FACTS ABOUT AGRICULTURAL DIVERSIFICATION IN ZAMBIA

Rhoda Mofya-Mukuka, PhD

Presentation at a Dialogue on Key Agricultural Facts with Zambia
Solwezi, 6th May, 2016
Presentation Flow

1. Overview of Agricultural Diversification
2. Concerns about Maize Centered Policies
3. Opportunities for Alternative Value Chains
4. Way Forward
## Overview of Agricultural Diversification

### Trends in Crop Diversification

<table>
<thead>
<tr>
<th>Region</th>
<th>2004</th>
<th>2008</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>.44</td>
<td>.33</td>
<td>.38</td>
<td>.36</td>
</tr>
<tr>
<td>Copperbelt</td>
<td>.38</td>
<td>.26</td>
<td>.27</td>
<td>.27</td>
</tr>
<tr>
<td>Eastern</td>
<td>.46</td>
<td>.44</td>
<td>.45</td>
<td>.46</td>
</tr>
<tr>
<td>Luapula</td>
<td>.31</td>
<td>.30</td>
<td>.39</td>
<td>.38</td>
</tr>
<tr>
<td>Lusaka</td>
<td>.21</td>
<td>.14</td>
<td>.21</td>
<td>.20</td>
</tr>
<tr>
<td>Muchinga</td>
<td>-</td>
<td>-</td>
<td>.52</td>
<td>.49</td>
</tr>
<tr>
<td>Northern</td>
<td>.55</td>
<td>.46</td>
<td>.52</td>
<td>.49</td>
</tr>
<tr>
<td>NorthWestern</td>
<td>.43</td>
<td>.30</td>
<td>.38</td>
<td>.40</td>
</tr>
<tr>
<td>Southern</td>
<td>.30</td>
<td>.27</td>
<td>.30</td>
<td>.29</td>
</tr>
<tr>
<td>Western</td>
<td>.40</td>
<td>.30</td>
<td>.38</td>
<td>.35</td>
</tr>
<tr>
<td>Zambia</td>
<td>.42</td>
<td>.35</td>
<td>.38</td>
<td>.37</td>
</tr>
</tbody>
</table>
Average Number of crops grown per Household - National

Indaba Agricultural Policy Research Institute
Northwestern Average Number of crops grown per Household

<table>
<thead>
<tr>
<th>Number of Crops</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.5%</td>
</tr>
<tr>
<td>2</td>
<td>32.1%</td>
</tr>
<tr>
<td>3</td>
<td>27.9%</td>
</tr>
<tr>
<td>4</td>
<td>13.1%</td>
</tr>
<tr>
<td>5</td>
<td>5.2%</td>
</tr>
<tr>
<td>6</td>
<td>1.0%</td>
</tr>
<tr>
<td>7</td>
<td>0.0%</td>
</tr>
<tr>
<td>8</td>
<td>0.0%</td>
</tr>
<tr>
<td>9</td>
<td>1.2%</td>
</tr>
</tbody>
</table>
Overview cont.

- Policies are oriented towards achieving mainly maize self-sufficiency
  - 57% of 2016 agricultural budgetary allocation to maize subsidies
  - 89.4% farmers grow maize
  - Area under maize 54%
Proportion of cultivated area devoted to various crops

- **MAIZE**: 53.6%
- **Sorghum**: 6.15%
- **Cassava**: 10.6%
- **Groundnuts**: 7.5%
- **Soya Beans**: 3.3%
- **Groundnuts**: 3.2%
- **Sweet Potatoes**: 2%
- **Cassava**: 1.5%
- **Orange Sweet Potato**: 0.1%
- **All Other Crops**: 6.9%
Proportion of cultivated area devoted to various crops by Province (2015)

Source: CSO/MAL 2015
Upward trends in maize production

Source: MAL CFS various years
Share of crops total quantity produced

- Maize: 71%
- Wheat: 6%
- Soybeans: 6%
- Groundnuts: 3%
- Sweet Potatoes: 3%
- Seed cotton: 3%
- Rice: 1%
- Sorghum: 0%
- Maize for seed: 2%
- Irish potatoes: 1%
- Virginia Tobacco: 1%
- Burley Tobacco: 0%
- Popcorn: 0%
- Pineapples: 0%
- Castor beans: 0%
- Wheat: 6%
- Sunflower: 1%
- Mixed beans: 1%
- Millet: 1%
- Seed cotton: 3%
- Sweet Potatoes: 3%
- Irish potatoes: 1%
- Virginia Tobacco: 1%
- Burley Tobacco: 0%
- Popcorn: 0%
- Pineapples: 0%
- Castor beans: 0%
Concerns on Maize Centric Policies
Concerns on Maize Centric Policies

- Limit the potential to use agriculture as a poverty reduction tool
  - Elevate risks, at both household and economy-wide level, associated with:
    - Climate change – droughts
    - Price volatility
    - Market risks
- Deplete soil nutrients through soil mining
- Limit the scope and scale of agro-processing, trading and input supply
Level of Undernourishment

Source: FAO et al. 2014
Global Hunger Index for Zambia

Source: IFPRI, 2014
Households Reporting inadequate Food Provisions

<table>
<thead>
<tr>
<th>Year</th>
<th>Households with adequate food provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>46.7%</td>
</tr>
<tr>
<td>2015</td>
<td>46.0%</td>
</tr>
</tbody>
</table>

Graph showing percentages of households with adequate food provisions from 2012 to 2015.
Households Reporting inadequate Food Provisions

<table>
<thead>
<tr>
<th>Province</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>6</td>
<td>8.20</td>
</tr>
<tr>
<td>Copperbelt</td>
<td>5.45</td>
<td>5.52</td>
</tr>
<tr>
<td>Eastern</td>
<td>20.6</td>
<td>8.18</td>
</tr>
<tr>
<td>Luapula</td>
<td>14.8</td>
<td>1.81</td>
</tr>
<tr>
<td>Lusaka</td>
<td>3.4</td>
<td>2.05</td>
</tr>
<tr>
<td>Muchinga</td>
<td>7.5</td>
<td>10.12</td>
</tr>
<tr>
<td>Northern</td>
<td>9.5</td>
<td>13.31</td>
</tr>
<tr>
<td>Northwestern</td>
<td>5.4</td>
<td>4.43</td>
</tr>
<tr>
<td>Southern</td>
<td>9.9</td>
<td>13.68</td>
</tr>
<tr>
<td>Western</td>
<td>17.6</td>
<td>2.70</td>
</tr>
</tbody>
</table>
Months of Inadequate Food Provisions
Malnutrition Rates

- Stunting
- Wasting
- Underweight

Percentages over time:
- 1992
- 1996
- 2001-02
- 2007
- 2013-14
Opportunities for Agricultural Value Chains

Alternative

Indaba Agricultural Policy Research Institute

Soybeans
Rainfall, Soil and Crop Suitability by agro-ecological Region

Region IIb:
- Rainfall range 800 – 1,000 mm/annum
- Loamy to sandy soils
- Cassava, sorghum, millet, seseme, cashew nuts, livestock, fisheries

Region I:
- Rainfall Less than 800mm/annum
- Loamy to clay soils
- Cotton, sorghum millet, seseme, cashew nuts, livestock, fisheries

Region IIa:
- Rainfall range - 800 to 1,000mm/annum
- Inherent fertile plateau soils.
- Maize, cotton, tobacco, sunflower, soybeans, irrigated wheat, groundnuts, flowers, paprika, vegetables, cassava, millet, horticulture, livestock.

Region III:
- More than 1,000mm of rainfall/ annum
- Very deep soils, sandy clay loam.
- Cassava, millet, sorghum, beans, groundnuts, rice, coffee, tea, pineapples, fish farming, livestock.
Livestock Production Opportunities by Province

Source: Ministry of Fisheries and Livestock and
1. Horticulture

- Gross margins of cabbage, tomato and onion are much higher than that of maize:
  - 219 times for cabbage,
  - 179 times for tomato
  - 138 times for onions
Proximity to good road infrastructure significantly increases smallholder farmers participation in horticultural markets.

Chaotic market places disadvantage farmers and other market participants.

Price instability reduces the probability of participation in horticultural markets.
What’s the way forward for horticulture
2. Soybeans

Commercial farmers accounted for the 80% of the production 2015/16

Increasing demand for soybeans driven mainly by a fast-growing poultry sector

Between 2003 and 2015 soybean production in grew at an average annual rate of 22 percent

The soybeans sector is expected to grow by 8 percent a year over the medium term to 2020
Soybeans production trends
Opportunities for Soybeans production

- Rising prices, which are the result of increased domestic demand for soybeans in animal feed, cooking oil, and processed soya products

- Movement of grain traders into the smallholder soybean market

- Improving soil quality on smallholder farmers through maize/soybean crop rotations
3. Groundnuts

Challenges

- Poor yields - 0.45ton/ha against 1.5 – 4.0
- Low market participation among the producers - about 45% sell
- 20% production is traded, 80% is for home consumption.
- *High levels of aflatoxin contamination* caused by poor drying and storage methods.
- Low levels of export. Among the lowest in the region despite having favourable agro-ecological conditions for growing the crop.
- Poor storage methods
- Low value addition
Production growth of Groundnuts in Zambia (2003=100)
Need for Diversification

- There’s evidence that increasing production of high value crops cannot compromise food security.
- Income earned from high value crop sales is usually ploughed back for more production and even the production of maize for consumption and sale in case of surplus.
- There’s evidence that agricultural diversification increases levels of household food and nutrition insecurity.
- Agricultural diversity promotes dietary diversity!
Way Forward for Improving Crop Diversification

- Improve extension advice and services
- Research and development
- E-voucher for FISP
- Help both the producers and the private sector to manage risk associated with prices, input supply systems, output markets and other environment factors
- Invest in the road, water, and electricity infrastructure to make markets work
4. Rice

- Tremendous growth in production attributed to two factors;
  - In the early 2000 to about 2010, National Milling Company and FRA bought paddy rice from the farmers
  - MAL working with JICA promoted the growing of Nerica rice which is an upland rice

- Low 2015 production which can be attributed to low rainfall in the province
Rice Production Trends

![Graph showing rice production trends from 2002 to 2016.](image-url)
Low production compared to other SADC countries

- Zimbabwe
- Zambia
- United Republic of Tanzania
- Swaziland
- South Africa
- Mozambique
- Malawi
- Madagascar
- Democratic Republic of the Congo
- Angola
What is the Way Forward for Agriculture

- Develop horticultural wholesale markets under PPPs
- Legal and institutional framework to allow brokerage/agent as current system is chaotic and
Declining % share of groundnuts in total area cultivated compared to maize and cotton
Households Reporting inadequate Food Provisions

- In 2012, 46.7% of households reported inadequate food provisions.
- In 2015, 54.0% of households reported adequate food provisions.

Indaba Agricultural Policy Research Institute
Households Reporting inadequate Food Provisions

<table>
<thead>
<tr>
<th>Region</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>6</td>
<td>8.20</td>
</tr>
<tr>
<td>Copperbelt</td>
<td>5.45</td>
<td>5.52</td>
</tr>
<tr>
<td>Eastern</td>
<td>20.6</td>
<td>8.18</td>
</tr>
<tr>
<td>Luapula</td>
<td>14.8</td>
<td>1.81</td>
</tr>
<tr>
<td>Lusaka</td>
<td>3.4</td>
<td>2.05</td>
</tr>
<tr>
<td>Muchinga</td>
<td>7.5</td>
<td>10.12</td>
</tr>
<tr>
<td>Northern</td>
<td>9.5</td>
<td>13.31</td>
</tr>
<tr>
<td>Northwestern</td>
<td>5.4</td>
<td>4.43</td>
</tr>
<tr>
<td>Southern</td>
<td>9.9</td>
<td>13.68</td>
</tr>
<tr>
<td>Western</td>
<td>17.6</td>
<td>2.70</td>
</tr>
</tbody>
</table>
Budget allocation towards Maize Support

Source of data: MoFNP and MAL
2. Soybeans

- Between 2003 and 2015 soybean production in grew at an average annual rate of 22 percent
- Commercial farmers accounted for the 80% of the production 2015/16
- The soybeans sector is expected to grow by 8 percent a year over the medium term to 2020
- Increasing demand for soybeans driven mainly by a fast-growing poultry sector
Soybeans production trends

Production (MT) vs. Area planted (Ha)

Indaba Agricultural Policy Research Institute
Opportunities

 Rising prices, which are the result of increased domestic demand for soyabees in animal feed, cooking oil, and processed soya products

 Movement of grain traders into the smallholder soyabean market

 Improving soil quality on smallholder farmers through maize/soyabean crop rotations
3. Groundnuts

Challenges

- Poor yields - 0.45ton/ha against 1.5 – 4.0
- Low market participation among the producers - about 45% sell
- 20% production is traded, 80% is for home consumption.
- High levels of aflatoxin contamination caused by poor drying and storage methods.
- Low levels of export. Among the lowest in the region despite having favourable agro-ecological conditions for growing the crop.
- Poor storage methods
- Low value addition
Production growth of Groundnuts in Zambia (2003=100)
Declining % share of groundnuts in total area cultivated compared to maize and cotton
4. Rice

- Tremendous growth in production attributed to two factors;
  - In the early 2000 to about 2010, National Milling Company and FRA bought paddy rice from the farmers
  - MAL working with JICA promoted the growing of Nerica rice which is an upland rice
- Low 2015 production which can be attributed to low rainfall in the province
Rice Production Trends

![Graph showing the growth rate of rice production from 2002 to 2016. The growth rate increases from 2002 to 2010, peaks in 2010, and then decreases in 2014 and 2016.]
Low production compared to other SADC countries

![Graph showing maize production for various countries in SADC from 1990 to 2013. The graph compares the production of Zimbabwe, Zambia, United Republic of Tanzania, Swaziland, Mozambique, Malawi, Madagascar, Democratic Republic of the Congo, and Angola. The x-axis represents the years from 1990 to 2013, and the y-axis represents production in 000 tonnes.]
Conclusion

- The agriculture sector offers potential to contribute significantly to national GDP through producing a diversified range of products for the local and international markets.

- Current and past agricultural development policies have inclined towards promoting maize production.

- Current agricultural growth being recorded is only being experienced by a minority of relatively better off smallholders who are benefiting from the government support to the maize subsector.
3. Groundnuts

- Groundnuts remains an important crop in Zambia:
  - Alternative source of income
  - Important component source of protein in the much of the rural diet
  - Cultivated by almost half of the smallholders
  - Second most cultivated crop after maize
  - Share of total cultivated land was only 8.8 percent while maize constituted 20 percent
Soybeans growth rate 2002-2015

Source of data: Ministry of Agriculture & Livestock’s Crop Forecast Surveys, 2002-2014
Why groundnuts?

- Rich in proteins, critical nutrient for reducing impaired growth especially in children
- High Demand for groundnuts locally and regionally
- An important raw material
- A woman’s crop – source of income for women
- Nitrogen fixation in the soil, which enhances soil fertility – low input crop

❖ More potential to improve household income, reduce poverty, improve the livelihoods and the nutrition status of the rural households
Soybeans markets

- 89 percent of the soybeans produced in the country is consumed by the animal feed industry.
- Remainder is for human consumption, and consumed as soy chunks and soy products such as Yummy Soy.
- By 2011 Zambia imported an average of 11,200 MT of soy oil and 25,000 MT of soya-oil cake and became a net importer of soybeans/products.
- 70 percent of Zambia’s national edible oils requirement is still met through imports (Chisanga and Sitko, 2013).
## Crop Diversification by Province, 2004 - 2012

<table>
<thead>
<tr>
<th>Province</th>
<th>2004</th>
<th>2008</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>.44</td>
<td>.33</td>
<td>.38</td>
</tr>
<tr>
<td>Copperbelt</td>
<td>.38</td>
<td>.26</td>
<td>.27</td>
</tr>
<tr>
<td>Eastern</td>
<td>.46</td>
<td>.44</td>
<td>.45</td>
</tr>
<tr>
<td>Luapula</td>
<td>.31</td>
<td>.30</td>
<td>.39</td>
</tr>
<tr>
<td>Lusaka</td>
<td>.21</td>
<td>.14</td>
<td>.21</td>
</tr>
<tr>
<td>Muchinga</td>
<td>-</td>
<td>-</td>
<td>.52</td>
</tr>
<tr>
<td>Northern</td>
<td>.55</td>
<td>.46</td>
<td>.52</td>
</tr>
<tr>
<td>Northwestern</td>
<td>.43</td>
<td>.30</td>
<td>.38</td>
</tr>
<tr>
<td>Southern</td>
<td>.30</td>
<td>.27</td>
<td>.30</td>
</tr>
<tr>
<td>Western</td>
<td>.40</td>
<td>.30</td>
<td>.38</td>
</tr>
<tr>
<td>Zambia</td>
<td>.42</td>
<td>.35</td>
<td>.40</td>
</tr>
</tbody>
</table>
Way Forward for Soybeans

- Increase productivity – improve extension services
  - Use of inoculum among Smallholders
  - Optimal input use to increase productivity & profitability
  - Legume-cereal rotation

- Edible oil import ban not a solution
  - Regional competition to increase productivity and make oils cheaper for Z consumers
  - Measures in place to ensure that imported oil is regional origin

- Awareness of use and benefits of consuming soybeans products,
Percent change in household income by participating in maize and horticultural markets

- All sellers: 157 (Maize), 22 (Horticulture)
- Households cultivating under 1 ha: 167 (Maize), 28 (Horticulture)
- Male headed households: 154 (Maize), 61 (Horticulture)
- Female headed households: 172 (Maize), 15 (Horticulture)
- Extremely poor households: 162 (Maize), 26 (Horticulture)
Horticulture way forward cont.

- Develop wholesale market e.g on the outskirts of Lusaka using cost-effective design with concrete flooring to facilitate drainage and cleaning
  - designated entry and exit points for vehicular and human traffic
  - Loading and off-loading bays, storage facilities
Production of maize in relation with other crops (2015)

Crop production (MT)

- Soya beans
- Groundnuts
- Sunflower
- Millet
- Rice
- Sorghum
- Maize

- 500,000
- 1,000,000
- 1,500,000
- 2,000,000
- 2,500,000
- 3,000,000
Budget allocation towards Maize Support
The Aflatoxin problem

- Groundnuts are highly prone to aflatoxin contamination (*Chuku*)
- Aflatoxin effects: liver cancer (*Hepato-Cellular Carcinoma (HCC)*), physical and mental development—e.g. stunting in Children
- Limits farmer’s access to international markets
- EU requirements max 10ppb (for processing) and 4 ppb for direct consumption.
- South Africa – requires max 5ppb
- EP survey (*Icrisat*)– 4 to 100ppb. Nyimba upto 4,980ppb
Way forward for groundnuts

- Private sector investment - supply of hybrid seed varieties using the out-grower model.
- Adoption of labour saving technologies
  - Intensify extension and training of farmers
- Increase local assembling of produce
  - linked to larger traders/marketing agents
  - links to national and regional level markets
- Increase oil processing using technologies that also use groundnuts as an ingredient in poultry feed
- Increase private sector investment in aflatoxin mitigation.
Mitigating Aflatoxin

- Aflatoxin mitigation –
  - Extension services on harvesting, shelling and storage
  - Establishing groundnut standards,
  - Aflatoxin testing equipment
  - Peanut butter and oil processing
Opportunities For Public And Private Sector Investment

- Development and supply of improved and certified seed – in partnership with already established channels ie EPFC and COMACO
- Development/distribution of labour-saving technologies – ADP – use of modified ploughs for harvesting, shellers, farmer training and credit schemes
- Group selling (bulking) – to access large markets, monitor standards
4. Rice

- Tremendous growth in production attributed to two factors;
  - In the early 2000 to about 2010, National Milling Company and FRA bought paddy rice from the farmers
  - MAL working with JICA promoted the growing of Nerica rice which is an upland rice

- Low 2015 production which can be attributed to low rainfall in the province
Soybeans markets

- 89 percent of the soybeans produced in the country is consumed by the animal feed industry.
- Remainder is for human consumption, and consumed as soy chunks and soy products such as Yummy Soy.
- By 2011 Zambia imported an average of 11,200 MT of soy oil and 25,000 MT of soya-oil cake and became a net importer of soybeans/products.
- 70 percent of Zambia’s national edible oils requirement is still met through imports (Chisanga and Sitko, 2013).