1. Policy outline - Bio economy Strategy
2. IKS and Food Security
3. IK-based Innovation Value Chain
4. Nutraceutical Consortium
5. Developed Product
6. Community Activities
7. Industry Involvement
8. Indigenous Health Beverages
9. Moringa
10. Output and Social Impact
IK-based Tech Innovation and Food Security

1. **12 Government Outcomes**
2. NDP, NGP, IPAP, APAP etc
3. DST 10 year innovation plan, R&D strategy
4. **IKS Policy**
5. 5 DST Grand Challenges
6. **Bio economy Strategy** - Grand Challenge
Bio-economy Strategy

• "Bio-economy" refers to bio-based science & innovation activities and processes that translate into economic outputs.

Manage NSI according to industry sectors, and incorporate value chain approach

Three thematic chapters:
• Agriculture
• Health
• Industry & Environment

IKS is a cross cutting pillar
IKS and Food Security

• Local communities have knowledge of indigenous edible plants that survive adverse weather conditions, like drought
• Some leafy vegetables are known to have health benefits in addition to their being source of nutrients
• Some current challenges associated with malnutrition, for instance vitamin A deficiency, can be addressed if indigenous foods are prioritized
• Indigenous vegetables like Cleome and cowpea leaves are a good source of pro-vitamin A carotenoids
• Indigenous legumes like cowpeas (Vigna unguiculata) are a source of protein
## IK-based Innovation Value Chain

<table>
<thead>
<tr>
<th>Applied RD</th>
<th>Innovation and Tech Diffusion</th>
<th>Commercialisation and Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>IKS-Based Concept Development</td>
<td>Applied Holistic Research and Development</td>
<td>Community Technology Transfer and Incubation</td>
</tr>
<tr>
<td></td>
<td>Inclusive Innovation and Product Development</td>
<td>Humane Business Models and Marketing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ubuntu Commerce and Benefit Sharing</td>
</tr>
</tbody>
</table>

**Flow Diagram**

1. Agreements
2. Clinical
3. Manufacturing
4. Commercialise
Nutraceutical Consortium

- **CSIR**: Product development
- **ARC**: Develop cultivation methods
- **University of Venda**: interaction with communities

- Plants being researched upon: indigenous and naturalised leafy vegetables: *Vigna unguiculata* (cowpea), *Cleome gynandra* and *Amaranthus cruentus*-naturalised, but IKS around its use has been developed
Developed Products

Herbal teas

Savoury muffin mix

Nutri-drink

Canned leafy vegetables
Community Activities

CSIR Team and the Community

Khanyisa Vegetable Processing Cooperative (14 members)

Food Processing Workshop

Demonstrating milling operations
Industry involvement: Commercialisation IK-based products

Field visits at ARC Roodeplaat

Discussing and finalising Nestle collaboration with Nutraceutical Consortium

Morogo/Imifino 2-minute Noodles was launched in October 2015
Many herbal teas and health teas that are currently traded are of foreign origin.

There are many indigenous teas known and used by communities –High in Nutrition and with Health benefits.

Current research projects by Universities and Research Councils are in cooperation with communities and some municipalities with NW province, Eastern Cape and Western Cape province.

These teas are planned to be packed into different blends, different formulations such as: iced teas, flavoured water, yoghurt, baby formula etc.

**Market Estimates:**
Harvest 8 ton/ha = 1600 ton ( R12.8 million)
640 ton of processed tea > R25 million

Industry Interest:

International consumer interest on the teas: Export 200 ton Honey bush and 5000 ton Rooibos to > 18 countries
IK-based Health & Nutri Beverages Processes and Products

Signing

Collection

Soil sampling, RDI

Community training

Products
Moringa Project

SEDIKONG CO-OPERATIVE, WITS, ARC, SABS
Moringa Products

Old package

New package
## Natural Markets

<table>
<thead>
<tr>
<th>Natural Product</th>
<th>Global Market Value</th>
<th>Forecasted Market Value</th>
<th>Leading continents and Countries</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural cosmetics (non-synthetic and highly organic)</td>
<td>$29.5bn</td>
<td>$10bn - $18bn (2013-2018)</td>
<td>Asia ($10bn)</td>
<td>Kline and Company, 2013 (international market research) USA</td>
</tr>
<tr>
<td>Nutraceuticals</td>
<td>Over $40bn</td>
<td>$236bn</td>
<td>USA ($50.2bn)</td>
<td>Frost and Sullivan and FICCI publication 2010 Mumbai - India</td>
</tr>
<tr>
<td>Traditional/Herbal Medicines</td>
<td>$62.0bn</td>
<td>$5TTrillion by 2050</td>
<td>European Union ($28bn)</td>
<td>ISM, AS Market report – Indian DSIR</td>
</tr>
<tr>
<td>Herbal/traditional Teas</td>
<td>$40.7bn</td>
<td>38bn litres and retail growth of over $8.1 from 2012 – 2017</td>
<td>USA ($10bn in 2013)</td>
<td>Tea Association of the USA Inc</td>
</tr>
</tbody>
</table>

### Natural cosmetics

- **Global Market Value**: $29.5bn
- **Forecasted Market Value**: $10bn - $18bn (2013-2018)
- **Leading continents and Countries**:
  - Asia ($10bn)
  - Brazil ($5.3bn)
  - USA ($4.5bn)
  - Germany ($1.2bn)
  - France ($57bn)
  - Italy ($520m)
- **Reference**: Kline and Company, 2013 (international market research) USA

### Nutraceuticals

- **Global Market Value**: Over $40bn
- **Forecasted Market Value**: $236bn
- **Leading continents and Countries**:
  - USA ($50.2bn)
  - Europe ($35bn)
  - India ($2bn)
- **Reference**: Frost and Sullivan and FICCI publication 2010 Mumbai - India

### Traditional/Herbal Medicines

- **Global Market Value**: $62.0bn
- **Forecasted Market Value**: $5TTrillion by 2050
- **Leading continents and Countries**:
  - European Union ($28bn)
  - Asia ($10.8bn)
  - Japan ($9.8bn)
  - N. America ($6.9)
  - South Africa ($2.9bn)
  - India ($463bn in 2010)
  - China (from $357 billion in 2011 to US$88 billion (B2.8 trillion) by 2017
- **Reference**: ISM, AS Market report – Indian DSIR

### Herbal/traditional Teas

- **Global Market Value**: $40.7bn
- **Forecasted Market Value**: 38bn litres and retail growth of over $8.1 from 2012 – 2017
- **Leading continents and Countries**:
  - USA ($10bn in 2013)
  - China (estimated $18.2bn in 2014)
  - Kenya ($920 million in 2009)
  - India ($260 million kg export by 2019-2020)
  - South Africa (R1 461/Kg in 2007/08)
- **Reference**: Tea Association of the USA Inc

---

**Note:** All market values and forecasts are approximate and may vary based on various factors and time periods.
Outputs and social impact

- Knowledge generation, e.g. patents, publications, etc.
- Commercial products
- Human capital development
- Community-based SMMEs
- Forging strategic partnerships
012 843 6314

Mammone.tang@dst.gov.za
Andile.grootboom.dst.gov.za
Hlupheka.chabalala@dst.gov.za

WE GIVE THANKS