

POLICY VOICES SERIES

Africa Research Institute



KENYA'S FLYING VEGETABLES
Small farmers and the 'food miles' debate
By James Gikunju Muuru

The Author

James Gikunju Muuru is a smallholder farmer from Mwea, in Kenya's Central Province. He lives with his wife and six children near Karii Koini village in Kangai location, Mwea division. Kangai, Gikuyu for 'small place of God', is approximately 30km south of Mount Kenya.

James comes from a large family, with 23 sisters and nine brothers. In 1955, aged ten, he persuaded his reluctant father to send him to school. He attended a local Catholic school until the age of 18.

For 25 years, James worked as a Community Development Assistant for Mwea District Social Services. He began his farming career in 1975, after purchasing a four-acre plot of land from a neighbour.

Since 1986, he has grown a variety of horticultural crops for export. Over the past 20 years, James has sold crops to some of Kenya's leading horticultural exporters, including Sunripe, Kenya Horticultural Exporters and East African Growers.

James is an active member of the local horticulture farming community. He is vice-secretary of Karii Koini Green Growers Association, a local farming group that specialises in growing green beans, and vice-chairman of Karii Koini Horticultural Self-Help Group, which produces soya beans and sweet potatoes.

James is also a member of Tisa, an organisation of 17 farming groups which is in the process of exploring the potential for direct sales of horticultural crops to Europe.

The Policy Voices Series

The Policy Voices Series highlights instances of personal achievement with wider implications for policy makers in Africa.

In publishing these case stories, Africa Research Institute seeks to identify the factors which lie behind successful interventions and to draw policy lessons from individual experience.

This series seeks to encourage competing ideas, discussion and debate. The views expressed in the Policy Voices Series are those of the author, and not those of Africa Research Institute.

Acknowledgements

The author would like to acknowledge the support and cooperation of Peter Ngigi, chairman of Tisa. This project would not have been possible without the assistance of Dr Stephen Mbithi and Francis Wario at Fresh Produce Exporters' Association of Kenya (FPEAK). James MacGregor at the International Institute for Environment and Development (IIED) kindly enabled introductions to horticultural experts in Kenya. This manuscript was compiled from original transcripts of interviews with James Gikunju Muuru, with editing and additional research by Jonathan Bhalla. Cover design by Krishna Stott. Editing and publication was managed by Aoiffe O'Brien. Africa Research Institute would like to acknowledge the generous assistance of Richard Smith.

Published by Africa Research Institute, 2009
ISBN No. 978-1-906329-05-1

Africa Research Institute is a non-partisan think tank based in London. Our mission is to draw attention to ideas which have worked in Africa, and to identify areas where new ideas are needed.

For more information please visit our website:
www.africaresearchinstitute.org
43 Old Queen Street, London SW1H 9JA, UK

Africa Research Institute



CONTENTS

Foreword	3
By Mark Ashurst Director, Africa Research Institute	
1. Introduction	6
2. Farming in Mwea	6
3. Then and now	8
4. Irrigation, or the 'furrow'	9
5. From maize...	9
6. ...to horticulture	10
7. Advantage Africa	10
8. Markets versus food security	11
9. Organise, then negotiate	12
10. KKGGA, green bean growers	13
11. Tisa, representing small farmers	13
12. Diversification, healthy crops	15
13. Quality control	15
14. Pangas, not tractors	16
15. Quality of life	17
16. Against 'food miles'	17
17. Recommendations	18

Foreword

Fruit, flowers and vegetables from Africa occupy only a small space on the shelves of European supermarkets – yet they are hugely significant in the often vexed debate about Africa's prospects. Two thirds of the continent's population depend on agriculture, but in per capita terms farm output is lower today than in the 1960s. The example of Kenya's labour-intensive horticulture industry demonstrates an alternative trajectory, founded on exports of non-traditional crops. In little over a decade, horticulture has become the largest sector of Kenya's economy – a bigger business than tourism or telecommunications.

Driving from Nairobi, the visitor to Mwea is struck first by the lush green of the landscape. Here, at the foot of the eastern slopes of Mount Kenya, farmers tend serried rows of vegetables. The film of dry red dust which clings to the roads in Central Province contrasts with the darker earth of irrigated fields. For Kenyan smallholders, the attributes of the land – fertile soil, temperate climate and water funnelled through a network of man-made canals – are their only comparative advantage in an emerging global industry.

On my first visit to Mwea, I noticed a farmer digging out partially grown green beans from a field – clearly well before they were ready for harvest. There was nothing wrong with the beans, he told me when I asked if the crop had failed. Instead, he had clinched a better contract to grow sweet potato for a large commercial exporter. His field would be re-planted with the more profitable vegetable. In Mwea, the pursuit of more valuable harvests has transformed the standard of living of a rural population which for generations has depended on a few staple crops for food and income.

James Gikunju Muuru has seen the horticulture boom from his vantage point in the village of Karii Koini, where he arrived as a small child after his family moved from the barricaded camps built by British administrators

before independence. His story is a telling counterpoint to the unresolved arguments among policy makers over the best strategy to improve the productivity of small farmers in the developing world. Horticulture in Kenya is entirely a private sector industry, and receives no government subsidy. The choice of crops is calculated purely in response to market demand. When prices change, farmers act quickly.

Every week, three consignments of one tonne of green vegetables are despatched by the Karii Koini Green Growers' Association for packaging in the warehouses of the largest commercial farms. By sharing infrastructure and know-how, smallholders are responsive to the commercial priorities of exporters. Their diligence and swift harvesting produce premium crops of higher quality than larger commercial farms. Already, about 60% of Kenya's fruit and vegetable exports are grown by smallholders.

Organisation and cooperation are a constant theme in James' story. The close collaboration between small farmers and exporters is due in large measure to effective organisation by local farmers' groups and trading associations. The umbrella organisation for Mwea's farming groups is known as Tisa – Kiswahili for nine, a name chosen initially to reflect the tally of its members. Its ranks now number double that figure: a measure of the group's success both in coordinating production and in raising the collective bargaining power of smallholders.

By managing a precise schedule of planting and harvesting, smallholders produce a reliable supply of fresh vegetables to meet the stringent quality standards and short inventory period of supermarkets in Europe. Annual exports account for just 10% of Kenya's horticultural production, but fully half of the industry's revenues. In 2009, foreign earnings from horticulture are on course to exceed US\$1 billion. Dr Stephen Mbithi, chief executive of the Fresh Produce Exporters' Association of Kenya (FPEAK), argues in these pages

that horticulture is Kenya's best answer to the challenge of globalisation.

Critics of this young industry object that African horticulture poses an environmental hazard. Fruit and vegetables grown by Kenyan smallholders are processed in the warehouses and packaging plants of large-scale commercial farms, then despatched by road to the main airports, and finally carried by air to Europe. This year, 85% of Kenya's fruit and vegetable harvest is destined for Europe, where retailers are keen to advertise their environmental credentials. The concept of 'food miles' – to indicate the distance travelled by food, and of 'carbon miles' – a measure of carbon emissions during transport, has become a sensitive issue for supermarkets in Britain and elsewhere.

The principles of 'slow food' and local sourcing have been taken to heart by consumers concerned at the ethical implications of an industry dominated by a handful of supermarket retailers. Environmentalism is only one of these concerns, but a liability for exports of African horticulture. If an emerging industry which has transformed the livelihoods of rural populations is stymied, smallholder farmers will retreat from the recent trend of diversification from staple crops into horticulture. Yet with the right markets and conditions, Kenyans have demonstrated that smallholders in Africa can participate in this burgeoning global trade.

The arguments in the debate over food miles deserve careful consideration. In April 2007, when Britain's Soil Association announced plans to review its 'organic' certification for all air-freighted agricultural products, its membership of organic farmers in the UK was swiftly accused of protectionism. Although the Soil Association subsequently retracted its threat not to certify African horticulture, suspicion lingers that environmentalism was deployed as a rhetorical Trojan Horse by European farmers – a means to attack more competitive producers in Africa, under cover of a seemingly creditable concern for the planet.

Most Kenyan horticulture exported to Europe is flown in the holds of passenger aeroplanes carrying European tourists to and from Nairobi. To follow the 'no food miles' principle and boycott air-freighted vegetables would in effect penalise African farmers for the pollution generated by European holiday-makers. The preoccupation with 'food miles' diverts more uncomfortable questions about ultimate responsibility for climate change. Given the huge disparity in carbon emissions between Africa and the industrialised nations, as the International Institute for Environment and Development has shown, a more relevant debate would concern 'fair miles' – whether it is justified to censure African horticulture for its carbon footprint, in the context of vastly greater emissions from industrialised nations.

British supermarkets became embroiled in a similar argument when Marks & Spencer, a food retailer, introduced labels in 2007, to indicate which items among its range of foods were transported by air freight. Some industry figures reacted with fury – led, in private, by Justin King, Sainsbury's chief executive. For King, a former head of food at Marks & Spencer, the message implicit in such labels was misleading and detrimental to the most competitive producers in Africa and South America. Even if UK consumers were to stop buying imported flowers, fruit and vegetables, preference for locally-sourced crops would not reduce the carbon footprint of European tourists flying to Africa's mountains, beaches and safaris.

By comparison with Europe, the ecology of African horticulture is worth preserving: the traditional methods of small farmers are simple, and worth preserving. Kenyan labourers work almost entirely by hand, from the first preparation of soil for planting to the final harvest. They have no tractors or other machinery. Crops are sprayed by hand-operated pumps (filled with regulated pesticides, accredited by professional agronomists). Crops which are seasonal in Europe grow naturally under the African sun at any time of year, while consumers in

industrialised countries want fruit and vegetables all year-round, a market worth £200 million in the UK alone.

The small farmers of Mwea live at the margins of the global economy but their experience contains, in microcosm, some fundamental lessons for effective participation in global trade. First, the need to be nimble: as demand changes, so farmers must adapt – switching from green beans to sweet potato. Second, the importance of infrastructure: the success of Kenyan horticulture is a direct consequence of irrigation canals built in the decades immediately before and after independence. Smallholders rely on the packaging and warehousing capacity of large trading companies, while exporters need reliable roads and airports for the swift export of perishable crops.

The European alternative to imports of African horticulture is far more damaging to the environment. Europe's biggest horticultural producers rely on mechanised farming in artificially heated 'hot houses'. The high costs of production are warranted by higher profit margins from flowers, fruit and vegetables. The same farmers tend not to grow lower value crops such as bananas, tea or coffee in 'hot houses'. Such crops are not considered commercially viable, although demand is constant throughout the year. The implication is that imports from Africa are acceptable where profit margins are low – a modern variant of the traditional patterns of colonial trade in raw commodities with the African, Caribbean and Pacific countries.

In policy terms, the example of Kenyan horticulture argues for a more ambitious strategy to promote African exports – an objective shared, but not achieved, by almost every generation of post-independence leaders. Relative to the size of its domestic economies, Africa's share of world trade has risen steadily throughout the recent era of international trade liberalisation. As a proportion of all world trade, however, Africa's share has deteriorated from 6% in 1960 to the current level of about 2%. For almost half a century, Africa has missed out on the rapid

expansion in world trade – growth curtailed only by the current economic slowdown, for which African institutions cannot be held responsible. In such adverse conditions, the global ambition of small farmers such as James Gikunju Muuru deserves close attention.

Mark Ashurst

Director, Africa Research Institute

1. Introduction

I am a smallholder farmer from Mwea in Kenya's Central province. I own a plot, about four acres of land on the outskirts of Karii Koini village, on which I cultivate horticultural crops for both export and domestic markets. I have grown a variety of crops over the last 20 years, including staple crops such as maize and beans. In the last year I have produced green beans, soya beans, sweet potatoes, baby corn, tomatoes and cabbage.

I was deeply concerned when I heard about the argument that horticultural crops from Kenya are bad for the environment. The so-called 'carbon miles' argument made very little sense to me, because we grow all our crops in an environmentally friendly manner. We rely on the sun and manual labour, not tractors or artificially heated greenhouses.

Horticulture has generated higher and more reliable profits than staple crops. The profits I have made from horticultural crops, particularly export crops, have paid for all of my children's education and medical expenses. I have built a new house, and made a number of investments in my farm, including a water pump and a bull to plough my fields.

More generally, the quality of life of villagers in Mwea has improved along with the growth of horticultural production. The incomes of smallholders have increased. Earnings from horticulture enabled Karii Koini Green Growers' Association to build a much-needed maternity clinic.

Horticultural production is hard work, especially for the export market. Our crops need regular irrigation, and must be regularly treated for disease and pests. The growth period for horticultural crops is shorter than for staples such as maize. They must be harvested more frequently. Strict international standards relating to horticulture have been challenging. Small farmers have learned how to produce specific crops in accordance with international best practice.

Staple crops are less labour-intensive but cannot support the same quality of life. Prices in staple crop production are volatile. I grew maize and beans for more than ten years, but it was difficult to make a healthy profit. When prices were low, I had to cut back on non-essential expenses. When prices were higher, I had to save in case prices dropped again. I made very few investments in my farm at that time.

Horticultural exports are an important industry for rural communities in Mwea. Farmers and labourers depend on the demand for horticultural produce from Europe for their livelihoods. I urge European consumers to continue to buy Kenyan fruits and vegetables.

2. Farming in Mwea

Mwea is located in Kirinyaga district in Kenya's Central Province. The vast majority of people are Kikuyu, Kenya's largest ethnic group. Gikuyu is the first language of people in Mwea, but Kiswahili is also widely spoken. Catholicism and Protestantism are the two main religions.

I have lived in Mwea for almost 50 years but I was born in the rural area of Njegas, also in the district of Kirinyaga. My family was displaced from Njegas, as part of a colonial settlement policy, when I was 11 years old. The colonial authorities wanted to separate civilians from Mau Mau fighters, an armed resistance movement to British rule. By moving rural civilians to fenced-off villages, the authorities hoped to deny Mau Mau fighters access to food and essential supplies.

The resettlement policy largely failed. Within a year families returned to their rural homes. But we did not return to Njegas. My father was offered title to a four-acre plot of land in the Karii Koini area of Mwea, an opportunity that would not have arisen in Njegas.

Most of the land in Karii Koini is owned by individuals and boundaries are legally recognised. Land disputes are rare. Smallholder farmers choose independently how to

Fair miles, not food miles

By Dr Stephen Mbithi

Chief Executive

Fresh Produce Exporters' Association of Kenya

The concept of 'food miles' expresses the environmental impact of transporting food. The further food travels, the more energy is consumed in transport. The term 'food miles' was devised as a way of indicating to consumers the carbon footprint of food transported by air. Environmental campaigners hoped to deploy the concept to discourage consumers from buying air-freighted produce.

In 2007, the Soil Association, the United Kingdom's main organic certifier, announced in a consultation the possibility of withdrawing its endorsement of air-freighted organic food. It was concerned that carbon emissions from air-freighted food outweighed the environmental benefits of organic farming. A public consultation conducted by the Soil Association sparked a wider debate about the environmental sustainability of consuming air-freighted food.

Earlier that year, the Carbon Trust, a government-owned environmental company, launched a trial carbon labelling scheme. Leading supermarkets followed suit, with Tesco investing £500 million to develop an in-house carbon labelling scheme in partnership with Carbon Trust. Marks and Spencer announced a £200 million 'eco plan' to become carbon neutral by 2011.*

My organisation, Fresh Produce Exporters' Association of Kenya (FPEAK), contacted a number of leading supermarkets in the UK to express concern about the plans. They made it very clear to us that the measures they had taken were the result of mounting pressure from European farm lobby groups, for whom we are competitors. By presenting air-freighted produce as environmentally unsustainable, they hope to discourage our consumers, and justify their own production subsidies. British supermarkets procure large amounts of agricultural produce from these groups.

Many Kenyans have been totally perplexed by the preoccupation with fresh produce air-freighted from Africa. We welcome efforts to reduce greenhouse gas emissions, especially because rural populations in Africa will bear the brunt of climate change. But singling out air-freighted produce from Africa is the wrong way to reduce global carbon emissions. More attention should be paid to how food is produced.

The horticulture sector in Kenya is environmentally friendly. Two-thirds of export crops are transported in the cargo hold of passenger planes. All our produce is grown under the sun. About 60% of export crops are

grown by small farmers, all of which is cultivated by hand. Kenyan horticulture is between four and six times less carbon-intensive than the European equivalent, which relies on temperature control and heavy machinery.

In global terms, Africa bears only a minimal responsibility for climate change. Carbon emissions from Kenya are 40 times lower per capita than in the UK. A recent study reported in the Guardian newspaper found that government buildings in the UK emit more carbon than the whole of Kenya. African countries don't pollute nearly as much as developed countries.

Horticulture from Africa accounts for 0.1% of the UK's total carbon emissions. Air freight accounts for 5% of air transport emissions. Passenger aviation accounts for 90%.** We are surprised at efforts to discourage air-freighted produce from Africa. Climate change is a real problem. But air-freighted horticulture from Africa is only a small contributor to this large problem. The real causes must be addressed.

Horticulture supports up to 4.5 million people in Kenya. Exports generate half of all revenue from horticultural production. The industry relies on air-freighting its harvest to international markets. Vegetables, fruits and flowers are highly perishable and cannot survive months at sea. Everything we export must be fresh upon arrival.

If European consumers did not buy air-freighted produce, thousands of smallholder farmers would revert to growing staple crops. The European Union accounts for 85% of Kenyan horticulture exports, of which 35% are for the UK alone. A small farmer with one acre of land would not earn enough money to feed his or her family, send children to school and pay medical bills. High value crops pay for these essential things.

The food miles debate must be seen in context. Every country has its comparative advantage in global trade. Asian countries produce much of the world's electronic technology. The US is the world's largest carmaker. The UK specialises in providing highly skilled services. Kenya has horticulture. If we are able to participate in the global economy, we must be able to enter markets where we have a competitive edge.

* Garside, B., MacGregor, J., Vorley, B., *Miles better? How 'fair miles' stack up in the sustainable market*, Sustainable Development Opinion, 2007.

** Ibid.

cultivate their land. In other parts of Mwea, land is held in a community trust and earmarked by the government specifically for rice production.

3. Then and now

Farming has always been the dominant livelihood in Mwea. When I was growing up, everyone grew staple crops, most commonly maize and beans. Farmers reserved small areas of their plot for millet and other small grains which grew well during the months of October to November, Kenya's short rainy season.

Today, most farmers in Mwea rely on horticultural crops. Export horticulture is more profitable than any other form of agriculture. I reserve only a small plot on my land for staple crops. I don't plant enough maize to feed my family throughout the year. Instead, I spend the money I make from horticulture to buy extra food.

When I was a child, it was common for rural families to rear cattle. My father owned more than ten cows. The region is fertile, and the relatively small population meant there was plenty of uncultivated land for grazing. Dairy production was an important source of income for rural families. Cattle were used for their meat, leather and high value in the payment of dowries. Over the year, families in Mwea have become far less reliant on farming cattle. Most land in the area is now cultivated for agriculture.

Food was often in short supply during my childhood. Farmers did not have access to mechanical irrigation, so they relied on rain to water their crops. Harvests were jeopardised by too much, too little, early or late rains. Farmers did not earn enough money to purchase extra food when harvests were poor. In years of low rainfall, poor farmers in Mwea struggled to feed their families all year-round.

Mwea's high altitude creates a climate both cool and sunny. Situated roughly 1800m above sea level and only 50km south of the Equator, conditions are good for

agriculture. There are two rainy seasons, from March to May, and again from October to November, the latter being the shorter of the two.

For many years, farmers in Karii Koini were not able to make the most of their land because they did not control the water supply. Expensive irrigation equipment was beyond the reach of rural communities. Small farmers did not receive any support from the government to irrigate their crops.

The productivity of agricultural land in Kenya varies, and is partly dependent on the climate in a particular region. Only 25% of Kenyan land is arable, much of it in the highlands of central and western Kenya. Average annual rainfall in the region can vary between 1,000mm and 1,800mm. Northern and north-eastern Kenya are predominantly arid and semi-arid, where average rainfall is between 300mm and 500mm¹. Pastoral farming by nomadic groups is the most common livelihood.

Arid and Semi-Arid land in Kenya



Source: Drought Management Initiative

4. Irrigation, or the 'furrow'

Farming in Karii Koini was transformed by the development of an irrigation system in the late 1980s. An old canal, known as a furrow, was extended to bring water from the Thiba river to local farms. Irrigation has released small farmers from dependence on the rainy seasons, allowing them to grow crops all year-round.

The furrow was built in the colonial period, initially to supply water for a detention camp. Before independence, about ten native detention camps were built in Kirinyaga district to hold suspected Mau Mau members. The furrow, dug by prisoners, provided a regular supply of water for drinking, washing and the prison wardens' swimming pool. After independence, the detention camps were closed and the furrow was abandoned.

In 1965, local elders keen to make use of the furrow decided to build a water-powered mill. The *posho* mill, which ground maize and other grains, remained in operation until the late 1970s when it was replaced by a more efficient electricity-powered mill.

The potential to improve irrigation of farmland was recognised in the mid-1980s. A Ministry of Agriculture survey in Mwea suggested that farmers in Karii Koini could irrigate their plots by extending the furrow. Local elders organised community workers to dig a network of new furrows or ditches. The government provided all the necessary infrastructure. Bridges were built so the furrows could pass under roads. Locks were installed to control the water supply from the river.

The furrow system provides farms with water in two ways:

1. Farmers dig small channels from the furrow leading directly to their plots
2. Water is extracted from the furrow by an electric pump

The Karii Koini furrow is maintained by the local farming community. Farmers who use the furrow are required to become members of Karii Koini Green Growers'

Association, a farming group which has 600 members. The furrow is maintained by membership fees paid by each farmer.

The irrigation scheme successfully increased farmers' productivity prompting construction of a further two furrow projects in the late 1980s. Kathaiga water furrow, larger in scale, currently serves 870 farmers, and Metoini Kombioni water furrow is maintained by more than 1000 members.

5. From maize...

My first career on leaving school was for Mwea District Social Services as a Community Development Assistant. Later, in 1975, I followed my father's example by growing staple crops. I purchased title to a four-acre plot of land from a neighbour, in 1974. Raised on my father's farm, I was taught how to grow maize and beans from a young age. I knew that I would be able to sell any surplus crop from my annual harvest as there is always local demand for maize.

It was difficult to support my family from the proceeds of staple crops. We always had enough to eat, but little else. I only sold any surplus crop once I had set aside enough food to eat for the year. At that time, farmers in Mwea could rarely afford to send their children to school and pay medical bills from the money earned growing maize.

Prices for staple crops are volatile due to the large numbers of producers and their reliance on rain to irrigate their crops. Maize needs high volumes of water and takes between four and six months to grow. The short rains in October and November are not long enough to sustain a full maize crop. Most farmers can only manage one annual harvest. In a year of good weather, the market is swamped with maize, driving down the price. In a year of bad weather, the price soars.

When I planted the same crop every year, the quality of the soil on my farm depleted. Fertilisers needed to

replenish certain nutrients in the soil were expensive. The cost seemed to increase each year. It was risky to invest in fertiliser without knowing how much income I was likely to earn from my crop.

6. ...to horticulture

Moses Karonjo, a local tomato farmer, inspired me to try horticulture in the early 1980s. Moses was the only local farmer to sell tomatoes at market. He was making a very healthy profit compared to maize farmers. Initially his tomato crop relied on rain water, but his earnings enabled him to invest in irrigation. In 1982, Karonjo became the first local farmer to irrigate his farm with an electric water pump which sourced water from the Thiba river.

Karonjo, an acquaintance of several years, agreed to teach me how tomatoes are grown. He allowed me and a few other local farmers to collect the waste and over-ripe tomatoes from his farm after he had harvested. I planted my first tomato crop from the seeds contained in the over-ripe tomatoes.

Tomatoes are far more profitable than maize. They are in high demand in urban areas, selling at 2000Ksh per 60kg crate, or 33Ksh per kilogram. Maize, on the other hand, sells for an average of 13Ksh per kilogram.² I can grow up to three tonnes of tomatoes on one acre of land. Tomatoes take three months to grow, enabling me to harvest a number of tomato crops throughout the year.

Horticultural production in Mwea increased in the late 1980s. Small farmers began to supply some of Kenya's leading horticultural export companies. Large commercial farms in Central and Western provinces, owned by export companies, were finding it difficult to meet increased demand from Europe. They began to contract smallholder farmers to boost volumes of horticultural crops.

Today, smallholders in Mwea are highly experienced in growing horticultural crops. We know exactly how to meet the requirements of exporters, who occasionally send agronomists to teach farmers how to grow new crops. Over the past twenty years, I have learned to grow a wide variety of horticultural crops to international standards.

I have supplied horticultural crops to several different export companies, including Sunripe, East African Growers and Flamingo. The first company to contact me, in 1987, was Kenya Horticultural Exporters (KHE), a leading producer of green beans. KHE supplied me with seeds and an agronomist taught me appropriate agricultural methods for growing green beans for export.

Contracts with exporters give me the security of a guaranteed buyer for my crops. There is no local demand for the crop varieties grown for export. Farming is a business: I cannot risk planting export crops without knowing that I will have a buyer. I have never received a cash advance from an exporter. If one of my crops fails, because of an outbreak of disease for example, I will have to absorb the loss.

7. Advantage Africa

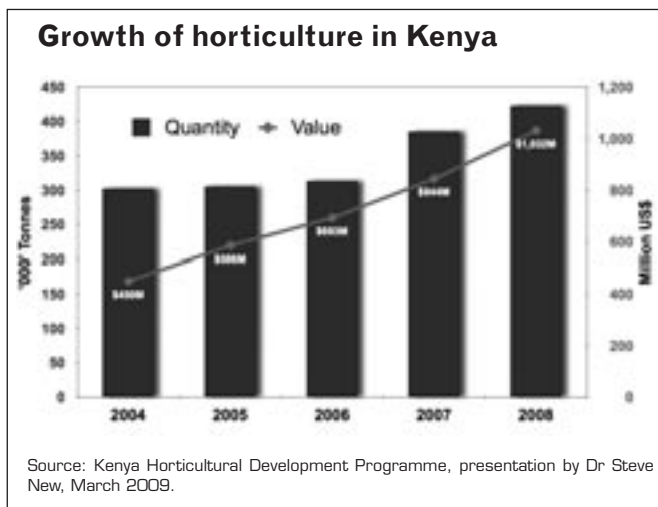
Horticultural production in Kenya has increased steadily in the last 30 years. The industry has been dominated by large commercial farms, but over the past two decades, smallholders gained a larger share of the market. Rising demand prompted exporters to turn to smallholders to increase volumes. There are no large-scale farms in Mwea. Horticulture is grown solely by smallholder farmers, whose plots vary in size, from half an acre to four acres.

In Kenya, horticultural crops are grown for both the domestic and export markets. Lower value domestic horticultural crops such as potatoes, cabbages and tomatoes are not exported because they tend to be heavy

and less easy to transport. Their value is not high enough to justify the extra costs associated with air-freight. All of these crops are consumed by the local population.

Demand for Kenyan horticulture is high in Europe, in part because domestic production in European countries is limited in winter months. Out of season, fruits and vegetables are grown in artificially heated greenhouses. In Kenya, horticultural crops can be grown all year-round without the need for temperature control.

Crops such as green beans, baby corn, runner beans and mange tout are grown specifically for export. Their light weight and high value make them cost-effective to export by air. These crops are grown almost exclusively for international markets, while Kenyans tend to prefer local cabbages and traditional vegetables.



8. Markets versus food security

Small farmers grow horticultural crops because they are profitable, earning up to seven times more income than maize. In a good year, my annual profits from growing green beans on a quarter of an acre will buy two acres' worth of maize. Today, I only grow maize on a quarter-acre

Horticulture reduces poverty

The first attempt to quantify the potential impact of export horticulture on poverty was published in 2002 by the Institute of Development Studies at Sussex University, UK. *Export Horticulture and Poverty in Kenya*, by Neil McCulloch and Masako Ota, compares the incomes of households involved in export horticulture with households which are not involved in horticulture. The authors note the positive economic contribution of horticultural exports and ask whether the growth in export horticulture benefits the poor.

Half of households surveyed are involved in horticultural work including packhouse work, farm labour and smallholder farming. Their incomes are compared with those of neighbouring households which are not involved in horticulture.

The findings

Households which participate in the horticulture industry are better off, on average, in both urban and rural areas:

- Non-horticultural smallholders had the highest incidence of poverty among those surveyed.
- Packhouse worker households and horticultural smallholder households reported the lowest incidence of poverty.

In addition to income, export horticulture appears to contribute to improvements in the economic situation of rural households in two ways:

- Employment for women - many of the farm workers employed in horticulture and most packhouse workers are women.
- Benefits – smallholders who produce for export companies benefit from access to credit and extension services.

The development model

By modelling the possible impact on poverty if non-horticultural households were to switch to horticulture, the authors hypothesise that policies to encourage greater involvement in the horticulture sector could reduce poverty in Kenya:

- Packhouse work could reduce poverty in urban households – one third of non-packhouse households surveyed fell below the food poverty line, by switching to packhouse work this could fall to one fifth.
- Any switch to horticulture, including farm labour, would improve the incomes of households in rural areas not currently involved in horticulture.

plot, earning enough money from the sale of horticultural crops to buy any extra food my family requires.

The profitability of each crop is dependent on:

1. Current market price
2. Cost of inputs required
3. Time taken for the crop to reach maturity
4. Soil quality
5. Disease control
6. Time of year

High prices do not always mean high profits. A crop may command a high price at the farm gate, but take a long time to grow and absorb large amounts of expensive inputs, such as fertiliser and agro-chemicals. In general, horticultural crops require more inputs and more management than staple crops.

The average prices for my crops in 2008 - 09 are:

EXPORT CROPS		
Crop	Price per kg	Growth time
Green beans	45-50Ksh	6 weeks
Soya beans	45-50Ksh	13 weeks
Sweet potato	20Ksh	13 weeks

DOMESTIC CROPS		
Crop	Price per kg	Growth time
Tomatoes	33Ksh	13 weeks
Butternut squash	20Ksh	13 weeks
Maize	15-20Ksh	4/6 months

Green beans are the most profitable horticultural crop. I can harvest two crops of green beans in the time it takes to grow one soya bean or sweet potato crop. But inputs for green beans tend be more costly, particularly in terms of fertiliser, agro-chemicals for pest control and labour. Sweet potatoes, although less profitable, require substantially fewer inputs than green beans. If I want to keep my farm costs down, I will grow sweet potato.

Smallholder horticultural farmers do not rely on the government for support. We occasionally have meetings with agronomists from the Horticulture Crop Development Agency (HCDA), the government agency tasked with developing the horticulture sector, but we receive no assistance from the government in accessing essential farm inputs.

9. Organise, then negotiate

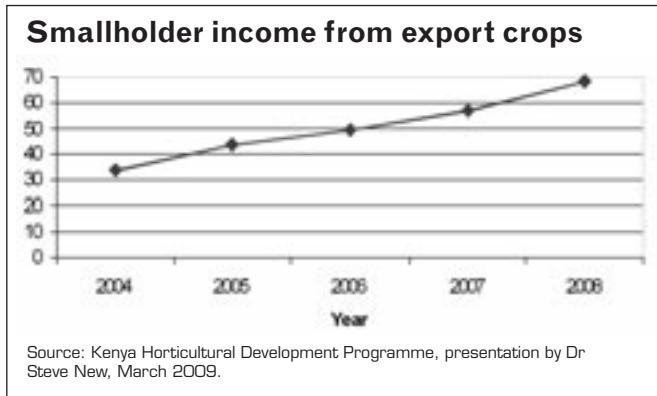
Smallholder horticulture farmers have increased their bargaining position by organising themselves through farming groups. When I first began to grow horticultural crops, small farmers were poorly organised, often selling independently to exporters at market. They could be played against each other to bring down prices. Farming groups enable smallholders to negotiate with a single voice, improving their bargaining position. If one exporter does not offer a fair price, they can try another.

Each farming group specialises in a particular crop. Smallholders who grow more than one crop, which is common, will be members of more than one farming group. The main functions of farming groups are:

- Act as the main point of contact between small farmers and exporters
- Negotiate prices with exporters
- Coordinate production
- Share inputs between farmers
- Ensure good agricultural practice

Exporters negotiate directly with farming groups to agree the exact quantities farmers will produce and the price per kilo. Seeds are extended on credit to farmers, as exporters often want very specific varieties of crop. Farming groups negotiate the price their members will pay for seeds and other essential inputs, such as pest control chemicals. When supply drops or demand increases, farming groups often find themselves in a stronger position to negotiate supplies of these inputs at a lower price.

By organising into groups, small farmers are able to produce on a similar scale to large commercial farms. They can produce large volumes. Farming groups benefit from economies of scale, and ease much of the burden of planning and negotiation. Buyers are able to collect their produce from a central location.



10. KKGGA, green bean growers

The Karii Koini Green Growers' Association (KKGGA), of which I am vice-secretary, coordinates the production of green beans. We also negotiate and monitor contracts. In recent years, we have become more efficient in terms of meeting the conditions of our contracts.

KKGGA currently holds a contract with Sunripe, a leading producer, processor and export company, for three metric tonnes of green beans per week. Sunripe makes three weekly collections, each of one tonne, on Mondays, Wednesdays and Fridays.

KKGGA coordinates production so that there is one harvest for each collection. Farmers plant between a third and half an acre of green beans, according to a set timetable. A single acre plot of land will produce, on average, three tonnes of green beans. We know exactly who will harvest on Monday, Wednesday and Friday ready for collection that day. Every week, we ensure that at least three more farmers are planting green beans.

Coordinating production in this way enables small-scale producers to respond quickly to changes in demand. At KKGGA we know who is producing what, and when it is ready for harvest. If demand drops for green beans, we can quickly adjust our levels of supply accordingly. Farmers who were scheduled to plant green beans will plant a different crop, depending on demand at that time.

11. Tisa, representing small farmers

Small farmers are growing in confidence. I am a member of Tisa, an organisation which represents 17 different farming groups in Mwea. Tisa, the Kiswahili word for the number nine, initially represented nine farming groups. Over the last two years, Tisa has grown to represent 17 farming groups. Tisa has a chairman, vice-chairman and board of directors.

Tisa acts as a central voice on behalf of its members. Its main function is to negotiate higher crop prices for small-scale producers in Mwea. Small farmers increase their bargaining position when they are able to come together in large numbers.

Tisa established a central depot where members can buy certified agro-chemicals. The depot is able to procure agro-chemicals in bulk, transferring the savings to Tisa members. The availability of reasonably priced certified agro-chemicals reduces the temptation for farmers to use cheap non-certified versions. All Tisa members purchase agro-chemicals from this depot.

Tisa is in the process of exploring the potential of selling horticultural produce directly to Europe. We want to find out if smallholder farmers will receive a higher price for their crops by selling directly to European importers, rather than selling to Kenyan exporters. This is provisional as direct sales to European importers might not guarantee higher incomes for producers. Smallholders

Kenya's best business

By Dr Stephen Mbithi

Chief Executive

Fresh Produce Exporters' Association of Kenya

Horticulture is the largest sector in the Kenyan economy - larger than tourism, coffee and tea. It generates annual revenues of US\$2 billion. The export market in horticulture, which accounts for just 10% of total volume, brings in US\$1 billion. Domestic sales make up 90% of volumes and generate another US\$1 billion. There are 240 large-scale producers and roughly 150,000 smallholder farmers. The sector employs 1.5 million labourers, and supports up to 4.5 million dependents.

Kenya produces a wide variety of horticultural crops, but green beans, mange touts, and roses dominate the export market because they are light, making them easy to transport over long distances. Most of the horticultural crops grown today are not indigenous to Kenya. They have been introduced by investors over the past 30 years in response to new demand, particularly from European countries where these crops cannot be grown all year-round.

In Kenya, we have a comparative advantage in horticultural production. Our position on the Equator provides year-round sunlight and the climate is temperate enough to allow continuous production. Most competitors are constrained by seasonal weather variations. Around 25% of Kenya's land is arable.

As demand for horticulture has risen, large-scale producers have increasingly turned towards smallholder farmers to boost export volumes. Smallholders now produce 60% of exported fruit and vegetables. Exporters provide small farmers with resources to enable them to meet production targets. Seeds, fertilisers and other farm inputs are made available to smallholders before planting. The value of inputs is deducted at the moment of purchase. Horticulture is an integrated sector.

Smallholder horticulture farmers are highly organised. Most small-scale producers are members of farming groups which coordinate harvests and share resources. This is a necessity. Individual smallholder farmers cannot produce at sufficient scale to trade independently. When organised, farmers earn between seven and ten times more income than from staple crops.

Farming groups evolved in a variety of different configurations. Some hold contracts with large-scale producers and exporters: they agree to grow a specific quantity of a particular crop. Other groups operate independently, producing large volumes for sale in centralised locations where exporters bid for their

crops. In recent years, a few highly efficient farming groups have approached European importers directly. They have managed to arrange all the necessary transport to export their produce independently.

Farming groups offer the perfect structure for implementing food standards. Fresh Produce Exporters Association of Kenya (FPEAK) runs training programmes on good agricultural practices in line with the international standards for fresh produce, set by Global Gap*. Farming groups enable FPEAK to rally farmers efficiently and teach them how to grow their crops in accordance with international best practice.

Horticulture farmers are flexible and dynamic. They are not loyal to any single crop, growing only what the market demands. Farmers respond to market developments by planting the most profitable crop. In the second quarter of 2009 the price of green beans fell, while the price of runner beans rose. Farmers responded by planting runner beans.

Horticulture is led wholly by the private sector. It is distinct from the wider agricultural economy that is geared towards making Kenya self-sufficient in food. Government subsidies to encourage maize production are common, but little attention is paid to the patterns of demand. Maize prices are volatile. When prices fall, farmers cannot recover production costs. They respond by shifting to other crops, creating sharp gaps in production, which in turn lead to food shortages.

Food shortages are common in Africa. Rural areas are most severely affected. Short term subsidies aimed at avoiding food scarcity are sometimes necessary. Subsidies are cheaper than food aid and better for the local economy. But in the longer term, subsidies should help farmers to respond to the market more efficiently. They should not push large numbers of farmers to plant the same crop because this causes the price to drop. The real problem is not that rural people lack food, but that they lack money to buy food.

Horticulture has done more to combat food shortages than decades of efforts to make Kenya self-sufficient in food. High value horticultural crops provide rural communities with steady incomes, which they use to buy food. They are driving agricultural reform in Kenya by producing what the market demands.

* Global Gap is a private organisation that sets voluntary standards for the certification of agricultural produce from all over the world.

will have to absorb the costs associated with marketing, transport and inspection. There is a risk that we will receive a lower price for our crops when we pay for all the extra costs associated with direct sales.

12. Diversification, healthy crops

Diversification protects small-scale producers against over-production, price slumps or sudden drops in demand. One of my biggest concerns as a horticulture farmer is to ensure I don't grow too much of one particular crop. If I grew too many green beans, for example, I would be forced to sell my surplus at market, where I am unlikely to receive a good price. When farmers grow too much of a particular crop, prices drop.

Diversification means I can rotate the crops I grow on a particular plot, helping me to maintain the quality of soil. Different crops require different nutrients. Maize, for example, drains nitrogen from the soil. Beans, on the other hand, add nitrogen to the soil. If a single crop is continuously planted on the same plot of land, high quantities of fertiliser will be needed to maintain a healthy balance of nutrients in the soil. Small-scale farmers divide their farms into quarter-acre or half-acre plots, rotating crops to maintain soil quality.

Diversification also helps reduce the build-up of pests and diseases which stunt crop production. Pests and diseases that attack green beans, for example, will not harm maize or sweet potato harvests. I always plant different crops next to one another to guard against the spread of diseases. On commercial farms, diseases can spread quickly because one crop is planted on a large plot of land. On small farms, crops are produced on small plots scattered over a large area, containing the spread of any disease.

Diversification is only successful if production is coordinated. Small farmers who coordinate production have a comparative advantage in growing horticultural

crops. At KKGGA, smallholder farmers produce a steady supply of green beans all year-round. We never break our production supply.

Global Gap, the international standard

"To growers, the market opportunities offered by the EU are some of the most financially attractive but most exacting, with access requiring compliance with a strict regulatory framework of measures designed to ensure human and plant health. Today, the measures go beyond the international requirements set under the sanitary, phytosanitary and technical barriers to trade agreements administered by the World Trade Organisation.

Although European legislation represents the minimum requirement for market access, many of the larger retailers – and some wholesalers and food service companies – also require suppliers to demonstrate compliance with independently-verifiable private standards such as the European retailers' protocol for good agricultural practice for farms, Global Gap. The British Retail Consortium Global Technical Standard applies to processors and the rest of the food supply chain. These so-called 'private voluntary standards' (PVS) have extended the level of control by European retailers back along their supply chains to farmers worldwide.

There are significant costs to be borne for such market access and these are usually paid by the supply chain participants rather than the retail organisations. Private voluntary standards' costs are per certification and the unit is usually the individual farm, regardless of size. African farmers, owing to their small average farm size (typically less than two hectares), find it difficult to afford the costs and fees associated with PVS compliance. These high per-farm costs reflect the fact that the standards were originally developed for much larger farms in Europe."

Source: Extracted from *Standard bearers: Horticultural exports and private standards in Africa*, edited by Adeline Borot de Battisti, James MacGregor and Andrew Graftham, International Institute for Environment and Development, 2008, and edited for clarity.

13. Quality control

Exporters have very specific quality requirements for each crop variety. Farmers in Mwea work hard to meet international expectations. I have had regular contact with agronomists from horticultural export companies, who provide on-farm training to help smallholders to meet international norms. Farming groups regularly hold

meetings to discuss experiences and problems, learning from each other. Agronomists from export companies often attend these meetings.

Farmers can be blacklisted if they use uncertified agro-chemicals. Small-scale producers are required to meet a range of standards by horticulture exporters who stipulate how crops are grown and presented. Crops need to be sprayed with water and various agro-chemicals in order to meet international quality standards. Farmers must use only certified pest control chemicals. If export companies discover that farmers have used non-certified chemicals, they will not buy our produce.

In the past, farmers have been tempted to buy cheaper unlicensed products to reduce the costs of production. There are a number of chemicals, blacklisted under international norms, which are available cheaply in Kenya. My farm has been audited three times by different export companies. Each time I passed the inspection without any problems.

14. Pangas, not tractors

Smallholder farming is good for the environment because it does not use machinery. Small farmers do not have access to mechanised farming equipment. For the most part, they rely on manual labour for each stage in the farming process.

It takes six weeks to grow green beans. We first clear the field using a panga, an east African farm implement similar to a machete. Weeds are removed from the ground by hand, before the field is prepared with a plough, drawn by two bulls. Trenches to channel water from the furrow are dug before planting begins. Hand pumps are used to spray crops with water and agro-chemicals. All the beans are then picked manually. Small farmers do not own tractors or mechanical devices.

I employ two labourers to work on my farm all year-round. When it is time to harvest, which is on average two or three times a month, I employ as many as 25 additional labourers

The Soil Association saga

Concerned that air freighted organic produce might do more harm than good to the environment, the Soil Association launched a public consultation on 'food miles' in May 2007. The first phase of the consultation mooted the idea that a food miles standard should be added to the criteria for organic certification:

"Air freight has the highest global warming potential of any form of transport. It is less than 1% of the total UK food miles but is responsible for 11% of the carbon dioxide emissions from UK food transport.

There are a number of options available to the Soil Association for addressing the environmental impact of air freighting organic food. These options range from taking no action, to labelling and carbon offsetting, to introducing a partial or general ban."^{*}

A majority of respondents to the consultation agreed that the association should impose standards on air-freighted produce, but they were divided over how this should be done. The potential of organic agriculture to reduce poverty and prevent environmental degradation in developing countries emerged as the main argument against a general ban on air-freighted produce.

A second round of consultation suggested that organic exporters should be required to meet the Soil Association's ethical trade standards and encouraged to reduce air freight. Air freight labelling was rejected on the basis that it would not help consumers to make meaningful purchasing decisions.

In response to the second consultation, and following a trip to Tanzania and Kenya to meet organic producers, the Soil Association dropped proposals on ethical standards and a reduction in air freight. It opted, instead, to work with partners in East Africa to promote the positive contribution of organic farming to food security and livelihoods. According to its website the association is working to:

- Develop a regional equivalent to EthicalTrade that is owned and administered by East African organic organisations.
- Build capacity in training, certification and inspection to reduce barriers for smallholders trying to access the European organic market.
- Campaign for improved food security associated with organic agriculture, and against GM.
- Identify the positive contribution organic farmers make to tackling climate change and suggest actions they can take to minimise their carbon emissions.

^{*}Extracted from *Air Freight Green Paper: a basis for discussion*, Soil Association, May 2007, and edited for clarity.

to pick crops ready for collection that day. It takes 25 farm workers three to four hours to pick crops on one acre of land. Horticultural crops cannot be stored for long periods of time. They must be picked immediately.

I regularly apply fertiliser to maintain the quality of the soil. When I began growing horticultural crops, I would leave plots fallow, helping to restore the balance of nutrients in the soil. Demand for horticultural crops has increased significantly over the past five years. I no longer leave my plots fallow, because demand is so high. Chemical fertilisers help maintain a healthy balance of nutrients in the soil, but they are expensive. These days, I tend to rely on cattle manure and compost as a substitute for chemical fertiliser.

15. Quality of life

Horticulture has improved lives in Mwea. Higher incomes from the sale of horticultural crops mean that rural families increasingly can afford to pay hospital fees and buy necessary medication. Twenty years ago, people lived in thatched houses made from straw. Today, the vast majority of people live in houses made from bricks. After only one year of growing tomatoes I was able to buy bricks and iron sheets, for a new house.

Smallholder horticulture farmers have more disposable income than if they grew staple crops. Fundraisers regularly visit my local community appealing for donations for the construction of new schools or educational projects. Today, I regularly make donations, whereas previously I could not. Literacy rates have improved. Primary schooling is free in Kenya, but more rural families in Mwea are in a position to meet the costs of sending their children to secondary school.

Members of Karii Koini Green Growers' Association (KKGGA) donate one shilling of their income from every kilogram of green beans to a community development fund. The purpose of the fund is to address the everyday needs of the local community.

In the past year, the fund has paid for the construction of a 6.3Ksh million (US\$82,4344.84) maternity health clinic. In the past, women have died from complications in child birth, exacerbated by the poor quality of government health facilities. The government agreed to provide beds and nurses for the clinic.

Mwea did not experience any violence in the aftermath of the disputed presidential contest and national elections in December 2007. No doubt this is partly because people are not divided politically in Mwea, but it also has to do with the fact that social conditions are relatively secure. A majority of young people are employed in horticultural farming. For many young people city life becomes appealing as they look to further their careers in business, but young people in Mwea won't sit around idle while they look for a job. They know they can earn a living from horticulture.

16. Against 'food miles'

In 2007, I heard for the first time about a campaign in the UK urging consumers not to buy horticultural crops from Africa. Some environmentalists argued that African horticulture is bad for the environment because our crops are transported to Europe by plane – so called 'food miles'. It has been reported to us that consumers were encouraged to buy local agricultural produce, because the environmental costs associated with local transport are much lower.

I object strongly to the argument that people in Europe should only buy local produce. This argument has no substance. In Europe, there is a high demand for horticultural crops. European farmers can grow these crops outside only during the three summer months of the year. In any other season, European horticulture requires artificially heated green houses, which I'm told create more carbon emissions than air freight.

European farmers cannot meet the demand. In Kenya, we can grow horticultural crops all year-round. If carbon

Carbon labelling

In 2007, two leading British supermarkets, Tesco and Marks & Spencer, introduced product labels depicting an aeroplane, to indicate to consumers that a product had been flown to the UK. The food miles debate had, they said, begun to generate consumer demand for more information on the green credentials of products. The chief executives of both supermarkets announced environmental action plans, vowing to reduce proportions of air-freighted produce available in their stores.*

Air freight labelling was promptly denounced as too crude a measure of the carbon footprint of food products. As the food miles debate matured, it became clear that food transportation had been singled out for scrutiny while emissions from food production had been ignored. A more sophisticated approach to the evaluation of carbon footprints was required, assessing the entire lifecycle of food, from field to plate.

In March 2007, The Carbon Trust, DEFRA, and the British Standards Institution, took on the delicate task of establishing a methodology to quantify the carbon footprint of products and services. Their evaluation framework, Publicly Available Specification (PAS), was tested by voluntarily six British companies, including HBOS, Innocent, Walkers and Boots.

The largest trial was undertaken by Tesco, with help from the Carbon Trust. A 'Carbon Reduction Label' was developed using the draft PAS methodology. It was introduced in April 2008 on 20 Tesco's own-brand products in four categories – potatoes, light bulbs, laundry detergents, and orange juice. The labels indicated the number of grams of CO₂ emitted by a product, from creation to consumption, and suggested how to use the product in an eco-friendly way.

A report on the trial by the Carbon Trust, *Working with Tesco: Product carbon footprinting in practice*, cites the achievements of the exercise so far. Valuable findings, says the report, include the discovery that cooking a potato in an oven increases its carbon footprint by 3.5 times more than boiling or microwaving. The Carbon Trust argues that such findings have helped improve the PAS methodology, and have encouraged Tesco's suppliers to roll out measures to curb emissions.

Sceptics have yet to be convinced. The PAS methodology is the first target for criticism. The PAS does not assess social or economic impacts associated with the lifecycle of products. No air-freighted products were included in the Tesco trial. Critics also doubt the feasibility of labelling all 70,000 Tesco products, and question whether the labels make a real impact on consumer choices. Tesco have yet to evaluate the effect of the labelling on customer behaviour.

* Garside, B., MacGregor, J., and Vorley, B., *Review of food miles, carbon and African horticulture*, COLEACP/PIR, 2008.

labels are applied to air-freighted horticulture, they should also be applied to all of the products Kenya imports from Europe.

It makes sense for Kenya to grow horticultural crops for export. Small farmers have been trained in good agricultural practices, adapting our farming methods to European standards over a number of years. Small-scale producers know exactly how to grow these crops to satisfy European consumers. We don't use greenhouses or large mechanised devices. Our farming practices are environmentally friendly. Everything is grown under the sun.

Thousands of people in Mwea depend on export horticulture for their livelihood. Horticultural farming is an important source of employment. People were worried they would lose their jobs when they heard about the environmental arguments in Europe. Small farmers are fully aware that income from staple crops cannot keep their families fed, educated and healthy. Horticulture has played an important role in reducing poverty.

17. Recommendations

The fundamental cause of poverty among rural populations is a lack of money, not a lack of food. In Mwea, small farmers have been able to earn significantly more income from horticulture than from staple crops. In the past 20 years, we have become efficient in horticultural production – without intervention or assistance from either the government or foreign donors.

Kenyan horticulture is entirely in the hands of the private sector, from smallholders to large commercial farms. However, both groups could benefit from more helpful policies to support primary agriculture. The following recommendations are among the priorities agreed by Tisa, my local farmers' group in Karii Koini.

The government can play an important role in helping small farmers diversify away from staple crops. Irrigation

Green versus red

An American study of greenhouse gas emissions in the food supply chain argues that consumers can do more to reduce their 'carbon footprint' by eating less red meat than by buying locally. In *Food-Miles and the Relative Climate Impacts of Food Choices in the United States*, Christopher L. Weber and H. Scott Matthews evaluate greenhouse gas emissions over the total lifecycle of food, from production to distribution.

They find that the process of producing food, including the use of farm equipment and supplies, accounts for vastly more emissions than transportation:

- Production accounts for 83% of food-related emissions.
- Wholesaling and retailing accounts for 5%.
- Transportation accounts for 11%.

A comparison of different food groups found that red meat emits more greenhouse gases than any other foodstuff:

- Red meat is about 150% more greenhouse gas-intensive than chicken or fish.
- Dairy products emit about 50% more than chicken or fish.
- Fruit and vegetables have lower production impacts but higher transportation impacts than chicken and fish.

The authors acknowledge some limitations to their findings.

- The study does not consider different transport conditions. Refrigerated transportation is more energy-intensive than non-refrigerated transportation.
- The report does not undertake a wider evaluation of the environmental impact of food production. Deforestation, agrochemicals, overfishing and other effects of different food production practices are not assessed.

They predict, however, that the inclusion of more detail would only make the environmental benefits of consuming locally produced food products look more dubious compared to a change in diet. Although exact proportions of greenhouse gas emissions in different stages of the lifecycle might change, most emissions would still be linked to production.

They conclude that for the average American household, buying local could achieve, at maximum, a 4-5% reduction in greenhouse gas emissions. A reduction of less than one day per week's consumption of red meat and/or dairy to other protein sources or vegetables would have the same climate impact as buying all household food from local providers.

Source: Weber, C.L. and Scott Matthews, H., "Food-Miles and the Relative Climate Impacts of Food Choices in the United States", *Environ.Sci. Technol.*, 2008, 42 (10), pp 3508-3513.

has been crucial to horticulture in Mwea. None of our achievements would have been possible without the Karii Koini furrow. For exporters who agree contracts with smallholders, the first priority is to identify experienced suppliers with reliable access to water and good transport infrastructure.

Small farmers are wary of regulation or interference by the government, but we would welcome more assistance for horticulture from the ministry of agriculture and other agencies. Priorities include:

- More funding for irrigation projects
- Better maintenance of roads and transport infrastructure
- Monitoring of contractual agreements between exporters and producers, to alert small farmers when they are underpaid for their crops.

Governments or donors should not tell farmers what to grow. We are not asking for subsidies for specific crops. Small farmers should be encouraged to respond to market demand. However, we would welcome subsidies or other discounts for inputs such as fertiliser. Our priorities for agricultural policy include:

- Subsidies to offset or reduce the cost of fertiliser and agro-chemicals, or;
- Bulk purchasing of farm inputs, to secure economies of scale for smallholders.
- Funding to increase the number of agricultural extension workers and agronomists working directly with small farmers.

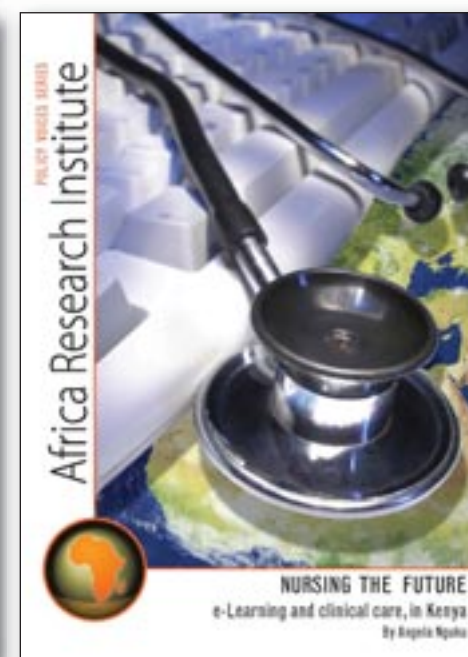
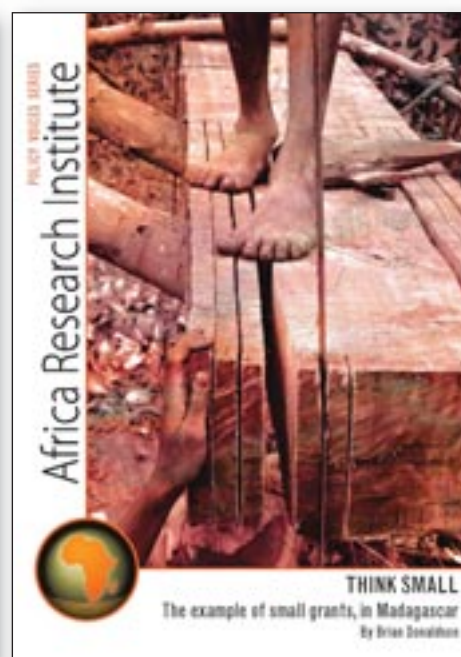
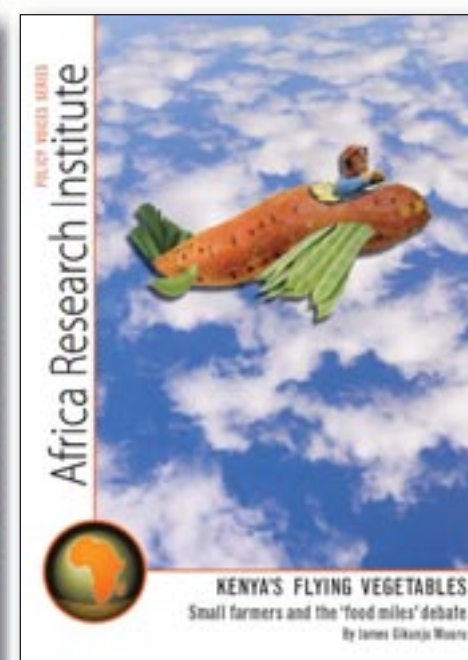
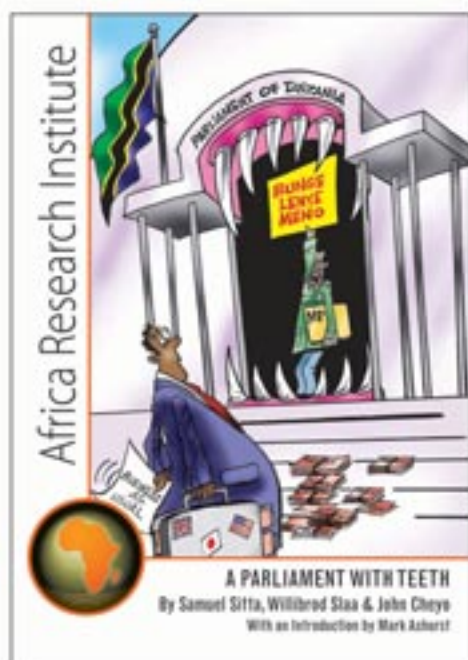
Proposals for 'carbon labelling' of exports of African horticulture may be harmful to small farmers. In Mwea, we work hard to meet international standards and have learned to follow strict rules on crop varieties and production techniques. Any system of carbon labelling by retailers in Europe should include:

- Abolition of labels indicating 'air-freighted' products
- Recognition of environmentally-friendly farming methods by African farmers
- Acknowledgement of the positive contribution of

horticulture to improving the livelihoods of rural populations

According to the Fresh Produce Exporters' Association of Kenya, the growth of horticulture demonstrates that national self-sufficiency in food production is no longer a viable goal for agricultural policy. Governments across Africa should accept that food security is not synonymous with self-sufficiency in food.

The traditional emphasis on staple crops such as maize has been characterised by poor productivity and low incomes. In order to reduce poverty, the first priority must be to raise the incomes and earning potential of rural populations. Higher value export crops such as horticulture generate sufficient income for farmers to buy food, medicine and other requirements. In contrast to staple crops, horticulture has been characterised by improved productivity among small farmers.



KENYA'S FLYING VEGETABLES

Small farmers and the 'food miles' debate

By James Gikunju Muuru

Flowers, fruit and vegetables from Africa occupy a small place on the shelves of European supermarkets. But among rural populations in Africa, the livelihoods of hundreds of thousands of smallholder farmers have been transformed by their hard-won stake in an emerging global trade. In Kenya alone, horticulture is bigger than tourism, tea, or telecoms. Small farmers grow more than 60% of the Kenyan vegetables sold in Europe, a trade worth \$1bn dollars a year.

Some of the largest European retailers, eager to demonstrate environmental credentials, have proposed labelling imported crops to indicate the environmental impact of air-freighted food. Yet Kenyan vegetables are grown under the sun in all seasons, and often transported in the holds of passenger aircraft carrying European holiday-makers to and from Africa's beaches and game parks. The alternative of growing out-of-season horticultural crops in Europe relies on mechanised farming in artificially heated 'hot houses'.

In this highly personal and keenly argued commentary, James Gikunju Muuru makes the first detailed response by an African smallholder to the controversy over 'food miles'. His account describes the serial feats of coordination, discipline, productivity and manual labour which make Kenyan horticulture competitive in global markets. For anyone who has ever asked how some of the poorest rural populations can reap the benefits of world trade, the example of James' four-acre plot in the Mwea district of Central Province is a compelling reply.

