

From HarvestPlus to SASHA and SPHI: Breeding as the Foundation of Success

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Research in South Africa (efficacy) and **Mozambique** (effectiveness) has proven that the beta-carotene in orange-fleshed sweetpotato is bioavailable and can **improve vitamin A status** in the SSA context



Feeding Trial in South Africa Intervention in Mozambique



Community-Level Integrated

125 grams of most OFSP varieties can supply the recommended daily allowance of vitamin A for children and non-lactating women

Urban Markets for Sweetpotato are expanding, especially with rising global food prices

- SSA has fastest growing urbanization rates in world
- Sweetpotato often used as breakfast food
- Traditional and nontraditional ag. exports within and from SSA \$16B

 Domestic markets for food staples
 \$50B now \$100B by 2015





Wheat Flour Substitute (15 - 50%)

Genetic Diversity within Crop Enormous Enabling Diversified Use

Starch in Processed Products



Nutritious Vegetable

Fried Snack





Sweet (porridges, bakery products) and non-sweet (cassava substitute) flours

Animal Feed



Development of the SPHI: 10 months in 2008/2009 Participatory investigation into the challenges faced and the way forward

Features

Phased process seeking input from stakeholders through field visits, multi-disciplinary theme papers, internet survey, and a series of five workshops
Working paper published on 6 major themes:

- -- Breeding
- -- Seed systems
- -- Integrated Crop Management
- -- Orange-fleshed Sweetpotatoes
- -- Value Chains
- -- Partnerships





7 Major Constraints Identified and Prioritized & Way Forward Debated



- Lack of timely availability of adequate quantities of disease-free planting material
- Varieties with limited yield potential in specific agroecologies & quality characteristics that do not meet demands of specific target groups
- Damage due to the sweetpotato weevils in drier zones
- Limited demand and inadequate market
- Poor agronomic practices
- Limited awareness of decision makers about potential contribution of the crop to poverty and malnutrition reduction due to inadequate evidence base ac
- Need for a critical mass of informed stakeholders with good information exchange to maximize investment return

Participants at the Challenge Workshop Reached Consensus on the Following VISION for a 10 year Initiative:

Repositioning sweetpotatoes in African food economies, particularly in expanding urban markets, to reduce child malnutrition and improve smallholder incomes



Two Phases: Greater Emphasis in first 5 years on Breeding and Seed Systems Research as the Foundation for Success





SPHI is a multi-partner, multi-donor initiative that seeks to reduce child nutrition and improve smallholder incomes in 10 million African families by 2020 through the effective production and expanded use of sweetpotato.

> The Sweetpotato Action for Security and Health in Africa (SASHA) Project is a 5 year project led by the International Potato Center that will develop the essential capacities, products and methods to reposition sweetpotato in the food economies of Sub-Saharan Africa. It serves as the foundation for the broader Initative.



Major Focus: Sweetpotato Support Platforms

to provide a structure that strikes a balance between the specific needs of each region and scale economies in the research process by organizing the work around research for development platforms that integrate and support the work of institutional partners in each sub-region

- Provide technical backstopping
 - Special emphasis on supporting AGRA supported Phd programs in breeding and AGRA support national breeding programs
 - PhD: Zambia, Kenya, Ghana (2), Burkina Faso
 - Masters: Mozambique
 - Program Support: Kenya, Malawi, Rwanda, Tanzania
 - Possible Program Support: Kenya, Ethiopia, Malawi, Zambia, Nigeria, Ghana, Uganda
- Assure gender-sensitive design and implementation
 - Senior management team will have a gender specialist
- Assure comparable data collection between countries engaged in the breeding and germplasm exchange, as well as consistent and coordinated monitoring and evaluation components

Major Focus: Breeding & Varietal Development

seeks to generate a radically expanded range of sweetpotato varieties that combine different quality characteristics with significant improvements in yielding ability



- Generate populations to meet dominant needs of users
 - All sites: High dry matter
 - East & Central Africa: virus-resistance, orange-fleshed dual purpose for animal feed
 - Southern Africa: drought resistance, orange-fleshed
 - West Africa: non-sweet sweetpotato, orange & white-fleshed
- Redesign sweetpotato breeding systems in Africa to produce varieties in fewer years (3-4) than currently (7-8 years): "accelerated breeding"
- Additional new breeding methods tackled:
 - heterosis into sweetpotato breeding
 - molecular markers for breeding for virus resistance

Major Focus: Weevil Resistant Varieties

to develop weevil-resistant sweetpotato varieties for SSA within 5 years

- Focuses on transgenic approaches using *Bacillus thuringiensis (Bt)* sources for weevil resistance
 - 20 years of conventional breeding failed to identify suitable sources





- Sweetpotato with weevil damage
- Heavy emphasis on training African biotechnologists (2 Phds, 4 technicians) for Kenya and Uganda utilizing new BeCA platform facilities

Major Focus: Seed Systems Research

establish demand-led cost-effective seed systems for the dissemination of new varieties and high quality planting material



- Develop and test strategies for the multiplication and dissemination of sweetpotato varieties
 - enhanced farmer-based capacities to maintain quality planting material
 - cost-effective public sector distribution programs
 - potential for for-profit nurseries
- Study the marginal costs in adding sweetpotato to an existing clonal crop (cassava) seed dissemination program in Tanzania
- Assure sweetpotato varieties can be maintained in a disease-free state over time at the sub-regional level and that safe and efficient germplasm exchange occurs between countries
 - develop field level diagnostic kits for virus detection

Major Focus: Proof-of-Concept Projects (PoCPs)

to understand the entry points in the value chain to improve market efficiency or diversify use especially for women, and design and test scalable approaches for improving food-based nutrition programs based on OFSP to combat vitamin A deficiency.

- PoCPs evaluate options that influence the capacity to go-to-scale and achieve the outcomes on poverty and nutrition that are planned for the second phase
- Potential PoCPs identified during field visits & Challenge workshop; drafts designed by partners during sub-regional workshops
- Criteria for Selection
 - be an innovative idea for a delivery system that could eventually be scaled up cost effectively
 - nutritional PoCPs must be significantly different from REU
 - partners with proven track record
 - appropriate varieties available for proposed activity
 - design must include a counterfactual

Kenya PoCP Uniqueness



 Evidence to date: OFSP improves vitamin A status of young children when introduced in an integrated approach (production – demand creation – market development)

Question: Can linking OFSP intervention to health

service delivery increase impact on vitamin A status?

- Rationale: multiple causes for VAD
 - inadequate vitamin A intake
 - inadequate absorption of vitamin A (parasites, diarrhea)
 - increased use of vitamin A to combat diseases such as measles or malaria
 - HIV infection impairs absorption of vitamin A

Kenya PoCP Research Focus & Partners



- Can linking an agricultural intervention and nutritional training to existing health services provide an incentive to pregnant women to increase health service utilization?
- Does integration of an OFSP agricultural-nutritional intervention into health service delivery for pregnant women and their children <2 years old lead to higher *increases in consumption of OFSP and other vitamin A rich foods* than existing agricultural extension and primary health services alone?
- Partners: PATH (International Health NGO), 2 national NGOs, KARI

Rwanda PoCP: value chain development



- The challenge: processing of sweetpotato products offers the opportunity to increase demand for the crop, create value added, and thereby expand the incomes of smallholder producers
- Research questions: compare the farmer welfare outcomes from the introduction of two models for producing sweetpotato flour:
 - one where intermediate chips are produced by farmer groups and the other where the flour producer (and bakery) does all the processing
- Test different models for inclusion of the poor and women in the development of new market chains for high value sweetpotato products

Rwanda PoCP: Vision of success



Bakery at SINA

- Re-positioning of white and orange fleshed sweetpotato and their products in the urban consumer market;
- Men and women farmers will have increased income through accessing high value sweetpotato markets and benefit through access to high quality planting material
- Partners: ISAR, Catholic Relief Services, SINA Enterprises

Feasibility Study Animal Feed (Pre-PoCP)



- Hypothesis: The efficient integration of dual purpose sweetpotato into dairy systems of the highlands and contract farmers in pig production in Kenya results in significantly improved profits for farmers and improved end product quality
- Brings enormous experience CIP has gained in China and Vietnam on silage production and use of dual purpose (food and feed varieties) into East Africa (Kenya and Rwanda)
- Other Partners:
 - KARI & ISAR (national research programs);
 - East Africa Dairy Development (EADD) Project
 - Farmer's Choice (private company producing bacon and sausages)

Feasibility Study Markets in Nigeria (Pre-PoCP)



- Nigeria: 2nd largest sweetpotato producer in SSA
- Widely variable statistics and poor evidence base
- Study will investigate whether Sweetpotato is an economically viable substitute for yam or cassava in popular processed products when varieties with appropriate quality characteristics are used
- Partners: Natural Resources Institute (leads); Federal Polytechnic Offa (agro-processing); Univ. of Ibadan (consumer); NRCRI (crop research program)

Thanks for your attention!

