabora, Tanzania.

4. **Mndolwa, M., Msuya T., Mhando, M.L, and Balama, C. 2005. Observations of some growth parameters of different eucalypts species grown at Kibaha, Tanzania.**

Abstract

Productivity of 19 different *Eucalyptus* species established at Kibaha was evaluated in terms of "survival" and "basal area". The assessed trials were established at an espacement of 2.5 x 2.5 m, received no thinning and ranged from 11 to 18 years old. Weeding was undertaken in the first five years followed by slashing in the subsequent years. Generally the trials showed poor survival. Nine species had survival of above 40 percent at least in one of the trials. Two species had survival rate between 32 and 36 percent while one species (*E. crebra*) had survival as low as 12 percent followed by four species (*E. grandis* x *tereticornis*, *E. botryoides* and *E. saligna*), which had survival rate as low as 7 percent. Three species failed completely (*E. tessellaris*, *E. pilularis* and *E. jacobsiana*). Combining survival percent and volume increment parameters it can safely be concluded that eucalyptus for afforestation at Kibaha has to include *E. tereticornis*, *E. grandis* and *E. tereticornis* (hybrid mysore) which at 18 age old had 71, 42 and 72 survival percent and 34, 32 and 27 $m^2 ha^{-1}$ basal area respectively. Differences in microclimate especially edaphic might have significantly contributed to the variations. For example, *E. grandis* in one 17 years old experiment had the lowest survival (16 percent) and low basal area of 9 $m^2 ha^{-1}$ as compared to the same species one year older which had survival of 42 percent and basal area of 42 $m^2 ha^{-1}$.

5. **Balama, C. and Shemwetta, D.T.K. 2005. Working methods by small scale logging contractors: A case of Sao Hill Forest Plantations, Mufindi Tanzania.**

Abstract

This study was designed to assess the current working methods by small scale logging contractors in Sao Hill Forest Plantations (SHFPs). Three companies namely S.G.W., M.W. and M.S.D. were studied. The study revealed that all companies performed logging activities, from felling to saw milling. The crew composition and organization was not proper and training to workers had skeleton protection gear. The working methods and tools used in these companies were poor and workers have poor working gear. Analysis of the quantitative data showed that average production rate was 7.5 $m^3 hr^{-1}$ for the manual logging operations (felling, limbing, manual log rolling and manual log forwarding and loading). It was noted that although the ultimate objective of these companies was high productivity, the levels attained fell short of expectation. The small scale logging contractors performed the operations without ethical obligations with regard to technical and social welfare. It observed that the quality of logging work was poor, which was equally associated with waste of wood and reduced the value of the remaining stand. This is at variance with the ethos of sustainable forest management and needs immediate redress by the forest owner by meeting harvesting rules and regulations.

6. **Kagosi, P.J and Kapinga, D.S. 2005. The potential of indigenous farming practices in enhancing household food security: A case study of Musoma District, Tanzania.**

Abstract

The study to explore the potential of indigenous farming practices in enhancing household food security was conducted in four villages, two villages from each of Makongoro and Nyanja Division, in Musoma District. The specific objectives of the study were to assess household food situation in Musoma District; to assess the contribution of indigenous farming practices to household food security; to identify technical and socio-economic factors affecting farmers in practising *Mikoka* and *Majaruba* farming practices in order to ensure their sustainability. The study involved a sample size of 122 respondents, out of these 120 farmers and two extension agents. Primary data were collected using structured questionnaire with both open and close-ended questions and field observations. Secondary data were collected from different sources to supplement data collected in the field. Data analysis was conducted using descriptive statistics. Results revealed that majority (82.5%) of respondents faced food insecurity problem in the study area; *Mikoka* and *Majaruba* farming practices have great contribution on reduction of household food insecurity in the district since yield of crops obtained in *Mikoka* and *Majaruba* were slightly higher or the same as that of rainfed farming although areas under *Mikoka* and *Majaruba* were small compared to area under rainfed farming. The practices were also found to be important sources of income generation and provided employment to majority of households' members during dry season. On the other hand *Mikoka* and *Majaruba* farming practices were constrained by lack of capital for buying improved tools and inputs; pest and diseases; flooding, soil erosion; theft of crops in fields; lack of irrigation skills, inadequate water for irrigation; and animal trampling in the fields. These constraints negatively affect efficiency and productivity in *Mikoka* and *Majaruba*. Respondent's suggestions on improvement of *Mikoka* and *Majaruba* farming practices were; to have extension agent in each village to share with farmers irrigation techniques; to have available credit to enable farmers to purchase improved tools and inputs; to provide training on improvement of *Mikoka* and *Majaruba* practices and emphasis on tree planting. From the results of the study the following recommendations were made: the government should encourage formation of farmers groups (association) to facilitate access to credit and extension services; to create programmes aiming at imparting skills to farmers so that they can improve in *Mikoka* and *Majaruba* farming practices; Farmers should be trained to adopt rain water harvesting and management and execution of irrigation projects so as to overcome the problem of erratic rain thereby allowing more intensive use of land in the District.

Newsletter Volume 5 No. 2, 2005

1. **Burgess, N.D and Kilahama, F. 2005. The state of the Eastern Arc Mountains and the pressures they faces.**

Abstract

The Eastern Arc Mountains have many values to Tanzania, and also face many threats. This article summarises some of the information gathered on these forests by the project 'Conservation and Management of the Eastern Arc Mountain Forests' during its first two years of operation. This main focus is on the state of the Eastern Arc and the pressures that the area faces.

Forest area has been declining in the Eastern Arc as forest outside reserves is converted to farmland. Forest loss is slowing as the boundaries of the reserves are reached. There is limited encroachment into the reserves, but a bigger problem of forest degradation through many forms of local use. However, it is not possible to determine whether forest condition is getting worse or not due to the few places where

comparative time series information is available. Water flows in the rivers flowing from the Eastern Arc are declining, but the underlying reasons are not known (rainfall has declined, forests have been lost and human populations have increased). Fires are one of the major threats to forests in the Eastern Arc, and have been increasing across the Eastern Arc Mountains in recent years. Land outside of Forest Reserves has the most fires, followed by plantation forests.

The few forests managed by private companies are the best managed in the Eastern Arc, followed by those under villages and central government control. The forests with poorest management are those under local authorities or which have not yet been gazetted (proposed reserves). Funds and local management control seem to be the most important factors in determining whether a forest is well, or poorly, managed.

2. **Nshubemuki, L. 2005. Choice of indigenous and exotic species for afforestation programmes in Tanzania: Some contributions to the on-going debate.**

Abstract

Tanzania's forest estate is a mix of indigenous and exotic tree species. There has always been a debate often from fixed viewpoints in the process, the debate has been plagued with half-baked scientific facts, over-optimistic expectations, sweeping statements and occasionally outright fallacies. Indigenous and exotic tree species generally meet similar functions at a macro-level. At a micro-level, it is worth noting that we are dealing with two some different values systems and efforts to compare the two may be similar to comparing an hand axe and a wedge. A brief discussion with follows seems to be revealing.

3. **Mbwambo, L., Mndolwa, M.A., Petro, R., Balama.C., and Mugasha W. 2005. *Boswellia neglecta*: A neglected source of valuable resin (Frankincense) for rural economy in Tanzania.**

Abstract

A survey of *Boswellia neglecta* tree species was done between 17th January and 1st February 2005 in Lushoto District to assess the species status in terms of density composition and size distribution. Transect surveys, Global Positioning System (GPS) and questionnaire survey techniques were used. A total of 11 plots of 20 x 20 m were located on 3 transects. All trees in the plot were identified and more interest was on the *Boswellia* associations. Species identification was done using the Lushoto Herbarium Specimen of *B. neglecta* and also local names were used to locate the tree. Data on stocking, height (m), DBH (cm) and crown diameters of *Boswellia* trees were recorded. *Boswellia* trees were found to be sparse to moderately dense compositions ranging from 25 stems to 95 stems per hectare with distribution increasing towards the Mkomazi Game Reserve woodland. It was found that *Boswellia* trees tend to be closely associated with *Commiphora* spp, *Grewia* spp and *Acacias* in typical *Acacia* – *Commiphora* woodlands. Regeneration can be either by seed or cuttings. Of the sampled trees, 57 percent were considered regenerants with diameters below 5 cm, height between 0.3 and 4.0 m and crown diameter below 1 m up to 1.5 m. Resin collection is usually done during dry season between July and October when the trees are stressed by high temperatures and produce to the maximum. Three *Boswellia* use areas were identified namely; religious rituals, firewood, and traditional medicines. There is no formal market established for the crop so far. Being such a valuable tree, under best management practices it can be an incentive for household gains and community participation in wildlife management.