Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Human Nutrition and Well Being: The case of Kenya

Regional Workshop on Inter-linkages between Human Health and Biodiversity- Maputo
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Narrowing of world’s food basket

- 300,000 • Known plant species
- 100,000 • Used by humankind
- 30,000 • Edible
- 7,000 • Used as food at local level
- 120 • Important at national scale
- 30 • Provide 90% of plant calories
- 4 • Provide 60% (rice, wheat, maize, potato)

Increased reliance on major crops furthered by globalization trends

Source: E. Frison, Bioversity 2012
A highly concerning global challenge

National Geographic 2011
Study conducted in 1983 by the Rural Advancement Foundation International gave a clue to the scope of the problem. It compared USDA listings of seed varieties sold by commercial US seed houses in 1903 with those in the US National Seed Storage Laboratory in 1983. The survey, which included 66 crops, found that about 93 percent of the varieties had gone extinct.

Source: E. Frison, Bioversity 2012
## Nutritional benefits
### Case of African leafy vegetables

<table>
<thead>
<tr>
<th></th>
<th>Amaranth (leaf)</th>
<th>Cleome</th>
<th>Nightshade</th>
<th>Cabbage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Per 100 gm</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron mg</td>
<td>8.9</td>
<td>6.0</td>
<td>1.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Calcium mg</td>
<td>410</td>
<td>288</td>
<td>442</td>
<td>47</td>
</tr>
<tr>
<td>β carotene μg</td>
<td>5716</td>
<td>10452</td>
<td>3660</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: E. Frison, Bioversity 2012
**Project aim:** Strengthen the conservation and sustainable use of biodiversity with high nutritional potential, by mainstreaming into nutrition, food and livelihood security strategies and programmes; develop markets and value chains for nutritionally-relevant biodiversity.

- **Plants for the Future Project (70 spp.)**
  - Non conventional leafy vegetables

- **Native root and tuber crops, traditional rice varieties, leafy vegetables and native fruits**
  - ALVs, sorghum, millets, nuts and oil crops, indigenous fruits and livestock

**5 year project : 2012 - 2017**

**Provide Evidence** – Demonstrate the nutritional value of local BFN and the role it plays in promoting healthy diets and strengthening livelihoods

**Influence Policies** - Use the evidence to influence policies and markets that support the conservation and sustainable use of BFN for improved human nutrition and wellbeing

**Raise Awareness** – Develop tools and best practices for scaling up the use BFN in development programmes, value chains and local community initiatives.
Involvement of a variety of actors

- Agronomists
- Environmentalists
- Health specialists
- Social services
- Nutritionists
- Processing & Marketing specialists
- Policy makers

Smallholder farmers and their communities
Project Components Activities and Outputs
Component 1
KNOWLEDGE BASE

Output 1.1:
Assessments of nutritional value of agrobiodiversity, and associated traditional knowledge, is carried out in 3 ecosystems in Brazil, Turkey and Sri Lanka and 1 ecosystem in Kenya.

Output 1.2:
National portal on local foods, containing databases on nutritional properties of agrobiodiversity and associated traditional knowledge, developed in each country and linked to relevant national and global nutritional databases.

Output 1.3:
The contribution of biodiversity indicators for food composition and consumption for agricultural biodiversity conservation and sustainable use is assessed.
Component 2
POLICY & REGULATORY FRAMEWORK

Output 2.1:
Cross-sectoral national policy platforms for mainstreaming agricultural biodiversity conservation and sustainable use into nutrition, health and education programmes established

Output 2.2:
National and international policy guidelines and recommendations that promote the mainstreaming of agricultural biodiversity conservation and sustainable use into nutrition, health and education developed

Output 2.3:
New marketing options for biodiversity foods with high nutritional value identified and developed
Component 3
INCREASED AWARENESS & OUTSCALING

Output 3.1
Best practices for mobilizing biodiversity to improve dietary diversity identified and promoted

Output 3.2
Capacity of producers, processors, users and researchers to deploy and benefit from nutritionally relevant biodiversity enhanced

Output 3.3
National information campaigns that foster greater appreciation of biodiversity as a resource for development and well-being conducted

Output 3.4
Guidelines for improved use of nutritionally-rich foods from local biodiversity, including processing, food safety measures, and recipes adapted to modern lifestyles based on traditional food systems developed.

Output 3.5
Tools and methods for mainstreaming biodiversity into food and nutrition upscaled and disseminated.
Project Institutional Framework and Implementation Arrangements
Biodiversity for Food and Nutrition Project

South-South cooperation

Universities - Ministries of Env, Agr, Health, Edu, Social Develop. – Research organizations - NGOs – Federation of Nutritionists – School Meals Programme – Value chains prog...

KARI, genebanks, Ministries of Health and Ag, AIDS Control Program, Museums, Universities, Env Management Authority, Rural Outreach Programme

Ministries of Environment, Ag, Rural Industries, Health and Nutrition - Ayurvedic Research Institute - Botanic Gardens – Universities - NGOs


Cross-sectoral collaboration

BFN Project PLATFORM

Bioversity International
UNEP, FAO, WFP
AVRDC, Earth Institute, ICRAF, CFF
Kenya

National Executing Agency (KARI)

National Steering Committee

National Genebank of Kenya

Ministry of Health - National AIDS and STI Control Program

KARI Marketing Division

Ministry of Health - Division of Human Nutrition and Dietetics

KARI Kakamega

National Museums of Kenya

Kenyatta University

National Environment Management Authority

Ministry of Agriculture - Policy Department

Busia County Community

Rural Outreach Programme (ROP)
Pilot site baseline surveys

• Assess current availability of local biodiversity for food and nutrition, traditional food lists, availability and utilisation
• Assess food-associated traditional knowledge including food harvests, preparation and storage
• Documentation of indigenous knowledge, loss of food options /dietary diversity
African leafy vegetables marketing in Busia Town

Traders sorting and displaying ALVs for sale on a road side market in Busia (K)
Cowpea (*Vigna spp*)
(Luhya, Likhubi Swahili -(Kunde)

- Variety “Lel Kwach” used in management of stomach aches
- Variety “Ikhwaike ” used in treating STI (indwasi) and preventing miscarriage
Mushrooms

• Used in the treatment for measles
Ximenia americana

English: wild plum; Luhya (Bukusu): kumutuli-kumubukusu; Teso: olimu, elamai; Luo: olemo (red fruit), olimbochok (yellow fruit); Swahili: mtundukula, mtundakula, mpingi

- Fruit is edible
- Root bark used in tonic drink/tea
- Bark & root a dye source
- Seed oil a preservative & good for beauty care
- Wood used in building
- Leaves fodder
Mondia whitei
Luhya: Omukombero; Kikuyu: Můhukůra

• For asthmatics
• Muscle relaxant
• Mouth freshener
• Male strength
**Urtica massaica**

English: Stinging nettle; Luhya: Isambakhulu; Kikuyu: Hatha, thabai; Kipsigis: Siwot; Luo: Ayela; Maasai: Entamejoi

- Used against hair loss
- Constipation
- Indigestion
- Ulcers
- Anaemia
- High blood pressure
- Night sweats
- Diabetes
Tylosema fassoglensis
Bukusu: kumuchayu, chingayu; Maragoli: imbasa; Kamba: Ivoile; Luo: ombasa; Maasai: esinkarua; Samburu: dalamboi

- Young pods and seeds eaten, raw or roasted as groundnuts
- Leaves fodder
- Tuber used in medicine for backache & other illness
- Sold in many markets
Croton macrostachyus

English: Croton; Luhya – musutsu; Kikuyu, Meru: Mutundu; Luo – Ngong’ng’o’; Kipsigis, Nandi – tebeswet

- Wound healing
- Veterinary medicine
- Sap, leaves, root and bark
  - skin rashes
  - flu
Myrsine africana
Kamba: Muketa munini; Kikuyu: Mugaita; Kipsigis: osegeteti; Maasai: olsegetiti

- Fruits effective on worms
- Wide medicinal use
- Arbotifacient
- Vermifuge, Anthelmintic,
Searsii pyroides (Rhus natalensis)

English: rhus; Luhya (Bukusu): kumusangura kumusecha, (Tachoni): obusangura; Teso: ewayo, ebubu; Sabaot: sirwa; Luo: sangla, osangla; Swahili: mkono chuma

- Fruits edible
- Roots taken in soup
- Roots a source of dye
- Leaves a fodder
- Tender shoots and leaves chewed as khat (miraa)
- Twigs used a toothbrush
Strychnos henningsii

Borana: karaa; Giriama: mbathe; Kamba, Kikuyu: muteta; Maasai: entuyesi; Meru: muchimbi; Pokot: chapkamkam; Mbeere: mutambi; Samburu: nchipilikwa; Somali: hadesa

- Roots, stems and stem bark boiled in soup for fitness and painful joints (Kikuyu, Maasai, Kamba)
- Fruits used for flavouring beer (Mbeere)
- Root decoction & leaves drunk in soup or honey to treat malaria & rheumatism (Pokot)
Toddalia asiatica

Luhya: luabare; Kikuyu: mururue; Kamba: maluia

- Roots for management of HIV
- Strong anti-biotic and anti-viral properties
- Has a wide medicinal use
Zanthoxylum gilletii

English: African satinwood; Luhya: Shikhoma; Bukusu: Kumusikhu; Luo: Sogo maitha; Kikuyu: Muchagatha

- Bark used in cough medicine
- Stem used for sore gum as toothbrush
Terminalia brownii

Luo: Manera, onera; Kamba: muuuku; Embu, Mbeere, Tharaka – mururuku; Somali: Harar, biiris; Kipsigis: Moissot

- Bark decoction emetic, used for fevers, pneumonia and colds
- Ground bark used in old wounds
- Bark used for stomach aches, fresh cuts as bandage
- Arbotifacient
- Used to make dogs infertile
Conclusions

- Recognizing and promoting dietary diversity, food cultures and their contribution to good nutrition
- Appreciating synergies between human health and sustainable use of biodiversity

Help towards achievement of Aichi targets 1, 4, T, 13 and 14.
Biodiversity for Food and Nutrition Project

There is always room for more
Thank You