INTRODUCTION: Zambia’s food and agricultural system remains largely undiversified providing neither food security nor adequate nutrition for all. Given that the majority of the households especially in the rural areas depend directly on agricultural production for their food sources, a lack of diversity in food production impacts negatively on consumption of diversified diets, resulting in different forms of malnutrition.

For agriculture, low production diversification contributes to lack of resilience of the food system. Therefore, there is a strong case for improving diversity in both food production as to generate a better understanding of the challenges in agricultural diversification from a farmer’s perspective.

This brief aims to contribute to informing the development of an agricultural diversification strategy by exploring the options for agricultural diversification in Zambia from the farmers’ perspective. The study’s specific objectives were:

- To determine the factors that contribute to agricultural diversification,
- To highlight the priorities and concerns of smallholder households on diversification and,
- To generate evidence that supports the lobbying and advocacy work of Hivos, Civil Society for Poverty Reduction (CSPR) and Civil Society Scaling Up Nutrition (CSO SUN) around a diversification agenda.

Options for Agricultural Diversification from the Farmer’s Perspective in Zambia

Rhoda Mofya Mukuka and Marjolein Mwanamwenge*

Key Points/Summary

- Despite Government policy aimed at improving food and nutrition security, Zambia’s food and agricultural system remains largely undiversified and is neither providing food security nor adequate nutrition for all.
- Households understand the need for agricultural production including: income generation; improving soil fertility; controlling pests; diversifying consumption; providing feed for livestock; and being able to grow foods that can do with little rainfall, but are facing challenges to diversify.
- Main factors constraining diversification include lack of access to diverse seed, inadequate market access, lack of financial capital, poor access to land (especially for the youth), and inadequate manpower. Other factors are lack of irrigation, erratic rainfall patterns, susceptibility to pests and diseases, and inadequate knowledge on diversification.
- Vegetable production has high potential for income diversification but faces challenges of low irrigation facilities and long distances to markets.
- There is low diversity within crop seeds, with maize being the crop with the highest diversity, with 46 per cent of farmers indicating to have grown more than one variety.
- Fruit production and consumption is low among the households, with people mainly relying on wild fruits or existing trees.
STUDY METHODOLOGY: The study focused on two Districts – Chongwe in Lusaka Province and Monze in Southern Province. While Monze is located in the low rainfall agro-ecological zone (region I), Chongwe is in region II which receives medium to high rainfall. Other than the agro-ecological differences, the two districts differ in proximity to major food markets and culture which may influence food production and consumption diversity.

Both quantitative and qualitative research approaches were applied to the study by undertaking household interviews through a structured questionnaire (n=320), in-depth qualitative interviews with selected individuals (n=40), focus group discussions (n=3), and a desk review on agricultural diversification in Zambia.

FINDINGS

Motivation to Diversify: The farmers decisions to diversify agricultural production is largely driven by the need to increase and diversify income sources, improve soil fertility, prevent pests, diversify food consumption, provide feed for livestock, and be able to grow foods that can tolerate drought.

Crop Diversification: Crop diversification can be measured with the Simpson Index of Diversity (SID) ranging from 0-1, with a higher SID reflecting higher levels of diversification. The average level of crop diversification among the farm households in the sample is estimated at 0.51, with minor differences between Chongwe (0.49) and Monze (0.53). As presented in Table 1, the SID increased with area of land under cultivation and household size. Maize is the most widely cultivated crop (98.4 percent), followed by groundnuts (73.4 percent), white sweet potatoes (69.4 percent) and cowpeas (40.3 percent). Only a few farmers cultivated rice, Irish potatoes, millet, sorghum, cotton, orange fleshed sweet potatoes, and cassava.

The average number of crops cultivated in the two districts is 3.8, with 45.1 percent of farmers cultivating three crops or less, and 12.9 percent of farming households cultivated six or more crops.

<table>
<thead>
<tr>
<th>Landholding size</th>
<th>SID</th>
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<tbody>
<tr>
<td>0-2 ha</td>
<td>0.48</td>
</tr>
<tr>
<td>2-5 ha</td>
<td>0.52</td>
</tr>
<tr>
<td>5-20 ha</td>
<td>0.54</td>
</tr>
<tr>
<td>&gt;20 ha</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Source for all tables and figures: Authors.

The gender of the primary decision maker in crop production has implications on the type of crops produced and ultimately on the level of crop diversification. The data show that in households with both a male household head and a female spouse, the production of crops which are considered cash crops such as maize, sunflower, cotton and soya beans are controlled by men. Women control the production of mostly food crops such as groundnuts, mixed beans and Bambara nuts. Previous studies have also shown a similar pattern in the gender of primary decision maker in crop production (see Mofya-Mukuka and Sambo 2018).

The decision to cultivate maize is mainly made to ensure adequate quantities of food for the household, while the decision to grow other crops is mainly based on availability of a market for crops with a good price. Women indicated that they grew crops to ensure enough relish for consumption. Other factors influencing the choice of crops included seeing what other farmers grow, knowledge of crop cultivation, low costs and availability of inputs, availability of fertilizer, labour, and rainfall patterns.

Vegetable Production: Most farmers in Chongwe produce vegetables (93.7 percent), whilst this percentage is lower in Monze (68.8 percent). Households in Chongwe sell their vegetables to major Lusaka markets, which is the main factor explaining the differences between the two study areas. The most frequently cultivated vegetables are pumpkin leaves (64.1 percent), sweet potato leaves (50.6 percent), rape (48.4 percent), okra (46.9 percent), amaranth leaves (40.3 percent) and tomatoes (32.8 percent). Most of the farmers (41.9 percent) cultivated between one and four
different types of vegetables in the past 12 months, with an average of 3.8 types of vegetables. The farming households in Chongwe cultivate a wider range of vegetables as compared to those in Monze (Table 2).

### Table 2. Number of Households Producing Vegetables

<table>
<thead>
<tr>
<th></th>
<th>Chongwe</th>
<th>Monze</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Percentage</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No vegetables</td>
<td>5.0</td>
<td>33.1</td>
<td>19.1</td>
</tr>
<tr>
<td>1-4 type of vegetables</td>
<td>45.6</td>
<td>38.1</td>
<td>41.9</td>
</tr>
<tr>
<td>5-7 type of vegetables</td>
<td>30.6</td>
<td>21.1</td>
<td>25.9</td>
</tr>
<tr>
<td>More than 8 types of vegetables</td>
<td>18.8</td>
<td>7.5</td>
<td>13.1</td>
</tr>
</tbody>
</table>

Apart from access to markets, ability to irrigate highly determines the choice and variety of vegetables that are produced. Tomato and rape are the most irrigated vegetables and decisions on the production of these two vegetables are mostly done by the men while women take more control of production of mainly rain-fed vegetables such as pumpkin leaves and sweet potato leaves. Figure 1 shows the percentage of farming household irrigating different vegetables.

**Figure 1. Percent of Households Using Irrigation by Crop Type**

Fruit Production: The respondents indicated an interest in cultivating fruits, both for consumption as well as for selling. The main reasons for growing fruits were the health benefits and income from selling fruits. However, there are many factors constraining the cultivation of fruit trees, including cattle eating the young saplings (human-animal conflict), termite attacks, lack of water, inadequate knowledge on fruit tree propagation and management, and the accessibility of fruit tree saplings. Only a few respondents were familiar with propagation techniques that can be used to acquire fruit tree saplings. There are a number of places where saplings can be bought, but most places are far, reducing the accessibility of fruit tree saplings.

**Constraints to Diversification:** The study showed clear interest from farming households to diversify crops. However, there are many constraints in diversifying crop production. Acquiring a diverse range of seeds was challenging as agro dealers located within the communities often have limited diversity, selling mainly maize seed, chemicals and fertilizer. Households will have to go to the Boma to find other agricultural inputs which increases the cost due to high costs of transportation. Interestingly, this is less of a problem for men as they are more able to travel longer distances.

Other constraints to diversify were related to inadequate capital necessary to purchase seed, hire additional labour, purchase chemicals or fertilizer; access to land, and being able to take the risk of cultivating crops for which a market may or may not be available.

Livestock Production: The percentage of households owning livestock is above 90 percent for both Chongwe and Monze. However, the composition of livestock varies across the districts, with households in Monze three times more likely to own cattle and two times more likely to own goats. The most frequently owned livestock are chickens (87.8 percent) and goats (57.8 percent), with an average of 25 chickens and 12 goats (Figure 2 following).

Most respondents indicated interest in rearing diverse livestock; especially cattle, goats, sheep, turkeys, guinea fowls, chickens and pigs. Major reasons for rearing of livestock were for animal draft power (cattle), income generation, savings, and consumption.
There are a number of challenges of diversification of livestock which include the lack of capital to buy and manage more types of livestock, limited access to land for grazing, livestock diseases, high cost of feed, and long distances to veterinary services. High cost of feed is mainly a problem for broiler chickens, as most other animals graze or are given leftovers. A specific constraint to diversifying livestock is the unavailability of various types of livestock.

CONCLUSION AND RECOMMENDATIONS

The findings of the study showed that smallholder households understand that diversification can increase income, resilience and support healthy diets, but the realities are that access to land, accessing a diverse range of agricultural inputs (including fruit tree saplings and livestock types), finance and the accessibility and absorption capacity of markets among others are limiting their capacity to diversify their production.

Achieving agricultural diversification requires a range of coordinated policy changes. The following are the critical measures that need to be put in place to improve production and consumption diversification:

- Develop a standalone national strategy for a sustainable food system that ensures culturally acceptable and nutritionally adequate diets for all.
- Reorient the agricultural sector to increase focus on more diverse agricultural production.
- Improve access to land for smallholder farmers.
- Support market institutions (both input and output) to pull farmers toward more diverse agricultural production.
- Stimulate demand for healthy and nutritious diets from the bottom up by supporting people-driven change initiatives.
- Address barriers hindering women’s empowerment.
- Invest in agricultural research and development that supports healthy diets.
- Promote innovative approaches to diversify the agricultural sector, including small scale irrigation.
- Promote and maintain biodiversity through promotion and maintaining of local crop varieties, animal breeds and under-utilized crops.
- Improve access to finance for smallholder farmers.

ACKNOWLEDGEMENTS

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This study was conducted in collaboration with Hivos International and CSPR. The detailed report can be obtained from Hivos.

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REFERENCES