

Grevillea grown on farmland

Timber business environment and its value chains

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Primary processing: use of powersaw to convert the stems into planks. Wastage is high due to the big kerf of the chain. Note the absence of protective gear/equipment on the chainsaw operator.
Photo: Sammy Carsan

Grevillea robusta was introduced in Kenya as a shade tree for coffee and tea cash crops. It was adopted by coffee planters from the very early days of the industry in Kenya and by 1910 the Forest Department had started planting it in mixed stands with cypress (*Cupressus lusitanica*). In the 1940s, it was widely recommended as a timber tree for planting at altitudes below 2,000 metres, while cypress was recommended for higher altitudes (Graham 1945:133).

The species is currently well accepted and established around the East African highlands having been naturalized locally in the last 100 years. In these densely populated zones, it is an important source of fuel wood and income from sale of construction timber. The wood is appreciated for fuelwood because it dries quickly- the trees are usually heavily pruned for fuel and construction of small farm buildings. The pale pinkish brown timber has a beautiful, well-marked silver grain, making it desirable for furniture and cabinet work. The species is popular with farmers because it provides viable

products, it is easy to propagate and can grow in low-fertility soils.

Grevillea is an excellent agroforestry tree as it does not compete with adjacent crops. Growth rates are varied but mean annual volume increment (MAI) of at least 15 m³ ha⁻¹ yr⁻¹ in block planting plans can be realized under optimal climate, soil and management conditions (Harwood and Carsan Pers. Comm). Farm timber production in central parts of Kenya such as Meru, has gained prominence owing to the now lifted ban on logging and dwindling timber supplies from plantations. There are nonetheless concerns that future tree planting for timber may not be productive as they are established from seeds of a narrow genetic base.

Given the socio-economic importance of *Grevillea* to support rural livelihoods around East Africa, The World Agroforestry Centre (ICRAF) and national partners have researched about its genetic resources management, farm production and marketing.

Grevillea timber business environment

Timber supply in Kenya is unsustainable considering the country's low forest cover. An over-reliance on plantation forests for all the timber supply is no longer tenable given the management constraints for plantation establishment such as high maintenance costs, fire risks and requirements for large tracks of land to site such plantations.

During the government ban on forest logging (1999-2013), there has been an increase in logging *Grevillea* from private farms to substitute supplies from plantations. Farmers are experiencing an upsurge in wood demand grown from their farms and the increased tree business at farm level requires enterprise skills to manage tree production.

Grevillea was previously (before the 1999 logging ban) widely grown to meet domestic wood requirement needs such as construction of homes, animal pens and for firewood. The tree is commonly used as a boundary marker



Chainsaw milling with attachment. A small investment for better quality timber. Notice the protective gear (gloves, helmet with eye protector and hear protectors). Photo: Sammy Carsan

and supports soil conservation measures such as windbreaks and erosion control in contour planting. The emphasis by extension services to use tree products mainly for domestic and environmental benefits seems to have limited its business development. Indeed grevillea is known to make high quality finished wood products in its native country- Australia.

In central parts of Kenya where up to 80% of all trees on farm is grevillea, the wood is often regarded as of inferior quality for use in furniture making and construction industry. Given its fast growth rates, young trees are commonly felled for timber affecting its durability as it becomes susceptible to pest attack on storage, especially attack by weevils and termites. The wood has therefore compared unfavorably with timber from *Cupressus lusitanica* and *Pinus patula*, from gazetted plantations, which command a huge market share. Furthermore, logging from state forests is preferred by commercial buyers due to favorable market factors such as bulk supply of wood and royalty prices on roundwood (the actual costs of the wood is often hidden and only a 'token' price is charged). Timber sourcing from small-holder farms is on the other hand considered a logistically expensive affair owing to the need to procure trees from many small farms which may not contain sufficient quantities.

Trees are perceived to be of poor form due to inferior silvicultural management practices such as poor pruning methods. The wood ends up with enormous knots which negatively affects the wood strength properties. Poor timber seasoning/stacking, often results in warped and bent timber. Most growers have poor market information,

limited capital to process wood and poor wood valuation techniques. The bulk of grevillea trees grown on farms is therefore commonly sold as standing trees. Farmers do not process the wood into timber. They may however negotiate with buyers to sell the branches and slabs as firewood. Buyers coming to farms usually have the upper hand in negotiations with the farmers, disposing of better price information and market networks.

Several policy and legal regulations often hamper timber trade from farms. Farmers have to acquire wood felling (certificate of origin) and movement permits from Kenya Forest Service before any form of timber trade can take place. This often translates to a disincentive to many growers who don't see the reason for felling permits for trees grown on their own farms. The entire timber acquisition process is therefore riddled with inadequacies which sometimes leads to corruption eroding gains from the trade. Timber sourcing from farms is constrained by conflicting sectoral policy regulations such as on water, agriculture, environment and coffee which for instance restrict tree felling around water catchments areas. Blanket pronouncements for farmers 'not to cut trees' often sends the wrong message to potential small and medium timber grower enterprises.

In addition, acquiring the right planting material is often expensive for farmers. Most farmers source seeds from their own farms or from their neighbors who have mature trees, or are running tree nurseries. Other farmers obtain planting materials from the local markets. We estimate that farmers may be losing up to thirty

(30%) per cent of the value of their wood product value by simply using seeds obtained from poor quality sources.

Farmers grow their grevillea trees on croplands, in line planting along boundaries, in blocks or woodlots. Small farm sizes accelerated by land subdivision and competing enterprises such as coffee, cereal crops and horticultural crops however limit expanded tree growing. Previously Grevillea was associated with a high incidence of root-rot *Armillaria mellea* in coffee and tea (Wallace 1935 and FD 1924:22). This brought the tree into some disfavour among commercial coffee and tea growers, but it remains extremely popular amongst small-holders in many areas.

Small-holder farmers indeed have a competitive advantage for particular market segments, due to their proximity to local markets, price advantages and lower costs of tree cultivation. Improved farmer organization, strengthened management capacity, better inputs (knowledge & germplasm) and negotiation skills are however much-needed to enhance socio-economic benefits at the community and household levels.

Value chain analysis

Resource audit

The Kenya Forestry Master Plan 1994 estimated that by the year 2010, the majority of timber and poles would be sourced from farms. Recent farm tree inventories have reported regular tree densities of 7.5 m³ per ha in the central agricultural areas of the country; with this rising to 17.07 m³ per ha in mixed agroforestry



Open air drying. Training on stacking for planks to increase circulation of air. Photo: Sammy Carsan

systems if extension services, provision of seeds and tree silviculture advice is availed (Njuguna, Holding & Munyasya, 2000; Carsan et al. 2013).

Grevillea tree ownership is usually by the head of family or closely linked to the landowner or next of kin. Farmers often sell standing trees on farm for timber and sometimes fuelwood. Power saw/chainsaw is the commonest implement used for felling and milling trees on farm. Tree buyers organize for tree felling by hiring chainsaw operators or mobile saw benches.

Timber yard owners usually located in urban centers are the main buyers, while furniture makers purchase specific hardwood timber species such as *Cordia africana* (mukumari) and *Vitex keniensis* (meru oak) for cabinet making. Mobile millers operate from known locations within local urban centers where they are visited by interested clientele. The mobile millers in turn move from village to village searching for trees to be felled. Timber processing is therefore largely dominated by mobile benches and chainsaw operators. Yet another big source of grevillea wood demand comes from tea factories who may buy whole lots through locally contracted agents who in turn buy materials from farms. The agents have been found to be rather indiscriminate when buying fuelwood trees from farms.

Timber purchase usually is done on a standing tree basis. Negotiations are undertaken, sometimes based on the amount of timber recovery that goes to the buyer and the amount left with the farmer. Log costs therefore vary upon negotiations.

After consolidating the purchase, felling and milling exercises are commenced. Chainsaw operators or mobile bench sawyers are hired for timber processing. Care has to be observed to limit crops destruction and other property on farm. Enough labour is required to facilitate

felling, splitting and timber collection on farm. Tree location on farm has to be carefully evaluated for felling and splitting operations. Trees on valley bottoms are difficult to transport as logs and are better split on site using chainsaws.

Once logs processing is finalized on farm, usually there is no adequate in-house storage for timber. It may just be stacked on a space within the homestead next to the wall of the main house or somewhere within the compound. Labour to stack and load is needed. Tractor-trailer and lorry transport is often used to ferry timber destined for urban centers to supply timber yards, furniture makers and construction sites. Local demand for timber, for instance by neighbours often uses porters offering cart transport.

Access roads to the farms, which are usually earth roads, have to be assessed before-hand to sort out transport logistics.

Marketing and sales take place at different levels. At the farm level, farmers sell trees, to different businesses or middlemen. For instance, furniture makers may source timber directly from farms or use middlemen or timber yards to source all their wood requirements. Operators in the construction industry may also procure timber directly from farmers or from timber yard operators in urban locations.

Service provision is non-existent for small-holder timber businesses. Individual businesses are currently capitalizing on the huge timber demand and no semblance of follow-up on customer satisfaction is currently provided. As a result little product differentiation is found among businesses and timber quality is rampantly compromised.

Few technology improvements are applied in milling and marketing timber trees from farms. The use of mobile benches and free-hand chainsaw mills is however common.

Timber recovery rates are about 40% for large sawmills, 30% for medium sawmills and 25% for small sawmills, though other studies have indicated recovery rates of 30-40% for bench saws and chainsaw milling (Onchieku, 2005). The use of chain-saw milling attachments such as frame mills, Granberg's, Alaskan, Mark III and the Small Log Mill with the potential to improve recoveries are not available and not used (Pasciesnick and Carsan, 2006).

Human capital

There is an urgent need to improve farm timber management skills. The supply of has changed from forest blocks to small farms and some businesses are able to adapt while others are not. At the same time, farmers are not organized for the market, are unaware of timber valuation, pricing and demand and have little negotiation ability as they function as individuals selling 3-5 stems at a time. Further, tree management is poor, producing poor boles that fail to fetch good prices. The timber marketing system has not been organized to receive produce from farms.

Many sawmillers employ casual unskilled labor resulting in enormous wastages on recovery. There is poor handling of chainsaws, with no protective gear resulting in frequent accidents and high maintenance costs. Care must be taken when machining and finishing the wood because Grevillea sawdust seem to contain a skin irritant that produces an uncomfortable rash lasting a week or more. Sawmillers also dislike farmer use of kerosene on freshly felled logs as a preservative of wood from weevils.

Timber seasoning is in addition found to be poor amongst wood processors and timber businesses. Poor storage often results in warped and bent timber that further increases wastage. There is therefore a need to avail skill sets that will help value chain actors' adopt strategies that will help improve the value of tree products obtained from farmers.

This article will continue in the next issue, continuing on challenges & constraints and final analysis.

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