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Nutrition-sensitive Agricultural Production and Consumption: Implications for Minimum Acceptable Diet of Children in 30 SUN Districts in Zambia
A Policy Brief

Why is crop production important to achieving minimum acceptable diet for children at the household level?

Child malnutrition is a multifaceted problem[1,2] determined by numerous factors, including dietary intake, health care and sanitation, and caring capacity and practice. In Zambia, challenges with child malnutrition continue to persist, despite the steady growth in national-level agricultural production. Currently, 34.6% of children under 5 years of age in Zambia are stunted. Agricultural production at the household level has been identified as a means of reducing child malnutrition by improving dietary intake, especially among low-income rural farm households. There is a strong association between children consuming a diverse diet and stunting.[3] However, evidence of how agriculture contributes to improving an individual's nutritional status, especially the nutritional status of children, remains inconclusive.

Food crop diversity in Zambia

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This brief provides empirical evidence of the effect of household production and consumption of nutrient-rich crops and livestock on the minimum acceptable diet (MAD) of children 6–23 months of age. The brief is based on results obtained from a study of 7,486 children from a corresponding number of households randomly sampled in the 30 districts of the second phase of the Scaling Up Nutrition (SUN 2.0)/Most Critical Days Programme Phase II (MDCP II).

The 2019 MCDP II Baseline Survey measured the status of agriculture factors associated with malnutrition and found the following:

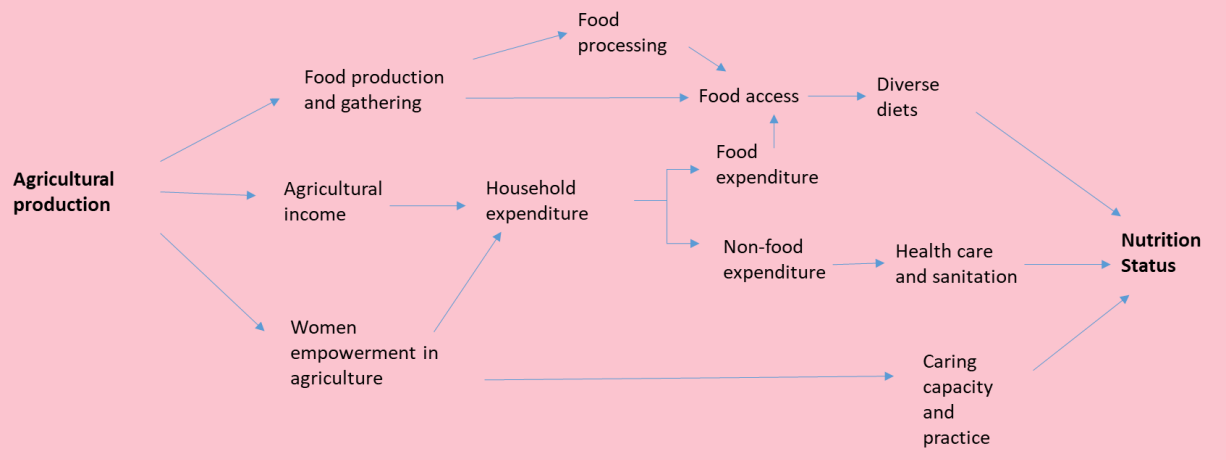
- Crop production of nutrient-rich crops and livestock for consumption positively and significantly influence children's attainment of MAD.
- Children in households producing and consuming nutrient-rich crops and livestock are four times more likely to achieve MAD than other children.
- Child's age in months, Minimum Dietary Diversity for Women, child's breastfeeding status, household reached with at least 90% of community nutrition interventions, mother's education level, mother's economic activity, and household's hunger status were important factors that significantly contributed to attainment of MAD in children.

Introduction

Stunting has remained high in Zambia, especially among child in rural households. Currently, 34.6% of the children in the country have stunted growth.[4] Nutrition-sensitive agriculture is one of the pathways to achieving child nutrition. As shown in Figure 1, stunting can be reduced by improving the diversity of a

child's diet. This brief presents results from an in-depth analysis of the effect of household production of nutrient-rich crops and livestock for consumption in Zambia and provides insights into nutrition-sensitive agricultural policies in the country.

Figure 1: Conceptual pathways from agricultural production to child nutrition



Adapted from: Herforth, A., & Harris, J. (2014). *Linking Agriculture and Nutrition: Understanding and Applying Primary Pathways and Principles. Brief #1*. Improving Nutrition through Agriculture Technical Brief Series.

Data and Methods

Data Sources

Cross-sectional data from the SUN 2.0/ MDCP II Baseline Survey were used to examine the impact of the production of nutrient-rich foods on MAD. The survey was conducted in 30 districts in Zambia in 2019 by the SUN Learning and Evaluation project. The data are representative at the district level with a sample size of 7,501 households. The sampled children were restricted to children under 24 months of age. The survey collected data on variables such as dietary diversity, diet frequency, and anthropometrics of children and mothers. During the interview, each mother was asked to recall all the food consumed by their children in the previous 24 hours.

MAD for children: MAD is the indicator of child nutrition in this brief. "This indicator measures the proportion of children 6-23 months of age who receive a minimum acceptable diet (MAD), apart from breast milk. It measures both the minimum feeding frequency and minimum dietary diversity, as appropriate for various age groups. If a child meets the minimum feeding frequency and minimum dietary diversity for their age group and breastfeeding status, then they are considered to receive a minimum acceptable diet."[9,10]

Production and consumption of nutrient-rich crops and livestock: Locally produced nutrient-rich crops and livestock that provide essential nutrients to maintain a healthy body were considered. These included crops such as dark green leafy vegetables, pumpkins, ground nuts, orange-fleshed sweet potatoes, squash, iron-rich beans, fruits, peas, lentils, orange maize, and carrots; and livestock such as chicken, rabbits, ducks, goats, pigs, cattle, and guinea fowl. The variable was equal to one if the households produced any of these crops and livestock and mainly consumed them.

Results and Discussion

Data from a total of 5,541 children, ranging from 6 to 24 months of age, were analysed. The mean age of the children observed was 14.1 months, with most children falling in the 12–24-month age group. Boys constituted 51.1%, and 48.9% were girls.

Attainment of MAD

As shown in Figure 2, less than a fifth (19.1%) of children achieved MAD in the 30 SUN 2.0/ MCDP II districts. More children in urban areas (28.5%) achieved MAD, compared to children in rural areas (14.7%). At the national level, 12% of children achieved MAD in 2019.[4]

Figure 3 shows the distribution of the prevalence of achieving MAD at the district level. Eight districts had rates below the national average of 12.0%, and more than half of the districts (red bars) were below the 19.1% average prevalence for the SUN 2.0 districts.

Figure 2: Minimum acceptable diet by region

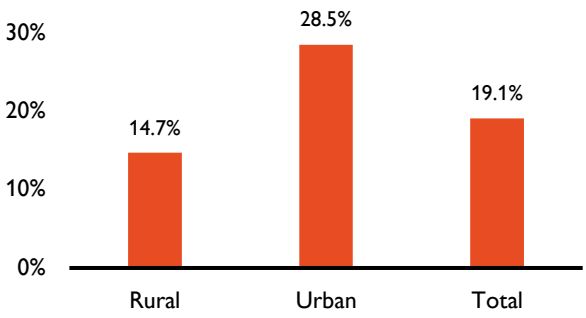
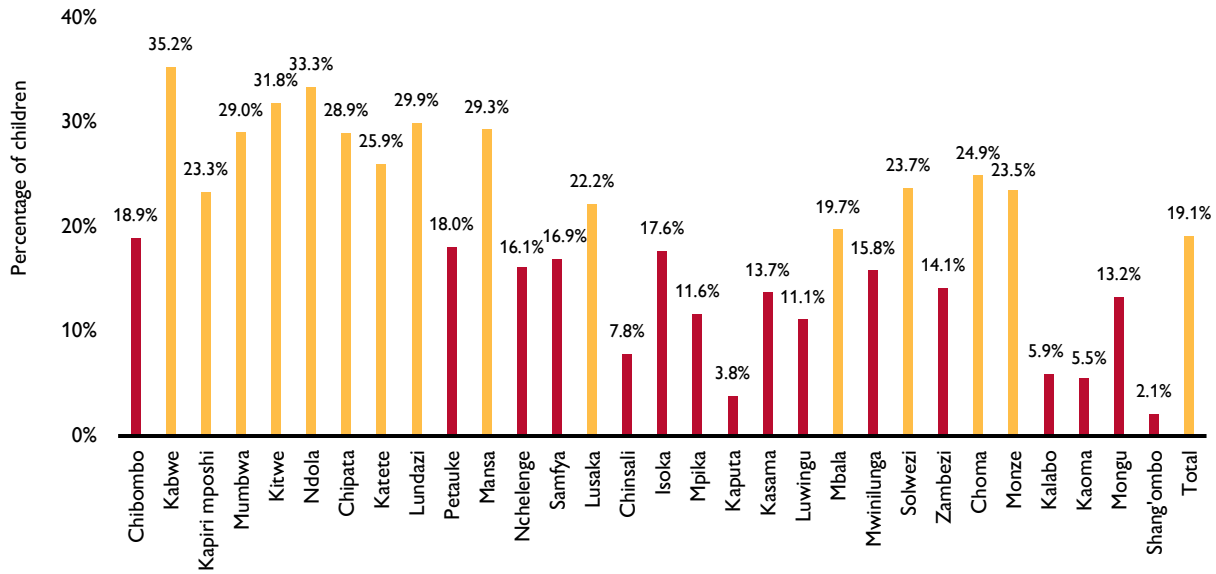


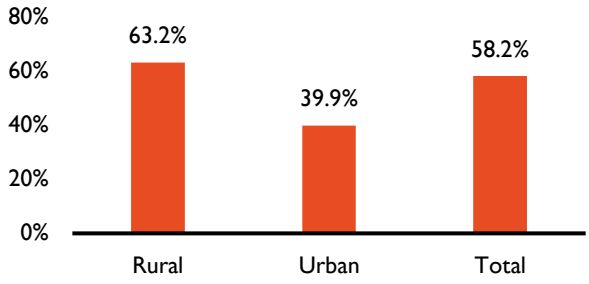
Figure 3: Minimum acceptable diet by district



Production and Consumption of Nutrient-rich Crops and Livestock

As shown in Figure 4, more than half (58.2%) of the households produced nutrient-rich crops and livestock for consumption. More households in rural areas (63.2%) produced nutrient-rich crops and livestock for consumption than households in urban areas (39.9%). This is expected, considering that rural households depend mainly on agricultural production for food provisions.

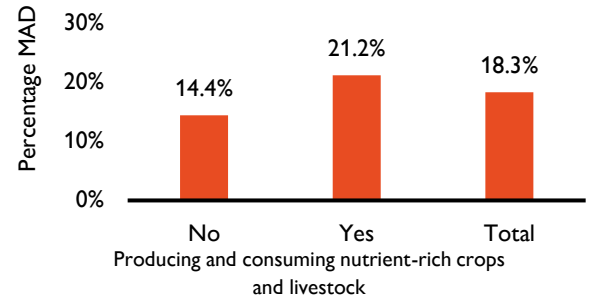
Figure 4: Production and consumption of nutrient-rich crops and livestock



Effect of Production of Nutrient-rich Crops and Livestock on MAD

As shown in Figure 5, there is a positive and significant association between the production and consumption of nutrient-rich crops and livestock and MAD of children (p=0.000). A higher proportion of children in households producing nutrient-rich crops and livestock attained MAD, compared to children in households that did not.

Figure 5: Association between production and consumption of nutrient-rich crops and livestock and MAD of children



Controlling for various factors that could influence MAD, the results still show that the production of nutrient-rich crops and livestock for consumption has a significant and positive influence on children's attainment of MAD. Children in households producing and consuming nutrient-rich crops and livestock are 79.1% more likely to achieve MAD than other children. These results indicate that improved access to nutritious foods at the household level, coupled with increased availability of diverse nutritious foods, is essential and can lead to improvements in child nutrition. This is achieved through the child consuming diverse foods or through the mother achieving Minimum Dietary Diversity for Women (MDD-W). Production of nutritious foods is also likely to improve household income if the produce is sold, because that money can be spent on the production of more diverse nutritious foods.

Other Factors Influencing MAD

Other factors, such child's age, community-level nutrition interventions, child's breastfeeding status, mother's nutritional status, mother's education level and economic status, and household food security status, significantly influence MAD of the child.

Regarding child's age, the results show that older children are 5.0% more likely to achieve MAD, compared to younger children. Although the change is small, the effect is highly significant and is as expected, considering that younger children are less likely to eat a variety of food. With regards to breastfeeding, the results show that children who have been breastfed are 68.2% more likely to achieve MAD than those who are not breastfed. Nutrition interventions delivered at the community level are important for improving child nutrition status. The results show that children whose households were reached by at least 90% of the community-level nutrition interventions were 17.6% more likely to achieve MAD, compared to those who were reached by fewer interventions or no interventions.

The study also found that the demographic and economic status of the mother have a significant effect on child nutrition. Children with mothers who achieve MDD-W were 78.9% more likely to achieve MAD, compared to children with mothers who do not achieve MDD-W. Age of the mother affects MAD at the 95% significance level. The study found that children with older mothers had a high probability of achieving MAD. Results showed a 5.0% likelihood of a child achieving MAD among older mothers, compared to younger mothers.

Further, results show that children with mothers who have attained secondary school or higher levels of education are more likely to achieve MAD, compared to children whose mothers have no education. Attaining primary school has no significant effect on MAD. The results on the effect of education on child nutrition are as expected, given that educated mothers are well-informed about the nutritional and health needs of their children and hence are more likely to feed their children a balanced diet. More educated mothers are also more likely to earn higher wages and salaries, compared to those with less education. These results are consistent with several previous studies.[5,6,7]

With regards to economic status of the mother, the results show that children with mothers who were primarily engaged in some form of employment (formal or informal employment) were more likely to achieve MAD than those with mothers who were primarily engaged in small-scale farming.

Furthermore, the results show that experiencing severe hunger at the household level has a negative effect on child's attainment of MAD. Children from households experiencing severe hunger were 5.5% less likely to achieve MAD.

Policy Environment

The Government of Zambia has made several commitments to end poverty, ensure food security, and improve the nutrition status of the population, particularly that of women and children. Some of these commitments include being signatory to the Sustainable Development Goals; adopting the United Nations Vision 2030, with the aim of ensuring that Zambia becomes a middle-income country by 2030; and adopting the Malabo declaration that is being implemented through the Comprehensive Africa Agriculture Development Programme to spearhead accelerated growth and agricultural transformation. At the national level, the government has developed policies such as the Second National Agricultural Policy (SNAP) of 2016 to 2020, aimed at addressing food insecurity at household and national levels. The SNAP emphasises agricultural diversification to enable a household to consume a diverse range of food. The introduction of agricultural input subsidies through an e-voucher system of the Farmer Input Support Programme was one way of promoting agricultural diversification by letting farmers access inputs of their choice. The programme was marred with several technical and administration challenges, however, and the decision to implement it throughout the country was quickly reversed. The SNAP does not specify the agricultural production combinations required to achieve an adequate supply of key nutrients at the household level.

Conclusion and Recommendations

The policy brief has discussed the effects of the production of nutrient-rich crops and livestock for consumption on child nutrition status measured by MAD. The results show that child dietary diversity is highly influenced by household production of nutrient-rich crops and livestock ($p=0.000$). Other factors, such as child's age, community-level nutrition interventions, child's breastfeeding status, mother's nutrition status, mother's education level, mother's economic status, and household food security status, significantly influence MAD of the child.

These results clearly indicate the importance of a household's production and consumption of nutrient-rich crops and livestock in improving child dietary requirements. The findings reflect the conceptual pathways from agricultural production to child nutrition, in which dietary intake is an immediate outcome of agricultural production. Yet, Zambia's current agricultural policy focus is on producing crops (mainly maize) for the market, with less emphasis on producing crops with high nutrient content.

Based on the findings outlined above, this brief recommends policies and interventions that encourage nutrition-sensitive agricultural production for consumption at the household level to improve both women's and children's dietary intake. More specifically, there is a need to:

- Develop policies and programmes that promote the production of nutrient rich crops for consumption and not only for the market.
- Revisit the administration of the Famer Input Support Programme through the e-voucher system for producers of other crops other than maize.
- Promote policies that support community-based interventions aimed at addressing child dietary diversity, particularly in the SUN 2.0 districts. More resources should be allocated to district-level structures, especially through the Ministry of Community Development and Social Welfare. Currently budgetary allocations to districts for community-based interventions remain inadequate limiting implementation of programs.
- Programmes, such as the Famer Input Support Programme or the fertilizer support programme under the Ministry of Community Development and Social Welfare, should consider targeting mothers with lower levels of education, those who do not achieve MDD-W, and those whose primary economic activity has a significant effect on child dietary diversity.
- Promote economic diversification programmes, especially in rural areas and among women to enable mothers to diversify their economic activities into off-farm employment and businesses.
- Enhance government policies promoting breastfeeding, especially in urban areas where breastfeeding rates are lower.
- Review current agricultural policies, which are mainly focused on promoting national food security, to address seasonal hunger, especially among households in rural areas.

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ABOUT SCALING UP NUTRITION Zambia

The Government of the Republic of Zambia (GRZ) is a member of Scaling Up Nutrition (SUN)—a global movement uniting governments, civil society, businesses, and citizens in a worldwide effort to end undernutrition. Phase 1 of the Zambia SUN programme began in 2013 with the goal to reduce stunting among children less than 24 months old in 15 districts.

Currently in its second phase, SUN has increased from 15 to 30 districts, coordinated by the National Food and Nutrition Commission of Zambia, and supported by a variety of partners and donors, including USAID/Zambia who supports the SUN programme through the SUN Learning and Evaluation (SUN LE) project.

This Policy Brief was made possible with the generous support of the American people through the U.S. Agency for International Development under USAID contract no. 72061119C00003.

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