

# Experiences with developing a botanic garden in the uplands of Kenya

M.J. Nicholson

Plants for Life, Limuru, Kenya

Plants for Life International (PLI) is a registered Kenyan non-governmental organization (NGO) based at Brackenhurst (BBIC) Convention Centre, Tigoni, 23 km north on Nairobi, Kenya at altitude of 1800-2200m. PLI propagates upland vascular plants in East Africa: orchids, ferns, herbs, grasses, shrubs, lianas, scramblers and trees. Since 2001, we have been removing exotic plantation species and planting indigenous species of plants. We have established an arboretum, a botanic garden of indigenous flora and a herbal (physic) garden.

## Brackenhurst Highland Arboretum

In commemoration of the new millennium, PLI (in collaboration with BBIC, which made the land available) decided to restore at least half of its 40 ha. (100 acres) property to indigenous forest. Phase 1 covered 2001-2005 and includes the >850 species listed on our database. The land was previously either pasture or plantations of commercial and ornamental exotic tree species (eucalyptus, wattle, cypress pine and Australian Blackwood).

In line with the Millennium Seed Project of the Royal Botanic Gardens in Kew, UK, the establishment of an indigenous plant collection has three goals:

### Conservation

Less than two percent of Kenya is covered by forest, compared with thirty percent of the country that was covered by forest and dry woodland 40 years ago. In contrast, both Tanzania and Zambia have forests and woodlands covering 50-60 percent of their land area. The ecological and economic impact of this deforestation is immense. Rivers that never dried up now cease flowing in the dry season because forest soils are no longer there to absorb rainfall and feed springs. Rainfall now runs off the soil and causes flooding downstream. Many of the high-value timber species are becoming rare. Plant (and animal) species are becoming extinct before their uses are understood. Indigenous biodiversity is falling, often being replaced by exotic (*Grevillea*, cypress, eucalyptus and wattle) or invasive species (birds like sparrows or Indian house crows, or aggressive plants such as *Cestrum aculeastrum* from Guatemala or *Solanum mauritianum* etc).

The forest is now a seed bank for many species that are locally, nationally or internationally threatened e.g. the climber *Embelia keniensis* of which fewer than a dozen plants are known.

With the re-establishment of indigenous shrubs and trees, increasing numbers of birds, animals and insects are returning. The latest bird list stands at more than 130 species. The flagship species we wish to encourage is the Colobus monkey, which lives, nests and feeds in tall indigenous (native) forest. In addition, the resident mammals in the forest we have planted since 2001 include Sykes Monkey, Greater Galago (Bush Baby), porcupine, white-tailed mongoose, bushbuck, jackal, grey duiker, and genet cat. These are generally seen at night, as the area is one of high population pressure.

### **Environmental education**

PLI runs courses on herbal medicines, tree growing (from tree nursery to forest establishment) and nature walks (bird and plant identification). We have provided numerous schools and visitors with environmental education over the past five years.

### **Recreation**

With over 10,000 mainly residential visitors annually, the creation of a clean, tree-filled environment for walking, running or picnics is a considerable attraction. There are broad views from the top of the property to the Ngong Hills, Nairobi and across to Kilimanjaro in the south-east. Being so close to Nairobi, it is an ideally situated for an ecotourism project

### **Current activities**

The project began in November 2000 with a small tree nursery and some clear felling of old wattle plantations. An inventory was made of pre-existing tree and plant species, which comprised a handful of mature indigenous trees with a majority of exotics. Since then, a small arboretum has been established both outside and within the main compound but this is rapidly becoming a closed canopy forest.

In addition, the afforestation project will concentrate on tree species known to have been in the original forest in the Limuru area. The objective is to increase the small areas of natural forest that still exist in the area, allow them to develop naturally and encourage bird, insect and plant biodiversity.

### **Arboretum and forest**

BHA has collected, conserved, propagated and planted over 1000 species of trees, shrubs, lianas and herbs since November 2000. These consist of over 850 species from upland Kenya plus 50 Kenyan species from lower altitudes, 40 species from elsewhere in Africa, and 60 exotic species. These can be found both inside the main compound but more extensively outside the main gates towards the main road in the valley. This work is continually expanding.

### **Herbal garden**

We have started a herbal garden with a view to commercialising the cultivation and processing of indigenous herbs of known benefit and with an established market in Kenya. We are targeting diseases that are becoming common in Kenya: hypertension, Type II diabetes (MAO), BPH (benign prostatic hyperplasia), chest complaints, & certain infections. Many of the plants we grow are immune system strengtheners. We have looked at over 200 ethno-botanical plants and have narrowed our focus down to *Prunus africana*, *Warburgia ugandensis*, *Urtica massaica*, *Girardinia diversifolia*, *Centella asiatica*, *Rubus keniensis*, *Alchemilla* spp. & *Plectranthus barbatus*.

### **Tree nursery**

Our tree nursery currently has many species for sale, especially on contract order. We concentrate on more unusual indigenous trees, plants found in the area and not generally available in roadside tree nurseries.

### **Indigenous flower garden**

In 2006 we started an indigenous flower garden within the Brackenhurst compound. As we plant more and more indigenous plants, we are finding more and more bird and insect species coming in.

### **Commercial Hardwood Production**

We are initiating an indigenous hardwood plantation project for commercial purposes. Hardwoods in Kenya are rare and very expensive. Most hardwood is now mahogany illegally imported from DRC. There are several species in this upland area which could be grown commercially: *Ocotea usambarensis*, *O. keniensis*, *Vitex keniensis* (Meru Oak), & *Olea capensis* ssp. *welwitschii* (Elgon Olive/ teak). Meru Oak is harvestable at 20 years (dbh>40cm.)

### **Upland Plant Book**

The PLI team is collating data and colour photographs for a field guide on the upland plants of East Africa.