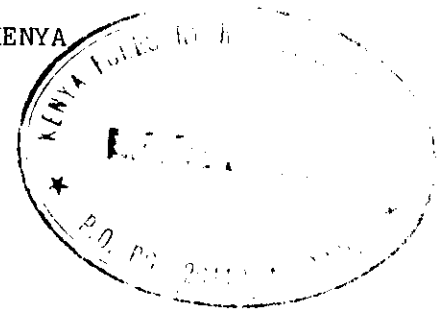
Scan

A STRATEGY FOR IMPROVING FARM FORESTRY IN KENYA



BY

J.A. ODERA

A PAPER PRESENTED TO THE PARTICIPANTS OF SOCIAL FORESTRY REFRESHER COURSE II - MUGUGA ON 30TH SEPTEMBER, 1988

1.0 INTRODUCTION

I hope that it has not been too gruelling or too exerting to you, given that you are all senior forest managers/extensior officers. Evidently, there is a lot to be covered in a seminar of this kind. Under the circumstances, it is often tempting for organizers to try to cover a large ground. I would like to assure you that there is no attempt by any quarter or claim of a professional-student relationship on matters of social forestry today. We are all at the rennaissance stage - focussing on assembling the body of knowledge on farm forestry, inventorying different land use systems that incorporate trees, developing methodologies for assessing the relevance and potential for trees in the farming systems, constraints to adoption of farm forestry etc. We have therefore cherished having you here to pave the way with us. It is evident that there has been a varitable explosion in the number of orgnaizations invclved in tree

planting during the last decade and an increased government support. Many farmers have sponteneously taken to tree planting in their holdings as a profitable land use activity. Tree seedlings are either issued freely or sold at greatly subsidized rates from points within easy reach of the farmers.

About 65 m and 100 m seedlings were produced and distributed in 1987 and 1988 respectively (equivalent to 54,000 and 83,000 ha respectively). However, available evidence suggest that overall the area of green cover is diminishing fast and that the ratio of the area cut to that of the planted area remains dismally low at about 5:1.

Mr. Chairman, today we meet at a most auspacious time. Our government has openly registered its concern about the accelerated loss of forests and the concommitant imperishment of the economic fabrics and the well-being of the people, particularly the sustainability of agriculture in areas where crops and livestock production is dependent on trees and shrubs. Environmental issues arise, too. Concerns about the loss of potentially valuable species of flora and fauna, accelerated erosion in deforested areas particularly watersheds, environmental degradation and the onset of desertification in the marginal land areas. Environmental issues and forestry (including agroforestry) agenda have ears of our leaders and the relevant bodies of the world communities.

1.1 OPPORTUNITIES FOR TREE PLANTING IN FARMS

The practice and opportunities for farm forestry are clearly different between the high potential and the marginal land areas,

and between the small scale and the large scale commercial farms. Because our most immediate concern is with the small scale farmer we must strive to focus on strategies which do not compete for land with the farmers' food production priorities. Direct competition with food and animal production for land can be avoided by planting trees in unused areas, such as roadsides, ridges, terraces, pasture leys boundaries of fields, riverine areas and surrounds of dwellings as live fences or living fence posts. The needs of medium scale farmers can be accommodated by using areas or sites that are too steep for cultivation or grazing, gravelly to rocky or beset with shallow soils to vlei soils subject to water logging.

In these situations different crop design and spatial arrangements are possible including:

(a) Hedgerow intercropping with arable or fodder crops·

(b) scattered trees in crop lands or pastures:

(c) multistata home gardens;

(d) trees/shrubs for stabilization of ridges, and terraces, and riverine areas etc.;

(e) intensive woodlot or fodder banks;

(f) farm boundaries, or aesthetic amenity trees in the crop lands.

THE RESEARCH AGENDA IN FARM FCRESTRY TODAY

The role and place of woody plants in the farmlands and in community land areas are already recognised. What is lacking?

(a) A clear policy guidelines for managing forests resources in private or community land areas.

(b) Proven technological packages that are technically feasible, economically viable and environmentally acceptable that are drawn out by ecological zones and farmers' needs oriented.

(c) Established market outlets for wood products from farm forestry to forster prompt sale of these products and a reliable source of income and farm revenue.

Scientific research and development hold the key to guiding farm forestry into a productive form of land use. Experiences from crops and forest management vehemently reveal that failure to align R & D effort with the development initiative that is attuned to the competative dynamics of the environment produces risky and usually futile expenditure of scarce resources.

As the country looks into the future with optimism and confidence emphasis must be on joint and sustainable production of food and wood. Key priority areas in farm forestry research agenda embrace technical and socio-economic issues including:

2.0 CHOICE OF WOODY SPECIES

The choice of suitable and useable tree/shrub species based on economic and agro-ecological considerations is the heart and soul of farm forestry development. Burley and von Carlowitz (1983) have provided a compedium of multipurpose trees and shrubs (MPTS) . The most popular of these are those with varying potentials for fixing or absorbing large amounts of N then returning them to the soil, while

concomittantly providing wood products -- poles, woodfuel, fodder and browse for livestock and other products and services. MPTs have a wide appeal because:

(a) They provide many goods and services at the same time and hence stand to occupy a small land area to produce a range of desired products.

(b) Can be integrated complementarily and non competatively in other forms of land use.

2.1 Species and Provenance Selection

Past work has shown that certain species have ability to enrich their microsites all be it at a slow rate. Investigations by different workers have shown that intercropping the Luecaena and application of green manure from prunning increases maize yield by upto 100 per cent. But obviously no single tree can cope with the range of variations of sites, management purposes, ecological and environment considerations etc. It is generally agreed that a good farm tree/shrub should possess ease of establishment, good survival rapid growth with high yield of biomass, nitrogen fixing capability, vigorous regrowth when cut or pollarded, efficiency of recycling of nutrients, favourable canopy and development of a deep rooting system that possess no competition to the arable crops.

There is therefore an urgent need for conducting systematic species and provenance selection and recruitment, including indigenous and exotic germplasm in different sites and management systems.

Urgent studies should be undertaken to compare the productivity of candidate woody species and arable crops within and between sites in order to establish a better appreciation of their resource use capabilities.

Species and provenance studies on various sites stand to generate a wealth of knowledge on tree performance under different conditions and management systems. It is envisaged that this initiative will provide a range of proven woody species for incorporating in the farming systems and given ecozones and land use types.

2.1.2 Genetic Tree Improvement

Genetic improvement of utility MPTs is the next step. This should focus on achieving:

(i) Increased biomass yield per unit land and labour

(ii) Disease and pest resistance

(iii) Selection of species and provenances of high calorific value for fuelwood species

(iv) Site adaptability particularly for the harsh ASALs combining drought resistance with fast tree growth.

Given time, selection and breeding programmes can greatly improve both the variety and quality of the planting stock available. Dramatic yield increases can often be achieved, in some cases by several hundred per cent. Tree improvement programme of softwood plantation species in Kenya has boosted yield by 40 per cent, through advanced genetic tree improvement.

The work on browse woody plants must strive to investigate the nutritive quality of candidate fodder and browse woody plants as well.

3.0 ESTABLISHMENT METHODS

Agroforestry intervention will only win the day with farmers when it becomes possible to obtain the tree/shrub seeds from the open market and to raise these with the same simplicity of raising other farm crops, such as maize, cabbages and potatoes etc.

The research initiative should therefore develop and evaluate low cost do-it-yourself packages for raising trees and shrubs for farm forestry investigations. Direct seeding has been proposed for some species and should be explored.

4.0 CROP DESIGNS AND MANAGEMENT PROTOCOLS

As already discussed, there is convincing evidence that mixing trees and crops may offer a greater opportunity for the short-term environmental benefits both aerial and edaphic. Past initiative has concentrated on alley cropping studies, and very little consideration has been accorded to other technologies. It is imperative that promising accessions should be tested under different crop designs already discussed under Section 1.1 and according to farmers needs and preferences. Hedgerow intercropping can certainly be seen as a potential alternative to shifting cultivation or Taungya cultivation, functioning mainly as a soil fertility restorer. But this initiative should be extended to other spartial arrangements and crop designs. Supportive studies should investigate:

(a) The heterogeneity of crops and the interaction between component species, including competetive influences; symbiotic relations and other ecological associations and possible allelopathic influences.

(b) Physiological parameters including crop water use

(c) Microclimatic influences

(d) Nutritional changes

(e) Productivities of food and wood crops under different technologies, nutrient turn over and recycling and total nutrient pools by MPTs and crop designs etc.

(f) Opportunities for using strategic biotechnologies such as mass propagation techniques for key MPTs, development of cultures of productive provenances of symbiotic micro-organisms and appropriate methods for innoculating selected micro-symbionts into associated MPTs and agronomic manipulation for improving crop performance.

(g) Development of management protocols including harvesting of the woody biomass, cutting frequencies and lopping, pollarding and subsequent regrowth; and time and method of applying prunnings.

(h) Development of avenues for protection from pest and diseases.

(i) Development of non-destructive utilization, and

(j) Economic interactions between different components.

Assessment should also cover crop productivity, changes in soil nutrients and physical structures under different MPTs and other treatments, and comparative water and soil conservation efficiencies of different crop spartial arrangements, soil chemicals and physical changes.

Development of modules and prescriptions for managing natural forests and riverine areas outside the forest reserve, should also be covered.

5.0 SOCIO-ECONOMIC STUDIES

Socio-economic research has hitherto recieved virtually no attention in the forestry management agenda. But undoubtedly hold the key to greater understanding of national collective responsibility for forest management including conservation of plant germplasm, the management of catchment forests and riparian areas etc. and the role and place of trees/shrubs in the farming systems and the development of a positive strategy for effecting unimpeded adoption of agroforestry technologies.

The following areas are particularly important and merit urgent attention:

(i) Identifying critical points for intervention where integration of trees/shrubs in the farming systems stand to raise overall farm productivity.

(ii) Developing market outlets for tree crops from farms, and pricing policy of wood products.

(iii) Exploring possible application of incentives for tree growing in farms, particularly in critical sites, such as catchment forests and water ways etc.

(iv) Developing a policy frame-work embracing farm forestry and a basis for scientific evolution of integrating trees in the farming systems and substainable management of forests etc in all areas.

(v) Identification of barriers to diffusion of agroforestry extension initiatives and innovation of agroforestry technologies.

(vi) Documenting the traditional values of trees and shrubs including socio-cultural values, herbal and folk medicines among different communities.

(vii) Conducting basic studies on the utilization of minor tree/shrub products including wood and plant extractives and other avenues with potential for promoting a wider range of utilization of wood resources and reduction of wastes in wood utilization.

These studies would provide a better understanding of the extent to which specific socio-economic environments facilitate or constrain given farm forestry technologies.

6.0 SEED ACQUISITION AND DISTRUBUTION

The question of seed availability can also pose a number of problems. The supply of high quality seeds currently obtainable at the national seed centre and on the world market is restricted to a relatively small number of species. There is an urgent need to develop seed stands and clonal seed orchards of proven agroforestry trees, through selection and recruitment of indigenous candidate agroforestry trees/shrubs species. Systematic introduction of plant germplasm of proven species should be organized from suitable sources and tested under the provenance studies programme. Proven material should be cultivated in the seed stands and orchards' programme. This initiative should be accorded the highest priority to build national capabilities for providing improved seed of authenticated origin and pedigree. Supportive studies should examine avenues for improving seed germination for seeds with germination problems, and mass propagation techniques for key MPTs.

The researchers and field officers should work out interim strategies for seed acquisition. This could cover identification of local sources of seed for regular collection while clonal seed orchards etc are being developed.

7.0 MOBILIZING JOINT RESEARCH-EXTENSION INITIATIVES

The challenges to scientific development of farm forestry are many and varied touching on different land use systems and ecclogical zones. With a force of well trained forest extension staff present in nearly all administrative divisions, we have a great opportunity for pooling resources between research and extension lines. Under this initiative the extension staff can undertake some adaptive prototype or pilot technology appraisal in farm forestry research and development.

There are urgent needs for information on tree growth and yield in natural forests outside the forest reserve and on different MPTs and others that are being cultivated in farmlands for poles, woodfuel, soil and water conservation and site rehabilitation etc. in different ecozones. This would provide volume and yield tables and a data-base essential for providing clear options for planned tree planting in farms based on quantified returns and the true character of forestry in national development.

It is also possible that under this initiative the researchers and field officers and the farmers can jointly respond directly to particular needs and constraints facing farmers and other land use agencies in given sites, ecozones, and socio-economic environments.

I am convinced that in this background we can promptly develop technically feasible and economically viable packages for improving and sustaining increased food and wood productivity for domestic and industrial use, for all time.