

Where is the money?

A comparison of profitability between crops and tree cultivation in the south eastern drylands of Kenya

By Linus Wekesa

Drylands are difficult environments, and people who live there operate behind a background of biological, social and economic impediments. Indeed, questions have often been posed as to whether anything good can come from the drylands. This is clearly demonstrated by the paltry budgetary allocations made by the government to such environments.

Drylands are the most remote parts of the country with poor transport, information and communication infrastructure. Such areas form Kenya's backwaters and once in the wetter parts of the country, people often crack jokes that they are now in Kenya.

The human population growth rate in the drylands is one of the highest in the country. The population of Makueni District, which is one of the south eastern drylands districts, increased from 190,631 in 1948 to 670,359 in 1989 with an annual growth rate of over 6 per cent. Such high human population in the drylands has resulted in a reduced resource base, precipitating food insecurity and poverty, which are rampant. The estimates of average annual farm income for a household with an average family size of five in the Ukambani districts, for example, is Ksh 69,820 per annum. This gives an annual income level of Ksh 13,964 per person. Such income level is below

the absolute poverty line estimated at Ksh 14,868 per person per annum.

In trying to meet their economic ends, smallholder farmers in the region are engaged in different farm activities. The farmers grow crops and trees to supplement returns from the main rangeland activities like livestock rearing. The range of crops grown is wide and varied, depending on the need and preference of the farmer. The most common trees under production are

the crops, the top three profitable ones used were pigeon peas, green grams and maize with VCR values of 2.62, 2.54 and 1.44, respectively. The top three woodlot species used were *Melia volkensii* (mukau), *Eucalyptus* spp and *Dalbergia melanoxylon* (mpingo) with VCR values of 2.99, 2.85 and 0.85, respectively. Finally, the top three fruits used were pawpaws, mangoes and guavas with VCR values of 7.63, 6.62 and 4.10, respectively.

The following table gives a good overview of the different categories:

Crops	VCR	Tree species	VCR	Fruit species	VCR
Pigeon peas	2.62	Mukau	2.99	Pawpaw	7.63
Green grams	2.54	Eucalypts	2.85	Mango	6.62
Maize	1.44	Mpingo	0.85	Guava	4.10

VCR= Value Cost Ratio

for fruit and timber/pole production. To help farmers make decisions on the enterprises in which to engage, Wekesa et al (2004) used value costs ratios (VCRs) to demonstrate profitability of crops and trees commonly grown in the south eastern drylands districts of Kajiado and Makueni. As a rule of thumb, a VCR of 2.0 was considered the minimum acceptable worthwhile rate of return. This means that for every one unit invested in production, the farmer is able to recover it and also earn another unit as profit.

The VCR values for the top three enterprises in each category were averaged and used to compare profitability of crops and trees on such smallholdings. Among

However, one has to be cautious in the interpretation of the results; a fruit species like pawpaw, with apparently the highest value cost ratio, is arguably the biggest consumer of water and less of a dryland species than mango and guava. The other extreme, mpingo, supplies an extremely valuable timber marketable at US\$ 10,000/m³, but is a very slow grower.

Moreover, in an area like southern Makueni (Masongaleni, Mtito Andei); eucalypts might die-back during a couple of dry years so that their value decreases drastically. In similar circumstances, mangoes will need additional watering to avoid abortion of its fruits due to drought. Growth



This is how a well-tended maize stand in ASAL can look (photo left, in Emali, Makueni District), but more often it will look like this (photo right, around Mumoni hills, Mwingi District)



A well managed *Melia* (mukau) woodlot in Kibwezi



A pawpaw plantation in ASAL. The picture was taken during the rainy season. During the long dry spell, the pawpaws will not yield much

of mukau and mpingo will simply stagnate and afterwards continue.

As species that provide a buffer against climatic variations and rainfall vagaries, this leaves pigeon peas, green grams, mukau and guavas as the most risk-free.

The results of the average VCR for the trees and crops are illustrated in Fig 3. The fruit trees had the highest VCR. The average VCR for the top three profitable fruit trees was 6.12, implying that one is able to recover the cost of investment in fruit production by year six and make a profit of 5.12. The top three profitable high value woodlot tree species had an average VCR value of 2.23, resulting in a profit of 1.23. The top three crops had an average VCR value of 2.20, resulting in a profit of 1.20.

Fruit production in the region was quite profitable, possibly because of their high yields and high producer prices. The fruits were of high quality and in demand both at the local and export markets. The poor performance of crops in profitability could be due to the low yields as a result of

declining soil fertility, poor producer prices and high costs of production.

The legumes were more profitable than the cereals. This was due to their high producer prices because of high demand in the market. In addition, legumes take a shorter time to mature, thus utilising the scarce rains to give good yields. Bulrush millet had the highest cost of production, making it the most unprofitable crop because of the labour required to scare birds away while the crop is in the field.

In conclusion, the study observed that fruit production is the most profitable enterprise among trees and crops on smallholder farms in the south eastern drylands. The fruits were profitable at all stages of tree growth on the farm compared to crops and woodlot tree species. The most profitable fruit trees were pawpaws and mangoes because of their high yields and quality fruits. This was followed by high value woodlot tree species whose profitability increased with years of tree growth.

The most profitable woodlot tree species

were mukau and eucalypts (*E. camaldulensis* and *E. tereticornis*). At over six years of age, the woodlot tree species were more profitable than the crops commonly grown in the area. However, during the initial years of production, crops were more profitable than woodlot tree species.

Based on the above observations, it was recommended that farmers be encouraged to engage in tree production to help diversify and optimise their incomes. The highly recommended trees for smallholder farmers were pawpaws and mangoes for fruit production, and mukau and eucalypts (*E. camaldulensis* and *E. tereticornis*) for timber and pole production. The recommended profitable crops were pigeon peas, green grams and maize **M**

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Caught in the act

African blackwood, also called ebony or mpingo (*Dalbergia melanoxylon*), transported on a donkey cart in the Makueni District countryside. Note the small diameter of the poles, and their dark inner side, which is the valuable part of the wood, much coveted for making carvings and parts for musical instruments (mouthpiece of flutes etc). Even such small poles take a long time to grow, the reason for their low VCR values (see main article).

In this case, the load was confiscated by the DFO because of its illegal nature. There was no transport permit and the tree is protected in Kenya and cannot be cut freely. There isn't much African blackwood of appreciable size left in Kenya. There is still some in Tanzania and Mozambique, where the Makonde people use it for their well-known wood carvings. However, even in Tanzania, it is diminishing **M**