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POLICY BRIEF
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Can Horticultural Market Agents Play A Role in the Development of Cost-Effective and Sustainable Price Information Systems?

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Key Points

- Smallholder horticulture in Zambia has great potential to increase rural income and facilitate broad-based rural poverty reduction;
- Analysis by IAPRI shows that only about 20% of the smallholder farmers have over the past decade or so been selling horticultural produce in spite of growing urban demand due to rising population and growth in income per capita. This is largely attributed to poor investments in hard (physical) and soft (e.g., market information, grades and standards, etc.) in the traditional or open market horticultural supply system.
- While it is critical to develop physical infrastructure of strategically located horticultural wholesale markets with links to different parts of the country as well as regional markets, provision of price information in the absence of these developments can go a long way in contributing to the development of the smallholder horticultural supply chains;
- The pilot phase of the iDE Zambia horticultural price information system (Lima Links) implemented during 2014 has shown that market agents or brokers despite their bad reputation can contribute significantly towards the development of these supply chains through involvement in price information generation and dissemination following sensitization training;
- The Lima Links data was found to be highly reliable and with practical uses especially in smallholder production and marketing (spatial and seasonal arbitrage) that enables them get the highest returns; and
- To achieve a private-sector led cost effective and sustainable horticultural price information business model, other interested stakeholders should emulate the IDE Zambia pilot Lima Links in order to expand and have a sustainable price information system.

INTRODUCTION: Efficient market information (or at least price information) provision can have positive effects on agricultural supply chains benefitting both farmers and traders, and indeed policy makers. Up-to-date, current, or real-time market information enables farmers to negotiate with traders from a position of greater strength. It also facilitates spatial distribution of products from rural to urban consumption areas and between markets moving from areas of relatively higher to lower supply driven by differences in prices. An analysis of historical market information enables farmers to make production and marketing decisions that enable them to supply the right products at the right time and right place enabling to them to get the highest returns. It also permits traders to make better decisions regarding the viability of intra- and/or inter-seasonal storage and supply decisions in terms of when and where to supply a particular produce. Overall, market information, makes the market work more efficiently for all market participants.

This information system is especially very important in the development of horticultural supply chains because of the highly daily and seasonal price variation. However, there is very little going on in this respect in Zambia because horticultural market system in Zambia largely

traditional (or open market) which is characterized by poor investment in hard (physical) and soft (market information, grades and standards, etc.) market infrastructure as well as dysfunctional ownership and management systems. The Zambia National Farmers' Union's mobile phone based price information system only caters for field crops, livestock, and other commodities. While the Indaba Agricultural Policy Research Institute (IAPRI) and its predecessor Food Security Research Project has over the past eight years generated wholesale and retail price information for tomato, rape, and onion in Lusaka as part of its research and outreach activities and, to a limited extent, used this data to analyze price trends on request from interested stakeholders.

Therefore, the implementation of a pilot horticultural price information system (Lima Links) by the International Development Enterprises in Zambia (iDE Zambia) during 2014 was a very welcome development. Lima Links used a number of selected market agents in Soweto (Lusaka), New Kasanda (Kabwe), Masala (Ndola), and Chisokone (Kitwe) markets to collect and enter into the system to track and report real-time prices of tomato, onion, rape, cabbage, Chinese cabbage, pumpkin leaves, sweet potato leaves, African eggplant (impwa), okra, and green maize. The reliability of this data may be doubted by key stakeholders because of unclear ownership and dysfunctional management of most horticultural wholesale markets such as Soweto, which are characterized by *survival of the fittest* kind of activities. Usually, in these markets, commodity committees or associations are put in place only to spearhead the interests of members—usually the market agents or brokers. If the data generated by these agents is questionable, it would have little practical value to supply chain actors and other stakeholders.

This policy brief is based on a longer working paper, a study by Hichaambwa and Nyamwaya 2015 (forthcoming), that was conducted to assess whether market agents or brokers can significantly contribute to sustainable development of smallholder horticultural supply chains in Zambia by using the pilot phase of the Lima Links price information collection and dissemination mechanism.

In so doing, the study focused on three main questions:

a) Given that market agents are generally considered untrustworthy, how reliable is the information they collect to feed into the information system for dissemination to other supply chain actors?
b) To what extent does the information, in its current form as disseminated by the system, have significant practical value to supply chain actors especially smallholder farmers?; and
c) What are the indicative impacts of this horticultural price data collection, processing, and dissemination system on the horticultural supply chains?

DATA AND METHODS: The main data sources used in the study were the:

1) Lima Links database in which market agents played a significant role in data generation and dissemination;
2) IAPRI horticultural wholesale price database at Soweto Market in Lusaka; and
3) Rural Agricultural Livelihoods Survey data of 2012 (CSO/MAL/IAPRI 2012).

To test the reliability of data generated by market agents in question 1, the study used statistical techniques to determine if there were any significant differences between monthly average Lima Links prices and two market prices: 1) random but regular observational market prices collected by iDE Zambia staff for the same crops in the same markets; and 2) IAPRI wholesale data for tomato, rape, and onion in the Soweto Market only.

To answer the second question, seasonal price analysis of the Lima Links data was conducted by crop and market to discern price trends and ascertain whether these would allow for spatial and season arbitrage by supply chain actors including traders and farmers. Provincial level smallholder horticultural marketing shares of these crops estimated using the RALS 2012 data provided further insights on what could be the driving force behind the observed price trends at each of the markets.

And finally, to address the third question, the Lima Links database was used to assess the growth in the use of the system measured as volumes traded (sales) and the number of

transactions per farmer as well as the level of use measured as system hits during the data collection pilot phase. Lessons were also drawn from the Lima Links evaluation which the IAPRI conducted on behalf of iDE Zambia in 2014 (Hichaambwa and Chisanga 2014).

KEY FINDINGS:

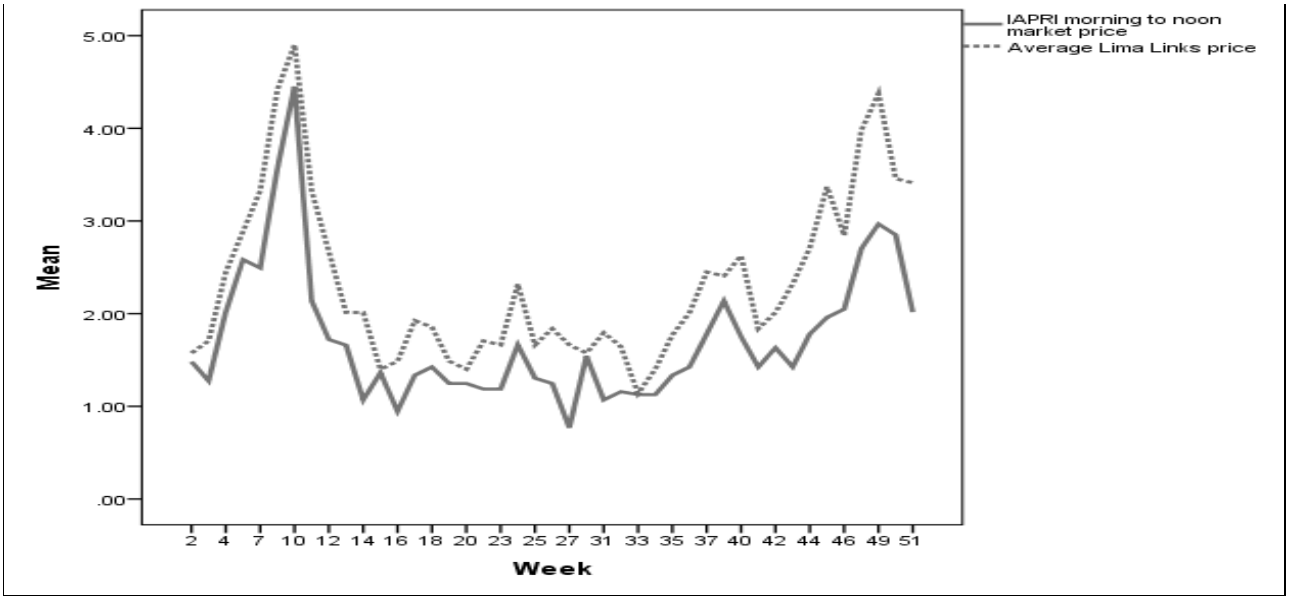
Reliability of the Data*:* Our analysis shows that the Lima Links data were not significantly different from the random but regular market prices collected by iDE Zambia staff. Also, when compared with IAPRI tomato, rape, and onion prices at Soweto Market, the Lima Links data show the same weekly trends for the 2014 with the latter being slightly higher especially for tomato (see Figure 1 for example). This was expected because the IAPRI prices targeted standard quality produce and price collection ended at about noon while the market agents under Lima Links are expected to have been transacting mostly in higher quality produce and collected data for the whole day. The intra-day price variation of tomato and rape tends to be much higher than that of onion which has a relatively longer shelf life. The Lima Links rape prices tended to be much closer to the IAPRI collected prices compared to the tomato prices because almost all the rape would be sold out by noon coinciding with the time when IAPRI price collection ended.

Between Markets and Seasonal Price Variation: Significant price variations were evident between different markets and seasons for all the crops. However, the degree of variation differed by crop. Meaning supply chain actors, including smallholder farmers, can use this price information for spatial as well intra-season arbitrage or for supplying produce to markets during the season when they would get the best returns (see Figure 2, for example).

Impacts on Supply Chains and Benefits to Supply Chain Actors*:* Interaction with end users of Lima Links who included smallholder farmers indicated the following benefits/impacts of the price information system:

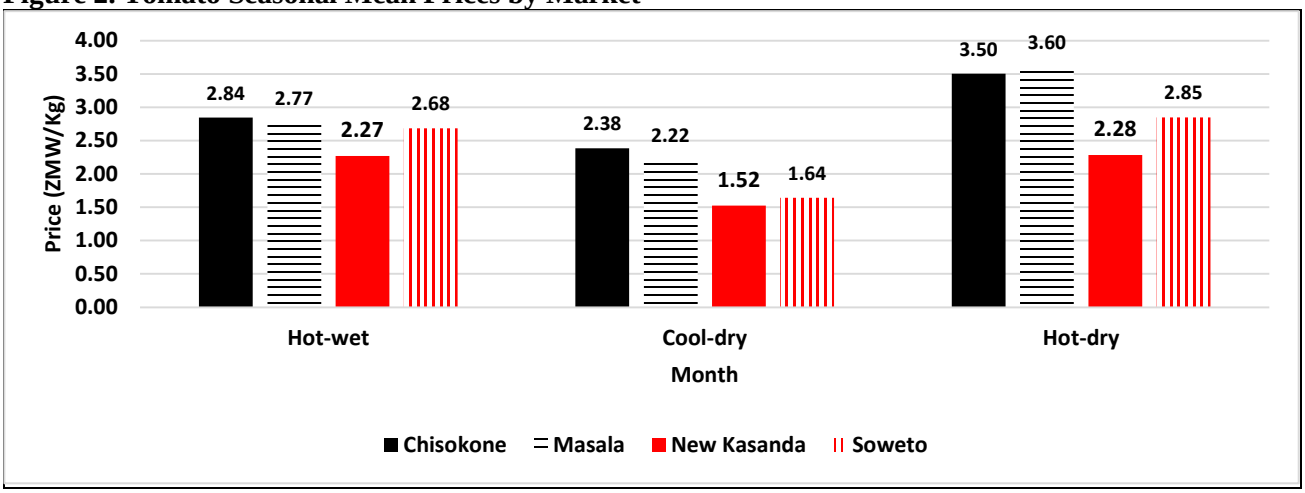
- ✓ Increase in supply chain activities. The total number of farmer transactions recorded by the market agents increased from 135 to 7,979 and the value of sales from ZMW649,411 to ZMW13,692,060 between the first and fourth quarter of 2014. Controlling for location of sales (the market) and market prices, these factors increased by 28% and 21% between the two quarters respectively.

Figure 1. Weekly Trends in IAPRI and Lima Links Tomato Prices at Soweto Market, 2014



Source: iDE Zambia Lima Links Database.

Figure 2. Tomato Seasonal Mean Prices by Market



Source: iDE Zambia Lima Links Database.

- ✓ System end users saw a number of benefits including:
  - Empowerment to choose which market to supply their produce;
  - Empowerment to plan which crops to grow/supply to which markets during which months;
  - Reduction in the cost of sourcing price information;
  - Increased sales income and great potential for increased household well-being; and
  - Improved bargaining between farmers and traders at the farm-gate.

Potential for growth in use of the system is very great. The number of users kept increasing beyond November 2014 when project funding ended and continued to be high through to May 2015 the latest month for which data were available for the study.

CONCLUSIONS/RECOMMENDATIONS:

There is no doubt that availability of price information is important to facilitate the development of the smallholder horticultural supply chains in Zambia. The main challenge in supplying this information is that the price generation and dissemination systems need to be cost-effective and sustainable. The system should not to be over reliant on donor or government funding except when it is seed funding during the initial stages of development.

This analysis has shown that market agents or brokers can play a critical role in the generation and dissemination of market information as long as they are sensitized and trained in the fundamentals of the system. This is because the information generated directly benefits them through increased volumes of sales. In addition, the analysis showed that: a) the availability of price information can significantly increase smallholder farmer transactions and sales; and b) the price data generated by the market agents (following deliberate capacity building) is reliable and has useful functions in produce spatial and seasonal arbitrage as well as planning of production and marketing of horticultural produce are concerned.

Therefore, iDE Zambia and other stakeholders need to develop this price information system further to cover more markets so as to train more market agents and include the involvement of the private sector in their quest of developing and implementing a sustainable business model. The evaluation of the Lima Links pilot phase showed strong potential for long term viability of the system with a conservative net benefit to cost ranging from 113 during the pilot phase to 170 depending on the number of hits per month achieved (Hichaambwa and Chisanga 2014).

The development of sustainable horticultural price information will go a long way in facilitating the development of smallholder supply chains even in the absence of well-developed and functioning horticultural wholesale markets. The ideal horticultural wholesale market situation, as recommended by Hichaambwa et al. (2015) would be to develop completely new structures appropriately designed

for the purpose with a basic concrete slab with allowance for drainage, designated truck entry and exit points, loading and off-loading bays, etc., from which only trained and certified market agents would be allowed to operate. These structures can be built and be managed under private-public partnerships arrangements along the lines of successful systems from other countries in the regions such as South Africa and less sophisticated ones in Mozambique. In the absence of such development, price information would play a critical part in complementing these markets' efficiency and effectiveness.

REFERENCES:

Central Statistical Office, Ministry of Agriculture and Livestock, and Indaba Agricultural Policy Research Institute (CSO/MAL/ IAPRI). 2012. Rural Agricultural Livelihoods Survey Data. Lusaka, Zambia: IAPRI.

Hichaambwa, M., J. Chamberlin, and S. Kabwe. 2015. *Is Smallholder Horticulture the Unfunded Poverty Reduction Option in Zambia? A Comparative Assessment of Welfare Effects of Participation in Horticultural and Maize Markets*. IAPRI Working Paper No. 96. Lusaka, Zambia: IAPRI. Can be accessed at http://fsg.afre.msu.edu/zambia/research.htm

Hichaambwa, M. and B. Chisanga. 2014. Evaluation of the Lima Links Horticultural Price Information System. An evaluation conducted by IAPRI for iDE Zambia. Lusaka, Zambia: IAPRI.

Hichaambwa, M. and N. Munthali. 2015, forthcoming. *Can Market Agents Play a Significant Role in the Development of Sustainable Supply Chains in Zambia? An Assessment Based on the Lima Links Horticultural Price Information System*. IAPRI Working Paper. Lusaka, Zambia: IAPRI.

IAPRI (Indaba Agricultural Policy Research Institute). 2007 to 2014. Horticultural Trade Flows and Price Dynamics Database. Lusaka, Zambia: IAPRI.

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