Strategic Repositioning of NUS for

Food Security, Nutrition, Health and Economic Development

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African Proverb

“If you Want to go Fast, go Alone

If you Want to go Far, go Together”

In NUS for a Food Secure Africa

Do we want to Go Fast or or Do we want to go Far?

Outline of Presentation

- Introduction
- Value and Potential NUS
- Major Constraints
- Repositioning Initiatives and Strategies
- Conclusions and Recommendations
- What needs to be done?
- My Appeal
- Acknowledgement

Introduction

JKUAT, Kenya
A University of Global Excellence in Training, Research and Innovation for Development

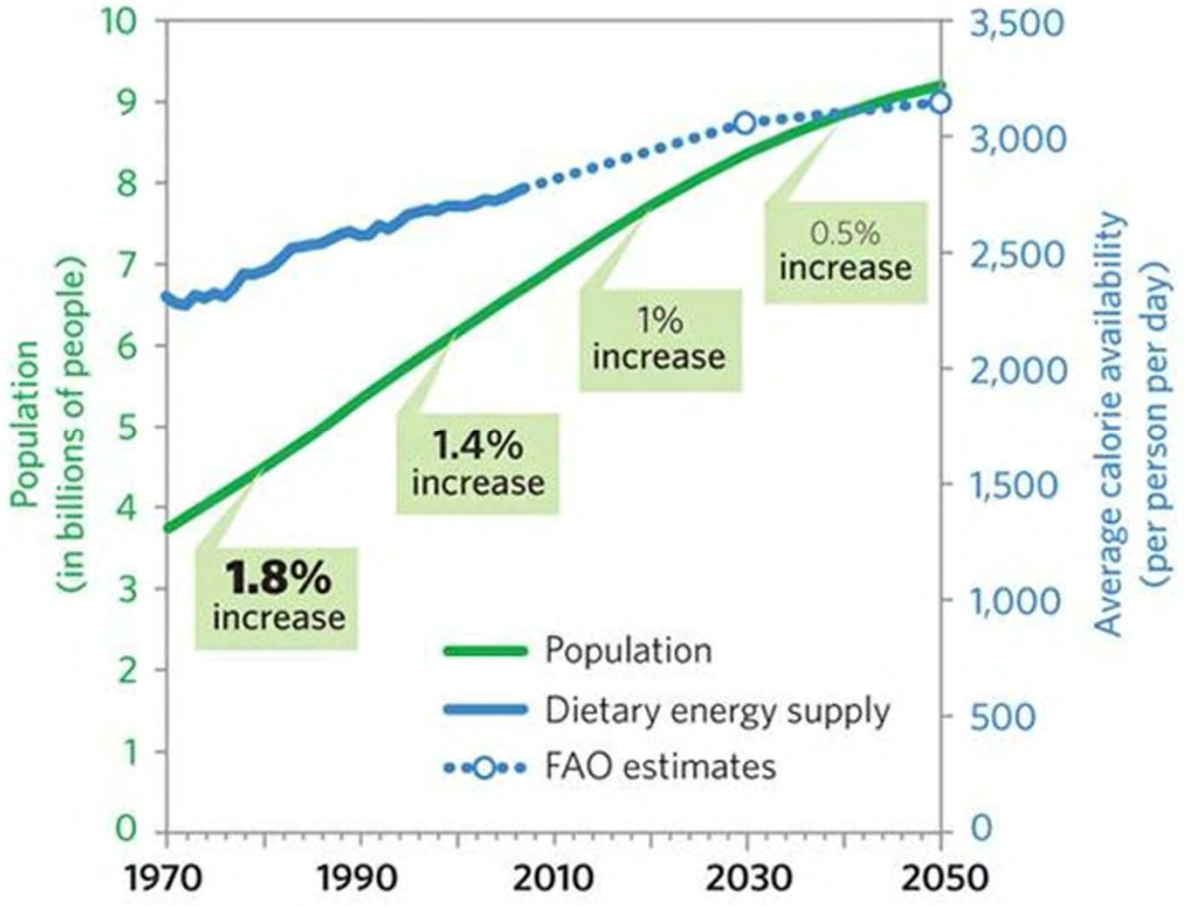
Introduction

Research Activities in NUS at JKUAT

- Rice (African rice varieties)
- Mushroom Research
- Papaya (pawpaw)
- African indigenous vegetables and fruits

Introduction

- **Population increase = need for morefood**
- **Hunger, Malnutrition & non-communicable diseases**
- **Climate change**
- **Water**
- **Environmental degradation**
- **Loss of Diversity**
- **Agro-biodiversity is critical to human surviva but are significantly undervalued and under-utilized**



Sources: Nature 466 (2010)

Introduction

- **Nearly half of the world pop live on <$2 a day**
- **Half the population in Africa live on < $1 a day**
- **90 % of the calories in the human diet come from 15 crops and 60 % from 3 crops (wheat, rice and maize)**
- **Agro-biodiversity remain unexploited**
- **Need to strategically reposition NUS for Food Security, Nutrition, Health and economic development**

Value and Potential of NUS

- Resilience to climate change
- Fit in Sustainable Cropping systems
- Minimize risks of crop loss
- Health benefits
  - NUS vegetables contain phyto-chemicals that are anti-cancer, anti-diabetes and anti-hear diseases
- Nutrition: NUS has competitive advantage

Amount (g) required to meet DRI of Provitamin A, Iron & Folate

	Provitamin A[1]	Iron[2]	Folate[3]
Common cabbage	16300	2395	952
Lettuce	740	758	606
Spinach	250	455	285
Ivy gourd	270	337	612
Tropical violet	320	160	1666
Jute mallow	130	137	594

[1]Daily DRI for adult males of 19-50 y: 900 µg RAE

[2]Daily DRI for adult males of 19-50 y: 9.1 mg of 15% iron bioavailability

[3]Daily DRI for pregnant females: 600 µg DFE

Major Constraints of NUS Production

- **Neglect and Stigmatization: weeds, poor man's, orphan**
- **Inadequate awareness of NUS value and potential**
- **Inadequate research and capacity building**
- **Lack of Quality Seed and technical packages**
- **Poor keeping quality, bitter and tedious to process**
- **Poor Marketing Strategies**
- **Poor policy framework**
- **Leading to low yields, production and consumption**

Repositioning Initiatives and Strategies

Development Opportunity in Diversity Initiative

Food security, nutrition and health

Source of income

Resilience of farming systems and environmental services

Inclusive Research, Capacity Building, Knowledge Management, Advocacy

Stakeholders DOCNet

- Global Forum on Agricultural Research (GFAR)
- Regional and sub-regional organizations and their relevant initiatives
- CGIAR Centers and emerging Consortium Research Programmes.
- International centers, organizations and initiatives
- National research and/or development organizations
- Non-governmental organizations/Community-based organizations
- Private sector

GFAR-Six Regional Bodies

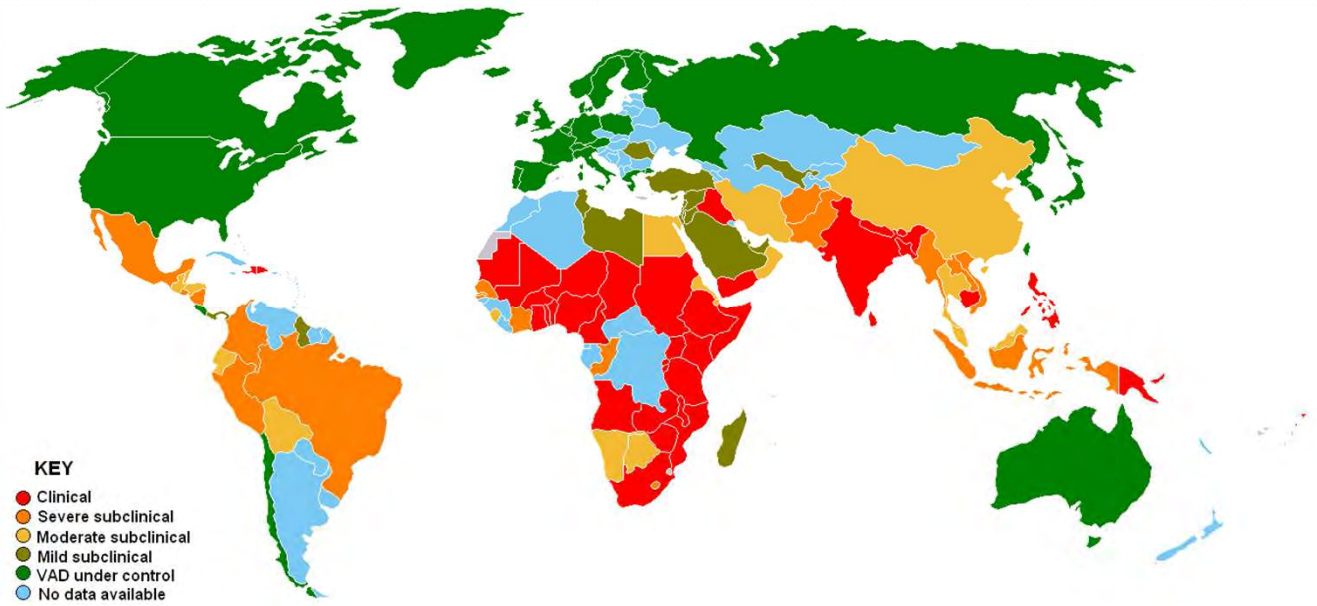
- Association of Agricultural Research institutions in the near East and North Africa (AARINENA)
- Asia Pacific Association of Agricultural research institutions (APAARI)
- Central Asia and Caucasus Association of Agricultural Research institutions (CACAARI)
- European Forum on agricultural research for development (EFARD)
- Forum for the Americas on Agricultural Research and Technology Development (FORAGRO)
- Forum for Agricultural Research in Africa (FARA)-2010 Initiative

GFAR

- GFAR Supports the initiative
  - GCARD Road Map-2010
  - GFAR MTP 2013-2016
- ITPGRFA-International Treaty on Plant Genetic Resources for Food and Agriculture
- The initiative includes: GlobalHort, INBAR, Crops for the future, PROTA, PAR, AVRDC, PROLIINOVA, AARINENA, APAARI, FARA, and FAO-AGPM
- The initiative has three Pillars

Pillar 1: Food security, nutrition and health

- **Demand for food-to increase by 70% within the next 40 years**
- **At least 2 billion people are experiencing malnutrition**
- **Diverse diets help address malnutrition and health**



Vitamin A deficiency
Source: Wikipedia

Pillar 2: Income Opportunities

- **Increase of urbanized population (net consumers)**
- **Opportunities to reach into (niche) markets for diversified high-value agricultural and horticultural products**

Pillar 3: Environmental sustainability

- **Climate change**
- **Degradation of agro-biodiversity**
- **Importance of diversity in cropping systems to buffer risks**
- **Conservation / use of diverse genetic resources**

Case studies on crops

Mungbean in Asia:

From underutilized crop to important part of rural livelihoods

Some relative benefits:

Earlier maturing and more drought tolerant than soybean

Similar nutrition to cowpea grain but can be used as a vegetable or a grain

More drought tolerant than dry beans (*Phaseolus vulgaris*)

Potential to enhance diets, to diversify cereal-cereal cropping systems and to generate additional income for the

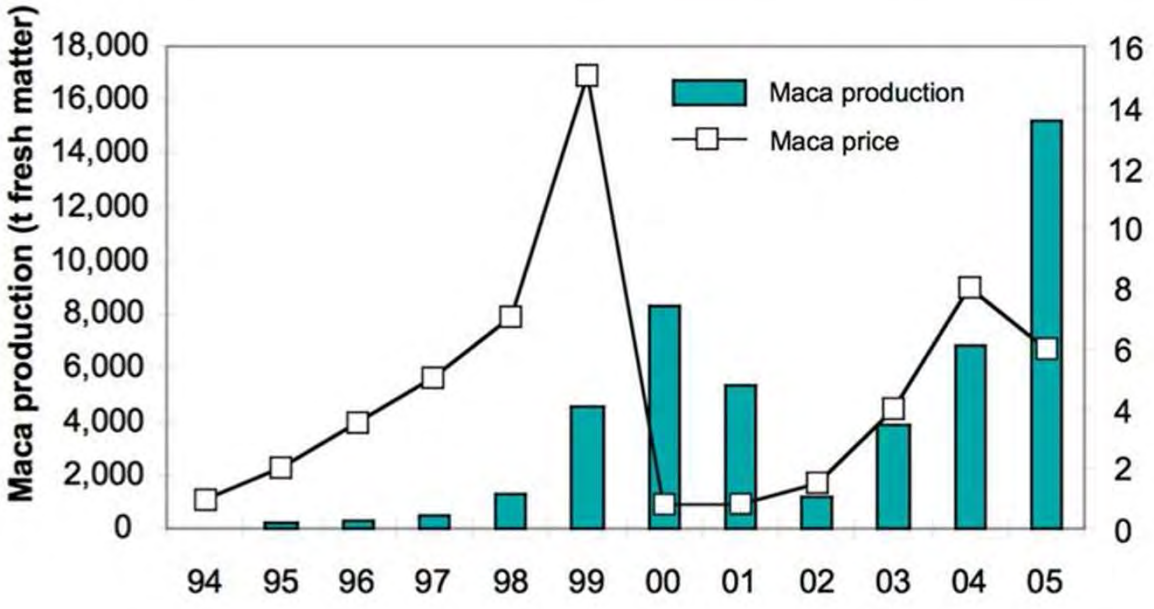
Research results and impact

- By 1990, 40 improved varieties released
- By 2000, more than 25% of world production with AVRDC improved varieties (40 Improved varieties)
- Improved nutrition and income

Maca in Peru

- Maca –edible root crop in Peru
- Since early 1990s aggressive promotion on internet and in export markets
- Development of novel food products
- Area under maca increased from

50 ha late 1980s to 3,000 ha in 2005



Bamboo in China:

1. **Scientific planning**
2. **Protection, rehabilitation and reconstruction of the local ecosystems**
3. **Developing environment friendly products/enterprises**
4. **Participatory decision making**
5. **Development and implementation of supportive policies**

African Indigenous Vegetable Initiative

Multi disciplinary and Multi-institutional Research for Development initiative-1991

(Researchers, Farmers, JKUAT, Maseno University, AVRDC, IFS, IPGRI, EU, Students and Policy makers, traders and consumers, NCST, KARI)

Contribute to alleviation of food insecurity, malnutrition and poverty in Kenya and other African countries by raising the status of AIVs

Identified Priority AIVs

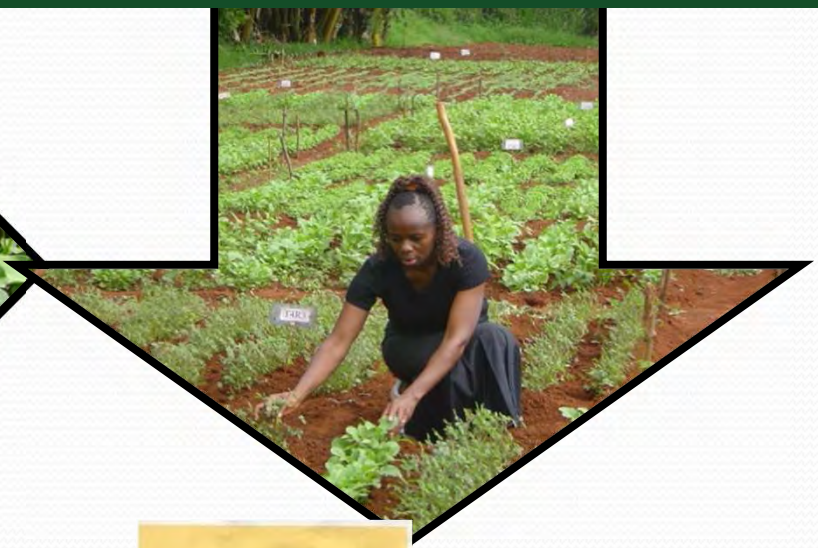
AIVs with Nutrition and Economic Potential in identified through a series of household, baseline and market surveys in various countries Characterization, Physiological, Agronomic, Nutritional and economic studies and recipe and product development of AIVs

Pumpkin
(Cucurbita moschata)

Jute mallow
(Corchorus olitorius)

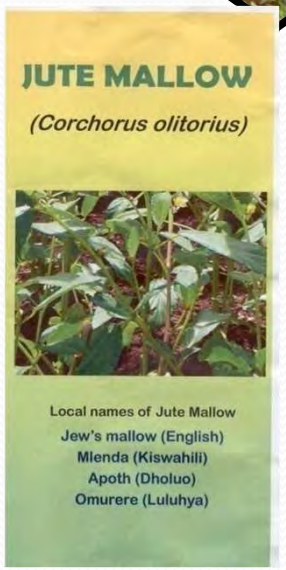
Cowpea
(Vigna unguiculata)

African Indigenous Vegetables



Products

Good crop for farmers



Leaflets

Quality seed

Availability

Indigenous vegetables gain popularity

BY DUNCAN MBOYAH

INDIGENOUS vegetables are now regaining popularity across East Africa.

According to a recent study conducted in Kenya, Tanzania and Uganda, there is high demand for cowpeas *(kunde)*, African nightshade *(managu)*, spider plant *(saga/dek)* and amaranths *(mchicha)* in major supermarkets.

Jute mallow *(mrenda/apoth)*, slenderleaf *(mtoo)*, African Kale *(kandhira)* and pumpkin leaf *(malenge)* follow closely in that order as common delicacies in most homes and restaurants.

More than 90 per cent of the farmers interviewed during the study observed that there had been an increase in the cultivation of the vegetables as a result of an increased demand and promotion.

The vegetables are in high demand in the United Kingdom, where a large number of Asians are now putting orders from Kenya and other countries.

Calls are now being made for the construction of a cold storage in regions where the vegetables are grown in plenty.

The study also found that the traditional vegetables are a major source of income that could be used in achieving Millennium Development Goals.

The International Foundation in Science, the Swedish International Development Agency (Sida) sponsored the study through the inter-university council of East Africa, and the European Commission.

"Despite the neglect that threatened their extinction, studies now show that these indigenous vegetables are highly nutritious," says the study's lead researcher, Prof Mary Abukutsa-Onyango of Jomo Kenyatta University of Agriculture and Technology (JKUAT).

The vegetables provide more than 100 per cent of the daily allowance for minerals and vitamins and 40 per cent of the proteins.

This study shows that the indigenous vegetable have medicinal properties, such as the ability to heal stomach related ailments and prevent anaemia.

These vegetables have not been fully exploited even though horticultural studies indicates they have short growth period, tolerates stress and respond well to both organic and inorganic fertilisers.

Abukutsa-Onyango said sustainable production of the indigenous vegetables has declined due to neglect, lack of quality seed, and use of inappropriate production technologies.

About 92 per cent of the respondents in the rural areas regarded indigenous vegetables as subsistence crops and not as produce with commercial value. Only three per cent saw the vegetables as an income-generating venture.

Most of the farmers cultivate these vegetables for their own use.

"Intercropping indigenous vegetables with other crops is more advantageous than mono-cropping and should be encouraged by farmers," says Abukutsa-Onyango.

In Kenya, the study done in Kisii, Vihiga, Kisumu, Butere Mumias, Bondo and Kakamega districts found that farmers use farmyard manure as a source of macro and micronutrients to nourish the vegetables and wood ash in controlling pests.

Majority of the farmers depend on rainfall, with handful from Kisumu using irrigation.

Abukutsa-Onyango says neglect by stakeholders; lack of technical packages, poor marketing channels and lack of interest in exploiting the potential of indigenous vegetables are the major constraints facing the industry.

Through the Farm Concern Project plans are in place to avail traditional vegetables in hospitals. Already, the project is picking up at Kenyatta National Hospital.

— An AWC Feature

Increased Popularity & Consumption

QUINOA-Andean crop-Peru
International Year of Quinoa-2013

The International Treaty on Plant Genetic Resources for Food and Agriculture

As of November 2008, 120 countries and the European Community are Contracting Parties to the Treaty

ITPGRFA

- **ITPGRFA-International Treaty on Plant Genetic Resources for Food and Agriculture**
  - **Legal binding multi lateral agreement-2001**
  - **Safeguard farmers rights related to PGR**
    - **Protect their traditional knowledge**
    - **Equitably participate in benefit sharing**
    - **Participate in decision making**
    - **Right to save, use, exchange and sell farm saved seeds**
  - **Mutual interface of farmers' and breeders rights**
  - **Activities undertaken to implement farmers rights include participatory breeding; community seed b**

Custodian farmers in India, Nov 2012

Women in participatory breeding

Jordan

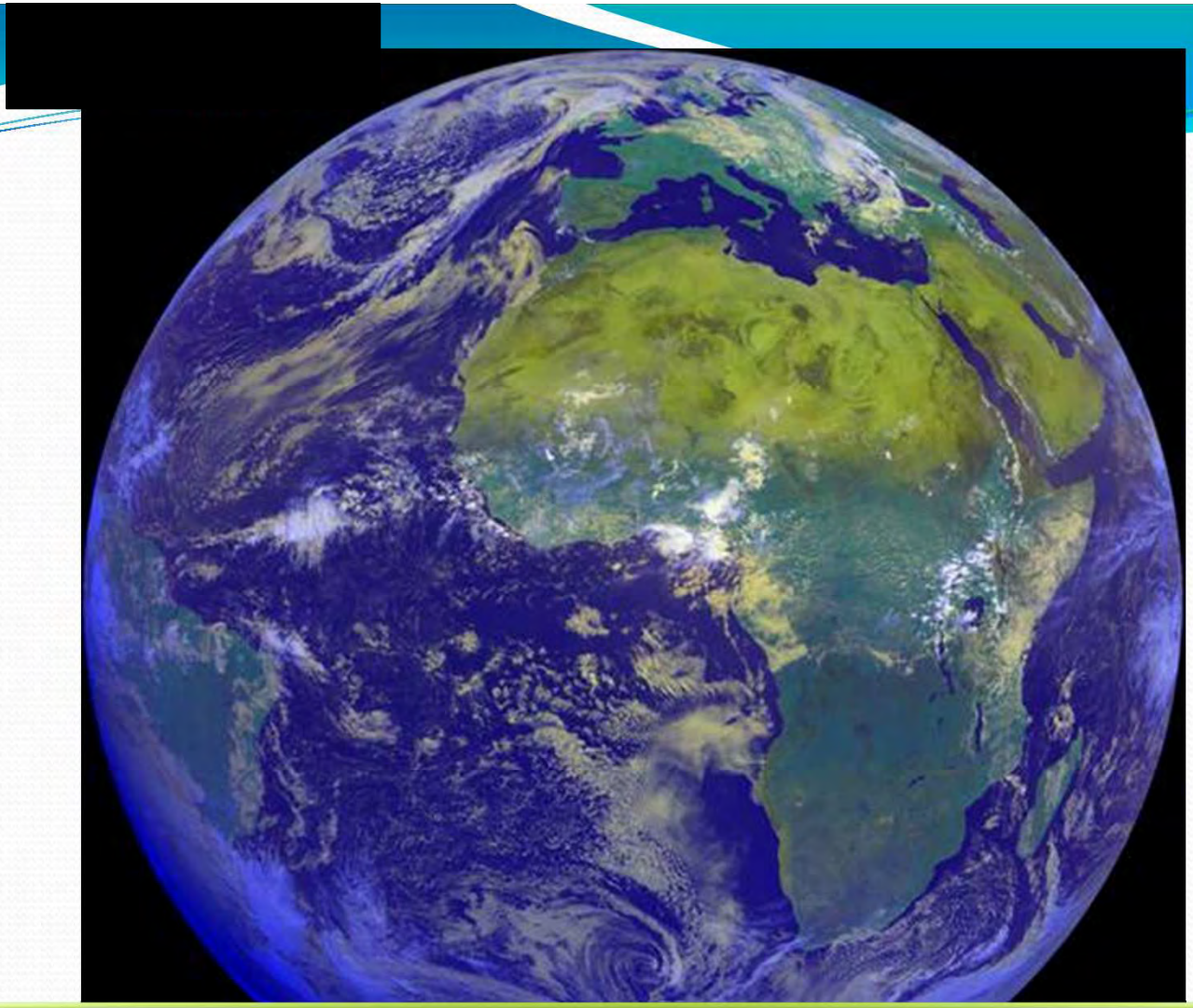
Eritrea

Iran

Yemen

Syria

Egypt



Strengthened capacity for NUS research would contribute to improved food and nutritional security, increased income, and adaptation to climate change in Sub-Saharan Africa

EU-ACP Project on NUS

- To develop capacity among scientists in 10 countries in Sub-Saharan Africa to formula design, implement, and disseminate the resuIt of research on NUS
- To raise awareness among various stakeholders
- A series of three training courses on research methods on NUS: 220 young researchers were trained

Partners

- **Grant manager**

- EU Partners

- Regional Partner

- National Partners
  - West Africa/Southern

- National Partners
  - Eastern/Southern Africa

Associate organizations & programs

- Crops For the Future, Malaysia
- Eastern Africa Plant Genetic Resources Network EAPGREN / ASARECA, Uganda
- Forum for Agricultural Research in Africa (FARA), Ghana
- CGIAR Research Programmes:

Capacity Building Initiatives

- **Curricula Development and University Training**

% BSc students who took research NUS projects increased from 20% in 2001 to 70% in 2006 KENYA

- **Trained over 200 researchers and extension workers from over 20 African countries (AVRDC-Arusha) between 2002 to 2008**
- **Farmers:1000 between 2001 and 2012 , AIVs**
- **Trained 14 policy makers in 2008 IndigenoVeg Project in South Africa (Rhodes University)**

Cordoba Declaration on NUS-2012

- **Raising awareness of NUS strategic roles**
- **Conserving genetic and cultural diversity of NUS**
- **Promote NUS in small scale farming and improve rural livelihoods**
- **Develop NUS value chains from Production to consumption**
- **Changing wrong perceptions about NUS develop evidence base**
- **Enhance research and develop capacities for promoting NUS**

Cordoba Declaration on NUS-2012

- **Building an inter-sector and inter-disciplinary collaborations for NUS**
- **Creating conducive policy environment for NUS**

Conclusions and Recommendations

- **Strategic repositioning of NUS will contribute food security, nutrition, health and economic development**
- **Potential collective action in research: Building upon existing initiatives and forging new partnerships, and working across crops rather than on individual crops and along the value chain**
- **Need for efficient knowledge management and capacity building on NUS**

What Needs to be done ?

- Change perceptions
- Develop capacity
- Enhance research
- Improve conservation
- Involve stakeholders
- Add value and upgrade market chains
- Create a supportive policy environment
- Increase cooperation

Parting Shot

- As we Discuss NUS for a Food Secure Africa in the Next three days
- Do we want to go Fast or Far?
- Putting farmers at the centre of research through participatory research is key to our success
- To Reposition NUS as Notable Utilized Species

My Appeal:

18 TAIFA LEO
Alhamisi, Septemba 18, 2008

LISHE BORA

Profesa wa Kilimo aongoza juhudi

KUPIGIA DEBE MBOGA ASILI

PROFESA Mary Abukutsa ofisini mwake katika chuo kikuu cha kilimo cha Kenyatta (JKUAT).

PROFESA Mary Abukutsa akiwa katika shamba la chuo kikuu cha kilimo cha Kenyatta (JKUAT), Juja ambacho hutumia kupanda mboga zina mbali mbali za kitamaduni anazo-fanyia utafiti.

PROFESA Mary Abukutsa (katikati) akiwa katika maabara chuoni.

Vote Yes: for NUS

Special Appeal:

To all of us and especially to the International Community to give NUS a deliberate focus and support

Acknowledgement

Ahsante

Thank you

Dankenshe

Muchas gracias

Muito obrigado

Merci beaucoup