EXPERIENCE WITH THE GROWING OF EUCALYPTS IN KENYA

By

P.K.A Konuche
Director,
Kenya Forestry Research Institute

1.0 Introduction

There are slightly over one hundred species of Eucalyptus in Kenya. About 80 species are represented in KEFRI's arboretum at Muguga. The earliest introduction was between 1903 and 1908 and in early years, plantations were established to provide firewood for the railway line to Nairobi and Uganda(FAO, 1981).

Eucalypts are among the most popular trees in Kenya because of their rapid growth, ease of management and their many uses for fuelwood, poles, posts, timber, pulpwood, peeler logs and protection of the soil. Old eucalyptus trees are now popular for furniture making.

The main species planted in the country are *Eucalyptus saligna* and *Eucalyptus grandis* in humid areas at altitudes of 1,500m to 2,000m. Other widely grown species are *Eucalyptus globulus* in cooler areas at altitudes over 2,000m and *Eucalyptus camaldulensis* in semi-arid areas. Species planted to a lesser extent are *Eucalyptus maculata* and *Eucalyptus paniculata* in dry sites in the highlands. *Eucalyptus regnans* and *Eucalyptus fastigata* grow well at elevations of above 2300m. The recently introduced hybrids of *E. grandis* and *E. camaldulensis* have shown promise in areas receiving rainfall of 750 – 1,000mm and elevations of up to 1,700m.

The area under eucalypts in the country is not exactly known, but this is probably around 50,000 hectares. The main growing areas are in forest reserves and tea estates in Kericho and Nandi districts. In farmlands, eucalypts are widely planted in high potential areas of Central, Rift Valley, Nyanza and Western provinces.

2.0 Management Practices

The management practices in Kenya depend on the objectives of growing the trees, availability of land and markets for the produce.

2.1 State Forests

The main institutions that grow eucalypts in public forests are the Forest Department and the Nyayo Tea Zone Development Corporation and their main management objectives are production of pulpwood, construction poles, power and telecommunication poles and woodfuel. Trees are usually planted at spacing of 2.7 m x 2.7 m giving initial stocking of 1320 stems per hectare (s.p.h). However, for various reasons including inadequate protection, most of the plantations in forest reserves are usually under-stocked (about 800 s.p.h). These plantations are cut at rotation of 8 to 10 years. After the first rotation, the trees are usually coppiced four or more times at the same rotation. Yields in eucalyptus plantations are usually 25 to 35 m3 per ha. However, with improved germplams of *E. grandis*, yields have been more than doubled.

2.2 Tea Estates

In tea estates, eucalypts are managed more intensively for production of woodfuel for the processing of tea. Trees are planted at closer spacing of 2.0 x 2.0 m or 2500 s.p.h. High survival is usually achieved. The tea companies are now using improved *E. grandis* and undertake high standard silvicultural practices. As a result, their plantations are well stocked with uniform growth and are high yielding (yields of upto 100 m^3 per ha per year at 8 years). In tea growing areas of Kenya, the growth of improved *E. grandis* has been recognized as the best in the world (Denison and Duncan, 2002).

2.3 Small Scale Farmers

Currently, eucalypts are some of the most popularly species grown by small scale farmers. For example in Kakamega and Vihiga Districts 85 percent of seedlings planted are eucalypts. Most small-scale farmers grow eucalypts at varying spacing with the closest at 1.5 m x 1.5 m (4500 s.p.h). In some cases, trees are established by direct sowing but planting of seedlings has been found to be a better method of establishment. Trees are usually planted along boundaries and as woodlots on poor sites or river valleys. They are cut at rotation of 3 to 15 years depending on the needs and market. Most farmers practice selective felling where trees are cut as the need arises. In some areas in western Kenya, trees on farms have been coppiced for over 50 years although the maximum number of years for coppicing should be 32.

Productivity of eucalypts grown on farms is low due to poor management, use of the wrong species and use of unimproved planting material. However, KEFRI has initiated a technology transfer programme to promote the use of improved *E. grandis* through supply of seed and establishment of on-farm demonstration plots. Farmers using improved *E. grandis,* are realizing yields which are comparable to those obtained in tea estates in Kericho.

Because of the current ban on timber harvesting in the country, most of the mature eucalyptus trees on farmlands, especially in the Rift Valley, are being cut for furniture making.

3.0 Eucalypts and Environmental Conservation

3.1 Soil Conservation

The effect of eucalyptus plantations on soil depends on annual rainfall, site conditions and management practices.

In low rainfall areas, receiving about 1000 mm per annum, high stocking of eucalyptus plantations result in severe root competition leading to suppression of undergrowth. This characteristic is also shared with other species such as cypress and the indigenous meru oak. In such plantations, it is common to see bare ground which leads to increased runoff and sheet erosion. However, low stocking on such sites promotes growth of undergrowth, which enhances soil conservation and increased soil infiltration.

In high rainfall areas, particularly those receiving over 1500 mm per year, there is little effect of high stocking of upto 2500 s.p.h. on the as heavy leaf litter provides adequate soil protection to reduce runoff.

The effect of eucalyptus plantations on soil fertility is not known in Kenya. However, at Muguga, good performance of indigenous tree species has been recorded in an area which had earlier been under eucalyptus plantations for over 50 years.

3.2 Biodiversity Conservation

Crowns of eucalyptus species are usually light. As such, they allow reasonally amount of light to reach the forest floor. At low stocking levels, it is therefore common to see regeneration of indigenous plant species under the canopy of eucalyptus plantations. In high rainfall areas (above 1500 mm per annum), there is usually luxuriant growth of understorey indigenous plants below a canopy of eucalyptus plantation. Some indigenous tree species such as *Polycias kikuyuensis, Prunus Africana* and *Zanthoxylum gillettii* have been observed to regenerate and develop below eucalyptus canopy.

3.3 Water conservation

The effect of eucalyptus species on water has been a controversial issue in Kenya. This was first raised in 1980s by the former Permanent Presidential Commission on Soil Conservation and Afforestation. As part of its programme, the Commission

undertook country wide campaign eucalypts further planting. This was not an official government policy and most farmers ignored the advice and continued to manage their trees. In some areas, however, the campaign led to reduction in planting of the species. In 1990, there was a change in the leadership of the Commission and the controversy on planting eucalypts ended only to resurface early this year. The current concern of environmentalists is that eucalypts are not good for water and biodiversity conservation. However, it appears that most Kenyans are not bothered by their concern.

In Kenya, the belief that eucalypts use a lot of water is based on the fact that some eucalypts species, such *Eucalypts camaldulensis*, can tolerate waterlogging. Indeed, some of the species have been planted in poorly drained sites with some success, but only after partial drainage. In swampy areas, eucalypts do not survive for long unless the site has been drained.

It is worth noting that Kenya has several species in the same family (Myrtaceae) as the eucalypts. This includes *Syzgium guineense*, which is not only riparian, but is also tolerant to waterlogging. Most Kenyans believe that being indigenous species, *S. guineense* is good for water conservation.

4.0 The Future of Eucalypts in Kenya

Although some concern is being raised on possible adverse effects of growing eucalypts, the planting of the species in Kenya is likely to continue for several reasons:

First, the demand for domestic wood energy for the growing rural population is increasing. And because of their fast growth, eucalypts are among the species that can be used to solve problem.

Secondly, the tea industry, which is the leading foreign exchange earner in Kenya, relies on eucalypts woodfuel for tea processing. In fact the Kenya Tea Development

Authority (KTDA), which produces 60 percent of tea in the country, has embarked on a programme to establish about 20,000 ha of *E. grandis* to provide woodfuel.

Third, 30 percent of pulpwood requirement by the Pan African Paper Mill should be from Eucalyptus. The company has just launched an on-farm eucalyptus tree growing programme.

Fourth, the current use of eucalypts for furniture production is likely to be institutionalized.

Fifthly, introduction of improved *E. grandis* and hybrid clones of *E, grandis* and *E. camaldulensisis* has created more demand for the species.

Finally, the government is not likely to adopt unpopular policy of banning the planting of eucalyptus in the country.

References

Denison, NP AND Duncan, E.A. (2002). Report on Clonal Eucalyptus Forestry

FAO (1981). Eucalypts for planting. FAO Forest No.11

Forest Department (1996)/ Treatment of Eucalyptus Plantations. Technical order No.57