

Regoverning Markets

Small-scale producers in modern agrifood markets

Innovative Practice

Tanzania

The impact of market links on horticultural production in the Mara region

January M. Mafuru, Adventina K. Babu and Tumaini F. Matutu

Lake Zone Agricultural Research and Development Institute

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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.

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1 Executive summary

In recent years the contribution of horticultural produce to nutrition and income for smallholders has increased. Both exotic and indigenous vegetables are now consumed as a source of minerals and vitamins nationally. In Tanzania, the horticultural industry is affected by lack of access to high value markets and production inputs. Many NGOs, donors, exporters and farmers' associations are undertaking initiatives to overcome constraints to the market access of small-scale farmers. However, the knowledge about what makes market access successful, particularly in smallholder farming, is limited. The Mara Smallholder Horticultural Project (MSHP) has mobilized small-scale farmers into producer and market networks and linked them to the high value markets of the Serengeti National Park tourist hotels and camps. In such markets farmers achieve high prices and regular demand for their produce throughout the year. Farmers have managed to increase the quantity marketed by acquiring more markets from lodges and camps. It is on the basis of the above that the current study is being undertaken with the objective of identifying how small-scale farmers could be better included in these dynamic markets. The study identifies the factors influencing the inclusion of farmers in the chain supplying the dynamic markets. The financial and non-financial costs and benefits the small-scale farmers (SSF) obtain from their inclusion in these dynamic markets and the sustainability of inclusion are also looked into. In essence this investigation seeks to evaluate the potential for 'scaling-up' and replication of the innovation and the lessons that can be derived for public and private policies to promote market inclusion of small-scale producers elsewhere.

The study involved informal interviews with members of two farmer group networks and other stakeholders involved in horticultural production and marketing. A checklist was used to collect information from the respondents, which included producers, transporters, buyers, input suppliers, and support agency (MSHP) and government extension workers. During the fieldwork, three groups out of the thirty farmer groups supported by the development agency and an additional three groups not supported by the agency were interviewed in order to compare the two categories of farmer groups in terms of cost-benefit analysis and cost of inclusions in the dynamic markets.

The data collected included information on the background of the parties involved, cost of production, use of inputs, storage, processing, transportation and marketing. Other information collected related to the vision of the chain, and organizational and cost-benefit analyses. The history of the interaction between farmers and the development agency was investigated in order to identify the motives of both parties and their expectations at inception of the programme, examine the roles and responsibilities of the parties involved, understand what actually materialized, and evaluate the advantages and disadvantages of the association accruing to each of the

parties involved. The respondents' perceptions regarding what could be done to improve the programme from the small-scale farmers' point of view were also recorded. The study used a sub-sector analysis approach to describe the different segments of the supply chain, from input suppliers to the consumers. Data analysis was largely descriptive, in which information on the cost-benefit of tomato production was generated.

The innovation involves a network of farmer groups, which are linked to tourist hotels by a development agency. Initially, the development agency mobilized farmers into marketing groups, and then connected them to form a network of suppliers of horticultural produce to the hotels and camps. In addition, the agency assisted the small-scale farmers to acquire support from various institutions in the region; it thus improved their skills and knowledge in horticultural production and other related issues. After four years of innovation, farmers have increased their household income, improved access to credits and extension services, and developed marketing skills. The main factors that have sustained farmers' inclusion in the dynamic markets are good governance, culture, commitment, and delivery of technical support. Other factors include integration into the support services, prompt payments after selling, and support by an agency.

In this case study the supply chain consists of input suppliers, farmer networks, transporters, and tourist hotels/camps. In addition the development agency, government extension services and farmers' training centres facilitated in the inclusion of farmers in the supply chain. However, the study noted that farmers also sold fruits and vegetables that do not meet quality standards of the hotels to middlemen in the open markets at low prices.

Network farmers supply horticultural produce according to standards and grades set by the hotels/camps, including clean and standardised tomatoes that are free from diseases and poisonous chemicals. The quality standards set by the hotels are based on the taste and preferences of the tourists. Farmers also have to meet the quantities demanded – hence consistent supply was a major factor, and a failure to meet this would result into exclusion from the market chain. Therefore, access to irrigation water and reliable transport services were important for farmers in order to remain included in the supply chain.

In the macro and meso contexts, the increase in horticultural production is primarily due to the policy support from the government, which emphasizes the promotion of horticultural crops. Other factors include increased demand due to urbanization and the growing mining industry, and the emergence of tourist hotels/camps due to the growing tourist industry. Group formation and the support received from the development agency helped farmers to remain included in the high value market, which increased their household income. Collective action has enabled farmers to

supply fruit and vegetables to tourist hotels/camps consistently by pooling together their produce to meet the quantities and quality demanded. Also, group formation has enabled them to access knowledge and skills through training, which is critical in the dynamic markets. Through the market linkage, the network farmers achieve an average of 160% more 'profit per kg of tomato sold to the hotels compared with non-network farmers, who only sell to local markets.

The demand for horticultural produce has been increasing due to urbanization and growth in the tourism and mining industries. Therefore there is a potential for replication of the market link model in other areas in the country by focusing on local markets and tourist hotels/camps. Farmers need to improve their entrepreneurial skills through group formation to enable them to access training and services such as extension and credits. In addition, the availability of reliable water for irrigation and a good road infrastructure are essential for small-scale farmers to sustain their inclusion in the supply chain.

At the time of writing, the demand from tourist hotels and camps is increasing; meeting this requires large vehicles and smooth transportation links. To ensure consistent supply, farmer groups should consider investing in a large vehicle in order to manage transportation. Furthermore, the current production level of horticultural products in the area is still higher than the demand from tourist hotels/camps; thus farmers need to market as groups to the local markets. However, for farmers to manage diversified markets and transportation they should be financially capable, which would require an efficient financing system such as savings and credit co-operatives (SACCOS). Therefore, farmers are encouraged to establish SACCOS to enable them to access soft loans from the banks.

2 Background

Since the 1990s, horticultural produce and commodities have been evincing increasing importance in developing countries, which have increased their overall share of world production (Segrè 1998). In recent years analysts have taken a much closer look at the horticultural sector of developing countries, especially in regard to its potential contribution to income generation and export earnings (OECD 1996; Islam 1990). The evolution of vegetable production has an important economic significance. For instance in Malawi, a wide range of exotic and indigenous vegetables are grown that play a critical role in the nutrition of the people by providing essential minerals and vitamins, as well as generating some income for smallholders. This has prompted the Ministry of Agriculture in Malawi to pursue research more vigorously, and extension personnel are receiving training in vegetable production (Mkamanga 1990). Another interesting example is in the North Indian state of Himachal Pradesh, where returns from vegetable growing are already quite high and could be much higher if the package of recommended practices is adopted. Increases in vegetable acreage on small and marginal farms will not only provide gainful employment for under-utilized family labour but would also reduce income disparity among farms of differing sizes (Bathi 1993).

In the Mara Region of Tanzania, the marginal returns from horticultural production are high compared with other crops. When selling tomatoes to the local markets farmers could obtain a gross revenue of US\$700 per acre per season, while farmers who supplied to hotels could obtain US\$ 1,120 for the same quantities (Babu et al. 2000).

New markets for higher-value agricultural and food products could provide small-scale farmers, who make up a large proportion of the poor in developing countries, with a vital opportunity to enhance and diversify their livelihoods. However, they must first overcome a wide range of constraints to accessing such markets including limited access to production inputs, poor transportation links, and a lack of market information. Furthermore, major changes in global agrifood sectors that require high value products (such as the growth of tourism) are rapidly taking hold in developing countries. These changes are impacting the ability of small-scale farmers to sell even to national markets, and are further crowding them out of global supply chains (Louw et al. 2006).

Against these challenges many NGOs, donors, exporters, and farmer associations are undertaking initiatives to overcome constraints to the market access of small-scale farmers. However, little knowledge about what makes such market access initiatives successful is available for guidance. While there is evidence that high value markets can be of great potential benefit to small-scale farmers, not enough is known about

how market access can be facilitated (Henson 2005), neither is there an adequate understanding of the social, economic and environmental benefits and costs of different mechanisms to facilitate market access in different contexts.

The restructuring of markets and the supply chain through the Mara Smallholder Horticultural Project (MSHP) has assisted some small-scale farmers (SSF) to acquire support from various institutions in the region and hence improve their skills and knowledge in horticultural production and other related issues. They have improved crop management practices, use of farm inputs, and post-harvest handling of produce, and maintained quality standards of produce. The MSHP has linked the farmers to the high value markets of the Serengeti National Park tourist hotels, where they achieve reasonable prices and regular demand for their produce throughout the year. Due to the improved quality of the produce sold by the innovative farmers they have acquired more markets from lodges and camps, Sirari a market situated at the border of Tanzania and Kenya and the Bunda Teachers' Training College. It is on the basis of the above that the current study is being undertaken. This study identifies how small-scale farmers could be better included in these dynamic markets. The study identifies the technical, organizational, managerial, financial and other changes that small-scale producers have to implement in order to be included in the dynamic markets. The financial and non-financial costs and benefits the SSF obtain from their inclusion in dynamic markets and the sustainability of inclusion are also looked into. In essence this investigation seeks to evaluate the potential for up-scaling and replication of the innovation and the lessons that can be derived for public and private policies to promote market inclusion of small-scale producers elsewhere.

3 Literature review

3.1 Factors affecting the link between farmers and dynamic markets

The forces of globalization and economic liberalization have had a dual effect on small-scale farmers and small to medium agribusinesses by exposing them to new prospects and challenges. Changes at the global level are destabilizing markets for agricultural products even in remote rural areas (Louw et al. 2006); increases in consumers' preference for supermarkets over local stores in rural areas in South Africa have been reported (D'Haese et al. 2005).

Conventional thinking has been that the position of smallholders, processors and agribusinesses in their national markets is stable and that the key issue is therefore how to gain access to the more profitable niches, such as exports. Yet a growing body of evidence is showing that the local, national and regional markets are themselves experiencing large transformations driven by a variety of factors. For instance, domestic markets in liberalized economies increasingly have more in common with export markets in terms of grades, standards, business practices, prices and ownership (IIED 2004). The emerging sector therefore has to fight for a market share domestically and in export markets. The supply, in effect, should offer a minimum standard of quality and stability. Buyer surveys have clearly established the importance of quality, reliability of delivery, and price as determining factors.

Increased reliance on major food crops has been accompanied by a shrinking of the food basket which humankind has been relying on for generations (Prescott-Allen and Prescott-Allen 1990); consequently a threat to non-traditional agricultural products such as fruit and vegetables has emerged. The dominant markets and processors have tended to favour suppliers who can ensure high volumes and consistent quality, and have engaged in long-term contracts to that effect. These criteria have tended to favour the more capitalized commercial producers and processors over the emerging sector.

At the farmer level, the key constraints (more or less in a priority order) are:

1. Lack of suitable seeds and chemicals, especially for vegetables.
2. Lack of training and extension services on production and processing.
3. Lack of support services such as credit, irrigation infrastructure, transport infrastructure, and processing and cold storage facilities.

The biggest constraint in the market chain has been the lack of market transparency, information and trust among the market chain actors (Louw et al. 2006).

3.2 Advantages and disadvantages of linking SSF to dynamic markets

According to Louw et al., 2006, the advantages of linking small-scale farmers to dynamic markets include:

1. The delivery of smaller quantities of produce to the supermarket, more often, thus ensures produce freshness. The market receives reliable fresh produce supplies from the SSF while it provides community development opportunities by supporting these suppliers, which leads to improved rapport and patronage.
2. Strong, well-established relationships with buyers based on trust and transparency. When the SSF deliver fresh produce of satisfactory quality over time, the buyers develop sufficient trust to engage with them in long-term business relationships, leading to the improvement of the farmers' livelihoods and wealth creation.

The disadvantages of the system include seasonal discontinuity in supply and incidences of insect damage-related quality problems:

1. Pricing of produce is potentially a contentious issue. Where the price is determined through negotiations that are based on market prices, quality delivered, and the supply and demand prevailing in the supermarket at that time, the problem may arise whereby farmers may not coordinate their supply schedules. This periodically results in many farmers delivering at the same time and causing an oversupply on a specific day. The resulting glut forces the buyer to purchase produce at reduced prices, which may not please the sellers.
2. Another problem may arise when the buyer makes payment for supplies on a weekly or monthly basis irrespective of which day the delivery is made. This poses a problem of oversupply.
3. With SSF there are periodic incidences of quality problems as a result of insect-related damage due to poor technical farming skills, transportation problems, and inadequate on-farm infrastructure hampering production.

For the sustainability of the linkage the following critical success factors were identified:

- Provision of training and extension in production, quality, marketing, business planning, financial, administration and other management concepts.
- Co-ordination amongst farmers to work towards better delivery schedules thus preventing oversupply and ensuring better prices. Resolution of transport problems, for instance through collective marketing.

- Development of coping mechanisms (e.g., irrigation) to deal with periods of adverse climatic conditions. Access to low cost inputs – for instance through input subsidies or collective input procurement.
- Diversification to various markets such as the central district markets and food processors.
- Capital investment requirements such as:
 - i) Market intelligence capital, e.g., investing in information and communication technology (ICT).
 - ii) Market organizational capital (e.g., a small-scale producer organization – which also adds significant value – can undertake packaging, thus adding different value).
 - iii) Specific technologies (capital mixed with market linkages).
 - iv) Financial capital (to improve SSF credit worthiness).
 - v) Strong and continued trust relationship between commercial sector role-players and SSF in order to ensure continued sustainability despite human resources changes within the commercial role-players.

Public sector input may also be sought to address some of these concerns. For instance, technical and management training and advice may be sourced from the extension services directorate of the Department of Agriculture and additional credit may be acquired from savings and credit schemes.

4 Methods

The case study presented in this paper was conducted in May and June 2007 in the Bunda and Tarime districts of the Mara Region in Tanzania. Informal interviews were conducted using checklists to collect data from individuals and representatives of horticultural production groups. Those interviewed include producers, transporters, buyers, input suppliers, and support agency (MSHP) and government extension workers. Three groups (out of 30 groups actively working with MSHP) were interviewed during this study. The Nyatwali and Guta groups, under the Balimi network, are actively selling to high value markets such as Serengeti National Park tourist hotels while the Masanga group (under the Gorong'a network) sells to other local markets. Furthermore, three groups from non-participating farmers were interviewed; two from Bunda District and one from Tarime District. The development agency was more actively working with the Balimi network due to the proximity of its farmer groups to the agency headquarters.

Face-to-face interviews were conducted with the manager and proprietor of the Mbuluzi Mawe Camp and Sopa Lodge in Serengeti National Park respectively; two middlemen, and a transporter supplying fruits and vegetables to the hotels. Three focus group discussions with small-scale traders involved in fruit and vegetable marketing in the local markets were also conducted. Other interviewees included MSHP staff.

The data collected included information related to: the background of the parties involved, cost of production, use of inputs, storage, processing, transportation and marketing. Other information collected related to the vision of the chain, and organizational and cost-benefit analyses. The history of the interaction between farmers and the development agency was investigated in order to identify the motives of both parties and their expectations at inception of the programme, examine the roles and responsibilities of the parties involved; understand what actually materialized, and evaluate the advantages and disadvantages of the association accruing to each of the parties involved. The respondents' perceptions regarding what could be done to improve the programme from the small-scale farmers' point of view were also recorded.

The study used the methodological framework discussed by Berdegué et al. (2006). A sub-sector approach was applied to describe the different segments of the supply chain from the producers to the consumers (Lusby 1997; Holtzman 2002). The information collected allowed for analysis of the whole chain in which the fruit and vegetables are channelled, from the farmer to the end consumer. The data analysis was largely descriptive.

5 Results and discussions

5.1 The innovation

5.1.1 Background

Efforts to improve crop marketing in Tanzania have increased since the early 1990s, when the economy was liberalized. This has given farmers the opportunity to sell crops to any interested buyer. The Government of Tanzania realized that investing in increased production alone has a limited effect on alleviating poverty unless markets are identified. The number one short-term objective in the local government's vision for the Mara Region is to raise income levels of rural people by supporting employment and income-generation activities. This contributes to the overall goal of poverty alleviation as it is stipulated in the Government of Tanzania's *Vision 2025* adopted in 1999 and more specifically in the *Poverty Reduction Strategy Paper* (PRSP) developed in 2000.

Horticultural production is an important economic activity to farmers in the Mara Region. It is estimated that about 65 hectares of land are used for horticulture producing 620 metric tons annually (Babu et al. 2000). Production is carried out using traditional technologies such as manual irrigation, with limited use of pest and diseases control measures. Therefore, horticultural production is practised mainly when water is available and diseases and pest incidences are low; thus supply of horticultural produce during the dry season (this falls in the months of January to March and June to September) is very low. During the dry season, production of horticulture is concentrated near the lakeshores and places where dams and/or boreholes have been constructed (Babu et al. 2000). Farming is small-scale, producing diverse types of fruit and vegetables. Volumes of production are small per family; some farmers work collectively at farming activities but they sell individually to the urban collectors. The markets for horticultural produce in the region are mainly urban areas along the lakeshore and the highways, where the population density is high.

The supply chain used to start from the farm gate or village markets, where urban small traders could collect horticultural produce using bicycles (80%) and buses or cars (20%) to transport their purchases to towns. Small traders purchased about 85% of the supply offered at village markets and the rest was sold to final consumers. In this system urban traders, local traders and middlemen frequently sold this produce to outlets in more than one district, be it directly (to consumer markets) or to traders in other regions. The price used to fluctuate; it might be high when the supply was low but at another time it could be low due to limited access to the market by farmers. A few farmers – especially those neighbouring the Serengeti National Park –

supplied some produce to the hotels and camps there. The roads in the rural areas are bad and thus post-harvest losses were high.

The major problems faced by farmers were unstable markets, erratic prices, and low demand for their horticultural produce. The local government encouraged horticulture production as a way of creating employment and income-generation in rural areas. The tourism industry in Tanzania has been on the rise since the late 1990s, when the economy was fully liberalized. This has created a high demand for horticultural produce. The tourist hotels and camps in the Serengeti National Park in the northwest part of Tanzania used to obtain fruit and vegetables from Arusha and Tanga in Tanzania as well as Kenya and South Africa.

The major problem in the horticulture sector in the Mara Region was the organization of various stakeholders to ensure satisfaction of supply and demand markets. These would provide alternative source of horticultural produce to the Hotels at the Serengeti National Park. During the rainy season roads tend to be bad and air transport is extremely costly. Local sourcing of required items has a good promotional value in the tourist trade and consumers are becoming sensitive about the quality of fruits and vegetables used and the use of chemicals to control pests. . In addition, the Tanzania National Parks Authority (TANAPA) wanted to contribute to the discouragement of hunting by farmers living in the vicinity of the park. Therefore hotels in the Serengeti would have preferred to reduce the costs of food supply by acquiring the food items locally, thereby supporting local communities and promoting environmentally sound production. However, the hotels needed a steady supply of produce of a reasonable quality

Prior to 2002 farmers used to produce fruit and vegetables at subsistence level. The surplus was sold to a number of small-scale traders (at very low prices) in informal markets at farm-gate, village, and urban levels. The traders set the price and there were no standards and grades of fruit and vegetables traded. Mara farmers did not have much experience in organizing a regular supply system and were unfamiliar with contract growing systems as well as the conditions and terms for delivery. Therefore, support from private sector parties was considered important for farmers to deliver the required quality standards and quantities to the hotels/camps consistently.

The stakeholders in the industry these included the government, the development agency (Institute for International Cooperation), community based organizations, non-governmental organization, private sector actors, and farmers' representatives through interaction considered creating a 'win-win' situation for hotels, development authorities and farmers if a supply system for horticultural produce to the lodges and hotels in Serengeti could be organized using the supply from the Mara farmers, thus

gradually replacing part of the supply from Arusha and Kenya. Therefore various stakeholders were involved in the implementation of the innovation.

5.1.2 Linking horticultural producers to tourist hotels

The concerns of different stakeholders in the horticulture sector were put forward during a roundtable discussion in Mara Region in 2000, which was organized by the Institute for International Cooperation (Institut für Internationale Zusammenarbeit - IIZ). The stakeholders who participated included government organizations, non-governmental organizations, community-based organizations, private sector actors, and farmers' representatives. The roundtable discussion resulted in a feasibility study in 2000, which was conducted by the Lake Zone Agricultural Research and Development Institute (LZARDI) Ukiriguru, to analyze the supply system of fruits and vegetables to Serengeti National Park tourist hotels. The study also evaluated the benefits and disadvantages of the linkage of Mara SSF to the hotels and identified types of assistance that were required for farmers to make profitable and sustainable supplies of the horticultural products. The feasibility study was followed by a two-day workshop involving a wide range of stakeholders, which established the Mara Smallscale Horticultural Project (MSHP) to link small-scale farmers with hotels in the marketing of fruit and vegetables.

The implementation of the project started in 2002 and involved a wide range of stakeholders including small-scale horticultural growers, the Anglican Church Mara Diocese, government extension staff, two farmer-training centres, and the donor HORIZONT3000. Each stakeholder has a crucial role to play towards the success of the supply chain. The management of project is the responsibility of the Anglican Church of Tanzania, Mara Diocese, which has well-established farmer training centres – Mogabiri Farm Extension Centre (MFEC) and Buhemba Rural Agricultural Centre (BRAC). The church also works in collaboration with district government agricultural extension offices in project areas, each providing one member of staff.

5.1.3 Roles of stakeholders in the supply chain

The Mara Smallholder Horticultural Project

The Mara Smallholder Horticultural Project (MSHP) started in the year 2002 with the aim of investigating and exploiting the potential of horticultural crops as a source of income to Mara Region farmers surrounding the Serengeti National Park. The project was established in order to mobilize SSF into groups and networks to become the major suppliers of horticultural products to various Serengeti tourist hotels/camps. The tasks of the project are to encourage horticultural growers to form production groups and join marketing networks as well as to ensure the regular supply of horticultural products to the tourist hotels/camps. Other activities include: improving the inputs supply system, establishing savings and credit schemes among small-scale

farmers, improving and utilizing extension services and training in terms of horticultural production and marketing skills, as well as practising gender equity and equal rights among farmer groups.

IIZ and HORIZONT3000

The Institute for International Co-operation (IIZ) is a major Australian NGO with development projects in over 20 countries. In Tanzania, IIZ supports community-based initiatives in sustainable agriculture in three regions (Mara, Coast and Mtwara). An objective of the organization is to improve people's living conditions by ensuring food security through facilitating an increase in agricultural production. It provides skills, basic financial training and management training for villagers. Its initiatives are executed in close cooperation with government and non-government organizations at regional and district levels.

In Mara Region, IIZ organized roundtable discussions in 2002 through its executing agency HORIZONT3000 to identify new opportunities for horticultural growers (from which process MSHP was formed). HORIZONT3000 funds the project through the Anglican Church of Tanzania (ACT) Diocese of Mara. It also provide the project with technical support on matters pertaining to management aspects, developing and implementing marketing strategies, organizing market networks, and developing supply agreements between suppliers and buyers.

District agricultural and livestock development offices (DALDOs)

These constitute one of the departments of the Ministry of Agriculture, Food Security and Co-operatives (MAFSC) and operate under the District Local Government Authority (DLGA). The department is important for the implementation of the project in Mara Region since it has extension workers in most of the wards in the region. The office has one representative who works with the co-ordinator of MSHP. It also coordinates and backstops various extension services to the farmers as well as linking MSHP to local programmes.

Farmer extension centres

Mogabiri Farm Extension Centre (MFEC) and Buhemba Rural Agricultural Centre (BRAC) are the two training centres under the ACT Mara Diocese located in Tarime and Musoma Districts respectively. The two centres are involved in offering training on horticultural agronomic practices, pest management, post-harvest handling techniques, nutrition, cooking vegetables, and environmental conservation. The centres also hosted the trainings on group formation and management, gender issues, marketing and record-keeping; they also work in creating awareness among communities to fight against HIV/AIDS.

Farmer groups

The effort by various stakeholders has resulted in the creation of a link between SSF as growers and Serengeti tourist hotels as potential markets for horticultural produce. Farmer groups, which have formed the networks named Balimi and Gorong'a (operating in Bunda and Tarime districts respectively), Gorong'a network is yet to start supplying to the hotel and is currently supplying the local market. Balimi network has a fruit and vegetable marketing committee responsible for collecting the produce from individual farmers and delivering it to the hotels. The deliveries are done on weekly basis – the committee receives the order from the hotel at the time of delivery of the previous week's order or sometimes by telephone communication. The supplies must meet the standards and grades for the produce and quantities to be delivered while the hotel pays the price as pre-agreed among farmers, MSHP and hotels.

On the day of delivery the committee hires the transport, collects the produce from farmers, grades and packages it and delivers to the hotels ordering from the network. The payment is done on delivery to the hotels and after the trip the money is distributed to the farmers as per volume supplied. This has resulted in a regular and smooth supply since farmers are satisfied with the payment system.

The innovation comprises two sets of organizations – those which are permanently represented the area (DALDO, MFEC and BRAC), and new organizations (HORIZONT3000 and MSHP) established to support farmers financially to access the dynamic supply chain. The permanent organizations have been providing technical services to all farmers in the region; hence they will continue to work with the network farmers once the new organizations phase out. Moreover, farmer groups have gained skills from training and extension services offered by DALDO and farmer extension centres. The system of farmer motivators will also help to link them with other service providers in the area, thus making them sustainable.

5.2 The supply chain and its segments

The supply chain comprises small-scale farmers, input suppliers, middlemen, transporters, local markets and hotels/camps. Stakeholders in the chain also receive support from various organizations.

5.2.1 Input suppliers

These include the suppliers of seeds, agrichemicals and a few implements (such as sprayers that are used to apply agrichemicals). The inputs supply system is characterized by three major chains comprising of Arusha (Kibo Company), Mwanza (Suba-Agro and Mukpar companies) and Musoma (wholesale shops). Kibo started supplying farm inputs in the area in 2006. The company delivers agrichemicals to the

wholesale and retail shops, mainly in urban areas, once a month. The company covers the costs of delivery.

The major distributors of the inputs to farmers are shops located in towns, mainly at the district level. In Bunda town there are several input shops, which all obtain inputs from the same sources. The shops used to just sell inputs related to tomato, white cabbage and onion, but from 2004 new crops such as red cabbage, Chinese cabbage, kale, carrots, watermelon, cucumber, spinach, eggplant, amaranth and sweet pepper have been introduced to horticultural production in the area. There have been changes in the supply of agrichemicals due to new pesticide products coming onto the market (such as Dego, Thionex, Seregon, while fungicides include Farmezad, Dithane, Lincoln, Makobox and 4pan). The SSF buy inputs from retail shops in small quantities they may even demand quantities smaller than those packaged by the manufacturer, which forces the retail shops to re-bag these inputs. The development agency supplies inputs to network farmers on credit as a revolving fund. Balimi network farmers purchase about half of their input requirement from the agency and pay back the money without interest after selling their crop.

5.2.2 Small-scale farmers

There are two networks that comprise of Balimi and Gorong'a networks the network have been able to save money in their account that is used as a revolving fund for the network. The amount of money in their respective bank account is US\$ 156.25, and US\$ 468.75 respectively.

Description of the farmer groups and their networks: the Balimi network

The Balimi farmer groups' network started in the year 2003. The network now comprises nine groups (100 farmers) situated in Tamau, Guta and Nyatwali villages in Bunda District. The aims of the farmers' network were to have a voice in marketing their products and to ease access to agricultural input and other services like training and loans. With the formation of the network it became easier for the groups to meet with other networks. Before their mobilization into the network, individual groups were producing mainly for subsistence purposes and it was not easy to achieve stable markets. Some of these groups were self-established while others were mobilized either through church initiatives or youth/women development organizations. After establishment of the network the objective of the groups changed from subsistence production to market-oriented production. Groups join the networks by submitting application letters to the network executive committee; the applications are discussed at network general meetings. Accepted groups are issued with the network constitution which includes by-laws and rules of the network. Membership to the network is open to all registered horticultural groups. Farmers join the network in order to access high value markets in the tourist hotel sector and all members of the groups participate in network activities.

The membership has increased with time as per benefits obtained. The Balimi network started with only three groups but now the network has nine groups. Farmers produce both indigenous and exotic types of fruit and vegetables as per market demand, and weather and soil conditions. The introduction of new crops such as spices and herbs (coriander, dill, mint, rosemary, basilicum, rocket, parsley and celery) and mushrooms was one of the successes that enabled the farmers to diversify the market.

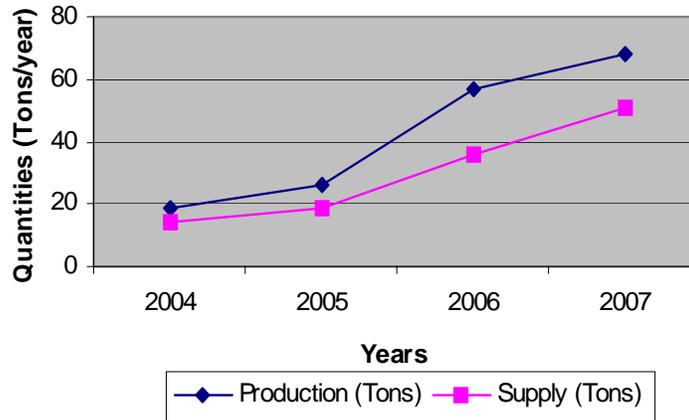


Figure 1: Quantities produced and marketed by the Balimi network from May 2004 to May 2007.

Source: Interview with Balima Network, Authors compilations

The leadership of the network falls to the executive committee comprising eight officials including chairperson, secretary, treasurer and their respective deputies, as well as two other members who form the secretariat. All elected officials are members of the farmer groups. The executive committee is responsible for the management of the network; it makes sure that all network activities are undertaken according to the constitution. The network also has a fruit and vegetable marketing committee, which consists of nine members, one from each farmer group. The vegetable marketing committee has the responsibility for carrying out follow-up on the hotel orders and other aspects of market demand and makes the information available to all the network farmers. It also collects, grades and transports produce to tourist hotels. The network meets once per month to receive reports from all farmer groups, monitor the trends of the markets, and give direction for the coming month's activities. Group leaders are elected on the basis of active participation in group activities and their experiences in local leadership, and must be members of a group within the network

Over the past four years both production and marketing have been increasing. In 2002 vegetables and fruit were delivered to Serengeti National Park hotels once in a week but since 2006 the frequency has increased to three times a week with more crops and more quantities (Figure 1). This successful development has been due to

high quality produce, reasonable prices, and timely and consistent supplies. Moreover, since January 2007 three more camps started receiving fruit and vegetable supplies from the network. Nevertheless, the quantity produced by Balimi network farmers was still greater than the quantity supplied to the tourist hotels/camps (Figure 1).

Description of the farmer groups and their networks: the Gorong'a network

Gorong'a farmer groups' network started in the 2003. The network comprises 46 farmer groups situated in Kitawasi and Masanga villages in Tarime District. The aim of the farmer groups' network was to facilitate access to MSHP services so as to improve the income of its members. Specifically they wanted to market their agricultural products collectively, improve their housing at low cost, and ease access to agricultural extension services and training. The long-term objective of the network is to pay school fees for the members' children. The formation of the network it made it easier for the groups to meet and exchange their experiences. Before their mobilization into the network, individual groups were doing non-agricultural income-generating activities such as making bricks, selling group labour, and utilising savings and credit. After the establishment of the network the objectives of the groups changed to include agricultural production and marketing in their income-generating activities.

The membership has increased with time as per benefits obtained: Gorong'a network started with only 16 groups but to date the network has 46 groups (630 farmers). Farmers mainly produce pineapple, carrots, kale and passion fruit depending on the weather and soil conditions. In 2005 the MSHP gave 17,200 pineapple suckers to 86 families on loan (each family received 200 suckers), but production is still low and farmers have not yet linked to the tourist hotels. Farmers sell their crop at local markets, specifically Tarime District central market, which holds weekly and monthly open markets.

Leadership of the network comprises five officials: the chairperson and secretary with their respective deputies and the treasurer. The network has no formal fruit and vegetable and fruit marketing committee because farmers are still marketing individually. The network meets on a quarterly basis to receive the progress reports of the activities from all the groups. Each group has a constitution and by-laws that governs its operations.

The MSHP provided one month's training to six farmer motivators from the network to help in provision of extension services. The farmer motivators provide extension services three times per month. Farmer motivators identify training needs and present them to MSHP during their quarterly visit. Over the past four years both production and marketing have been increasing. The frequencies, quantities of agricultural produce, and number of markets have increased. The network still needs

to be organized into marketing groups so that they can acquire more stable markets and reliable prices. The problems that delay the organization of the network into marketing groups include low production levels and the long distance between the network and the hotels/camp in the Serengeti National Park as well as poor road infrastructure.

Generally, the majority of the members of the individual farmer groups have completed primary school education but they have limited managerial knowledge. Each group has a constitution that guides them in their operations. All members of the group were involved in designing the constitution, including group by-laws. The MSHP has trained farmers in group leadership and financial management as well as marketing skills; it also assisted the groups to get registered by the district civil society registrar. Network activities are financed through a network fund generated from contributions of the groups. Each group pays an entry fee of US\$ 3.79 and an annual membership fee of US\$ 7.58 to the network. Groups get funds from joint fields and contributions from individual farmers. Other sources of funds include penalties paid by those who violate group by-laws (such as failure to appear in group meetings or activities without notice etc.).

Production and marketing of horticultural crops in Bunda District

Production of horticultural crops in Bunda District started in 1992 on a subsistence basis. Farmers produced these crops individually for consumption and the surplus was sold to village and urban markets. Horticulture growers were affected by low and unreliable market prices. In 2002, the Mara Smallscale Horticultural Project (MSHP) was formed, which mobilized horticultural growers into farmer groups and two networks of these groups. The objective was to increase household income for horticultural growers through collective marketing. The project linked horticultural growers with tourist hotels in Serengeti National Park, and trained farmers on improved horticultural production practices such as proper use of inputs and credits. Before 2002, Balimi network farmers were growing tomato, cabbage and onion as main crops. Minor crops included kale, carrots, okra and amaranth. To date farmers are producing Chinese cabbage, red cabbage, baby marrow, green beans, sweet melon, celery, parsley, basil, radish, fennel, mint, cucumber, leeks, beetroot and broccoli in addition to the previous main crops. The new crops have a high demand, especially in the tourist hotels.

Farmers in the Balimi network produce as individuals, but they market together as a group (whereas in the Gorong'a network farmers are still producing and marketing as individuals in local markets). Some of the production inputs (such as seed and chemicals) are obtained from the project on credit and the remaining quantities are purchased from input shops located in urban centres. (Both input shops and the project charge the same prices.) The majority of the farmers in the groups do not use chemical fertilizers, but they do use farmyard manure. However, farmers near the

lakeshores are required to establish horticultural fields sixty metres away from the lakeshore on the grounds that they should not pollute water with chemicals infiltrating from the fields. Therefore, these farmers have to invest in improved irrigation methods – such as the use of water pumps – as opposed to the manual irrigation currently used by the majority of the farmers. Yields for farmers along the lakeshore differ between network and non-network farmers because network farmers use improved management practices (i.e., rate of fertilizer application, proper spacing to achieve maximum yields etc.).

Balimi network farmers sell between 57% and 70% of the total harvest to tourist hotels/camps in the Serengeti National Park. In 2002, farmers sold about 70% of their total produce to tourist hotels; the remainder was sold to traders from urban centres (20%) and at the Tanzania–Kenya border point (10%). By the beginning of the 2007 season, the proportion of horticultural produce sold to the tourist hotels has increased to 75% of the total production.

Balimi network farmer groups receive their supply orders from the hotels one week in advance in order to give them enough time to harvest and deliver the produce requested. Once the order is received, the vegetable marketing committee determines the amount of produce each farmer will supply. The vegetable marketing committee keeps a record of network farmers who have horticultural produce to market, thereby making it easier to source the quantities stipulated in the orders from those who have the required products. The produce is collected at a centre and packaged according to the specified standards set by hotels. The produce is transported from the collection centres to the hotels on the same day using hired pick-up trucks rented from private transporters. One member from the vegetable marketing committee accompanies the pick-up truck. Transport and marketing costs are paid at the rate of US\$ 0.03 per kg, which is deducted from the sales. The MSHP and hotels determine the prices annually, which average at US\$ 0.39 per kg of tomato. The farm gate prices are between US\$ 0.13 and US\$ 0.15 per kg while in urban and border markets the prices range between US\$ 0.17 and US\$ 0.19.

The standards and grades required by the hotels include clean of standardized appearance, free from poisonous chemicals. Middlemen require tomatoes that are free from disease, and of various sizes depending on the customer preferences. For example, buyers from Kenya prefer small tomatoes while those from the local markets demand large tomatoes with thin skins. When selling to middlemen farmers make their own arrangements, so there is no collective bargaining. Normally, these farmers receive low prices which change from time to time depending on demand and supply conditions prevailing during the season.

Success factors

This intervention has been implemented for more than four years now and the farmers' economic opportunities have increased; input credits, irrigation facilities and the number of groups has also increased. The SSF have formed many groups (at the beginning there were 19 groups, now there are 46 groups with 730 farmers). The benefits to the groups include increased bargaining power, easy access to various support services, and sharing experience among group members. There are now new horticultural products in the area, while consumption of fruit and vegetables by the farmers' families has increased. Some families have opened bank accounts.

- **Good governance:** representatives from the farmer groups in the Balimi network meet once in a month while individual groups meet on a weekly basis. The meetings have the aim of sharing information on challenges and the opportunities available. The members also have time to discuss crosscutting issues like HIV/AIDS awareness, and gender and environmental issues. All the groups under the network are guided by the constitution and the district legally registers them.
- **Culture:** farmers and fishermen dominate Bunda District as it borders Lake Victoria to the south and west. For the most part a commercial fishing system is practised in the area by companies and large-scale fishermen; thus most SSF produce horticultural crops for income-generating and they fish mainly for home consumption. In Tarime District, farmers are agro-pastoralists; their main activities are crop and livestock production.
- **Commitment:** in order to make sure members are active and follow the constitution the Balimi network has set by-laws. For example when a member fails to attend a meeting then a penalty of US\$0.39 is paid, and when he/she is late for a meeting a penalty of US\$ 0.16 is paid. Other penalties do vary according to the infraction committed and if the farmer fails to pay then the constitution is invoked, which may involve the farmer being excluded from the dynamic supply chain
- **Delivery of technical advice:** Balimi network farmers have managed to invite some experts from the district authority to their monthly meetings to discuss issues such as irrigation and financial matters (e.g., formation of SACCOS), which are important for sustainability of the network. Project staff also visits the groups in order to clarify issues for farmers or explain new ideas. The aim of inviting experts is to fully maximize the gains to the group. Several technical personnel are invited to quarterly meetings of the Gorong'a network to advise farmers on various issues such as the environment, co-operatives, livestock production and savings and credit.

- Integration into support services: the Balimi network has two savings and credit cooperatives (Mwangaza SACCOS for women only, and Balimi SACCOS for all network members) while the Gorong'a network has one. The aim of these SACCOS is to encourage the spirit of saving and borrowing, which helps the farmers in improving their production and living standards generally. The hotels pay Balimi farmers' cash on delivery. This helps the farmers to plan how to spend their money. Members of the Balimi network are not restricted to joining the Balimi and Mwangaza SACCOS only; some members have joined other SACCOS in the area. Through their collective action, Balimi farmer groups have gained support from the United Nations Development Programme (UNDP), which has funded a solar irrigation system that will be using lake water. This irrigation system is expected to help seven farmer groups as well as individual farmers. Gorong'a network received support from DKA (the development cooperation agency of Jungschar) and Welthaus Graz of Australia for construction of their SACCOS building.
- Payment schedule after selling: the fruit and vegetable marketing committee for Balimi network collects horticultural crops from farmers early in the morning then cleans, grades and transports produce to its destination, where the hotels pay on delivery. When farmers making the delivery come back from the hotels they distribute the money according to the produce a farmer supplied. Farmers are satisfied with the system of payment and have gained confidence in the business, which has resulted in a smooth supplies delivery system.
- Transparency and accountability: the farmers in both the network keep proper records. In addition, one member from the Balimi network vegetable marketing committee accompanies the truck to the hotels on rotational basis. Furthermore, the prices for different products supplied are known so it is difficult for anyone to falsify records, which has promoted transparency and accountability.
- Support and backstopping by an agency: the skills farmers acquired through training by development agencies have enabled both the network to be able to set the price of their produce, improve management practices, and plan according to a production calendar, which has resulted in regular supplies and a superior standard of horticultural products that can compete in the market.

Challenges facing the networks

- Market information: the project has distributed fruit and vegetable samples and promoted its produce in the nearby markets and hotels. From 2004 to date the project has advertised its activities several times in newspapers (including the Daily News, Mtanzania, the Business Express, the East African and the Sunday Citizen). It is through these advertisements that the project has become known by various organizations. The project has been registered as a member of the NGO Participatory Environment and Land Use Management (PELUM-Tanzania) and farmer groups have joined MVIWATA (the national farmer groups' network),

which has helped them to participate in agricultural shows within the region and outside the region. However, the collection of information regarding prices from different markets has not been done – therefore farmers may not know the prices of their produce in other markets. This reduces their power to negotiate the price of their produce with buyers and the opportunity of accessing new markets. Extra efforts have to be made to reach more tourist hotels in the park since tourism is expanding at a growing rate.

- Road infrastructure: poor road infrastructure limits the transfer of horticultural products from supply sources to their destinations. During the rainy season many of the Mara Region feeder roads can become inaccessible. This limits the quantity of produce that can be transported and increases transportation costs, thus reducing profit to the farmers.
- Irrigation systems: availability of water throughout the year is important for the regular supply of fruits and vegetables. The Balimi network farmers grow horticultural crops around the lake. It is possible to use the lake water for irrigation if windmills are installed. The situation in the Gorong'a network is quite different because farmers there depend on rain-fed agriculture. Irrigation water is sourced through boreholes and rain harvesting, which needs the intervention of the agency.
- Inadequate capacity of the current markets: farmers produce more fruit and vegetables than the current market can absorb. Since tourism is expanding, more efforts are needed so that farmers can supply to new emerging markets. Proper market information is necessary to improve the market system.

5.2.3 Transporters

Balimi network farmers hire a pick-up truck to transport their produce from the collection centre to the hotels/camps. The number of trips per week has increased from one per week in 2003 to four per week during 2006-2007. The increase was due to the greater quantities demanded by the hotels/camps. On average, the pick-up truck carries one ton of horticultural produce per trip. The transporter charges US\$ 126.38 per trip. The cost to the transporter includes fuel, lubricant, accommodation and gate fees; this all amounts to US\$ 84.57, making the transporter a gross profit of US\$ 41.81. (These costs are for one ton of all horticultural crops). The transport charges have increased recently from US\$96.85 in 2004 to the current rate due to higher prices of fuel and auto parts.

5.2.4 Middlemen

There are two groups of middlemen who create the market chain for the local markets; the wholesalers and the retailers. The wholesalers buy the produce from farmer groups and sell to local formal and informal markets. They obtain the produce from the farm gate at the price of US\$ 0.15 per kg and sell to retailers at US\$ 0.19 thus

making a margin of US\$ 0.04 per kg. Middlemen also sell part of the horticultural produce to the tourist hotels/camps at a price of US\$ 0.39 per kg. The prices received by farmers from middlemen fluctuate depending on the season. During the rainy season prices per kg increase to US\$ 0.34 per kg but declines to as low as US\$ 0.10 per kg during the dry season.

5.2.5 Hotels

Groups of small-scale horticultural growers under the Balimi network are linked to hotels/camps in the Serengeti National Park by the development agency. First, the farmer network and the agency agree on the prices, and then the agency negotiates this price with the hotels/lodges to come up with the final prices and quality standards of the produce to be supplied. The price is set annually, but the quantities are determined on a weekly basis. Once produce is delivered the hotel, management inspects the quality visually; produce with a low quality standard is rejected. Acceptable produce is weighed and farmers are paid in cash on the same day. The hotels/camps require produce which is fresh, clean and free from insect pests.

The hotels give orders and quality specifications on weekly basis. Normally hotels store the produce using cold rooms, which can keep horticultural crops fresh for one week. Sopa Lodge has been buying horticultural products from the Balimi farmer network since 2003. At the time of this study, the hotel was buying about 90% of its horticultural requirements from the network; the remaining quantities are obtained from a women's group producing horticultural products near the Serengeti National Park. Since early 2007, the Balimi network has extended its services to three more camping sites within the national park, supplying up to 40 percent of camps' requirements.

Sopa Lodge pays cash on delivery, but the new camps pay one month after delivery, therefore farmers use their own fund to continue the supply. Hotels/camps require suppliers to be consistent in terms of quantities and quality. Usually there are no contracts signed between the buyer and the network, the business depends on an informal written agreement; however, when a supplier doesn't meet the above conditions in terms of quantities and quality the arrangement is terminated. In the event that ordered quantities or produce are not available, the supplier informs the hotel/camp in advance so that the buyers can arrange to receive the supply from other sources.

5.2.6 Urban markets

Individual farmers usually sell their product to the wholesalers who supply to the informal urban markets, which operate along roadsides in open places and central town markets. They mostly operate in locations that are easily accessible to consumers. Wholesalers buy small quantities at an average price of US\$ 0.19 per kg,

which need to be sold within two to three days because wholesalers do not have proper storage facilities; hence spoilage of produce is higher compared to the hotels. Traders in these markets sell horticultural produce in small units to consumers at an average price of US\$ 0.21 per kg.

Within the supply chain, the different actors are coordinated to ensure that the suppliers meet the quality and quantity demanded by the buyers. The hotels/camps set product standards and grades, which are communicated to the suppliers. Network farmers, through the fruit and vegetable marketing committee, make sure that each member adheres to the requirements of the buyers. To maintain the required standards farmers use trays and crates to transport the produce to the hotels. The farmers and the hotel management monitor jointly the performance of the suppliers in meeting the product conditions. The vegetable marketing committee does the monitoring of the quality standards of horticultural produce among farmers, including use of poisonous chemicals in the fields. The transporter also makes sure that the horticultural produce is well packed and can be delivered to the hotels in the required form. The development agency provides the support to the network to meet product standards by training farmers on how to maintain quality during production and marketing of horticultural produce.

- Vision of the chain: since 2007 the demand from tourist hotels has increased. Similarly, the demand at the border point and the urban market (Bunda central market) has been increasing due to demand from surrounding towns and villages. The number of tourists at hotels and camps demanding supplies from the groups has also gone up. The best opportunity for market growth would be in new horticultural crops such as mint, cucumber, watermelon, pineapple, coriander, sweet melon, basil, radish, beetroot, cauliflower, leek and pumpkin. This would require farmers to acquire more knowledge on the production and marketing of these crops, including improved irrigation techniques (such as use of water pumps). With the current financial capabilities of the groups, it would be difficult to sustain the markets without fast-tracking establishment of functioning SACCOS.

5.3 The Macro and Meso contexts

Increased agricultural income is central to reducing poverty in Tanzania, and is a key component in the National Strategy for Growth and Poverty Reduction (MKUKUTA in Swahili acronyms). Agriculture is the largest sector of the economy, contributing about 45 percent of GDP, and employs 80 percent of the labour force. Agriculture accounts for most of the economic activities in rural areas. The sale of agricultural commodities accounts for 70 percent of rural incomes. Smallholder farming dominates agricultural production, and a large proportion is for subsistence. In 2004,

the agricultural sector grew by 6 percent, up from 5.5 percent recorded in 2003. A recent Agricultural Sector Review (ASR) identified horticulture as one of the 'sources of growth'. Tanzania's floriculture and horticulture sectors have high growth potential according to the Diagnostic Trade Integration Study (DTIS) and Tanzania's National AGOA (African Growth Opportunity Act) Strategy. Cut flowers exports totalled US\$12 million in 2005 (US\$34 million for total horticulture), destined primarily for Europe. Tanzania's horticultural exports grew by 41 percent in terms of value (37% by volume) between 2001 and 2005. The Government of Tanzania promotes production and marketing of horticultural products jointly with a development agency (IIZ).

- Government: the Government of Tanzania prioritizes horticulture as a potential sub-sector for export diversification to mitigate the risk of dependency on traditional exports, whose price recently has been declining and fluctuating widely. The Ministry of Agriculture, Food Security and Cooperatives, and the Ministry of Trade, Industry and Marketing are promoting production and marketing of horticultural crops. Government extension staff play an advisory role to horticultural growers. The Ministry of Trade, Industry and Marketing supports horticultural growers to access domestic and foreign markets by disseminating market information to the producers.
- IIZ : The development agency: is involved in mobilization of farmers into groups, and networks, where they receive training on improved production practices, post-harvest management of horticultural crops including storage, marketing skills, market organization and networking. The agency also supports the farmer groups in terms of input credits and loans for irrigation equipment, extension services, and the establishment and operation of a market information system by linking the groups with tourist hotels and camps. Other activities include promotion and advertising through the production of leaflets, T-shirts and posters, and via the local TV station and radio. The agency will withdraw its support from the farmer networks once they develop stable leadership, acquire adequate skills, and are able to penetrate the markets independently.

Several factors have influenced the demand for horticultural produce in the country. Since 2005 the mining industry has been growing at an average of 15.7 percent per annum. In Tarime and Musoma districts there are new mines that increase the population and hence the consumption of diverse types of horticultural produce. Another factor is the growth of the tourism industry following economic liberalization in the early 1990s. The number of tourists inflow increased to 624,020 in 2005 compared to 116, 993 in 1997. Urbanization is another major factor influencing demand for horticultural crops. It is estimated that between 1995 and 2010, 86 percent

of the total population growth is projected to occur in urban areas, causing the urban population to nearly double its size. Changes in eating habits of people living in urban areas and health education have contributed to the high demand for fruit and vegetables.

5.4 History of innovation in the evolution of the supply chain

The evolution of the supply chain involved several steps comprising of planning, formation of farmer group networks, training, linking farmer group networks to Serengeti tourist hotels/camps in the Mara Region, and input and credit support, as well as irrigation technology.

Planning

The stakeholder workshop organized by the donor HORIZONT3000 in Mara Region resulted in the establishment of the Mara Smallholder Horticultural Project (MSHP). The project is supported by a board of directors, which includes several organizations. Members of the board includes: project co-ordinator, Mogabiri Farm Extension Centre (MFEC), Buhemba Rural Agricultural Centre (BRAC), DALDO, District Executive Director (DED) from project districts, and representatives from farmer groups and hotels. The board meets twice a year when the members visit one of the three-district field activities as a monitoring activity. The MSHP is responsible for capacity building to small-scale growers (price negotiation, extension, input supply and market information). It also links farmers with other organizations supporting the project in order that they can access other services such as training, research, and savings and credit schemes.

Formation of farmers' groups

Two farmer networks were formed in 2003 and comprise 55 farmer groups. Initially, the network farmers were supposed to sell their horticultural produce to medium-scale farmers who would supply the produce to the hotels. The medium-scale grower was supposed to pay the network farmers a price that differed from the hotel prices by a sum equal to the cost of transportation. In the course of implementation it was noted that the medium-scale grower exploited the network farmers in Balimi. Thus the supply chain changed and the farmer group in Balima networks were linked directly to hotels by MSHP Gorong'a network is yet to be linked to the hotels. Through these networks the SSF plan what to grow, develop markets, and receive training. All groups are currently registered at the district level. For flexibility and smooth supply of fruit and vegetables, a simple written agreement between parties is used since the groups are currently registered. Through the collective action of SSF, the middlemen have been removed from the supply chain. This has resulted in an increase in producer prices but hotels still get their supplies at lower prices than when they were sourcing their supplies from Arusha, Tanga and also South Africa

because of reduced transportation costs. There is also improved farmers' bargaining power for their traded products, increased accessibility to extension services, and the benefit of sharing experiences among group members.

Extension and training

The extension services to the project farmers are provided by the project staff and DALDO extension workers located in most wards in the district who advise farmers on various aspects of the management of fruit and vegetables. Based on the demand-driven approach, farmers identify training needs and then the MSHP organizes training with the appropriate organization. MFEC and BRAC have been the major trainers of farmer groups on agronomic practices, control of pests and diseases, gender issues, environmental management, post-harvest techniques, and cooking of vegetables and nutrition. The district co-operative officers conducted training on record-keeping, marketing, and financial management. Group farmers have therefore received benefits from this training that are not available to non-group farmers. Farmers have access to regular extension services, improved fruit and vegetable quantity and quality standards, and better handling practices and have thus acquired new markets such as the Bunda Teachers' Training College and the Sirari (Tanzania-Kenya border point) as well as more hotels in the Serengeti National Park. This has induced non-participating farmers to copy aspects of horticultural production from participating farmers. These developments in the supply chain are a result of a restructuring of the system. The project has established a farmer-to-farmer extension system by putting in place farmer motivators in order to reach more farmers. The farmer motivators received special training and work hand in hand with the government and project extension workers. This way the project gradually reduces the number of activities it provides by direct extension services to farmer groups.

Input supply and loans

MFEC, through the project, supplies finances for input/implements to SSF on a loan basis since farmers have inadequate capital to buy farm input during the production stage. The loans are repaid after sales are made. This system has increased the use of agricultural inputs by SSF. Due to the importance of agricultural loans some groups have formed SACCOS, which help them to save and get loans. This has allowed the project to gradually withdraw from the provision and monitoring of loans as established SACCOS become financially strong. The inputs given to SSF were of very good quality and of affordable price. This has resulted in improved crop quality, creating produce that can compete in the market. Information about the provision of loans for inputs was covered during farmers' training in order that SSF can understand the importance of the loan scheme.

Irrigation

Water is the most important resource for the regular supply of fruit and vegetables. The number of treadle pumps has increased from 9 to 26 and the number of shallow

wells has increased too in Tarime district. However, farmers from different locations have different needs in respect to irrigation systems. For instance, farmers in Bunda District who are close to the lake can use windmills to pump water to the upper slope collection tanks, and then irrigate through gravity. In drier areas like Tarime District, the construction of water reservoir tanks or dams would assist farmers to produce horticultural produce throughout the year. The SSF that surround the lake are able to grow their horticultural produce throughout the year while farmers who depend on rain have their production limited by the rainy seasons. The ability to grow horticultural produce throughout the year could help the SSF to enter in many markets.

5.5 Explaining inclusion or exclusion

The case study shows that the Balimi network has been included in a dynamic market for horticulture crops. The horticultural produce marketed by Balimi farmers has attributes that allow it to meet the required standards, which include producing crops without using poisonous insecticides, and selling fresh produce packaged in trays and crates. Quality standards and grades are set by the hotels/camps and network farmers have to follow these. However, the packaging materials used are negotiated according to their costs and availability. The conditions for commercial transactions involve decisions on transport costs and payment schedules by the hotels/camps. This farmer network negotiates with the transporters on costs and when they are to be paid. Normally, farmers pay transport costs after receiving their payments from the hotels/camps. Hotels/camps have agreed to pay farmers in cash on the day of delivery. Nevertheless, some of the new camps prefer to pay farmers one month after the horticultural produce has been delivered.

To deliver horticultural produce consistently to the hotels/camps, Balimi network farmers have acquired water pumps for irrigation using water from the lake. In addition, the network has established SACCOS in order to access loan from banks which would enable them to meet the transaction costs required to remain included in the dynamic supply chain. The groups have formed a vegetable marketing committee to ensure that quality of produce supplied to the hotels/camps meets the set standards and grades. The network has managed to remain included in the dynamic supply chain because of the technical and financial support received from the development agency. However, gradually the members of the network are gaining the required skills such as production and marketing.

The main factors required for small-scale farmers to remain included in the market chain are: group formation, a constitution, adherence to specified quality standards, production and marketing skills, and access to water and transport services.

1. Group formation. For farmers to be included in a dynamic market for horticulture products they should be mobilized into groups/networks. These are able to pool together their produce to fulfill orders received from the hotels, when a single farmer may not have enough quantities all year round to do so. This helps farmers and hotels to engage in business in a long-term relationship. Groups/networks increase farmers' collective bargaining power; they can thus sell their produce at higher prices than if they were to all sell individually. Farmers do not negotiate with the hotels/camp – the development agency that negotiates with the buyers uses farmers' proposed prices to come up with the market prices.
2. Adherence to specified quality standards. The dynamic markets use agreed standards and grades, which suppliers should adhere to. Balimi network farmers have a vegetable marketing committee that ensures that all farmers follow the specified standards before produce is transported to the hotels/camps. Farmers who fail to adhere to the specified standards are excluded from the market.
3. Adherence to the group/network constitution. The Balimi network has a constitution with established by-laws, which each member is obliged to obey. The network constitution was drafted by a team of elected representatives from member groups. The draft constitution was endorsed by group members at one of their regular general meetings. Those who violate the by-laws are either punished according to the constitution or their membership is terminated. For example, network members who come late to a meeting or fail to attend a meeting are fined US\$ 0.45 and US\$ 1.00 respectively and members who do not then pay the fine are excluded from the group/network. A farmer wishing to join the network must be a regular producer of vegetables and/or fruits, and becomes a member by paying membership fees to his/her group. In addition, he/she should be ready to co-operate with other members.
4. Production and marketing skills. In order to produce according to specified standards and grades, network farmers need to acquire production and marketing skills. Farmers in the Balimi network have been trained in improved production practices as well as marketing skills (such as receiving and fulfilling orders, grading, and scheduling payments). In addition, network farmers set their production calendar, which is followed by member groups to ensure continuous supply to the hotels/camps.
5. Access to water and transport services. Tourist hotels/camps require farmers to supply horticultural produce all year round. Groups that cannot supply the required quantities and qualities consistently will be excluded from the market. Availability of water for irrigation, particularly during dry the season, is critical for continuous production of horticultural crops. Furthermore, a

reliable transport service – including road infrastructure – is important to enable farmers to remain in the market.

5.6 Cost-benefit analysis

The MSHP spends about US\$ 87, 765.00 to support the farmer networks annually. The cost includes salaries for project staff, transport, administration, training for farmers, and production of promotional materials. The project cost at the beginning of the innovation was high because it needed to assist farmers to develop the required skills. As the networks acquire the necessary skills the project will be phased out; farmers will therefore become responsible for their production and marketing costs, which can be managed by the groups. Currently, the project is spending less time and money on the Balimi network, compared with the time and money spent with the Gorong'a network, which is still developing into a marketing network. At the farm level, production costs have increased slightly due to increased use of inputs (particularly non-poisonous insecticides, which are more costly than poisonous ones). However, the yield per unit has also increased compared with that achieved by non-innovation farmers. In addition, the value of the produce itself has gone up due to farmers' adherence to the standards required by the hotels, thus achieving higher profits for these farmers than for their counterparts (Tables 1 and 2).

Nevertheless, because of the need for quality control the cost of inclusion has also increased at the level of the group since members of the group have to contribute towards the cost of this. In addition, the need for a workforce skilled in the areas of marketing and price negotiation has increased. Currently, MSHP staff is carrying out these functions, which require special expertise. The hotels and camps demand horticultural produce for the whole year, but demand is low during the months of December to May followed by high demand from June to November (the latter is the peak period for tourism). However, the low demand period coincides with high demand in local markets where these crops fetch the highest prices, while from June to October prices in local markets are lower than hotel prices. Therefore, network farmers get a higher income from horticultural produce because they sell at higher prices in both markets.

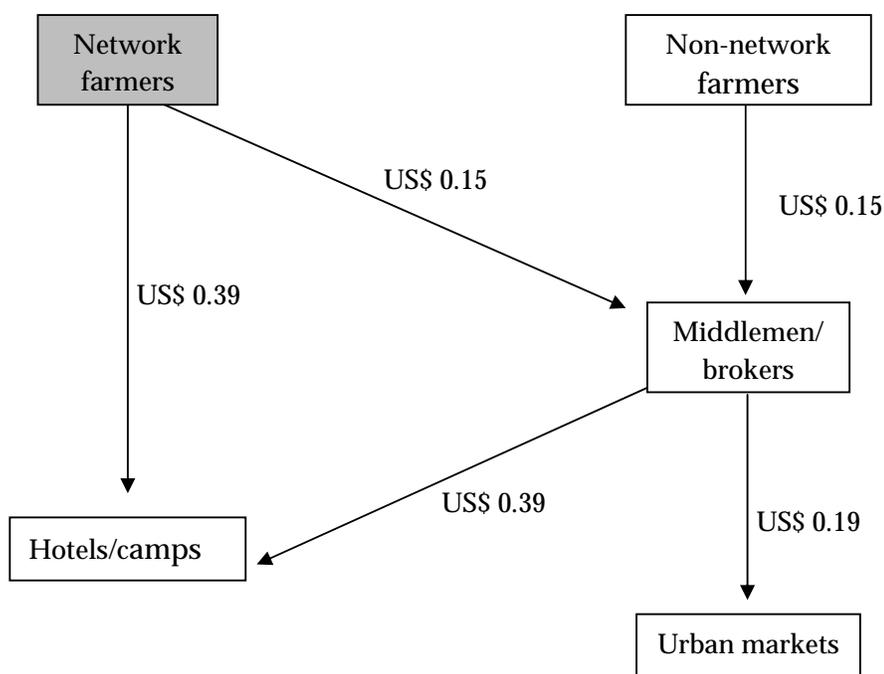


Figure 2: Supply channels and prices per kg of tomato.

Table 1: Costs and revenue (US\$) per acre of tomato by Balimi network farmers.

Details	Balimi		Gorong'a
	Nyatwali	Guta	Masanga
Yield (kg/acre)	4,000	4,200	4000
Price (US\$/kg)	0.39	0.39	0.15
Gross revenue	1,560	1,638	600
Costs			
Land ploughing	20.34	15.63	17.19
Harrowing	19.53	14.06	17.50
Planting	7.81	11.72	9.38
Manure	0.00	9.77	10.94
Seed	7.81	5.47	6.25
Spraying	243.75	135.65	70.31
Watering	113.75	106.25	128.75
Weeding	23.44	15.63	18.06
Harvesting and transportation	70.31	65.45	58.13
Marketing	103.52	150.39	154.38
Total costs	610.26	530.02	490.89
Net revenue	949.74	1,107.98	109.11
Net revenue per kg	0.24	0.26	0.03
Net annual revenue	2,849.22	3,323.94	218.22

Note: farmers in Balima network produce three times per year while the farmers Gorong'a network produced twice per year.

Network farmers get higher yields per acre than non-network farmers because of improved production management, which is also associated with higher production costs (Tables 1 and 2). However, network farmers sell to higher value markets, which give them higher profits – between US\$ 0.23 and US\$ 0.26 per kg (Table 1), compared with margins of US\$ 0.03 obtained by non-network farmers (Table 2). Note that Gorong’a Network farmers have not been linked up with the hotel and are selling their produce to open market. Network farmers spend more money on spraying, watering and marketing than non-network farmers, because the former are obliged to maintain the quality standards set by the buyers. Network farmers are not allowed to use poisonous insecticides; they are therefore obliged to use non-poisonous insecticides, which are more costly than poisonous insecticides. In terms of marketing, network farmers use special packaging materials which maintain the quality of the product while transporting to the hotels.

Table 2: Costs and revenue (US\$) per acre of tomato by non-network farmers.

Details	Buzimbwe	Mogabiri
Yield (kg/acre)	3,348	3,100
Price (US\$/kg)	0.15	0.15
Gross revenue	502.20	465.00
Costs		
Land ploughing	24.34	23.44
Harrowing	20.78	19.55
Planting	6.25	11.72
Manure	5.47	7.03
Seed	10.94	7.81
Staking	8.59	0.00
Spraying	72.66	105.47
Watering	125.78	98.13
Weeding	23.44	23.24
Harvesting and transportation	25.00	36.33
Marketing	80.31	58.59
Total costs	399.56	391.31
Net revenue	102.64	73.69
Net revenue per kg	0.03	0.03
Annual net revenue	307.92	221.07

Note: Buzimbwe farmers produce 3 times per year, while Mogabiri farmers produce two times per year.

Although innovation farmers are achieving higher margins from the marketing chain, they are likely to remain competitive because they receive training and extension services that help them to maintain the quality standards of the produce, as required by the hotels; they thus out-compete non-innovation farmers. In addition, one of the major objectives of the tourist hotels is to discourage illegal hunting in the park; they are therefore keen to help farmers in the vicinity of the park improve their income levels through horticultural production. Furthermore, the marketing chain of the produce from innovation farmers is short, involving only two parties (i.e.,

growers themselves and the hotels) while for the middlemen the chain may involve four parties i.e. growers, rural buyers, urban buyers and hotels. The chain involving the middlemen the farmer gets lower price as each player has a mark-up along the chain while in the innovation price paid by the hotel directly accrue to the farmers. latter obtain the produce at a higher price and so are likely to demand higher prices from the hotel than innovation farmers for the same produce.

5.7 The potential for up-scaling and replication

The Mara Region has soils and a climate suitable for production of various horticultural crops. However, areas near the lakeshore have reliable water supply throughout the year; thus these areas are suitable for the year round supply of the fruit and vegetables demanded in local markets and tourist hotels/camps in the Serengeti National Park. The demand for horticultural produce in local markets and tourist hotels/camps has been increasing due to urbanization and growth in the tourism and mining industry. Therefore, the potential for replicating the market link innovation, particularly in the Lake Victoria Basin, is high.

Since 2005 the Food and Agriculture Organization (FAO) has been supporting the Government of Tanzania to promote small-scale irrigation for horticultural growers in four regions (Mara, Mwanza, Shinyanga and Kagera) of the Lake Zone. This project (Small-scale Horticultural Growers) targets a total of 384 farmer groups (about 4,000 farmers) which would bring about 500 acres under small-scale irrigation in twenty-eight districts. The project concentrates on improved production techniques (irrigation technology and management practices) that would encourage more production of horticultural crops. Nevertheless, the project doesn't link horticultural producers with high value markets. Hence the potential for up-scaling the market link innovation discussed in this paper.

Cost-benefit analyses (Tables 1 and 2) show that network farmers make higher profits than non-network farmers by selling to tourist hotels/camps. Also, network farmers have improved their production calendar to coincide with the different high demand periods in local markets and tourist hotels/camps, thus earning higher income from horticultural production. Therefore mobilizing farmers into groups and linking them with reliable markets can improve their income through increased bargaining power, planning, and access to services such as extension and credits. Although horticultural production can be practised in many areas in Tanzania, availability of water throughout the year is a limiting factor. Furthermore, many areas are not accessible due to poor road infrastructure – it is therefore difficult for farmers in these areas to sell in urban markets and tourist hotels/camps. Therefore improving the water supply system through boreholes and upgrading the condition of the roads would encourage increased production and marketing of horticultural crops in areas in the country where there is potential for this.

It was also noted that at start-up the innovation is costly, particularly as it involves external support. Therefore efforts to integrate the innovation into the existing local structures would reduce other costs such as salaries for project staff, administrative costs etc. The current districts' structures already have all the required staff except market development experts, who can be contracted from other local institutions.

6 Policy implications

6.1 Requirements for inclusion

The case study has indicated that tourist hotels/camps demand horticultural products all year round, with peak demand occurring between June and November. Furthermore, the supplies need to meet the required quality standards and quantities specified in the orders. Therefore small-scale farmers have to adhere to the terms of agreements (including consistent supply) if they are to remain included in these dynamic markets. It was further noted that demand for new products has been increasing; thus farmers need to learn and adopt with alacrity the technologies used to produce the emerging products.

Consistent supply all year round implies continuous production and smooth transportation. In this case study, it emerged that the Balimi network farmers were able to produce horticultural crops continuously because of a supply of water from Lake Victoria. On the other hand Gorong'a farmers relied on rain-fed production; thus they were unable to produce crops during the dry season. For farmers to remain included in dynamic markets a reliable water supply is crucial, which calls for improved irrigation systems such as water pumps, boreholes etc. Furthermore, unreliable transport due to poor road infrastructure has been a major reason that the Gorong'a farmer group network has not been able to supply produce to hotels/camps in the Serengeti National Park. The Balimi network farmers find transportation costly because of poor road conditions. Thus a consistent supply to the hotels remains doubtful if farmers cannot manage production and have a reliable transportation system for their produce.

6.1.1 Institutional support

The MSHP has supported the farmers with network formation, training, and linkages with transporters and markets (as well as to other organizations). By doing so, farmers' production and marketing skills have improved. To link farmers effectively with dynamic markets, formation of farmer groups using participatory approaches is necessary. In addition, the groups should be trained in group management, entrepreneurship, and establishing and maintaining linkages, as well as in leadership skills. Training can include information on how to use contract farming/production to strengthen linkages between producers, market practitioners, and end users (as well as on establishment of quality standards and the inspection procedures required for meeting the market demand). The Balimi network has been operating as a registered group supplying fruit and vegetables to the Serengeti Sopa Lodge since 2004 and payments are effected on the day of delivery. Beginning in 2007, the network had started supplying to new campsites, which pay farmers a one month

after delivery. To continue supplying fruit and vegetables to these camps the network has established two savings and credit co-operative societies (SACCOS) to enable the network to acquire soft loans from the banks. A SACCOS requires each member to deposit money into the joint account, which he/she can borrow at a low interest rate. In addition, the network can use this money as collateral to obtain a loan from the bank which can be provided to member at reduced interest rates. The Government of Tanzania is promoting formation of SACCOS among the rural poor so as to enable them to access soft loans from the bank.

The demand from tourist hotels/camps is increasing, which is likely to create transport problems for the network. Currently, the Balimi network hires a pick-up truck from private transporters with a capacity of one ton. Sometimes the network hires a similar vehicle from the development agency. With increased demand from the buyers, a large vehicle will be required to sustain inclusion of farmers in the market. The network should consider purchasing a truck, which will also reduce transportation costs.

6.1.2 General policy

Smallholder farmers are traditionally production oriented, and are slow in adapting to changes in the market. Furthermore, they have inadequate levels of entrepreneurial skills, thus the majority of them have not been able to cope with the dynamics of the market environment. Developing entrepreneurial and marketing skills would lead to an improvement in agricultural marketing. Since 2004, several new products have been demanded by the hotels, which were not originally grown by network farmers. The development agency, in collaboration with a research institution (Lake Zone Agricultural Research and Development Institute (LZARDI) Ukiriguru), has trained farmers at farm level using trials to grow some of the new horticultural crops in order to adopt cultivation and produce enough for the markets. Although on-farm trials have been popular in the area, limited work has been extended to horticultural crops. With an increasing demand for consumption of new horticultural crops from tourist hotels, efforts are needed to promote on-farm trials of these crops to ascertain their performance under the prevailing production environment. Further research is required on post-harvest handling of the new crops to meet specified standards and grades.

Although the Balimi network farmers have secured reliable high value markets in the Serengeti National Park hotels, the volume sold to this market is still small compared to production levels. There is a need to encourage group marketing of network farmers to other markets such as those at the Tanzania-Kenya border, mining centres, and supermarkets as well as urban markets where middlemen/brokers operate. Linking farmer groups with these markets would improve their income through

collective bargaining. Currently, they sell to these markets individually, thus receiving only low prices.

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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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