

Looking for alternative markets

With the shift to non-wood poles, eucalyptus growers need to look elsewhere for business

BY JOSHUA CHEBOIWO

The genus *Eucalyptus* comprises more than 700 species and unknown number of hybrids and varieties, which are planted in different ecological conditions. It is a native of the Australasian subcontinent, mostly Australia.

Eucalyptus species were introduced to Kenya as early as 1902 to supply firewood for the Kenya - Uganda Railways. Since then, due to its fast growth, wide ecological distribution, good stem form, coppicing ability, durable wood, multipurpose use and ready markets for its various products, eucalyptus is now the single most widely grown species in the country.

The commonly cultivated eucalyptus species in high altitudes include *Eucalyptus regnans*, *E. globulus*, *E. grandis* and *E. saligna* whereas mid-high altitude species are *E. urophylla* and *E. robusta* and lately, hybrids. In the lowland drylands, the preferred species include *E. camaldulensis* and *E. tereticornis*.

The major eucalyptus growing counties in the country include Kakamega, Vihiga, Kisii, Kericho, Nyeri, Kiambu and Nakuru, among others. Eucalyptus is used for transmission poles, industrial firewood, pulpwood, sawn wood, and pole wood for construction and fencing.

The total contribution of forest products and services to Kenya's gross domestic product (GDP) is indicated as Ksh 16.4 billion, equivalent to 1 per cent of national GDP, and eucalyptus makes a large part of that. The growth performance of *E. grandis*, the main species grown in Kenya, ranges from 45 to 68m³ per hectare per year. Higher growth rates have been achieved recently with enhanced selection and management practices.

In the medium and lowland zones, the growth is relatively lower, ranging from 23 to 35-45m³



A three-year-old wooden pole installed by the Rural Electrification Authority (REA) in Kibwezi, completely destroyed by termites. (Photo: Jan Vandenabeele)

per hectare per year. The recent increase in commercial growing of *E. grandis* by small and large scale farmers as well as companies has been largely driven by high demand in the transmission pole sector. Another factor is the increased demand for industrial firewood by tea processing companies that have been switching from expensive furnace oil to firewood to cut costs and increase profits.

The other key product in demand is poles for construction, scaffolding and fencing. These developments have motivated hundreds of farmers to invest in thousands of hectares in new plantations, planting mostly *Eucalyptus grandis*.

Profitability of transmission poles

The transmission pole sector is one of the most profitable forestry based enterprises in the country due to high demand, short rotations and good prices. The farm gate prices of standing poles rose from Ksh 750 in 1999 to Ksh 2,500 per piece by 2009, an increase of 233 per cent (Cheboiwo, 2010). Prices peaked in 2014, with

standing trees fetching between Ksh 3,000 and 4,500 and higher for larger seven to ten-year-old trees.

Expansion in processing capacity

The utility pole sector processing capacity has witnessed tremendous growth and is still expanding. The fact that supply tenders for Kenya Power Limited (KPL), the main consumer of utility poles, are still open to regional supplies from the East African Community (EAC) countries and beyond, allows the sector access to sufficient utility poles competitively to meet the demand. This competitive environment is pushing producers to deploy strategies to cut costs, including use of the latest technologies and measures to minimise operational costs.

In 2004 there were only two treatment plants in the country capable of processing 160,000 wooden poles per year. That increased to 28 plants in 2013 with an installed capacity of over 1.5 million pieces per year (Cheboiwo, 2014, Guda, 2014) and by 2015 it is estimated at 55

with capacity to treat over 2.5 million poles per year.

However, the aggregate demand for KPL and the Rural Electrification Authority (REA) was estimated at 700,000 poles per year. Therefore, despite that massive expansion of processing capacity, local treatment plants are faced with a myriad of problems including the unpredictability of the tendering processes of KPL and REA. This means that treatment plants are unable to predict actual quantities needed, to enable them synchronise acquisition of semi-processed poles and import of treatment chemicals from overseas suppliers. This has restricted processing to mostly below 40 per cent of the installed capacities and excess unsold stock in the yards. The combined effect has been reduced purchases from tree-growers and potential fall of pole prices due to supply and demand dynamics.

The Kenya Wood Preservers Association (KWPA), an umbrella body for manufacturers of wooden transmission poles in the country, is predicting the ruin of the 55 plus treatment plants in the country. The sector is reported to have large volumes of unsold stock in their yards that are likely to be wasted away and idle machinery purchased at billions of shillings. Some factories are reported to have sent home hundreds of employees due to depressed demand for wooden poles in the country. However, Kenya Power says that wooden poles will still play a big role in its distribution network.

Expansion of electricity distribution

The utility pole sector in Kenya currently generates business in excess of Ksh 8 billion (US\$ 95 million) per year. KPL predicts that the demand for utility poles for power distribution is

growing at an average of 10 per cent annually. It allocates local suppliers 80 per cent of its annual demand, standing at 550,000 pieces, and 20 per cent to external firms mostly from Tanzania and Uganda.

REA, with an approximate annual demand of 150,000 poles, allocates 100 per cent to local suppliers. By the end of 2014, the combined national demand stood at 700,000. KPL's demand projections show that the demand for utility poles is expected to increase from the current 550,000 to 800,000 by 2018. The share of imports is also expected to increase from the current 150,000 to 200,000 in the same period (Cheboiwo, 2014).

KPL says all new transmission lines will use concrete poles and that it will limit wooden poles to domestic connections. Despite KPL's pronouncements, its strategic plan indicates that it will spend Ksh 15 billion to purchase utility poles in the next five years to expand its power distribution network and replace ageing wooden poles.

Threats to wooden pole sector

Quality of treated wooden poles

KPL has set very stringent quality standards as outlined in KBS KS516:2008 for treated wooden poles. The utility poles should be from recommended species that include *Eucalyptus grandis*, *E. saligna*, *E. maculata*, *E. citriodora*, *E. microcorys*, *E. globulus* and *E. regnans*. The selection and manufacturing should comply with the Kenya Bureau of Standards (KBS) 516 specifications.

The utility poles should be sun or kiln dried before being treated with CCA-C to meet the Kenyan Wood Protection Association Standards (AWPA) C-4 and UC- 4A, 4B and 4C, Latest Edition. The fixation process should ensure that

the preservative treatment is fixed in the wood at its maximum level. Quality control in each stage in the production process is important to ensure that the utility poles are in full compliance with both industry standards and additional specifications.

However, recent reports indicate that the quality of wooden poles supplied to KPL by various manufacturers may not have met the expected standards of between 12-20kgs/m³ of CCA salts, and suspicions are that the majority are below 6kgs/m³. Several reasons have been advanced by technical experts that range from substandard treatment cylinders and control systems, use of lower chemical concentrations, higher proportion of sapwood (more than 80 per cent) due to fast growth, lower drying period and corruption whereby poor quality materials are accepted.

Price of wooden poles

Wooden utility poles are facing nascent competition from concrete poles and potential of the re-emergence of steel or fibreglass poles. Lower quality and high prices for wooden poles are likely to push major users to shop for alternatives. The current fast growth of treatment plants and their processing capacities in the country and growing imports has made the sector very competitive, hence potentially able to keep prices low.

However, KPL recently accused the wooden pole suppliers of manipulating prices to ensure that they remain high despite expanded supplies from farms and the existing competitive environment, hence its decision to diversify to concrete and fibreglass poles that last longer, thus cutting replacement and maintenance costs.



Concrete poles installed by the Rural Electrification Authority (REA) in Kihwezi. (Photo: Jan Vandenaheele)

Concrete poles

Concrete poles were introduced in the 1960s in Nairobi and Mombasa but discontinued in the 1970s due to cost considerations. However, concrete poles were reintroduced into the country in 2010 when a manufacturing plant with a capacity of 30,000 poles per year but an output of 12,000 was commissioned in Nairobi.

The number of firms that manufacture concrete poles has shot up from two in 2013 to seven by 2015, with an estimated production capacity of 150,000 poles per year. The first firms to produce concrete poles were Bett Company and Jungle Energy. These were then joined by Royal Transmission in Nakuru and Buzeki in Eldoret, among others.

Concrete poles have a longer lifespan than wooden poles but are heavy and thus require specialised handling equipment. Again, non-renewable materials are used in their manufacture. KPL reports that a 10-metre wooden pole retails at Ksh 12,000 compared to Ksh 18,000 for a concrete pole of the same size. Therefore, switching to concrete poles makes economic sense as they cost 33 per cent more, but have a lifespan twice that of treated wooden poles.

By 2013, concrete poles accounted for only 3 per cent of the total demand by KPL, which is still far less than the 30 per cent currently allocated to imports. But the durability of concrete poles can eat into wooden pole replacements into the future.

Fibreglass poles

In April 2014, KPL revealed it would start using fibreglass poles to reduce electricity transmission costs, accelerate connections to households and reduce the cost on timber poles. The company indicates that fibreglass poles, made from silica sand, limestone, soda ash and plastic, are stronger, lighter, more durable and sturdy enough to withstand rugged terrain compared to concrete and traditional wooden poles.

The fibreglass poles are impervious to rot and pests and require no maintenance. They can last up to 80 years, which is one-third longer than concrete poles and more than three times the wooden poles' average of 25 years. Fibreglass poles are reported to be ideal for salty, swampy and hilly places and do not require heavy machinery to erect.

The poles underwent tests with a sample from Duratel, a Chicago-based maker of utility poles and power transmission structures. However, the plant to manufacture fibreglass poles is yet to be commissioned in Kenya.

Imports

KPC indicates it will still reserve 20 per cent of



Treated wooden poles at the Kenya Power yard in Eldoret, where poles are received from the various treatment plants. (Photo: BGF)

its pole requirements to imports mostly from Tanzania and Uganda as part of the promotion of regional trade. However, data available shows that between 2009 and 2014, the actual imports averaged 70,000, except for 2012 when they peaked at 187,000 poles (Cheboiwo, 2014).

Some remedial measures

Training on woodlot management

Recent studies by Cheboiwo (2013) indicate a massive entry of poorly trained farmers into eucalyptus growing for transmission poles. These farmers have not received adequate advisory services on site selection, quality seedlings, spacing, planting and management practices.

Some farmers have been planting commercial woodlots at low spacing, sometimes 1 x 1m, and in poor quality sites such as swamps, drylands, murram soils and steep slopes with rock outcrops. Such practices have led to poor growth and mass deaths.

Proper siting, good quality germplasm, correct spacing and management operations will ensure that a large number of planted trees meet the specified requirements instead of the current situation where only a paltry 30 per cent are eligible.

Improvement of pole seasoning

The Kenya Wood Preservers Association maintains that their members deliver poles that meet the standard specifications. On the other hand, users like KPL complain of poor quality poles that fail in less than 10 years.

Technical experts hold that *E. grandis* grown under favourable highland conditions in Kenya exhibits one of the highest growth rates in the world, attaining sufficient sizes at age 7 - 8 years as compared to 13 - 15 years elsewhere in the world. The sapwood at such ages ranges between 89 - 90 per cent as compared to 60 - 70 per cent on which the current standard treatment penetration is based. Therefore, the 12-20kg/m³ CCA standard treatment may not be adequate and a higher concentration may be needed.

Another factor is that the seasoning period of three to four months may not be sufficient to remove free and cell water to facilitate sufficient chemical penetration into the sapwood. Some experts recommend seasoning for six to eight months.

The industry may also need to relook at other factors such as treatment equipment and systems currently installed, skills of the personnel deployed, quality of chemicals in use and quality control procedures.

Alternative markets

Following falling demand for semi-processed transmission poles, eucalyptus growers can diversify to other market niches. These include industrial firewood for food processing and textile industries, charcoal, sawn wood, saw logs and construction pole wood.

Export potential

Kenya has imported poles since the 1990s, mostly from South Africa, Brazil, Zimbabwe,

Finland, Chile, Australia and recently, Tanzania and Uganda. Therefore the Mombasa – Kampala northern corridor transit route that has been used to import utility poles into Kenya can serve as an export route as well. Existing import and export infrastructure includes a favourable taxation regime, timber importers and regulatory and enforcement agencies that currently support trans-boundary timber trade with DRC and Tanzania.

Recent studies by the East Africa Policy Centre show that moving a 20-tonne container through Mombasa port to Nairobi costs US\$ 1,300, to Kampala US\$ 3,400 and to Kigali US\$ 6,500. It was reported that port charges and delays account for up to 40 per cent of the costs.

In contrast, the same container costs US\$ 1,200 to move from Japan to Mombasa port. Therefore the major handicap to trade in the East and Central Africa region has been transport costs. The port of Mombasa has the capacity and equipment to handle pole exports anywhere in the world.

According to some import/export merchants, Rwanda and Uganda are the only viable markets for utility poles currently, due to transport costs and ease in business transactions. However, since Kenya is exporting goods to Ethiopia through the Moyale border points, the same infrastructure and trucks can be used to transport utility poles. The Mombasa – Kampala northern corridor transit route can also be used to export utility poles to Sudan and DRC. The export market may need higher standard specification in terms of chemical penetration and longevity in use for they will be competing with the best in the world.

Industrial firewood

A number of industries across the country use firewood in processing. Currently, the sector is dominated by small players with minimal capital and equipment. The contracted suppliers are a mixture of farmers and merchants. The key buyers in the sector include 65 Kenya Tea Development Agency (KTDA) affiliated factories, textile and food processing firms such as Pwani Oil Refineries (Mombasa), Menengai (Nakuru), Rivatex and Raymonds Textiles (Eldoret), Lessos Dairies (Eldoret), Homalime Ltd (Muhoroni), among others.

The KTDA affiliated factories currently experience fuel wood shortages especially in Central Kenya, and in Kericho and Kisii counties. The aggregate demand for industrial firewood is in excess of Ksh 2.4 billion with the tea sector accounting for 66 per cent of demand. Studies indicate that the main cost in firewood trade is transport. Therefore, the firewood trade is more attractive to farmers and merchants with their own transport.

Construction poles

Another alternative market is the construction sector with a demand for different products such as long poles for temporary structures, scaffolding and fencing posts. This market is relatively small but likely to grow with urbanisation.

The construction poles are grouped mainly into three categories depending on girth and length, such as small woods (fito), mediums (parallels) and king posts. The age of construction poles ranges from 1.5 to 3.5 years. Most merchants that stock construction poles also have fencing posts and domestic firewood.

Charcoal

Charcoal has remained an important source of energy for cooking in most urban and rural households in the country. Charcoal is the second most important traded wood product in terms of volume and value after sawn wood. The estimated per capita consumption of 0.3915 translates into approximately 16.3 million cubic metres of wood per year.

Except for some sustainable production from black wattle, most of the charcoal in Kenya is sourced from unsustainable harvesting in arid and semi-arid lands (ASAL) and farm clearing in high potential areas.

According to Cheboiwo and Mugo (2012) charcoal production and marketing is a big business in the rural and urban areas with an estimated 67 million bags, equivalent to 2.4 million metric tonnes, being traded annually. At the current price of Ksh 800 per bag this translates to Ksh 53 billion and the predicted fall in supply will mean a large section of the demand will be unmet.

Therefore the entry of eucalyptus into the charcoal sector is a viable business model. However, there may be some technical challenges on wood density and carbonisation process to produce good quality charcoal.

Financial stability

Most of the treatment plants are subsidiaries of larger businesses with stable financial bases. Fewer than five plants are stand-alone businesses. Thus, in our opinion, most of the treatment plants operating in Kenya have a well-founded financial base, and are unlikely to collapse due to financial stress unless under prolonged accumulation of unsold stock.

However, a drastic fall in demand for poles would definitely make investors relocate elsewhere. The scenario has become increasingly likely in the short and medium term due to the continued entry of new players, competition from other products and imports.

Conclusion

The growth of the pole wood sector has been very fast, and has come with some challenges. Quality requirements call for urgent attention, to safeguard the interests of hundreds of investors that include power distribution firms, wooden pole manufacturers and hundreds of investors in eucalyptus growing.

(For references for this article, please contact the publishers).

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Treated wooden poles. If Kenya Power and the Rural Electrification Authority turn to concrete poles, tree-growers could suffer massive losses. (Photo: BGF)