Market-First Science Driven Approach to Enterprise Development in Rural Areas—Using Horticulture as an Engine of Change
New Crops and Natural Plant Products

Mission: To introduce indigenous MAPs into the Galilee Mountains, into steep hillsides and land thought to be unsuitable for conventional agriculture.

Germplasm collection and NP evaluation
Production and postharvest curing/handling (e.g. *Salvia sclarea*) and processing of 10 MAPs.
Terracing and reshaping the hillsides
Extraction and distillation units
Developing the scientific platform rel to supply
Pre-Community development
Generated interest in environment stress physiology, genetics and NPs
From the NCI Drug Discovery Program: A Case Study for the Anti-AIDS plant of Cameroon, *Ancistrocladus korupensis*

- Tropical liana; new species
- Age unknown
- Biology unknown
Rare Genetic Medicinal, Cloned in the Forest, for local community for replanting & sustainable collection using fallen leaves

Candidate for metabolic engineering? Chemical synthesis or new analogue?
ENTERPRISE DEVELOPMENT in Horticultural Crops and Products is multidisciplinary involving many actors connected by champions.

**Private Sector**: Processor, Buyers/Markets Locally, Regionally/Internationally

**Plant/Crop Champions**

**Stakeholders**
- Small Farmers
- Rural Communities

**NGO’s, Environmental, Development Organizations**

**African: National, Regional & Local government (public policy)**

**Private African Companies (Local and Regionally-**

**International Donors**
- USAID & others

**HortCRSP**

**African and US Universities and Research Org.**
Models of New Crop Introduction & Commercialization

- Market First with rural farmers & African communities as our stakeholders
- Science-grounded (university and research linkages)
- Active community participation, strong private & public sector partnerships at outset
- Nonlinear and dynamic
- A holistic approach: seed to final product
- High quality germplasm, introduction of new and non-domesticated plants into cultivation, plant improvement, sustainable wild harvested and sustainably introduced
- Quality Assurance and Quality Control are key factors in Horticulture R&D, translational research & commercialization.
- Botanical product standardization; and value-added product development by community and/or in source country
- Capacity building, technology transfer
- Local & regional ownership and private: public partnerships

Participatory Approach and Demonstrations
ASNAPP SENEGAL’S COOPERATIVE PARTNERS

ASNAPP’s Rural Development strategy relies on collaborations with rural producer cooperatives. These co-ops, primarily made up of women, have proven highly successful at adapting their farming to the agricultural and quality standards promoted by ASNAPP. Through their relationship with ASNAPP and each other the co-ops have forged strong community ties and fostered economic prosperity for themselves and their families.

Viviane Badiane
of the Nioro cooperative

The women of the Latmingue cooperative
Technologies to obtain clean products
Hibiscus, Senegal: >35 Grower Groups; >4,000 women; Organic certification achieved. FairTrade certification to a few. Future challenge: Yields

Linking Private Sector Buyers to Communities now organized into grower associations; with improved germplasm and Technology. QC and traceability from field through sales.
From Gender Divide to Gender Shift: Enterprise Development Success
Griffonia (Griffonia simplicifolia):

- A Source of 5-HTP
- Seeds are used as an anti-depressant, to treat serotonin deficiency syndrome, and in the treatment of headaches and weight control.
- Can be found in the US dietary supplement market for weight loss, an antidepressant, anxiety, in treating fibromyalgia, insomnia.
By working on grades, standards and QC, quality increased, exports have risen, more than tripling.
Griffonia collectors from one of the cooperatives and groups organized in Ghana.

In Liberia- 2010- 750kg seeds collected and sold; in 2011- 10 MTs of seeds collected and sold! (in concert with TetraTech ARD, ASNAPP)

The bag contains dried griffonia seeds (see rack) paid to a collector that will provide enough income to pay for one month of rice for his family (in Liberia, 2/ 2010).
Standards Development in Ghana (Voacanga africana)

Before ASNAPP

After ASNAPP

Voacamine
Antioxidant Activity

<table>
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<tr>
<th>Location</th>
<th>Ascorbic Acid (mg/100g)</th>
<th>Total tocopherols (mg)</th>
<th>Total Carotenoids (mg/100g)</th>
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<tr>
<td>Kicukiro</td>
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**Total Protein**

Child between 1 to 3 years old is 13 grams/day
Child between 4 to 8 years old is 19 grams/day
Moringa: Also a Rich Source of Health-Beneficial Bioactive Flavonoids*

*Samples from Ghana, Rwanda, Senegal, and Zambia, analyzed using our HPLC/UV/MS
Mitengo Women’s Cooperative, Lusaka, Zambia
Mpuntu: A Community-Based and Owned Finished Line of Africa Natural Products
Applying our models to fresh Vegetables
Our farmer groups (including disabled heads of households) now meet quality, time of delivery, and have earned >$1.5 million by providing >85% fresh produce and culinary herbs. And, had no prior commercial horticultural experience.
Open field vegetables Disabled community Livingstone, Zambia; and in concert with UC-Davis, Purdue, ASNAPP- we focus on improved production, scheduling, market expansion and postharvest.
Quality of Geranium Oils (Pelargonium Species): Case Studies in Southern and Eastern Africa

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Abstract

HIBISCUS QUALITY CONTROL GUIDELINES: A PRIMER For PRODUCTION AND HANDLING

Malany Diatta, Babou Diouf, Petrus Langenhoven, Abdoulhassan Samoiolo, Badara Sadio, Rodolfo Jukari, Hamadi Dieng and Jan Simon
ASNAF
In concert with the Association Education Sante

WHO guidelines on good agricultural and collection practices (GACP) for medicinal plants

Sanitary Specifications for Natural Products

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Approved by Dr. H. Rodolfo Jukari, WHO, Geneva, 2003-09-11, S. 966

Created by: Applications & Measurements (Section of Ethics & Protection of the Environment), National University of Science and Technology, 124000 Windhoek, Namibia; e-mail: khobus@nust.ac.na

Approved by the Ministry of Health, New User Agriculture and Natural Plant Products Program, PO Box 80922, Kigali, Rwanda, 2003-09-11.
Link all development work (e.g. R&D) to support marketing efforts and enterprise development and partnerships.
Bringing it together: Farmers selling their fresh produce to Livingstone hotels, and learning entrepreneur skills are leading to significant economics benefits to her/his family and the community producers.
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- BARD

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- Association de Sante (AES, Senegal)
- And, the farmers, communities, grower associations with whom we partner

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- Rutgers University (2000-current)

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From ATRIP, ASNAPP to PFID/NP (Partnerships in Food Industry Development for Natural Plant Products (with ASNAPP and Stellenbosch University).

USAID: Regional Center for Southern Africa, Pretoria, South Africa

NCCAM: National Botanical Center for Age-Related Diseases (2000-2010) (with Purdue and Univ. of Alabama)

NIH: Center of Excellence for Research on Complementary and Alternative Medicine (CERC) for Alzheimer’s disease (2008-2013) (with Mt. Sinai Medical School and Purdue)

USAID-Liberia: EHELD and PROSPER-ongoing

THANK YOU!

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