Regoverning Markets

Small-scale producers in modern agrifood markets

Innovative Practice

Kenya
Access to high value markets by smallholder farmers of African indigenous vegetables

Isaac K. Ngugi, Raphael Gitau and James K. Nyoro

Tegemo Institute, Egerton University

www.regoverningmarkets.org

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Regoverning Markets is a multi-partner collaborative research programme analysing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle- and low-income countries. The aim of the programme is to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of the dynamic changes in local and regional markets.

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Executive summary

From the recent past, consumers have become increasingly aware of the nutritional and medicinal value of African indigenous vegetables. This has caused a rise in demand especially in major urban centres. The supply of these vegetables has however not matched this growing demand. Most farmers are semi commercially oriented poor farmers, are not organized, and lack inputs and skills to enable them to satisfy the dynamic market requirements. They are not able to access high value markets such as supermarkets and are often exploited by middlemen. Responding to the changing consumption patterns and market opportunities occasioned by the growing demand for these vegetables in the urban centres, a number of farmers in collaboration with development agencies and government have come together to form producer groups to get around their constraints and meet the conditions in the markets. It is on this backdrop that this study was undertaken with the principal objective of identifying how small-scale farmers could better be integrated in the emerging and restructured markets such as supermarkets. The study identifies the factors attributed to successful inclusion in the chain supplying the dynamic markets and estimates the cost and benefits of the inclusion.

The data used in the study were collected using a checklist of interviews with various stakeholders that were involved in the African indigenous vegetables business. These included farmers, farmer group representatives, input suppliers, a development agency, supermarkets and grocers. Although there are about 25 farmer groups that are working with the supporting agency in growing indigenous vegetables, two were purposively sampled and a thorough evaluation undertaken on them.

To understand in detail the production aspects, individual farmers were randomly selected and interviewed. To allow for comparative analysis especially on cost-benefit analysis, farmers were randomly selected from two categories, one from members that were involved in the innovation and therefore included in the chain that successfully accessed the dynamic high value markets and the other from non-members and therefore excluded from accessing the high value markets. The information collected was also important in estimating the cost of inclusion.

The data collected included that on cost of production, transport and marketing of indigenous vegetables. Other information collected, related to the degree of integration and coordination along the chain. The study adopted a value and supply chain approach to identify the key participants in the market and the relative value of the produce along the chain. Data on farm budgets or cost of production were entered and analyzed in Excel. The analysis was largely descriptive. The information that was collected allowed for analysis of the whole chain, in which the indigenous vegetables were channelled, from the farmer to the end consumer.

Two domains characterize the innovation namely: a) collective action by small-scale producers and b) strategies and methods of development agencies. The farmers, acting collectively, developed a partnership with a development agency, Family Concern, to work together. The innovation involved well-coordinated linkages among farmers, support agency, government extension staff and supermarkets. All these worked together harmoniously in promotion of a viable enterprise in indigenous vegetables. Each actor played a crucial role in the sustenance of the supply chain.

The factors attributed to successful participation of the farmers/groups in the dynamic markets include: good governance; an ingrained culture of farming; commitment; access to technical advice; integration into necessary support services; regular and predictable incomes; transparency and accountability; support and backstopping by a an agency.

For this case study, the supply chain comprised of input suppliers, farmers (organized into farmer groups), transporters and supermarkets. There were however other entities that played key roles to enhance the performance of the chain. These were development agencies and government extension officers. Although the supermarkets were the main outlets for the farmers' indigenous vegetables, occasionally they could sell to greengrocers and open markets.

The quality standards set by the supermarkets are market driven and are dictated by the prevailing consumer taste and preferences. The quality standards are that the indigenous vegetable units (bunches) be: clean, neat, not attacked by insects, appropriate length (between 12 and 18 inches), agreed quantity (about 600g), harvested before they flower or develop seeds, and fresh. The farmers that were unable to meet these standards were excluded from the chain. Further, access to water in this case through irrigation was crucial if farmers were to consistently supply to supermarkets throughout the year.

Considering the macro and meso context, the main factors attributed to increased demand for indigenous vegetables included: urbanization, emergence of supermarkets as major outlets for vegetables, change of dietary habits and increased awareness about the health benefits of indigenous foods.

The collective action by the farmers and the collaboration with the support system (Family Concern) yielded benefits to farmers. For the farmers who were organized into groups in this case business support units (BSUs), they benefited by selling their products directly to retailers at a higher price, bypassing middlemen and merchants altogether. They provided a larger amount of produce and maintained a continuous supply and hence were preferred than other suppliers by supermarkets. The

collective action by farmers promoted all-year-round supply to the high value markets. During low seasons when farmers did not have large quantities, they pulled together the little they had and were still able to meet the orders from the clients, supermarkets. On average, the farmers that benefited from the innovation made 55 per cent more margins per kilogram of indigenous vegetables sold, compared to farmers selling in the local markets.

There is potential to replicate the intervention in other areas within the country, with a focus on delivering the vegetables to respective nearby urban centres. With the promotion of the nutritive value of the indigenous vegetables and the training of farmers in their production, demand and supply of the vegetables are likely to go up. Although the species of indigenous vegetables grown in Kiambu (the study area) and marketed in supermarkets, are less than five, the country has over 210 species of leafy vegetables which are untapped, an indication of the potential for replication and scaling up. With increasing urbanization and population, there is a potential market for the indigenous vegetables. The marketing infrastructure is enhanced by the diffusion of supermarkets and grocers from big towns to smaller ones and also by the improving hygiene of wet markets that could serve as outlets for the vegetables.

Farmers need to be continuously trained on the new requirements or standards of the high value dynamic markets. Farmers who are unable to keep up with the quality and quantity demanded by the markets are excluded from the chain. Collective action has promoted their inclusion in the chain and hence the need to support producer organizations.

Access to water is essential if small-scale farmers are to sustain their inclusion in the supply chain. Expansion of piped water or digging of boreholes to enhance access of water by small-scale farmers is fundamental.

Considering the increasing cost of transport, the farmers should consider integrating forward. If constrained financially, they could start by establishing a partnership with the transporter and therefore share the profits through the chain-partnership relationship, and thereafter acquire their own vehicle and entirely control this function. This way, they will reduce the cost of transport at least by the margin that the transporter made.

To manage the risk marked by a single outlet of indigenous vegetables, for instance the recent closure by Uchumi (one of the two larger supermarkets in Kenya), the farmers need to be well prepared and therefore flexible in supplying other outlets such as wet markets and institutions such as hospitals, schools, and hotels. In this connection, appropriate market infrastructure such as sheds and stalls in wet markets within the country are necessary in enhancing commercial production of

indigenous vegetables. Shortage of such infrastructure significantly contributes to a lowering quality and shelf life of vegetables sold through the wet markets.

1. Background

African indigenous vegetables are known for their importance in providing nutritious food, both in rural and urban areas. The vegetables play a crucial role in income generation and subsistence. Some of them have been attributed with having medicinal-value properties and are grown for home consumption. They are considered traditional crops, because whereas some of the plants were planted, others were readily available and harvested in their habitat appearing as volunteer crops or weeds. Others had been consumed for countless generations signifying their value and importance in local cultures. The value of indigenous vegetables is not fully appreciated in Africa especially in urban areas (IPGRI 2005).

Although indigenous leaf vegetables and fruits have been an integral part of agricultural systems in Africa, most African countries have not given them priority in crop development. They have not featured significantly in the research agendas of international or local organizations that have tended to focus on improved exotic varieties. Local varieties have been replaced by improved or exotic varieties and species. However, producing more exotic food crops by itself is not a panacea to malnutrition problems in Africa. The quality of food and its nutrient content is very crucial. Through greater production and consumption of indigenous vegetables, we can eliminate malnutrition and promote healthy diets in Africa. Although there is resurgence in demand, the diversity of indigenous leaf vegetables and fruits of Africa, has in the past been seriously eroded as a result of multiplicity of environmental, political, and socio-economic factors (Adebooye and Opabode 2004).

Kenya has suffered from transitory and chronic food insecurity, mainly due to drought and floods and an over reliance of maize crop. Exploitation and growing of indigenous vegetables adaptable to the local environment, will, in the long run improve the food situation, nutrition, and health of the people. In Kenya there are more than 210 species of leafy vegetables that are part of traditional diets and have not been fully utilized, thus there is a great potential to be harnessed (IPGRI 2006).

Over the past ten years, consumers have become increasingly aware of the nutritional and medicinal values of vegetables, and the demand has been on the rise especially in major urban centres in Kenya. This has created demand especially in both formal and informal markets in the urban centres. In order to assist farmers to grow these vegetables and access the markets, a developmental organization, Family Concern, has been assisting farmers to transform themselves from subsistence into business support units (BSUs) to produce the vegetables on a sustainable basis and ensure consistency of supply to the markets. Formation of these farmer associations has led to the development and enforcement of a suitable code of conduct, credit access and affordability, transport, and operations.

The market restructuring and supply chain in Kenya through Family Concern has assisted small farmers to adopt suitable farm inputs, use improved crop husbandry practices, handle produce properly after harvesting, enhance quality, and maintain the recommended standards and packaging. The non-governmental organization (NGO) has linked these farmers to high value markets e.g. supermarkets where they fetch reasonable prices. Farmers are also guaranteed markets for their products throughout the year. Currently the indigenous vegetables are in high demand. It is on the basis of the above that the current study is being undertaken. The key aim of the study is to identify how small-scale traditional vegetable farmers could be better integrated in the emerging and restructured markets such as supermarkets. The study identifies the factors attributed to successful inclusion in the chain supplying the dynamic markets and estimates the cost and benefits of the inclusion.

2. Literature review

In Kenya, vegetables constitute a significant portion of the horticultural output. In 2003, vegetables constituted about 18 per cent of the horticultural export volumes (IPAR 2005). Indigenous vegetables are mostly grown in rural areas and support a significant proportion of households. The rural population depend on it both as a source of food and income. Improvement of this sub sector can be a milestone in the fight against poverty in the rural areas. The consumption of traditional vegetables is increasing significantly amongst the urban population. This is because of the growing recognition of their high nutritional value. For example, Amaranthus has 13 times more iron and 57 times more Vitamin A than cabbages (IPGRI 2006). The indigenous vegetables are a very good source of Vitamin A, B complex, C, and E. Nonetheless, there is no explicit government policy that attempts to promote production and marketing of these products in the high-demand areas, such as Nairobi.

2.1 Factors attributed to decline in production of African indigenous plants

Following the advent of exotic vegetables, the production and consumption of African indigenous plants have declined. According to Adebooye and Opabode (2004), the factors attributed to the erosion of African indigenous plants include:

1. Erosion of culture and breakdown of traditional systems of plant resources management resulting in loss of traditional varieties.
2. The world market has been tailored to focus on only a few crops, which has resulted to the industrial growth globally to be dependent on continued supply of these few crops at the expense of the traditional varieties.
3. Deforestation, salinization, desert encroachment and erosion lead to land degradation with concomitant loss of the plant genetic resources that the land supports.
4. Natural disasters, including droughts, floods, pests, and diseases, which have led to widespread losses of plant diversity from both farmers' fields and natural habitants.
5. Climatic changes, which have posed a threat to diversity as many plants, are unable to adapt to changing temperatures and moisture gradients caused by global warming and the associated climate change.
6. Political instability, civil unrest, and insurgence that have led to loss of genetic resources in fields as farmers flee from war torn areas.
7. The research mandates of most institutions focus on the routinely cultivated species at the expense of the indigenous species. This has resulted in the continued and ever-increasing relevance that the routinely cultivated species are enjoying.

8. African governments are not making adequate investment in the area of conservation of their indigenous plants heritage.
9. The ever-increasing population, greater competition for natural resources and some interplay of natural resources.

In most rural areas in Kenya, there is inadequate knowledge on indigenous vegetable production and utilization by the farmers (Mwangi and Ligeyo 1994). The decline in the use of indigenous vegetables especially after independence in preference of exotic vegetables led to the decline and loss of genetic resource (IPGRI 2006).

2.2 Resurgence of high production and consumption of indigenous vegetables

Over the past ten years, consumers have become increasingly aware of the nutritional and medicinal values of indigenous vegetables and the demand has been on the rise especially in major urban centres. The supply of these vegetables has however not matched this growing demand. Farmers are semi commercially oriented poor farmers, owning less than two acres of land. They are not organized and face problems of inadequate inputs and lack of market information. They are not able to access high value markets and are often exploited by middlemen. The lack of awareness of production and utilization of the indigenous vegetable is also another hindrance. It has been shown that the home garden production of vegetables can improve food supply and family nutrition especially in the rural areas of Kenya (Cheatle and Nekesa 1993, Chweya 1997).

Responding to the changing consumption patterns and market opportunities occasioned by the growing demand for these vegetables in urban centres, a number of farmers have come together to form producer groups to get around their constraints and meet the conditions within the markets.

Key retail outlets include supermarkets and established institutions (hospitals, hotels, grocers), which impose stringent conditions on quality of the produce. The retail outlets demand specific standards for leaf size and appearance, and put a premium on pesticide maximum residue. Thus if farmers are not organized it is quite difficult to meet these requirements.

The factors that are contributing to the expansion of domestic High Value Agricultural Products (HVAPs) markets include; urbanization, a change in dietary preferences, increased awareness about the health benefits of HVAPs and general income growth in some countries in Sub-Saharan Africa (Temu AE and Temu AA 2005). The demand has been growing rapidly in the world market throughout the

year, forcing supermarket chains to source from multiple producing countries thereby exploiting opportunities provided by differences in the climatic conditions and seasons around the world.

In Kenya, farmers grow both exotic and indigenous vegetables because they are preferred and are easily available in rural areas, have a good taste, and take a short time from planting to harvesting. However, many people do not know the value of the indigenous vegetables as compared to the exotic ones. Therefore there is a need to expose the farmers to their nutritional value and utilization. Family Concern, the Ministry of Agriculture through the Department of Home Economics and the International Plant Genetic Research Institute (IPGRI) have been instrumental in creating awareness among farmers and consumers on the nutritional values of the indigenous vegetables. Family Concern has also trained farmers in production.

Rural–urban migration has contributed immensely to the growth and demand of HVAPs in the markets. The growth of urban population together with an increased income, and higher dependence on the market as a source for food has expanded the market for traditional crops. Also, urban dwellers are more informed, have more access to information and are more educated which has raised their level of awareness about health benefits of HVAPs, leading to a change in dietary preferences. This in turn has generated a lot of pressure for a change in production of HVAPs in the country. Increased opportunities in the urban areas and stagnation in agricultural productivity is responsible for high rate of rural-urban migration in Sub-Saharan Africa. This trend has posed new development issues in African cities.

The growing of the traditional vegetables in the rural area for the urban market will safeguard the genetic diversity of these valuable crops and help maintain them and also reintroduce already lost genetic resources while contributing to a better livelihood for rural people.

The area of indigenous vegetables more than doubled in the period 1992-2001 compared to kale that increased by 20 per cent while the other vegetable increase was between 0-10 per cent (HDC 2004). The upsurge in demand for indigenous vegetables was also triggered by promotional campaigns done by research organizations like IPGRI, development agencies like Family Concern, and the government through Department of Home Economics at the Ministry of Agriculture.

3. Methods

Data used in this study were largely from primary sources. A checklist with structured questions was developed to aid in the data collection. The data were collected by interviews with various stakeholders who were involved in the African indigenous vegetable business. Those interviewed included: seed suppliers, farmers growing indigenous vegetables, representatives of farmer organizations, transporters, support agencies (Family Concern), supermarkets (Uchumi), a subsidiary organization of Nakumatt supermarket (Fresh 'n' Juici), greengrocers and government extension staff.

Although there are about 20 groups that are working with the support agency in growing indigenous vegetables, two were purposively sampled and interviewed for this study. These are the ones consistently selling to high value markets such as supermarkets. These were Kamuchege Agro-Business Self-Help group and Mugima Self–Help group situated at Githunguri Division of Kiambu District in central Kenya. Both are involved in the production of indigenous vegetable growing business, which they started planting two years ago. To understand in detail the production aspects, individual farmers were randomly selected and interviewed.

The data collected included the cost of production, transport, and marketing of indigenous vegetables. Other information collected, related to the degree of integration and coordination along the chain. The study adopted a value and supply chain approach to identify the key participants in the market and the relative value of the produce in the chain. The information that was collected allowed for analysis of the whole chain in which the indigenous vegetables are channelled from the farmer to the end consumer. To allow for comparative analysis especially on cost-benefit analysis, two samples of farmers were randomly selected, one from members involved in the intervention and the other from non-members. This information was also important in estimating the cost of inclusion. Data on farm budgets were entered and analyzed in Excel. The analysis was largely descriptive. In the currency conversion, one US Dollar was equivalent to Kenya Shillings 72.7, 75.7 and 79.9 for the years 2006, 2005 and 2004 respectively (Oanda 2006). Given that the range in weight of vegetable bunches as reported by farmers was 500-700g, an average of 600g was used in the conversion of bunches to kilograms. The farmers replant indigenous vegetables between four and eight times in a year and therefore an average of six times a year is used to estimate the annual net revenue.

4. Results and discussion

4.1 The innovation

Until recently, most of the African indigenous vegetables were grown only on a subsistence basis and any surplus was sold to nearby informal markets or to brokers, often fetching very low prices. The farmers used to be exploited by middlemen who bought the produce at the farm gate due to poor market linkages. They had no voice in price setting, and lacked knowledge on production and access to markets, and the ability to supply the vegetables consistently to the markets. There were no standards and grades that governed the vegetable trade.

With the consumers becoming more sensitive on sanitary and phytosanitary aspects, the existing high value markets for indigenous vegetables impose stringent conditions on quality of the produce they purchase. The retail outlets demand specific standards for leaf size and appearance, and sometimes put a premium on the pesticide maximum residue levels for chemicals found in the vegetables. They also demand consistency in supply and prefer to deal with groups rather than individual farmers so as to cut on transaction cost.

Considering these stringent conditions, the farmers, acting collectively, developed a partnership with an NGO, Family Concern, to work together. The innovation is therefore characterized by two domains: a) collective action by small-scale producers b) strategies and methods of development agencies. The innovation has promoted well-coordinated linkages among farmers, the support agency, government extension staff and supermarkets. All these work together harmoniously in promotion of a viable enterprise. Each actor has a crucial role to play in the sustenance of the supply chain. The innovation was characterized by three major steps: 1) Formation of producer groups 2) Training 3) Value chain analysis.

1. Formation of producer groups: The first task was for the farmer groups to transform from subsistence farming to farming as a business. Twenty groups in Kiambu District were formed between the years 2000 and 2005. The groups had to identify what commodity or groups of commodities they could gainfully produce. The development agency organized the groups into BSUs, which now had a commercial orientation rather than subsistence.
2. Training: The BSUs were taken through a 26 module training, covering production techniques as well as business management, administration, record keeping, invoicing, and group dynamics and cohesiveness.
3. Value chain analysis: The development agency conducted a market survey to help inform on the product's value chain, its stakeholders, and the market

potential. The market survey also identified the traders connecting the farmer groups to the supply chains appropriate for the produce.

These efforts led to linking the BSUs to Kenya's leading supermarket chains, Uchumi and Nakumatt. While the farmers deliver direct to Uchumi, the supply of indigenous vegetables to Nakumatt is done through traders who supply to its subsidiary company, Fresh 'n' Juici. Uchumi presents orders to the BSUs mainly by telephone communication while Nakumatt through Fresh 'n' Juici has agreements with suppliers that are either farmers or brokers. There are about 200 suppliers to Fresh 'n' Juici comprising of three or four suppliers per product. Through the arrangement with Uchumi, the farmers bulk their produce and deliver to the supply chains as a group. The supplies must meet the standards and grades for the produce, quantities to be delivered and the transaction conditions pre-agreed between the supermarkets and farmers. As a result of all these efforts, the supply of African indigenous vegetables to the major supply chains has increased dramatically, and there are prospects for further increase. The supply of these vegetables to the informal markets has also increased.

Once the indigenous vegetables are harvested, the farmers hire a vehicle and transport the produce to supermarkets, mainly Uchumi. A member of the marketing committee, who is also a farmer and a group member, accompanies the transporter. Within each group, there is a marketing subcommittee to oversee marketing issues. The marketing subcommittee ensures that farmers meet the set standards. Each group has a constitution and bylaws, and has established leadership structures.

4.1.1 Description of the farmer groups

Kamuchege BSU

Kamuchege BSU, started as a self-help group in the floriculture enterprise in 2001. The aim of collective action was to eliminate brokers who were exploiting the small-scale farmers. The membership then was nine though grew to 30 by mid 2006. The group ventured into vegetables in 2004, after the prices in flowers (such as Arabicum and Onis) went down. The main vegetables grown were Amaranthus blitum (leaf amaranthus), Cleome gynandra (spider plant), Solanum scabrum (African nightshade), kales, dania and spinach, though a few farmers of the group also grew beetroot, broccoli and lettuce. The group buys seeds collectively thereby enjoying from economies of scale. The leadership of the group comprise of a chairman and secretary and their respective deputies, a treasurer and two other officials. The group has bylaws for good governance.

Kamuchege group has a field subcommittee of three people who oversee production in the farms and a community-based organization (CBO) subcommittee of seven

people, responsible for exploring opportunities for collaboration with donors. The subscription fee is US$ 1.38 per member per month. The group meets once every month for various deliberations. It recently started a Savings and Credit Cooperative (SACCO) and members contribute US$ 0.69 monthly towards it. In connection to the SACCO, the group is in the process of forming a finance subcommittee to oversee its operations. It is also in the process of establishing a welfare subcommittee to address the welfare issues of members.

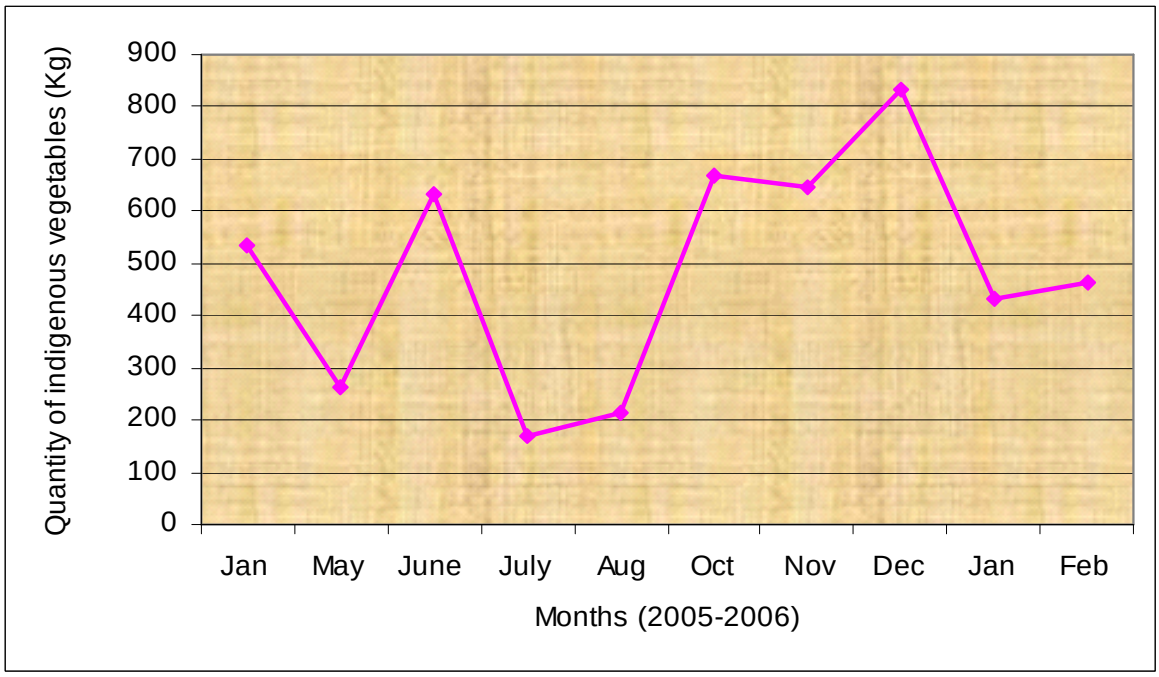


Figure 1: Supply to Uchumi by Kamuchege BSU

Figure 1 shows the quantities of indigenous vegetables that Kamuchege BSU supplied to the Uchumi supermarket in the years 2005 and 2006. The supply comprises of a combination of the three common types of African indigenous vegetables: Amaranthus, African nightshade and spider plant. Although there were fluctuations, the figure shows a general increase in supply, an indication of the increasing demand for the vegetables. During the months of February, March, April, and September, the group did not produce enough vegetables as these were the dry periods and there was a scarcity of water. In such instances, they sold to other outlets such us local markets because the little they produced could not compensate for the high cost of transport and marketing that is associated with supermarket outlets located far away from production zones.

Mugima BSU

Mugima farmer group was started in 2001 with 26 people. The farmers were then growing flowers such as arabicum and could even export. Currently the membership is 19. The decline has been caused by varied reasons such as some

members getting jobs hence withdrawing from farming, others being committed elsewhere, whiles others withdrew to circumvent paying accumulated fines/penalties due to continuous absentia from meetings. The group engages in adaptive trials in that when introducing new crops, they first plant in common experimental plots. Then once the farmers learn how the crop is grown and have confidence that it can do well in the area, they adopt the crop in their respective farms. The main vegetables by the group are African nightshade, spider plant and Amaranthus. They also grow spinach, kale, cowpea (Kunde/Thoroko) and Ethiopian kale. The demand for the vegetables is mostly high and the big challenge is how to satisfy it.

Over the three years, the production of indigenous vegetables by the group has been going up (Figure 2). The average weekly frequency of delivery to Uchumi was twice in 2004, three times in 2005, and in 2006 they were delivering four times per week. The supermarkets prefer shorter shelf life of vegetables dictated by the consumers' preferences for fresh vegetables. This has ramifications on the cost of transport by the farmers.

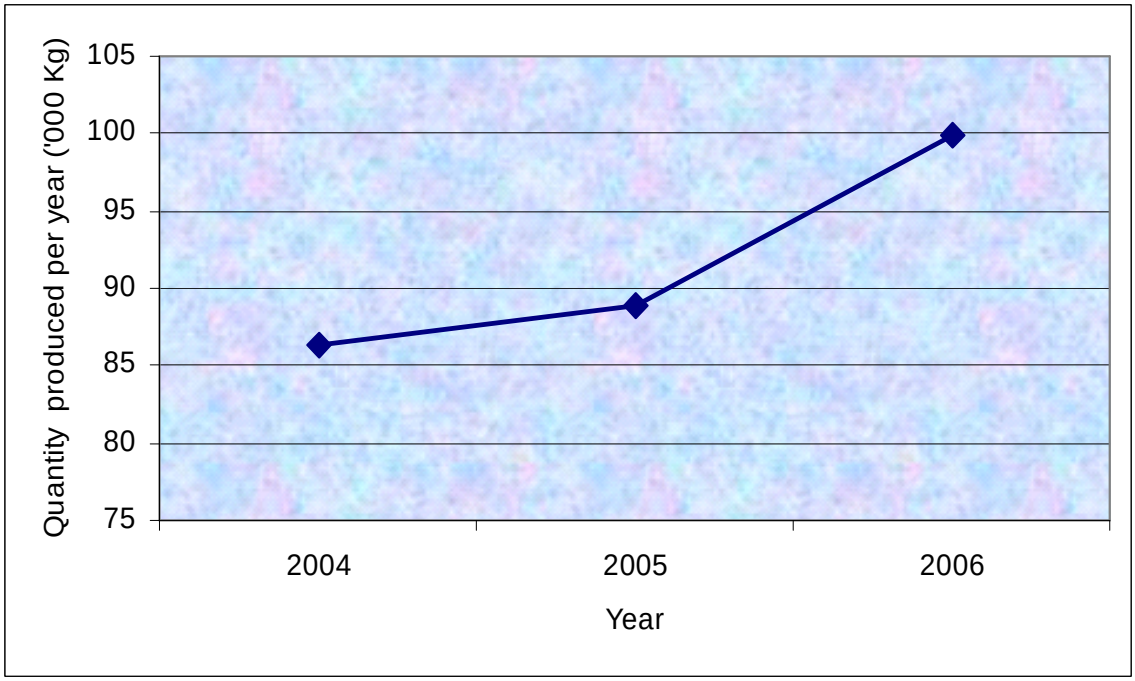


Figure 2: Average annual production of indigenous vegetables by Mugima BSU

The leadership structure of the group comprises of a chairman and secretary, their respective deputies, and a treasurer. Each member contributes US$ 1.38 per month towards the group's SACCO. This enables the group to pay its farmers on delivery thus encouraging farmers to bring their crops. The group has bylaws for governance. It has four subcommittees (roles described below) each with its own chairman. Membership of each subcommittee is shown in Table 1. The group conducts its

elections every year in the month of June. It meets every Tuesday, normally between 9am and 12pm for updates on the previous week's activities, present orders and discusses other relevant issues.

Table 1: Membership of subcommittees of Mugima BSU

Subcommittee	Membership
Agricultural	3
Social	5
SACCO	3
Marketing	4

The agricultural subcommittee has the responsibility of checking how much each member has grown and the type. They also check whether the farmer has adhered to the required standards that are set by the buyers, usually the supermarkets. It monitors the distribution and planting of seeds.

The marketing subcommittee handles the marketing issues of the group. Based on the available products, the committee is supposed to get orders from both the formal and informal markets. They also manage the product quality, organize the collection centres and make transport arrangements, recording the supply of each and every farmer, off loading, invoicing and conducting all the transactions. They accompany the transporter to the market. The marketing subcommittee also explore new markets. For instance, they are currently exploring possibilities of selling to open markets such as Kangemi, Kawangware and Ukulima, all located around Nairobi City. However, although these open markets and grocers pay farmers cash on delivery, unlike the supermarkets, they buy only small quantities of produce. This increases costs, as the farmers have to travel and sell to many outlets. The farmers therefore prefer selling to supermarkets where they are able to trade large quantities thereby cutting on transaction costs.

The welfare subcommittee is concerned with the welfare of members with a bias to the disadvantaged ones. The subcommittee is able to assist for instance, the farmers who are orphaned, unable to pay school fees, and so on.

The SACCO subcommittee deals with financing issues. They are able to pay farmers promptly even when supermarkets delay payment to farmers. This is because they draw money from the SACCO, pay farmers upon delivery of their produce to supermarkets and reimburse once proceeds from sales are received.

4.1.2 Success factors

Mugima and Kamuchege BSUs are examples of the farmer groups that have been successful in the production of indigenous vegetables and marketing them in high value markets such as supermarkets.

Good governance: Farmers of Mugima BSU meet every Tuesday of the week while Kamuchege meets once a month. This provides a forum to air and solve their problems. The members are also updated by officials on the previous week's or month's activities. The groups have a constitution that governs their operations. This instils discipline among the members.

Culture: The members have an ingrained culture of farming having produced flowers. The ancestral background of the people in this area is farming unlike in some other regions of the country where farmers are nomadic pastoralists.

Commitment: To promote attendance to the meetings, the groups have fixed a fine of US$ 0.69 paid by any person that does not turn up. If a farmer fails to turn up when the groups have organized an activity, for instance, cultivation on common demonstration plots, the penalty is higher at US$ 1.38.

Delivery of technical advice: For the case of Mugima BSU, weekly meetings have improved accessibility by the ministry staff, or other interested groups that would like to train the farmers or offer services to the group. Technical people are well aware of the Tuesday meetings. These include the Ministry of Agriculture staff as well as others with new ideas. They therefore present any information useful to farmers on this day and consequently the farmers are able to maximize the gains from this group.

Integration with other support services: Mugima BSU has a SACCO. This facilitates prompt payment to the farmers upon delivery of vegetables pending payments by supermarkets. The payments have therefore consistently been made on a weekly basis. The supermarket pays the group after a fortnight. Correspondingly, Kamuchege BSU has plans underway to introduce a SACCO. In case of accumulated arrears in payments that the SACCO may not support, Family Concern intervenes and pays the farmers. They then recover the money after the supermarkets pay before dispatching the proceeds to farmers. This partnership with the development agency is therefore important to the farmers.

Regular and predictable incomes: The regular weekly payments attract members to the group. They therefore become loyal to the group.

Transparency and accountability: The farmers keep proper records. This promotes transparency and accountability, and consequently builds confidence in the group.

To ensure that there is no collusion in any dubious act in the marketing of produce, there is alternation on the person accompanying the transporter to the market.

Support and backstopping by an agency: The skills acquired through training by development agencies such as Family Concern and Food and Agricultural Organization (FAO) have enabled the farmers to practice good farm management. This has enabled them to produce superior standards required by the dynamic markets.

4.1.3 Challenges

Inadequate skills: Production and marketing of indigenous vegetables requires skills that the farmers might not have. This makes them seek assistance from research institutions such as Kenya Agricultural Research Institute (KARI) and non-governmental organizations such as FAO and Family Concern. The private sector and the government through the Ministry of Agriculture also provide training to farmers. Farmers also need assistance to make the initial linkages with buyers. Finally, establishing marketing system takes time and requires patience.

Water scarcity: Most of the areas where indigenous vegetables are grown lack piped water. The growing of the vegetables is therefore mainly done on lowlands along the rivers and streams. This makes it easy for farmers to irrigate during the dry season by hand, because they lack the capital to enable them to adopt more advanced technologies. Growing on the lowlands has the disadvantage of crop erosion during rainy seasons due to flooding. Further, it raises the cost of bulking, as the crops have to be moved from lowlands to uplands where there are collection points.

Insect attack: Another challenge facing the growers of indigenous vegetables is insect attack especially by spider mite/red spider. Supermarkets discourage spraying yet this is the familiar method to farmers for controlling the mites.

Decreased land size: The decreasing land size due to population pressure is another challenge that is facing the farmers in the area of Githunguri. Being a high potential area, the population is high and farmers own just small pieces of land. The area of expansion by most farmers is therefore limited.

Deteriorating soil fertility: The farmers also believe that the productivity of soils have gone down and therefore there is a need for soil analysis and advising of farmers on appropriate soil improvement strategies. The cost of soil analysis is however quite high to a small-scale farmer.

Delayed payments: Although the groups are getting a good price from Uchumi supermarket, once the product is delivered, they get their payment after a fortnight.

They therefore keep on relying on SACCO and support systems that make the payments available to them immediately after delivery to the markets and then offset them once the supermarkets make the payments. This creates concerns on the sustainability of the groups if the support is withdrawn.

High transport cost: The farmers depend mainly on hired transport to ferry their products to the market. Sometimes the vehicle may break down, thereby delivering the farmers' produce late or failing to deliver due to mechanical problems. This would imply a loss to the farmer. Furthermore, the cost of transportation has been going up. For Mugima BSU, in nominal terms, it was US$ 18.87 per trip in 2004, US$ 23.78 in 2005, and US$ 27.51 in 2006 and the transporter is anticipating increasing it to US$ 30.26 per trip.

Competition from other suppliers: There are many different suppliers who deliver their fresh products to the supermarkets. As such, there is stiff competition among the suppliers. This implies that the farmers must adhere to the required standards and orders if they are to sustain their position as preferred suppliers.

Problem of getting manure: In order to maintain the standards set by the market chains, the farmers have to make use of good crop husbandry practices. Manure is required to improve and retain soil fertility and ensure healthy crops. The manure is however sometimes not available within the locality.

4.2 Supply chain and its segments

The supply chain comprises mainly of input suppliers, farmers (organized into farmer groups), transporters, and supermarkets. There are however other entities that play key roles to enhance the performance of the chain. These are development agencies and government extension officers. Although the supermarkets are the main outlets for the farmers' produce, sometimes they also sell to greengrocers and open markets.

4.2.1 Input suppliers

These include the suppliers of seeds, manure, and agrochemicals. Among the inputs, seeds are compulsory but manure and agrochemicals are dependent on the degree of fertility of the soils and insect attack respectively. The seed supply system is characterized by a single well-established distributor, based at Githunguri shopping centre. The farmer groups buy the seeds from this supplier. The supply is assisted by the development agency in that they link him to seed prominent seed manufacturers and negotiate a price on his behalf. He therefore acquires the seeds at a discount and

the agreement with the development agency is that this discount should translate to lower seed prices at retail level, hence low cost of seeds by farmers.

4.2.2 Small-scale farmers, their organization and support system

In Githunguri Division of Kiambu District, two farmer groups namely Kamuchege and Mugima BSUs were visited and interviewed. Both are involved in the indigenous vegetable business, which they started producing two years ago. They are managed by officials, who are elected by members for a specified period. A constitution drafted by the groups, guides them in their operations. Members who do not adhere to the bylaws are expelled from the group.

The groups were formed as a bargaining platform for the poor small-scale farmers, who were being exploited by the brokers and traders in the local markets. Farmers used to suffer from the cost-price squeeze due to high input costs and low producer prices. The commonly grown indigenous vegetables include Cleome gynandra, Solanum scabrum and Amaranthus blitum, which are in high demand in the market. The farmers purchase their seeds from a stockist located at a nearby township. The development agency supports this farmer by linking him to suppliers of high quality seeds and negotiating for a favourable price. The agency also provide initial training to the farmers on good agricultural practices such as essence of double digging and integrated pest, disease, weed and crop management which enable them a reduce cost of production and meet market demands.

Family Concern organizes for them, the selling of their products to supermarkets. Among the two groups visited, each member grows his products in his respective plots. Once they get the supply order from the supermarket, it is the responsibility of the production committee, on the basis of the quantity ordered, to determine the amount of products each farmer would supply. If the farmers do not have enough, they outsource from non-group farmers. Non-group members normally produce on a subsistence basis and in case of excess they sell to the local markets or brokers at lower prices than those prevailing at supermarkets.

Produce once harvested is cut into required sizes (12-18 inches) and tied into bunches each weighing about 600g. The produce is put in well-aerated baskets and is then taken to an agreed collection centre. The farmers do all this by themselves in one day and if the produce is too much, they employ casuals to help. The weights and lengths of units are dictated by the supermarkets and they base this on consumer taste and preferences. On the basis of Kaplinsky and Morris's (2001) method of analyzing the mechanisms of governance and coordination in the supply chain, this implies that the supermarkets play legislative governance in this case. This is because the supermarkets set product standards and to a great extent the transaction conditions. The farmers, in addition to production and harvesting cut the

produce into standard length and also package them into units (about 600g each), a characteristic of forward integration. From the collection centre, produce is transported to the market accompanied by a member of the marketing subcommittee. The group pays for their expenses. Family Concern and the supermarkets determine the prices, which averages at US$ 0.23, though occasionally may go up to a maximum of US$ 0.32 per kilogram during the dry season. The prices are much higher as compared to the open market where they fetch between US$ 0.07 and US$ 0.11 per kilogram.

The group hires the transport to deliver the supplies to the market. A pick-up truck is normally used, whereby each farmer is deducted about US$ 0.03 per kilogram to cater for transport and marketing costs. The supply order ranges from 720kg to 1200kg per week and the pick-up truck is able to carry all this in one trip. The farmers must meet the quality standards set by the supermarkets, failure to which the produce is rejected. The standards are, that the supplied vegetables be clean, neat, healthy, and of the size ranging between 12 and 18 inches long.

4.2.3 Transporters

The farmers normally hire a pick-up truck that delivers the produce from the collection point in the locality of the farmers to the supermarkets. In 2004, the transporter charged US$ 24.76 per trip made to the supermarkets, and carried an average load weighing 480kg. The charges have however gone up to average at US$ 27.51 in 2005. The costs to the transporter are fuel and lubricants US$ 13.76, rent or bribery on traffic US$ 1.38 and city council charges US$ 0.83, hence making a margin of US$ 11.55 not accounting for depreciation of the vehicle.

4.2.4 Supermarkets

Supermarkets work closely with the development agency and small-scale farmers. They normally give guidelines on the quality and quantity required to supply the increasing demand for indigenous vegetables. The quality is assessed by visual inspection.
The quality standards set by the supermarket are that the vegetable units be:

- clean
- neat
- not attacked by insects, (no holes)
- right length (between 12 and 18 inches)
- right quantity (weigh between 500g and 700g)
- harvested before they flower or develop seeds
- fresh (not wilted)

The supermarket also requires that the produce be delivered between 6.00-7.00am on the day of delivery. The supermarket gives orders with quality specifications, failure to which the products are rejected. Rejection of the products serves as an evolution process whereby farmers learn the need to adhere to the standards required. Family Concern assists the farmers in negotiating for the prices of the products with the supermarkets. The buying price per kilogram of African indigenous vegetables by the supermarkets is US$ 0.23 while the selling price is US$ 0.34 thereby making a margin of US$ 0.11.

Nakumatt chain of supermarkets procures its vegetables via its subsidiary company, Fresh 'n' Juici. Table 2 shows the buying and selling prices of the common vegetables sold by the supermarket. Unlike Uchumi, which procures from producer organizations, Nakumatt procures largely from preferred individuals. These preferred suppliers are those able to supply consistently and normally in large quantities thereby contributing to reduced transaction costs. Some of the suppliers purchase the produce from farmer groups.

The supplier who is interested in delivering indigenous vegetables has to go through the following stages to be included in the Nakumatt chain:

1. express interest;
2. write an application;
3. hand it in for review and approval;
4. bring in a sample of whatever product they will be supplying; and
5. they are then allowed to continue supplying only in small amounts until the company is satisfied that the standards are met. After that they are allowed to supply in bulk.

The indigenous vegetables are only accepted if they are young and leafy. They have to be healthy and fresh. The vegetables need not have developed seeds. The supermarket staff are trained to select only the best. Any produce that does not meet the standards is given back to the farmer; this implies that the farmer/representative is present from delivery to the selection and the weighing.

Farmers do not receive advance payments but are paid on delivery. In Nakumatt (Fresh 'n' Juici), payment is done daily for the suppliers who bring in produce valued at the most US$ 275. The rest are paid in a month's time depending on the agreement. The company does not offer transport services to the suppliers. If, and when a supplier does not meet the set standards, he/she is discontinued from supplying to the company.

The company does not provide extension services to farmers. Set standards are dictated by the customer's requirements. Fresh 'n' Juici supplies to all the Nakumatt

supermarket branches except those located in Mombasa. It also supplies to the Norfolk hotel in Nairobi and the Tusker mattresses supermarket branches.

Table 2: Buying and selling prices of vegetables in Nakumatt supermarket

Vegetables	Buying price (US$)	Selling price (US$)
Managu	0.23 (per kg)	0.34 (per kg)
Terere	0.23 "	0.34 "
Saget	0.23 "	0.34 "
Kunde	0.23 "	0.34 "
Sukuma	0.23 "	0.34 "
Cabbage	0.12 "	0.33 "
Spinach	0.23 "	0.34 "

Source: Interview with Nakumatt 2006

4.2.5 Greengrocers

The indigenous vegetables farmer groups also sell to greengrocers around Nairobi city. The price to these greengrocers is the same as in the supermarkets US$ 0.23 per kilogram and the grocers sell the same at US$ 0.34 thus making a US$ 0.11 margin. The challenge especially in selling to the greengrocers is that they order smaller quantities compared to the supermarkets. For example, Mugima BSU would deliver around 1920kg per week to supermarkets while a greengrocer would only purchase 60kg per week.

4.2.6 Informal market

The groups occasionally sell their produce to informal markets. They split the unit that sells for US$ 0.23 in supermarkets into three smaller quantities and sells them for US$ 0.04 each thus realizing US$ 0.12 from the bunch. In the informal markets such as Gikomba market, on the outskirts of Nairobi they sell to traders cum wholesalers, who then sell to consumers. However, these too do not buy as large a quantity as is the case with supermarkets.

4.3 The macro and meso context

The Kenyan economic growth has recently drastically improved to the tune of 5.8 per cent in 2005/06. This is highest rate registered in the last decade. Agriculture grew by 6.7 per cent compared to 1.4 per cent in 2004. Horticulture exports grew by 19.2 per cent in 2005, injecting US$ 0.51 billion compared to US$ 0.45 billion in 2004 (Economic Survey 2006). The Economic Recovery Strategy for Wealth and Employment Creation is the national blue print that guides the government in the improvement of the economy.

The players characterizing the macro and meso context with regards to the intervention of indigenous vegetables are the government and the supporting agency.

Government: the government through the Ministry of Agriculture mainly the Department of Home Economics, promote consumption of indigenous vegetables. They do this by sensitising farmers and the community in general on the medicinal and nutritive values of these vegetables. This way, they are able to promote consumption, raise the demand and thereby accelerate the flow of indigenous vegetables along the supply chain. The government, also through a new extension programme under the Ministry of Agriculture provides extension services to farmers, thereby promoting production.

Development agency: The development agency helps farmers to get organized into BSUs. They then train them on good governance of the groups. They also link the farmers to outlets such as supermarkets and assist them in identifying and negotiating with the transporters.

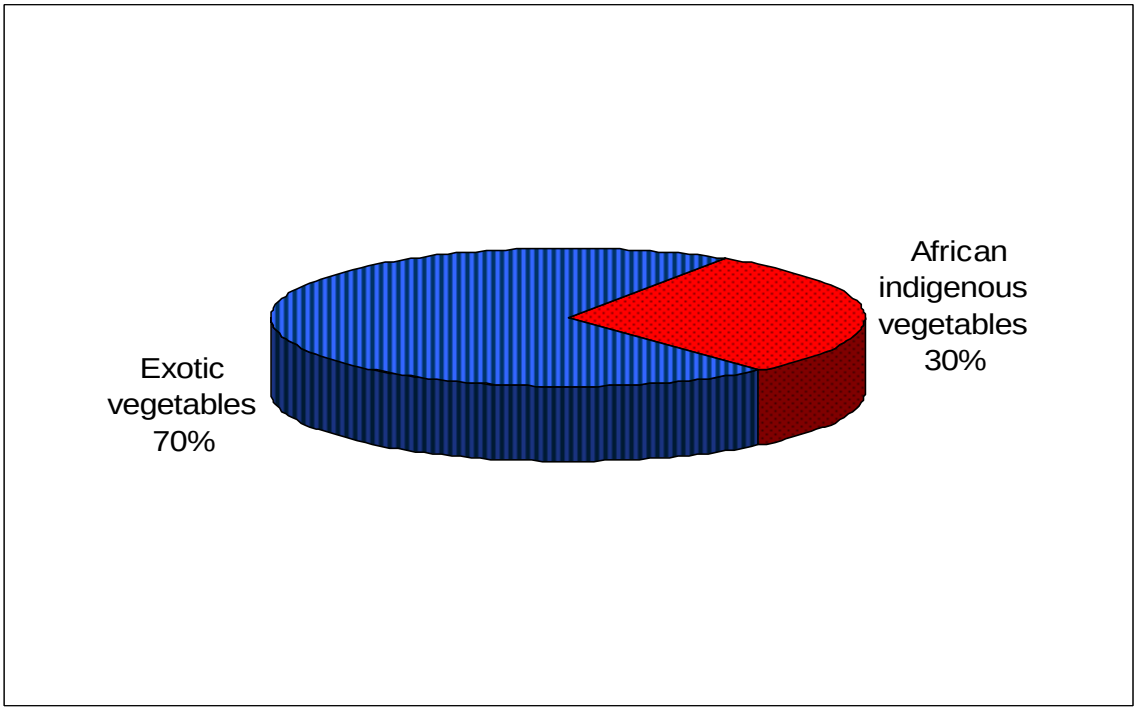
Urbanization, emergence of supermarkets, change of dietary habits and increased awareness about the importance of indigenous foods has led to the increased demand of these products especially in urban areas. Table 3 shows the market shares for the common indigenous vegetables in Nairobi.

Table 3: African indigenous vegetables market share for Nairobi market

Vegetable	**% Market share**
Black Nightshade (managu)	30
Spider plant (sergeti)	28
Cow pea (kunde)	20
Amaranthus (terere)	12
Mlenda, kanzira mitoo	9
Other	1
Total share	100

Source: Family Concern 2003

According to Family Concern the proportion of African indigenous vegetables marketed in Nairobi has been going up. The vegetables currently account for about 30 per cent of the Nairobi vegetable market (Figure 3).



Source: interview with Family Concern 2006

Figure 3: Proportion of the vegetable market accounted by African indigenous vegetables

4.4 History of innovation against supply chain evolution

The collective action by small-scale farmers in the Githunguri area started in 2001 when FAO through Farmers' field schools organized farmers and provided the capital that could support farmers in training on various enterprises or opportunities. The trainers included KARI, Ministry of Agriculture; Land 'O' Lakes, and private companies, especially those dealing in animal feeds and agrochemicals. After training, the farmers were able to identify a venture, in this case, flower farming. The main flowers that they grew were Onis and Arabicum. However, the flower business was not doing well as the prices went down in 2003.

Following poor performance in floriculture, the farmers in 2004 explored other avenues with the help of the development agency Family Concern. This was the growing of indigenous vegetables. The agency helped the farmers in organizing themselves into BSUs and equipped them with skills by training.

The growth of indigenous vegetables however, requires water throughout the year. However, the Githunguri area experiences only two rainy seasons. Given this limitation in availability of water for some months of the year, the farmers irrigate, especially during dry seasons. This allows for year round production of indigenous vegetables. Irrigation is however done manually, since farmers lack the capital to buy appropriate machinery. The area lacks piped water and therefore, to minimize the cost of irrigation, the farmers plant the vegetables adjacent to the rivers.

The skills that the farmer groups received through training have placed them in a better position than non-farmer groups. Due to the ability of the groups to supply in accordance with the private grades and standards set by the supermarkets, they have secured their position as preferred suppliers. Such development in a procurement system is a characteristic of restructured agrifood supply chains (Berdegue et al. 2005).

4.5 Explaining inclusion or exclusion

In this case study, there are many aspects that explain inclusion and exclusion of small-scale farmers in chains that are serving the dynamic restructured markets of vegetables. These are mainly with regard to grades and standards, group formation, group constitution, water access, and skills.

Adherence to private grades and standards: The adherence to the private grades and standards (see section 4.2.4) that are set by supermarkets and other high value outlets determine whether or not small-scale farmers will access the markets. Farmer groups or farmers that were unable to meet the stringent standards set by supermarkets were excluded from the chains that supplied these high value outlets

Group formation: unless farmers are organized into groups, they risk being excluded from the dynamic markets. In Kiambu, the two business support groups were able to sell their products to the supermarkets unlike farmers who were not organized into groups. In the study area, non-members of BSUs sometimes supplied their products to the groups so that their product could fetch a higher price. However, the produce had to be of a standard acceptable to the group. The non-members however paid the group US$ 0.02 per kilogram of produce that was marketed through the BSUs on top of other marketing and transport costs.

Adherence to constitution of the groups: Farmers that did not adhere to constitution or bylaws were dropped from participation in BSUs and consequently excluded from accessing the supermarkets.

Access to water for irrigation: Access to water in this case through irrigation is crucial if farmers are to consistently supply to supermarkets. The supermarkets require that farmers be able to supply the indigenous vegetables consistently throughout the year. Water would enable farmer's produce even during dry seasons.

Acquisition of skills: Appropriate skills in the management of groups, production, and handling of the produce, are essential if farmers are to produce according to standards demanded by the markets and therefore are essential in sustenance of

their inclusion in the chain. In this case study, the training was conducted by the development agency, though in addition the farmers got advice from technical people such as those from the Ministry of Agriculture.

4.6 Cost-benefit analysis

For the farmers who have joined the BSUs, they have the benefit of selling their products directly to retailers at a higher price, bypassing middlemen and merchants altogether. BSUs provide a larger amount of produce due to pooling together and maintain a continuous supply, and the farmers are in a stronger bargaining position. Diversification especially in selling to greengrocers and also to the informal markets at a slightly higher price is also beneficial to the farmers.

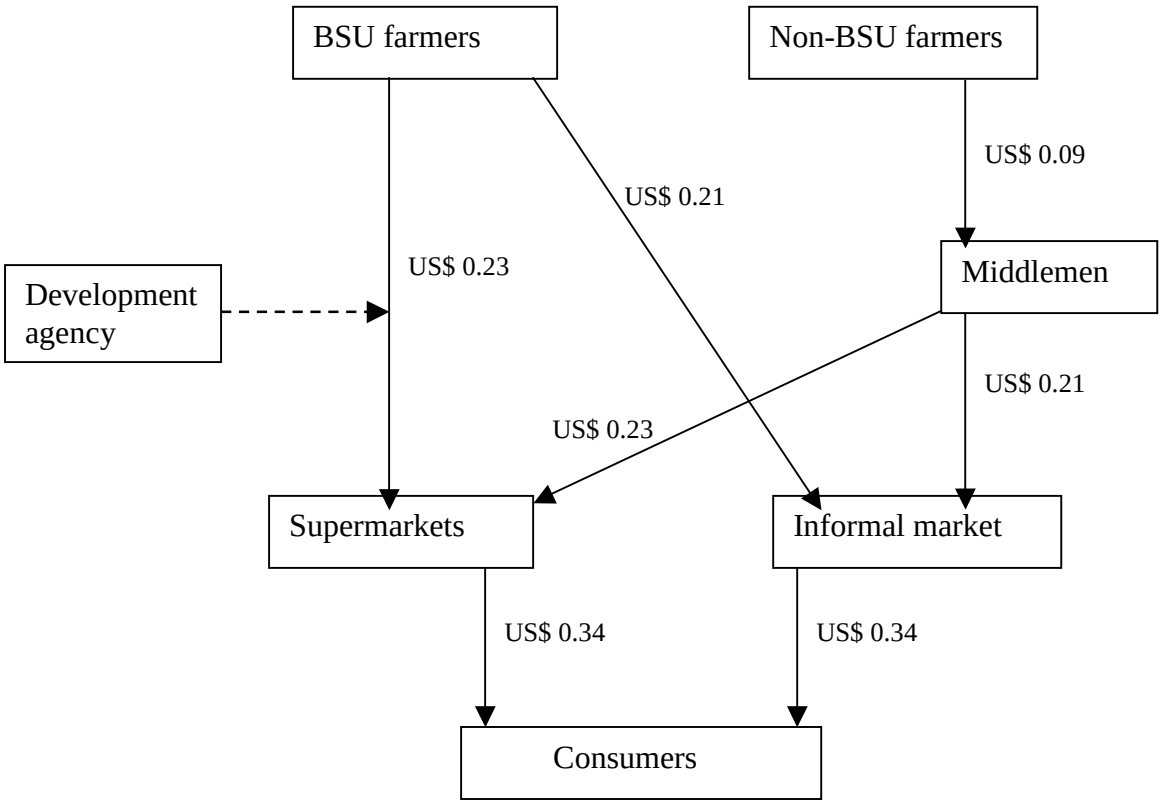


Figure 4: The main supply channels and respective prices per kilogram

The collective action by farmers promotes the all year round supply to the market. During the low season, although farmers do not have large quantities, they are able to pool together the little they have and still meet the orders by the clients, the supermarkets. Prices are especially higher during the dry season (US$ 0.05-0.09 per kilogram above the normal price).

Table 4: Cost and revenue (US$) per acre by members of BSUs

Details	Mugima BSU farmers (Githunguri)			Kamuchege BSU farmers (Kagwe)	
	A	B	C	A	B
Yield (kg/acre)	1500	1688	2250	2204	3600
Selling price (supermarkets)	0.23	0.23	0.23	0.23	0.23
Gross revenue	**343.88**	**386.93**	**515.82**	**505.23**	**825.31**
Costs					
Land ploughing	18.34	8.60	8.60	2.11	13.76
Planting	2.75	5.16	5.73	2.81	6.88
Manure	0.00	0.00	15.13	0.00	0.00
Seed	10.32	10.32	10.32	10.11	12.38
Spraying	6.19	0.00	0.00	0.00	0.00
Watering	0.00	5.73	4.30	1.40	20.63
Weeding	0.00	0.00	3.44	5.61	27.51
Harvesting	6.88	11.46	6.88	8.42	13.76
Packaging & bulking	17.19	19.35	25.79	25.26	41.27
Transport	6.30	85.11	25.22	103.16	6.88
Marketing	1.43	19.34	12.61	25.26	41.27
Total Costs	**69.41**	**165.07**	**118.01**	**184.14**	**184.32**
Net revenue	**274.47**	**221.87**	**397.81**	**321.08**	**640.99**
Net revenue per kg	**0.18**	**0.13**	**0.18**	**0.15**	**0.18**
Annual net revenue	**1646.84**	**1331.20**	**2386.86**	**1926.50**	**3845.94**

Farmers who are selling their vegetables in the high value markets make between 30 and 70 per cent more profit compared to farmers selling in the local markets. This is because they are able to fetch US$ 0.23 from the supermarket and US$ 0.21 from the informal markets unlike the counterparts who sell at US$ 0.09, normally to middlemen (Figure 4). While members realize high margins ranging between US$ 0.13 and US$ 0.18 (Table 4), the non-group members get only a margin of between US$ 0.05 and US$ 0.09 (Table 5) per kilogram of indigenous vegetables. Also the group are able to bargain for higher prices and deliver the vegetables to distance markets (Kawangware, Kangemi in Nairobi) that will fetch higher prices.

Table 5: Cost and revenue (US$) per acre by non-BSU members

Details	Non-BSU farmers (Githunguri)			Non-BSU farmers (Kagwe)		
	A	B	C	A	B	C
Yield (kg/acre)	1500	1688	2250	2204	3600	2250
Price at local market	0.11	0.11	0.11	0.08	0.08	0.08
Gross revenue	**172**	**193**	**258**	**177**	**289**	**181**
Costs						
Land ploughing	18.34	8.60	8.60	5.61	13.76	5.73
Ridging	0.00	0.00	0.00	0.00	0.00	0.00
Planting	2.75	5.16	5.73	2.81	6.88	2.01
Manure	0.00	0.00	15.13	0.00	0.00	0.00
Seed	10.32	10.32	10.32	10.11	12.38	10.32
Spraying	6.19	0.00	0.00	0.00	0.00	0.00
Watering	0.00	5.73	4.30	1.40	20.63	5.73
Weeding	0.00	0.00	3.44	5.61	27.51	7.45
Harvesting	6.88	11.46	6.88	8.42	13.76	12.61
Total costs	**44.48**	**41.27**	**54.39**	**33.97**	**94.91**	**43.84**
Net revenue	**127.46**	**152.17**	**203.52**	**142.89**	**193.95**	**136.69**
Net revenue per kg	**0.08**	**0.09**	**0.09**	**0.06**	**0.05**	**0.06**
Annual net revenue	**764.79**	**913.00**	**1221.11**	**857.31**	**1163.69**	**820.15**

On average, the farmers who were members of BSUs made a margin of US$ 0.16 per kilogram of indigenous vegetables delivered to the supermarkets. On the other hand, farmers outside the innovation (non-BSU members) make a margin of 0.07 per kilogram. Therefore on average, farmers who benefited from the innovation and hence included in the chain that sold to the supermarkets realized 55 per cent higher margins than those who sold in the local market.

From Table 4 and 5, it is clear that the farmers who were in groups made more profits than that made by farmers that were outside the BSUs. The prompt payment of the product on delivery promoted by the existence of a SACCO makes being in a group more advantageous. There were instances where non-members growing indigenous vegetables in the area were delivering their vegetables to the group in order to fetch a higher price.

4.7 The potential for up scaling and replication

Most of central Kenya has soils and climatic conditions that are more or less the same (red volcanic soils). However, the growth of indigenous vegetables in the

province is concentrated in Kiambu District (where Githunguri is located) largely due to the proximity of Nairobi City (market), implying low transport cost and availability of urban markets. Nevertheless as other towns in the province grow and as the diffusion of supermarkets from big towns to smaller ones progresses, the potential for up scaling and replicating the indigenous vegetable venture increases.

There is a potential to replicate the intervention in other areas within the country with the focus on delivering the vegetables to nearby urban areas. With the promotion of the nutritional value of the indigenous vegetables and the training of farmers in their production, demand and supply of the vegetables are likely to go up. Although the species of indigenous vegetables grown in Kiambu and marketed in supermarkets are less than five, the country has over 210 species of leafy vegetables which are untapped (IPGRI 2006), hence potential for replication and scaling up. With increasing urbanization and population, there is potential market for the indigenous vegetables.

It is clear from Table 3 and 4 that farmers selling through collective action and hence accessing high value markets such as supermarkets realize more income than those selling individually in the local markets. The farmers in the group make between 35-72 per cent more profit per bunch compared to those not in groups. Also the groups are able to diversify their market by selling to greengrocers and large wet markets at a higher price. The non-group members sometimes deliver their products to the group and after the group sells the vegetables they pay a price since they are able to fetch higher prices. As such, the government in collaboration with the farmers and other stakeholders within the industry should sensitize and encourage the vegetable farmers even in other parts of the country to form and actively participate in grassroots membership organizations. This would promote access to extension services and to high value markets as well as benefit from economies of scale thereby maximizing on their incomes. Through SACCOs, the formation of groups would also promote mobilization of savings.

Although there are many areas in the country where indigenous vegetables can do well, commercial production is concentrated near large urban centres due to the availability of a market. Given the increasing demand, supply from such areas may not be adequate. This calls for improvement in a transport system that would ensure access to vegetables, which are far away from markets. One option would be to encourage private sector to invest in transport industry by buying and operating refrigerated trucks and cold-storage facilities. This however would be viable only after production is large enough to allow for recovery cost, the accompanying high that characterizes such a system.

5. Policy implications

Requirements for inclusion

For the small-scale farmers to sustain their inclusion in the dynamic and restructured markets, they should adhere to private grades and standards demanded by the markets. They should also be able to make the deliveries consistently. This calls for continuous adoption of innovative strategies by farmers.

The all year round production is a key requirement if farmers are to continue supplying the supermarkets. To make this possible farmers do irrigate their vegetables during the seasons when rains are not available. For instance in this study, Kamuchege BSU could not produce for supermarkets during some months due to a lack of water, while Mugima succeeded in doing so through irrigation. Access to irrigation water is therefore crucial if small-scale farmers are to be sustained in the supply chain. The fact that overdependence on rain-fed production limits the opportunities of small-scale vegetable farmers to engage in commercial vegetable production has also been identified in the past (IPAR 2005). Expansion of piped water or digging of boreholes to enhance access of water by small-scale farmers is fundamental.

One component that came out clear as essential if small-scale farmers are to sustain their inclusion in the chain supplying to the high value markets is the need for training. Farmers need to be trained and therefore gain skills on the new requirements or standards that are required by the high value markets. Farmers who are unable to keep up with the quality and quantity demanded by the high value markets are excluded from supplying to this market. In our case study, the training component was provided by research institutions, development agencies, government extension workers, and farm input providers.

Institutional

There is need for a change agent or a support system to facilitate the small-scale farmers in their activities. In this case study, the change agent is the development agency, Family Concern. They oversee the whole process. They trained the farmers and therefore prepared them for challenges in the market. They also conducted market research and linked farmer groups to input suppliers, transporters, and to outlets such as supermarkets.

It is important that farmers get organized into groups. Operating as a group helped the farmers to access high value chain markets. They are able to provide continuous supply of the product, and they are also able to diversify their markets. They are able to pay the farmers upfront through SACCO money for the products delivered, as

evidenced by the case of Mugima BSU. Collective action has promoted inclusion in the chain, hence the need to support producer organizations.

Considering the increasing cost of transport, the farmers should consider integrating forward. If constrained financially, they could start by establishing a partnership with transporters and therefore share the profits through the chain-partnership relationship, and thereafter acquire their own vehicle and concomitantly control this function. This way, they will reduce the cost of transport at least by the margin that the transporters make.

General policy

Adaptive trials by the farmer groups also are important if small-scale farmers are to continuously supply the markets characterized by changing consumption patterns. As the consumption of vegetables changes from exotic to indigenous ones, farmers are uncertain if the indigenous vegetables whose demand is increasing would do well in their area. To manage the risk, Mugima BSU started with pilot areas and only distributed the seeds to members once they were confident that the crop could do well. This way, the farmers are able to supply for the increased demand hence sustaining their inclusion in the chain. This is encouraging and therefore there is a need to promote the use of adaptive trials among farmer groups.

To manage the risk marked by a single outlet (supermarkets) of indigenous vegetables, for instance closing down that characterized Uchumi recently, the farmers need to be well prepared and therefore flexible in supplying other outlets such as wet markets and institutions such as hospitals, schools and hotels. Appropriate market infrastructure such as sheds and stalls in wet markets within the country are crucial in enhancing commercial production of indigenous vegetables. Shortage of such infrastructure significantly contributes to a lowering of quality and shelf life of vegetables sold through the markets.

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Regoverning Markets

Regoverning Markets is a multi-partner collaborative research programme analysing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle- and low-income countries. The aim of the programme is to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of the dynamic changes in local and regional markets. The programme is funded by the UK Department for International Development (DFID), the International Development Research Centre (IDRC), ICCO, Cordaid, the Canadian International Development Agency (CIDA), and the US Agency for International Development (USAID).

Innovative Practice

Innovative Practice is a series of case studies from the Regoverning Markets programme providing examples of specific innovation in connecting small-scale producers with dynamic markets at local or regional level. Based on significant fieldwork activities, the studies focus on four drivers of innovation: public policy principles, private business models, collective action strategies by small-scale farmers, and intervention strategies and methods of development agencies. The studies highlight policy lessons and suggest working methods to guide public and private actors.

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