DIVERSIFYING LOCAL LIVELIHOODS: TANZANIA
EXPERIENCE OF DIVERSIFYING FOOD PRODUCTION
AVRDC- WVC/TAHA/SUA

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Background

• Agricultural production systems: from local diversified (cereals, roots, horticulture) systems to monoculture farming

• Consequences:
  – Loss of diversified diets
  – Disappearance of indigenous foods
  – Vulnerability to economic instability
  – Income does not guarantee nutritional quality of diets
HORTICULTURE IN TANZANIA’S AGRICULTURE PRODUCTION SYSTEMS
Staple crops include maize, rice, sorghum/millets, wheat, and banana:
  – Consumption and income generation
  – Research and development, markets, etc.

Traditional cash crops: sisal, coffee, cotton, tea, pyrethrum
  – Export earnings declined from 50% in 1990 to 2.3% in 2002
MITIGATION MEASURES ADOPTED

• Diversification
  – Inclusion of other non-farm activities e.g. mining, carpentry, crafting.
  – Promotion of non-traditional products for export markets: horticulture, fish and minerals.
Non Traditional Cash Crops

• Promotion of non-traditional cash crops:
  – Diversify agricultural exports
  – Increase foreign currency earnings
  – Diversify sources of nutrients hence diets
**HORTICULTURE IN TANZANIA**

- Integral part of agricultural practice and consumption at household level
- Huge commercial potential for domestic and export markets

<table>
<thead>
<tr>
<th>Proportion</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.8%</td>
<td>Total crops</td>
</tr>
<tr>
<td>14.2%</td>
<td>Total export</td>
</tr>
<tr>
<td>26.7%</td>
<td>GDP in 2006</td>
</tr>
<tr>
<td>30%</td>
<td>Export earnings</td>
</tr>
<tr>
<td>65%</td>
<td>Industrial raw materials</td>
</tr>
</tbody>
</table>

- Paucity of statistics of Non Traditional Agricultural Production due to
  - Small scale producers
  - Informal cross-border trade
## HORTICULTURAL CROPS

<table>
<thead>
<tr>
<th>Type</th>
<th>Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruits</strong></td>
<td>Pawpaw, oranges, mangoes, pineapples, banana, guava, grapes, tamarind, peaches, pears, apples, jackfruits, breadfruits, strawberries to mention a few.</td>
</tr>
<tr>
<td><strong>Non leafy vegetables</strong></td>
<td>Tomatoes, onions, carrots, sweet pepper, cauliflower, cucumber, eggplant, African eggplant, okra, etx</td>
</tr>
<tr>
<td><strong>Leafy vegetables</strong></td>
<td>Amaranths, night shade, pumpkin leaves, sweet potato leaves, cassava leaves and a wide range of indigenous leafy vegetables.</td>
</tr>
<tr>
<td><strong>Spices, herbs and infusions</strong></td>
<td>Cinnamon, cloves, turmeric, ginger, black pepper, garlic, coriander, green tea, roselle, lemon grass, etc.</td>
</tr>
<tr>
<td><strong>Medicinal</strong></td>
<td>Aloe Vera, Artemisia</td>
</tr>
<tr>
<td><strong>Flowers</strong></td>
<td>Roses, carnation</td>
</tr>
</tbody>
</table>
Challenges

- Inadequate supply of inputs, seeds, research and extension.
- Poor marketing system
- Quality deterioration
- Post harvest losses
- Inadequate storage, packaging, technology and processing facilities
- Poor infrastructure
- Inadequate quality control system
- Weak industry linkage
- Inadequate research
- Inadequate data on production, marketing and income/wealth generated
- Inadequate skilled and competent human resource
- Underdeveloped business environment for horticulture
- Inadequate promotion
- Limited access to finance and investment
- Unfavourable land policy
- Limited appreciation of its contribution to food and nutrition security
Role of the AVDRC – WVC
Asian Vegetable Development and Research Centre
World Vegetable Centre
Arusha
• Focuses on research and development of African indigenous vegetables
• 2000 accessions of African indigenous vegetable germplasm developed and conserved
• Promotes consumption of high nutrient, diverse and safe vegetables with enhanced nutritional qualities and Nutriceuticals potential
## Nutrient content of Indigenous Vegetables

<table>
<thead>
<tr>
<th>Vegetable type</th>
<th>Fe (mg)</th>
<th>Zn (mg)</th>
<th>B-carotene (µg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amaranth</td>
<td>5.95 – 37.50</td>
<td>0.36 – 0.43</td>
<td>2.7 – 3.29</td>
</tr>
<tr>
<td>Nightshade</td>
<td>6.95 – 14.55</td>
<td>0.21 – 0.26</td>
<td>1.09 – 5.02</td>
</tr>
<tr>
<td>African egg plant</td>
<td>2.00 – 2.80</td>
<td>0.12 – 0.32</td>
<td>0.04 – 0.29</td>
</tr>
<tr>
<td>Sweet potato leaves</td>
<td>1.4 - 67.00</td>
<td>0.2 – 2.42</td>
<td></td>
</tr>
<tr>
<td>Cassava leaves</td>
<td>12.2 – 41.3</td>
<td>3.67 – 13.06</td>
<td></td>
</tr>
<tr>
<td>Chinese cabbage</td>
<td>38.4 – 43.6</td>
<td>5.8 – 6.89</td>
<td></td>
</tr>
<tr>
<td>Amaranth</td>
<td>33.09 – 64.4</td>
<td>3.65 – 6.42</td>
<td></td>
</tr>
<tr>
<td>Cowpea leaves</td>
<td>22.20</td>
<td>3.01</td>
<td></td>
</tr>
<tr>
<td>Pumpkin leaves</td>
<td>14.4 – 57.40</td>
<td>3.42 – 4.69</td>
<td></td>
</tr>
<tr>
<td>Spider flower</td>
<td>57.90</td>
<td>9.57</td>
<td></td>
</tr>
</tbody>
</table>
## Nutrient Content of Cereals

<table>
<thead>
<tr>
<th></th>
<th>Fe (mg)</th>
<th>Zn (mg)</th>
<th>B-carotene (µg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>2.4 - 3.5</td>
<td>1.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Sorghum</td>
<td>4.1</td>
<td>1.6</td>
<td>0</td>
</tr>
<tr>
<td>Wheat</td>
<td>1.2</td>
<td>0.7</td>
<td>0</td>
</tr>
<tr>
<td>Rice</td>
<td>0.6</td>
<td>1.2</td>
<td>0</td>
</tr>
</tbody>
</table>
Sokoine University
TRAINING
Programmes:

- Agriculture,
- Economics,
- Engineering,
- Bioprocess & Post Harvest Engineering,
- Irrigation,
- Horticulture (230),
- Agronomy,
- Nutrition (1370),
- Animal science, Aquaculture,
- Food science
Nutrition Training

• In 1985 – 2000 nutrition course was core for all degree programs in the faculty of Agriculture
• Currently, an elective course for all programs and increasingly more students are electing.
Client-oriented & Demand Driven on Farm Research
Uluguru Mountain Horticulture Development Project

Uluguru Mountain Agricultural Development Project

Location: Upper Mgeta ward of Morogoro District, on the slopes of Uluguru Mountains.
UMHODEP → UMADEP

Objectives: strengthen the linkage between experts from SUA and communities in the Uluguru Mountains to be able to provide alternative agricultural solutions

approach:

– Trial demonstrations
– Regular training seminars
– Farmers' participation: continuous assessment and indigenisation of the innovation
Tissue culture

• In vitro mass propagation of clean planting materials of desirable banana and pineapple cultivars

Banana: 31 cultivars
11,000 plants distributed to 118 farmers
Potted Banana plant and produce
Other Research Activities

- Pigeon pea
- Soya bean
- Mushroom
- Livestock
- Vanilla
Nutrient Analysis

• SUA/AVDRC/Giessen collaboration
  – Analysed more than 50 different varieties of indigenous vegetables
  – Results have not been transformed into useful information for consumers in the communities.
  – A gap in communication
Outreach
Recipes for Success

• (SUA-GLOBAL HORTI):
  – Objective: Enhancing productivity and consumption of indigenous horticultural food crops for better nutrition and health
  – Approach: Health Clubs - community-run resource centres to enhance communication of research results
Extension Support

• Collaboration: Ministry of Agriculture and Food Security to produce various nutrition Information and extension materials for community use
OUTREACH ACTIVITIES

• Vegetable processing and cooking methods to enhance high nutrition retention.

• Formation of village nutrition groups to motivate nutrition activities in the community.
COOKING DEMONSTRATIONS

• Attracted men and community leaders, to come out, prepare and test some of the cheap and often neglected vegetables can be prepared into tasty dishes.
CAADP Nutrition Capacity Development Workshop
Lessons Learnt

- No additional production costs, traditional farming and marketing systems
- Understanding of the benefits
- Physical and market Infrastructure
- Regular sharing of results
- Information, education and communication materials
Challenges

• **Research**: how can we mainstream nutrition and agriculture research in local and district plans

• **Training**:
  – discriminatory sponsorship and
  – How can we organise training at all levels to accommodate these changes

• **Outreach**: how can we involve the media for sharing results
Opportunities

• Kilimo Kwanza
• Political environment
• Markets
• High awareness
• Diversified training programs
• Job prospects
Way forward

- Understanding diversity benefits
- Integrate diversity in agricultural regional planning
- Encourage and support private sector/communities in biodiversity conservation
- Include biodiversity components into agriculture, forestry, fisheries, nutrition and health
- Design governance approaches to support diversity in agriculture/food production/consumption
- Promote information, education and communication materials on agricultural/food production diversity
- Promote nutrient analysis of indigenous vegetables and fruits.
Thank you
TANZANIA HORTICULTURE ASSOCIATION

- Promotes and informs the Tanzanian horticulture sector at national and international levels.
- Collection centres for horticultural products in Arusha, Morogoro, Tanga and Njombe regions.
- Package horticultural produce and products for distribution