



Greener Journal of Social Sciences

ISSN: 2276-7800

ICV 2012: 5.99

Assessment of Market Potential for Horticultural Produce for Smallholder Farmers around Mutare City, Eastern Zimbabwe

By

Clayton Mashapa

Elton Mudyazvivi

Patience Mhuriro-Mashapa

Tawona Matenda

Wonder Mufunda

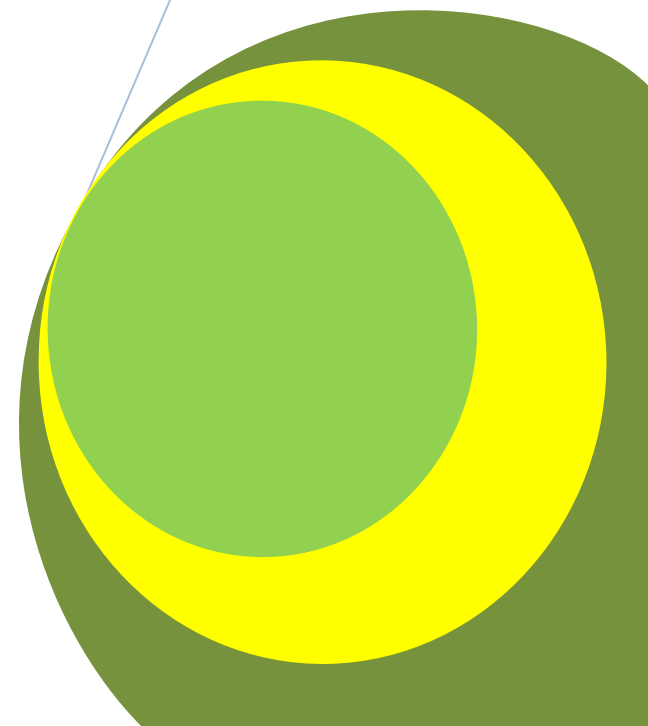
Lighton Dube

Patience Zisadza-Gandiwa

Bertha Mashayamombe

Edson Gandiwa

Never Muboko



Research Article

Assessment of Market Potential for Horticultural Produce for Smallholder Farmers around Mutare City, Eastern Zimbabwe

Clayton Mashapa^{1*}, Elton Mudyazvivi², Patience Mhuriro-Mashapa³,
Tawona Matenda¹, Wonder Mufunda⁴, Lighton Dube⁵,
Patience Zisadza-Gandiwa⁶, Bertha Mashayamombe⁷,
Edson Gandiwa⁸ and Never Muboko⁸

¹Caritas International, Zimbabwe, Catholic Diocese of Mutare, Private Bag 877, Mutare, Zimbabwe.

²Netherlands Development Organisation, SNV Zimbabwe Office, 6 Caithness Road, Eastlea, Harare, Zimbabwe.

³Department of Agricultural Economics, University of Zimbabwe, P. O. Box MP 167, Mt Pleasant, Harare, Zimbabwe.

⁴Caritas International, Zimbabwe, National Office, Africa Synod House, corner Fourth Street and Selous Avenue, Harare, Zimbabwe.

⁵Faculty of Commerce and Law, Zimbabwe Open University, National Office, P. O Box MP 111, Mt Pleasant, Harare, Zimbabwe.

⁶Transfrontier Conservation Areas Office, Parks and Wildlife Management Authority, P.O. Box CY 140, Causeway, Harare, Zimbabwe.

⁷Department of Agriculture and Extension Services, Ministry of Agriculture, Mechanisation and Irrigation Development, P O. Box 842, Mutare, Zimbabwe.

⁸Department of Wildlife and Safari Management, Chinhoyi University of Technology, Private Bag 7724, Chinhoyi, Zimbabwe.

*Corresponding Author's Email: clayjemashapa@yahoo.co.uk, Mobile: +263 772 59 17 17

ABSTRACT

We carried out a market assessment to understand horticulture market dynamics around Mutare City, eastern Zimbabwe. We used the value chain development approach of starting from understanding what the market wants then using information gathered to inform producers of horticultural produce. This approach is underpinned by market-led production concept. Our study results highlighted opportunities for the participation of smallholder farmers in the horticulture sub-sector value chain; it provides horticulture market intelligence to smallholder farmers as to which crops to grow, when and for which market niche. There are opportunities for smallholder farmers to fill the identified horticultural produce demand gap around Mutare City, eastern Zimbabwe. Smallholder farmers could capitalize on the opportunity of horticulture produce scarcity that exists across Mutare City, so as to engage in market-led horticulture production. Our study contributes to a knowledge base of horticulture value chain development around Mutare City, eastern Zimbabwe and related areas aimed at economic development and peri-urban and urban household poverty reduction, which involves addressing the major constraints and opportunities faced between farmers and traders at marketing systems along the given horticultural value chain.

Keywords: smallholder farmer, horticulture, market-led production, peri-urban, urban, Mutare City.

INTRODUCTION

Sphere of influence exists for the smallholder horticulture sector to supply domestic urban markets in Zimbabwe (Mbiba, 1995; Horn, 1997). For example, since 2009, Caritas International Zimbabwe, Mutare, a humanitarian and development arm of the Zimbabwe Catholic Bishops Conference in partnership with state actors lead by the Ministry of Agriculture, Mechanisation and Irrigation Development has been implementing a donor funded food security and livelihoods restoration programme targeting about 4500 vulnerable smallholder farmers in peri-urban and urban areas of Mutare City, eastern Zimbabwe (Zimbabwe Department of Agriculture and Extension Services, Mutare

District Annual report, 2013). The programme aims to provide for food security of smallholder farmers through sustainable household income from sales of horticultural produce.

In order to meet the objective of such a programme, it is essential that the horticultural produce find a viable market (Makaya, 1994). The market for horticulture produce is very dynamic, and without knowledge, most smallholder farmers end up with a loss. Regrettably, in Zimbabwe, losses of horticulture produce due to spoilage (15%) and market glut (60%) are significant (Hicks et al., 1997; Zimbabwe Horticulture Promotion Council, 2013) and as a result, smallholder horticulture producers typically have limited access to higher value markets in urban areas (Turner and Chivinge, 1999; Poulton et al., 1999). In the traditional selling systems smallholder farmers have a tendency to produce without prior assessment of market demands and then force a product into the market (Sena, 1997; Thirtle et al., 2003). With the nature of perishable products this threatens viability of horticulture enterprises. Odunfa (1995) observed losses due to both post-harvest and market losses as high as 60% in fruits and vegetables and between 40-50% for horticultural root and tuber crops. Additionally, given the rise in popularity of convenience and snack foods in urban areas, horticultural produce demand must be met, and this can provide opportunities for peri-urban and urban-based smallholder farmers to benefit from close proximity and supply of fresh produce to satisfy the demand from the growing urban populations.

We carried out a market assessment to understand horticulture market dynamics around Mutare City, eastern Zimbabwe. Our study aimed at estimating the demand of horticultural produce, to identify and get an insight into the functioning of the main horticulture marketing channels in operation around Mutare City. Therefore, the objectives of this study were twofold: 1) to establish the general annual trend of supply status of selected horticultural produce, and 2) to determine the principal channels through which selected horticultural produce flow into the market around Mutare City, eastern Zimbabwe. We aimed at exploring opportunities for the participation of smallholder farmers in the horticulture sub-sector value chain system; as this could inform related future intervention strategies by non-governmental organizations, policy makers and provide horticulture market intelligence to smallholder farmers as to which crops to grow, when and for which market niche, around Mutare City, eastern Zimbabwe.

METHODS

Study area

Our study area covered peri-urban (± 40 km from Mutare City centre) and urban areas around Mutare City, eastern Zimbabwe (Figure 1). Mutare City and its periphery experiences a cool and warm climate of annual rainfall ranging from 700-1050mm, with a mean annual minimum temperature range of 9 to 12 °C and a mean annual maximum of 25 to 28 °C (Moyo et al., 1993), it is within an agro-ecological zone which contributes significantly to large and informal markets of fruits and vegetables especially common guava (*Psidium guajava*), bananas (*Musa acuminata*) and tomatoes (*Lycopersicon esculentum*) and also the production of tea (Muir, 1994).

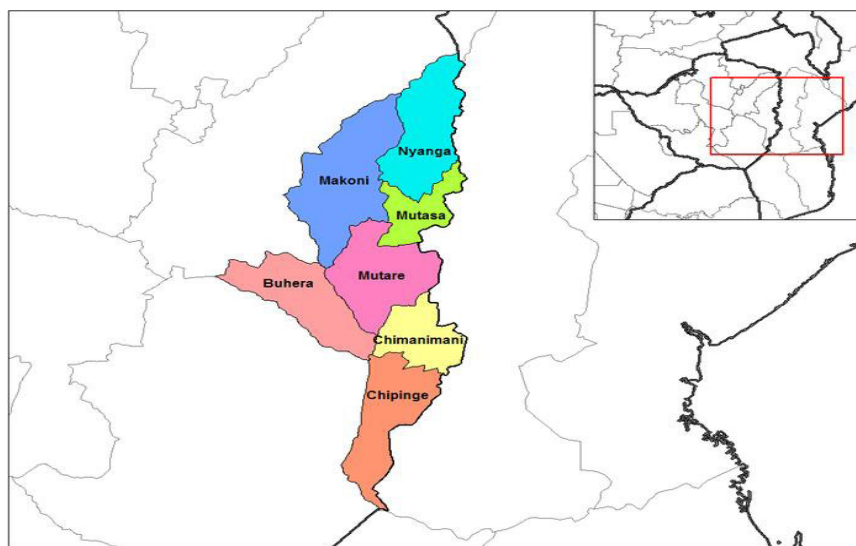


Figure 1: Study area map showing Mutare City and the peri-urban districts areas, eastern Zimbabwe. The highlighted red rectangle on the Zimbabwe map indicates the sphere of influence of horticulture produce market around Mutare City.

Study design and data collection

The investigation of market potential of horticultural produce around Mutare City was conducted in June 2013, in which 54 horticulture market players were interviewed. The main tool for data collection was an interview questionnaire guide following Mashapa et al. (2013). The study focused on the demand side of horticulture market, with little on supply chain of smallholder horticulture production. We used the value chain development approach (Loader, 1997) starting from understanding what the market wants then using it to inform production, that is the market-led production concept (Thirtle et al., 2003). In order to find out which horticultural commodities were popular in the market, respondents were asked to indicate horticultural produce they traded in, throughout the year.

Our study further attempted to estimate the total demand of selected horticultural produce as consumed in Mutare City, a town of about 188 243 people (Zimbabwe National Statistical Agency, Population Census, 2012), thus, each study respondent from the 54 horticulture market players was asked to estimate the weekly demand for the product they traded in three scenarios of peak, average and scarcity periods of the year. Those were then averaged to calculate estimates of yearly total demand for specific horticultural product. From the horticultural produce demand as indicated by the study respondents, aggregate demand estimates for the whole of Mutare City and its horticulture market was calculated by applying a factor (based on the estimated proportion of the aggregate horticulture market that the study respondents represented). With regards to the variations in horticultural produce supply over the year, the study respondents were asked to indicate periods in which they experience scarcity, adequate supply and oversupply for the selected horticultural produce. Information on horticultural product prices were sought from the study respondents for three annual scenarios of horticulture supply: peak supply; normal supply; scarcity. The study respondents were also asked to highlight challenges they face with suppliers of horticultural produce.

Categories of horticulture market players like Cairns Foods Zimbabwe Limited Company, Mutare Spar Supermarket, Manica Produce Wholesalers, Africa University and individuals like the Vendors operating along streets that were interviewed across Mutare City are presented in Table 1. The majority of the respondents were vendors followed by supermarkets and institutions such as colleges and hotels. Data were analyzed using Statistical Package of Social Science (SPSS) version 17 (SPSS Inc, Chicago, USA). Moreover, a horticulture sub-sector map was developed.

Table 1: Numbers of horticulture market players interviewed and their categories

Category	Number of Horticulture market player interviewed	Percentage of Horticulture market player interviewed
Vendors	26	48 %
Supermarkets	10	19 %
Institutions (e.g. Colleges & Hotels)	6	11 %
Catering Shops	6	11 %
Wholesalers	4	7 %
Processing & Canning companies	2	4 %
Totals	54	100 %

RESULTS AND DISCUSSION

Figure 2 presents the horticulture sub-sector map showing principal channels through which horticultural produce flowed into the market around Mutare City, eastern Zimbabwe. There were three principal channels through which horticulture trading was taking place, namely the; (i) Sakubva Musika open market, (ii) Horticulture Wholesale companies, and (iii) Processing Industry. The horticulture produce market around Mutare City was divided into two: (i) the fresh and (ii) the processed produce. Horticulture produce processing revolves around the application of scientific principles for the preservation or modification of foods to make high quality, safe and appealing products for the consumer and this was mainly done by the few Industrial Canning companies in Mutare City, whereas, the majority of horticulture market players were trading in horticulture produce in its raw and fresh state. Smallholder irrigation schemes mainly from peri-urban areas, which produce in bulk, were the principal suppliers to the processing industrial companies (Figure 2). This could be due to their distance from town and the volumes that are produced at the schemes. Processing companies mainly require large volumes of horticultural produce for processing and such a demand can be met by an organized irrigation scheme. Nyamaropa, Nyanyadzi, Chibuwe, Mutema-Taona were the principal smallholder irrigation schemes that were supplying the processing companies (Makhado, 1994). The peri-urban smallholder irrigation schemes are limited in market options and therefore supply at lower prices to processors who themselves are subdued by imported processed horticultural products. The Sakubva Musika- Vendors market channel was mostly informal and was described to be easy to enter and exit. The

horticulture Wholesaling market channel was characterized by some contracting arrangements but also non-contractual transactions. The horticulture Processing Industry channel was largely done through prior contractual arrangements.

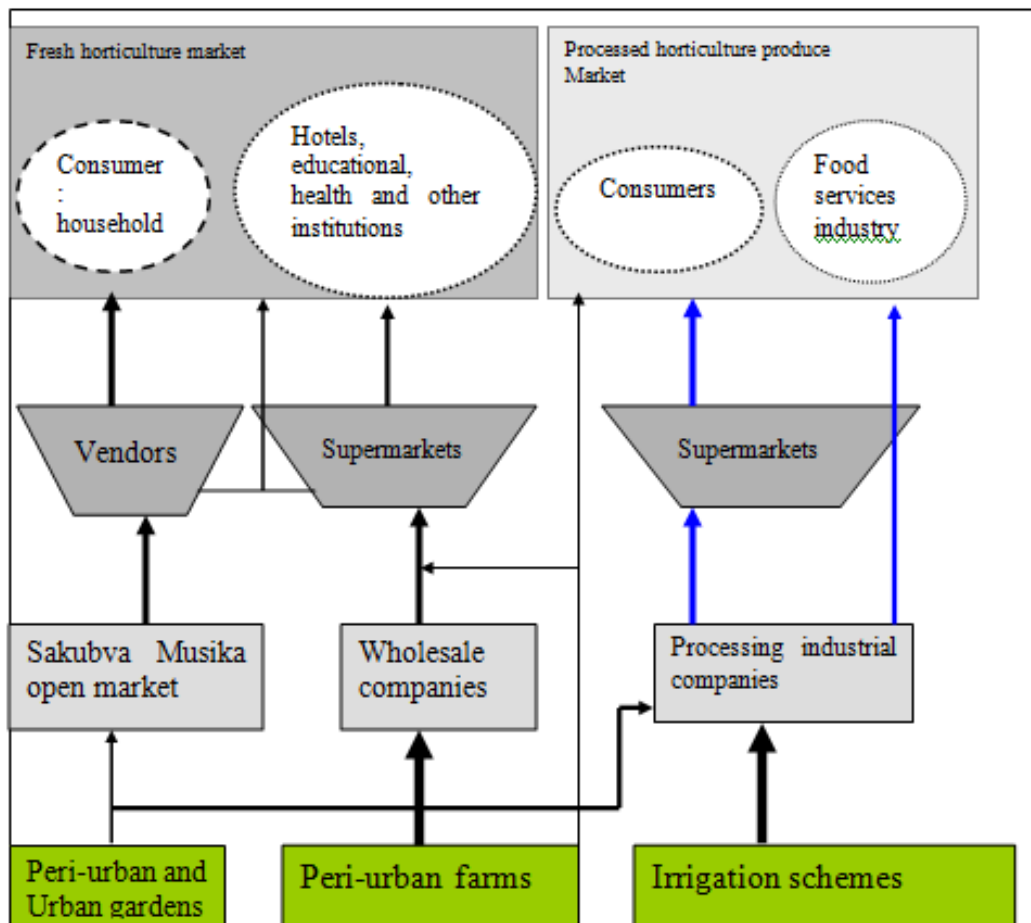


Figure 2: Principal channels through which horticultural produce are marketed around Mutare City, eastern Zimbabwe.

Figure 3 indicates the percentage of respondents who traded in specific horticultural products throughout the year. *L. esculentum*, onion (*Allium cepa*) and cabbage (*Brassica oleracea*) proved to be the most popular products traded throughout the year as indicated by over 50% of the respondents. Least popular were produces like gem squash (*Cucurbita pepo*), sweet potato (*Ipomea batatas*) and egg plant (*Solana melongena*) as indicated by only less than 10% of the respondents who traded in those products. Interestingly, our study found that horticulture market players did not regard *I. batatas* as a commercial product while *S. melongena* and *C. pepo* were said to be for a small high value income market.

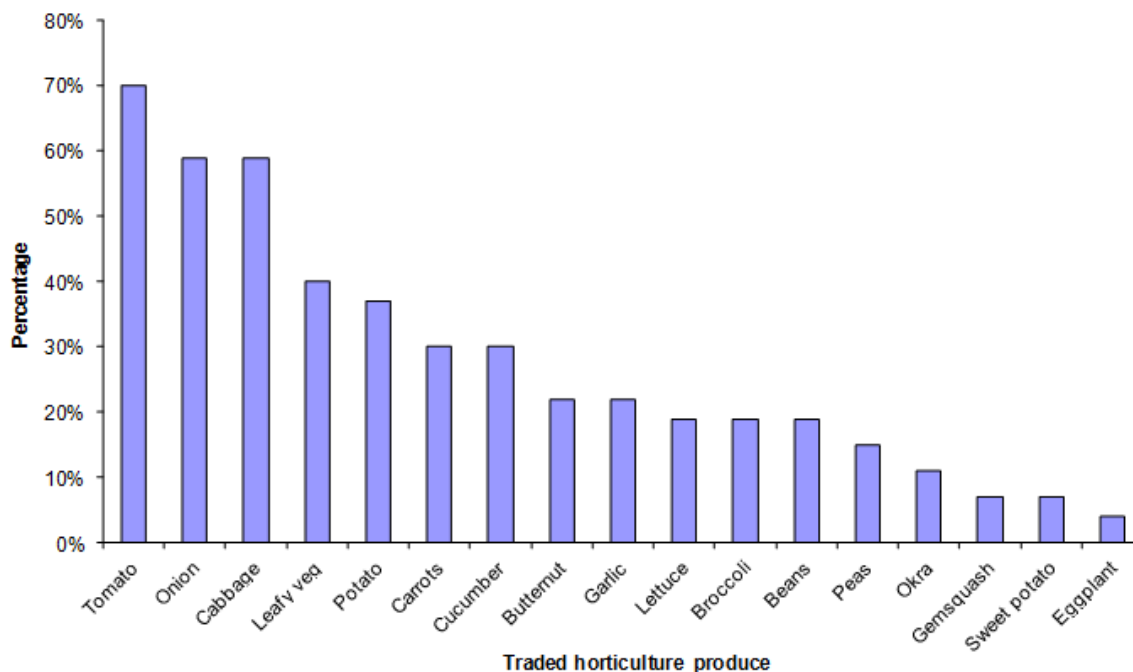


Figure 3: Horticultural produces by percentage of respondents who traded in the products throughout the year in Mutare City, eastern Zimbabwe.

Table 2 summarizes the horticultural produce total yearly demand estimates for selected horticultural products across Mutare City, eastern Zimbabwe. *L. esculentum*, leaf vegetables and cucumbers (*Cucumis sativus*) were high in demand, whereas, the least on demand were *S. melongena* and *C. pepo*. Throughout the year, horticulture market players in Mutare City trade in horticultural produce on demand (see Figure 3 and Table 2), thus, the forces of demand influences trade in horticultural produce.

Table 2: Estimated total yearly demand for selected horticultural products in Mutare City, eastern Zimbabwe

Variable Name	Wholesaler (MF -100%)	Vendor (MF- 5%)	Food Outlet (MF- 10%)	Supermarket (MF- 42%)	Institutions (MF- 23%)	Canning (MF- 100%)	Total
<i>Abelmoschus esculentus</i> (kg)	30	2 100	0	95	0	0	2 225
<i>Allium cepa</i> (kg)	1 500	10 400	100	4 857	1 226	165 000	183 083
<i>Allium sativum</i> (kg)	1 100	640	20	233	0	0	1 993
<i>Brassica oleracea</i> (kg)	700	3 100	0	136	1 195	0	5 131
<i>Brassica oleracea botrytis</i> (kg)	850	300	250	452	0	0	1 852
<i>Brassica oleracea capitata</i> (kg)	500	156 200	100	976	130	0	157 907
<i>Cucumis sativus</i> (kg)	3000	84 500	200	4 857	1 260	600	94 418
<i>Cucurbita moschata</i> (kg)	3 350	8 800	800	1 536	130	0	14 616
<i>Cucurbita pepo</i> (kg)	350	300	50	107	0	0	807
<i>Daucus carota sativus</i> (kg)	1 150	2 740	200	1 321	173	0	5 585
<i>Ipomea batatas</i> (kg)	2 050	800	0	214	0	0	3 064
<i>Lactuca sativa</i> (kg)	500	200	60	2 788	86	0	3 635
Leaf vegetable (kg)	5 800	96 100	4 100	5 881	3 830	0	115 711
<i>Lycopersicon esculentum</i> (kg)	4 000	495 700	200	8 500	1 369	165 000	674 770
<i>Pisum sativum</i> (kg)	400	2 100	50	357	43	50 000	52 951
<i>Solana melongena</i> (kg)	220	0	40	107	0	0	367
<i>Solanum tuberosum</i> (kg)	5 500	96 800	4500	5 464	3 913	0	116 177

MF – Market factor (estimated percentage of the market that the survey respondents represented)

Table 3 indicates the specific market windows that emerged for selected horticulture produce around Mutare City, eastern Zimbabwe. We observed that for most horticultural produce around Mutare City, there is an oversupply in summer (September - March) and scarcity in winter (April - August). Peri-urban and urban smallholder farmers could capitalize on the opportunity and take advantage of the specific horticulture market windows (produce scarcity) that exists across Mutare City, so as to engage in viable market-led horticulture production (Table 3).

Table 3: Horticultural produce supply situation and periods of scarcity across Mutare City, eastern Zimbabwe

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Allium cepa</i>	Red	Red	Red	Red	White	White	White	Green	Green	Green	White	White
<i>Allium sativum</i>	Red	White	White	White	Green	Green	Green	Green	Green	White	White	Red
<i>Brassica oleracea</i>	Red	Red	Green	Green	White	White	White	Red	Red	Red	Red	Red
<i>Brassica oleracea capitata</i>	White	White	White	White	Green	Green	Green	White	White	Red	Red	Red
<i>Brassica raparapa</i>	White	White	Green	Green	Green	White	White	White	White	Red	Red	Red
<i>Cucurbita moschata</i>	White	White	Green	Green	Green	Red	Red	Red	Red	Green	Green	White
<i>Daucus carota</i>	Red	Red	White	White	Green	Green	Green	White	White	White	White	Red
<i>Lycopersicon esculentum</i>	Red	Red	White	Green	Green	Green	Green	Green	Green	White	White	White
<i>Phaseolus vulgaris</i>	White	White	White	White	White	White	White	White	White	White	White	White
<i>Pisum sativum</i>	White	White	White	Green	Green	Green	White	White	White	Red	Red	Red
<i>Solanum tuberosum</i>	Green	Green	Green	White	White	White	White	Red	Red	Red	Red	Red

Key: Periods of oversupply ■ Period of scarcity ■ Adequate supply

Prices of horticultural produce (Figure 4) were clearly related to supply and demand situations. This trend could also be determined by change in climate seasons. The changes in climate seasons affect the eating habits of consumers. For example, horticultural produce such as *C. sativus* and water melons (*Citrullus lanatus*) are relatively not much consumed during the cold months of the year. Over-supply of the horticultural produce forces the prices downwards and during periods of scarcity the produce fetches higher prices. Our study noted differences in prices of horticultural produce channeled into the defined markets (Figure 2). It was observed that the market of fresh horticulture produce is more profitable than the market for processed horticultural produce. For instance, an average price of tomato for the processing industry was US\$0.10/kg whilst in the market for fresh horticultural produce of the same product; it was selling at US\$0.50/kg.

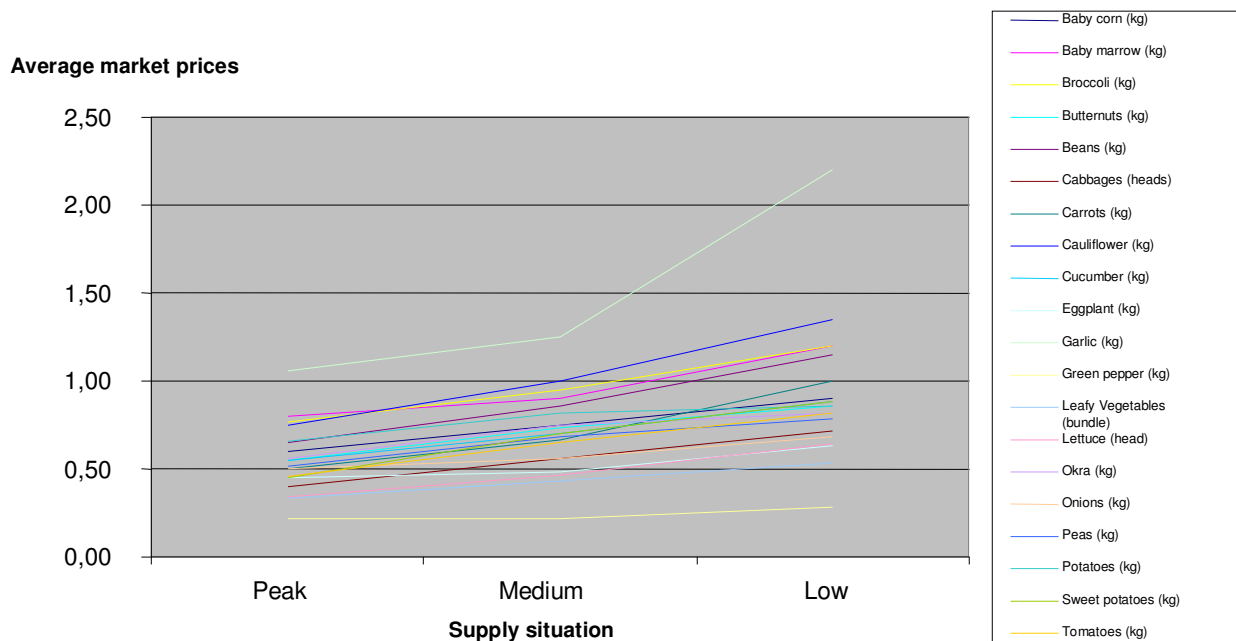


Figure 4: Average prices (US\$) of horticultural produce by supply and demand scenarios.

Our study respondents indicated that buyers of horticultural produce in Mutare City face challenges of erratic supply (n=18, 33%) from suppliers of horticultural produce. The other challenges highlighted included horticulture price instability (n=12, 22%), poor horticultural product quality (n=12, 22%) and high horticultural produce transportation costs (n=10, 19%). In order to be successful, smallholder farmer entrants into the market would need to address these shortfalls so as to ensure horticulture enterprise viability (Mbiba, 1995). Due to seasonality of horticulture production, 56% (n=30) of our study respondent admitted that the source of supply for horticultural produce could not meet their horticultural produce demand all year round, thus, our study communicates that peri-urban and urban smallholder farmers could capitalize on unmet demand around Mutare City. Smallholder farmers could ensure the continuity of supply of good quality horticultural produce into the market. Our study highlighted market prospects and profitability of horticulture production, that is, in order to get more returns, peri-urban and urban smallholder farmers around Mutare City could focus on fresh horticulture produce market and less on the processing market.

Our study contributes knowledge to horticulture value chain development in eastern Zimbabwe and related areas aimed at economic development and peri-urban and urban household poverty reduction which involves addressing the major constraints and opportunities faced between farmers and traders at multiple levels along the given horticulture value chain. This could inevitably trigger a wide range of actions such as enabling the flow of horticulture market information, facilitating improved market access, or increasing access to higher-value markets or value-added quality horticulture products. In a value chain marketing system development, farmers are linked to the needs of consumers, working closely with traders and processors to produce the specific goods required by consumers. Using the horticulture value chain approach, and through continuous innovation, research and feedback between different stages and actors along the value chain, the farmer's market power and profitability can be increased and livelihoods enhanced (Thirtle et al., 2003).

The understanding of the organization of the horticulture sub-sector in Mutare City is an important start at weighing the chances of smallholder farmers in the market. There are opportunities for smallholder farmers to fill the horticultural produce demand gap around Mutare City, eastern Zimbabwe. These urban and peri-urban smallholder farmers could have an advantage for being in close proximity to the market which reduces transport costs and helps in freshness maintenance of horticultural produce. As more people migrate and settle in urban areas (rural-urban migration) in Zimbabwe and elsewhere in developing countries, there is the urgent need to promote peri-urban and urban horticulture, where appropriate, using all available land resources to offset anticipated short falls in relation to horticultural produce demand. Farm units close to towns and cities have potential to operate intensive semi-or fully commercial smallholder horticulture enterprises (Smith and Tevera, 1997; Thornton and Nel, 2007). When carried out properly under safe conditions, this system of urban and peri-urban horticulture can contribute to food security by increasing quantity of food available especially during times of crisis (Shumba, 1992), enhance the freshness of perishable horticulture produce on the urban market and offer opportunities for productive employment to the unemployed (Smith and Tevera, 1997; United Nations, 2009).

Evidence from our study suggests that there is a real potential to enhance viability of smallholder horticulture production through market-led production, but that a number of factors currently prevent the development of such activities. Many of these factors are market-related, especially with respect to seasonality of horticulture production and poor access to markets information (Turner and Chivinge, 1999). Smallholder horticulture producers, however, with market intelligence, market-led horticulture production and reasonable access to markets (e.g. those in peri-urban and urban areas) may be able to overcome some of these problems. This can be achieved by tapping horticultural produce demand around Mutare City as urban populations are growing at 5% per year in Zimbabwe (Zimbabwe National Statistical Agency, Population Census, 2013), thereby increasing the demand for horticulture produce in these areas as the majority of urban dwellers rely on purchased food products to meet their food needs (Aragrande, 1999; Department for International Development [DFID], 2012).

CONCLUSIONS AND RECOMMENDATIONS

We conclude that by relying on the market forces of supply and demand, smallholder farmers can capitalize on "special market windows" when horticultural produce is in short supply, that is during periods of horticultural produce scarcity. We noted that in periods of horticultural produce scarcity, horticulture market players travel to other parts of the country where produce might be obtained or end up importing (for a few who are able). Our study respondents indicated that some smallholder farmers face marketing problems due to seasonality of horticulture production, thus we recommend that horticulture suppliers could venture into greenhouse horticulture production so as to meet demand during scarcity periods when climate is a limiting factor of production. Though seasons greatly influence production of horticulture crops, peri-urban and urban smallholder farmers are urged to alter the production calendar, where possible, so that they can provide produce on the market during periods of scarcity (Table 3).

We recommend training of farmers and agricultural extensionists for transformation towards sustainable market-led horticulture production practice which is necessary to change the mind-set of all stakeholders. Adoption of market research to inform production is said to be acceptable to those who have an innovative mind-set and who engage in a lifelong process of learning and it is complex for those who give up when the first problems appear and for those accustomed to conventional traditional subsistence agriculture (Mashapa et al., 2013). The effective supply of horticulture produce to the urban markets is of huge developmental importance for smallholder horticulture production. We advise smallholder farmers around Mutare City and elsewhere to realize that the market of horticultural produce is very dynamic and market conditions change rapidly; hence, there is need to constantly scan its behavior for effective and viable market-led horticulture production. An integral component of the horticulture value chain and its market systems is the horticulture supply chain which remains a research gap for the present study area. Successful innovations for horticulture value chain development not only requires appropriate research outputs, but also relies on a supportive policy and institutional environment, functioning infrastructure, the availability of credit and technical support, and the existence of healthy markets.

ACKNOWLEDGEMENTS

This research was supported by Caritas International, Zimbabwe in collaboration with the Zimbabwe Ministry of Agriculture, Mechanisation and Irrigation Development. We wish to thank the Caritas International, Zimbabwe, Mutare management and staff for supporting this study. We are indebted to Sister Euphrasia Chaza, the former Development Coordinator of Caritas International, Zimbabwe, Mutare.

REFERENCES

- Aragrande, M. 1999. Studying food supply and distribution systems to cities in developing countries: Methodological and operational guide. Food into Cities Collection, Rome: FAO.
- Department for International Development (DFID). 2012. Zimbabwe Country Strategy Paper 2012. UK: Department for International Development.
- Hicks, J.R., Hicks, E.R., Malusalila, P. and Nenguwo, N. 1997. Post harvest handling of fruits and vegetables by small-scale Zimbabwean growers. In Jackson, J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp.39. Harare: University of Zimbabwe Publications.
- Horn, N.E. 1997. Horticultural production and marketing among smallholders in Zimbabwe. In Jackson, J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp.122-142. Harare: University of Zimbabwe Publications.
- Loader, R. J. 1997. Assessing transaction costs to describe supply chain relationships in agri-food systems. Supply Chain Management. 2(1), 12-22.
- Makaya, P.R. 1994. The communal farmer on the export scene. Horticultural Quarterly Review. 4(4), 4-15.
- Makhado, T. 1992. Smallholder irrigation in Communal Areas. In Whingwiri, E.E., Rukuni, M., Mashingaidze, K. and Matanyaire, C.M. (eds.) Small-scale Agriculture in Zimbabwe: Farming Systems, Policy and Infrastructural Development. pp. 50-63. Harare: Rockwood Publishers.
- Mashapa, C, Mhuro-Mashapa, P, Zisadza-Gandiwa, P and Gandiwa, E. 2013. Adoption of agro-ecology practices in semi-arid environment of Chimanimani District, eastern Zimbabwe. Journal of Sustainable Development in Africa, (15) 5. pp. 1-19.
- Mbiba, B. 1995. Urban Agriculture Zimbabwe: Implications for Urban management and poverty. UK: Avebury, Ashgate Publishing Limited.
- Moyo, S., O'Keefe, P. and Sill, M. 1993. The Southern African Environment. Profiles of the SADC Countries, London: Earthscan Publications.
- Muir, K. 1994. Agriculture in Zimbabwe. In Rukuni, M and Eicher, C.K (eds) Zimbabwe's Agricultural Revolution. pp 195-207. Harare. University of Zimbabwe Publications.
- Odufa, A. 1995. Structure, potential and constraints of small-scale food processing in Africa. In Richter, J., Basler, A. and Franzen, H. (eds.) Small-scale Food Processing Contributing to Food Security. Food and Agriculture Development Centre (ZEL/ATSAF/DSE).
- Poulton, C., Mukwereza, L., Chaonwa, W., Loader, R., Mariga, K., Masanganise, P and Sanyatwe, D. 1999. Overcoming informational constraints: Improving horticultural marketing and technical information flows to smallholders. Zimbabwe Country Report: Project R7151 Crop Post Harvest Research Programme. Kent: University of London, Wye College.

- Sena, M.I. 1997. Horticultural marketing in Zimbabwe: Problems met by smallholders and experience of the Mashonaland East Fruit and Vegetable Project in addressing these schemes. In Jackson, J.E., Turner, A., and Matanda, M. (eds.) *Smallholder Horticulture in Zimbabwe*. pp.65-77. Harare: University of Zimbabwe Publications.
- Shumba, E.M. 1992. The farming system. In Whingwiri, E.E., Rukuni, M., Mashingaidze, K. and Matanyaire, C.M. (eds.) *Small-scale Agriculture in Zimbabwe: Farming Systems, Policy and Infrastructural Development*. pp. 16-30. Harare: Rockwood Publishers.
- Smith, D.W. and Tevera, D.S. 1997. Socio-economic context for the householder of urban agriculture in Harare, Zimbabwe. *Geographical Journal of Zimbabwe*. (Special Issue on Urban Agriculture) 28, pp.25-38.
- Thirtle C, Lin L. and Piesse J. 2003. The Impact of Research-led Agricultural Productivity growth on Poverty Reduction in Africa, Asia And Latin America. *World Development*. Volume. 31. 1959-1975.
- Thornton A.C. and Nel E. 2007. The significance of urban and peri-urban agriculture in Peddie, in the Eastern Cape Province, South Africa. *Journal of Development Studies*. Volume. 37 No. 1. 13-23.
- Turner, A and Chivinge, O. 1999. Production and Marketing of Horticultural Crops in Zimbabwe: A survey of Smallholder Farmers in the Mashonaland East Province. Ithaca: Cornell International Institute for Food, Agriculture and Development (CIIFAD).
- United Nations. 2009. International Market Access Information, Horticulture Sector, Geneva: UN.
- Zimbabwe Department of Agriculture and Extension Services, Mutare District Annual Report. 2013. Annual report 2013: Mutare District Agricultural Main Report. Mutare, Zimbabwe: Agritex.
- Zimbabwe Horticultural Promotion Council. 2013. Bountiful Zimbabwe. Harare: Zimbabwe Horticultural Promotion Council.
- Zimbabwe National Statistical Agency, Population Census, 2013. Census 2012: Zimbabwe Main Report. Harare, Zimbabwe: ZimStats.