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Orange-fleshed Sweetpotato (OFSP) INVESTMENT SUMMARY



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Why invest in orange-fleshed sweetpotato (OFSP)?

Forty-three million children under the age of five years across Sub-Saharan Africa are vitamin A deficient, as are large numbers of older children and adults, particularly pregnant women. Vitamin A deficiency is one of the most damaging forms of undernourishment. It reduces immunity to disease, resulting in higher incidence of disease-related deaths, increased burdening of the already stretched health care systems, and indirect costs related to lost productivity and lost economic development. Undernourished children are at a high risk of impaired mental development, which has adverse implications for a country's productivity and growth, as such children will be less able than their healthy counterparts to be innovative or to respond to opportunities even as adults. A poor diet and frequent infections are the causes of vitamin A deficiency. Young children, as well as pregnant or lactating women, have a particularly high risk of vitamin A deficiency due to their body's need for micronutrients to support its rapid growth.

“There can be no keener revelation of a society's soul than the way in which it treats its children”

Nelson Mandela

Vitamin A deficiency can be addressed in different and complementary ways: through taking supplementary capsules, eating fortified foods and adopting long-term, sustainable food-based approaches where locally produced foods rich in vitamin A are actively consumed as part of a balanced and diverse diet. However, each of these strategies has advantages and shortcomings (Table 1), which highlights the need for an integrated and long-term approach to address vitamin A deficiency.

Table 1 – Options for addressing vitamin A deficiency

Vitamin A supplementation	Food fortification	Dietary diversification
<p>Provision of vitamin A capsules twice a year to children under five years increases child survival and reduces child mortality by about 24%.</p> <p><i>However:</i></p> <ul style="list-style-type: none"> • The benefits are short term, lasting two–three months. • Only the under-five's are targeted not the whole population. • Vitamin A supplementation campaigns are largely donor dependent and may not be sustainable in the long term. 	<p>Cooking oils, sugar, flours and infant foods can be fortified with vitamin A and other essential nutrients to reach those who purchase and consume such products.</p> <p><i>However:</i></p> <ul style="list-style-type: none"> • Access to fortified foods may be limited by availability and purchasing power, particularly in rural areas. • Young children can eat only small quantities of the fortified foods, so food fortification needs to be combined with other interventions. 	<p>Many vitamin A rich foods are available, such as mangoes, pawpaw, pumpkin, dark green leafy vegetables, eggs, liver and milk. These foods contain many other essential nutrients as well.</p> <p><i>However:</i></p> <ul style="list-style-type: none"> • There is inadequate awareness about the need for dietary diversity and about vitamin A rich foods that are easy to produce, access and consume by all wealth groups and ages. • Current food crop systems often contain little variety. • Long-term investment in nutrition education is required. • Seasonality of vitamin A rich foods needs addressing through dietary advice and adoption of food storage practices.

Orange-fleshed sweetpotato (OFSP) is not only a good source of energy but it also contains high levels of beta-carotene, which is converted into vitamin A in our bodies. OFSP is a healthy, delicious and affordable food that can be enjoyed in numerous forms: the roots can be eaten boiled or roasted or mashed into puree for use in a range of nutritious products including breads, chapatis, cakes, juices, porridge etc. Sweetpotato is a low input, low risk crop that is grown widely across Sub-

Saharan Africa. Throughout history, it has played an important role in saving people from famine. Sweetpotato produces more biomass and nutrients per hectare per time unit than any other food crop in the world. In most locations across Sub-Saharan Africa, an area of just 500 m² of OFSP crop can provide enough vitamin A for a family of five each year. Throughout Africa, sweetpotato is grown mainly by women, and where market linkages are established it can enhance women's incomes, in addition to its nutritional and food security roles. Investing in nutrition is investing in a country's future. Improving nutrition is a good investment.



Orange-fleshed sweetpotato's role in achieving development goals

Most nations across Sub-Saharan Africa recognize the importance of investing in agriculture for economic growth, and realistically, they have few other options for tackling the mass rural poverty in the medium term. However, they are conversely envisioning longer term economies based on complex services and industrial economies. For this to be realized, child malnutrition needs to be addressed now, otherwise the necessary human resources for this transformation will not be available.

One in every three children in Sub-Saharan Africa is stunted with a body and a brain that have failed to develop properly due to undernutrition. The impacts of malnutrition are felt at individual and national levels, and not only through high child mortality, poor educational achievements and increased health care requirements but also reduced adult productivity and high disease burden, meaning that they will persist into the next generation. Estimates suggest that 2–3% of the national income of a country can be lost to malnutrition, which for Tanzania, for example, would equate to about US\$ 1 billion per year, and for Nigeria, up to US\$ 16 billion.

Most countries in Sub-Saharan Africa are actively promoting agricultural growth. But it is essential to distinguish between a focus on increased agricultural production and a focus on improved nutrition. More food does not necessarily mean better nutrition. Attention needs to be paid to the *quality* as well as the quantity of the food produced and to teaching those preparing food about the importance of balanced, diverse diets and the methods for retaining the nutrients when food is prepared.

Many children in Sub-Saharan Africa have diets that consist almost entirely of starchy staple foods like maize, cassava and rice with few vegetables and little protein. Whilst these children may get enough calories, they miss out on a varied diet that would give them enough proteins and protective vitamins and minerals. Promoting an integrated food-based approach to address malnutrition — including the 'hidden hunger' of micronutrient malnutrition — through the consumption of locally grown, nutrient-rich crops such as orange-fleshed sweetpotato can help ensure the general population, as well as the targeted groups, benefits in the long term. In addition, promoting the consumption of nutrient-rich crops and crop husbandry and strengthening market infrastructure, agroprocessing and nutritional awareness will enable rural communities to produce higher yields of their nutrient-rich crops for food and nutrition security, sale, and processing for value addition.

After the initial investments in training, setting up of seed systems and introduction of new varieties, programmes promoting nutrient-rich staple crops have low recurrent costs but significant potential to be replicated at scale. Such pro-poor, nutrition-sensitive agricultural investments fit perfectly within integrated development frameworks such as the Comprehensive Africa Agriculture Development Programme (CAADP). Investments in orange-fleshed sweetpotato will help Africa in achieving its development agenda (see Table 2).

Table 2 – Synergies between orange-fleshed sweetpotato (OFSP) investments and achievement of the goals of the June 2014 Malabo Declaration for Africa Accelerated Agricultural Growth and Transformation (3AGT)

Malabo Declaration commitments and their synergies with OFSP investments
<p>Commitment to enhancing investment finance in agriculture</p> <ul style="list-style-type: none"> • Uphold 10% of public expenditure to agriculture target – sweetpotato production is rapidly increasing across Africa owing to the crop’s high productivity and wide suitability, decreasing farm sizes and urbanization. Investments in this often overlooked staple food crop will produce high returns. • Support conditions for facilitation of private investment in agribusiness – support large or small-scale food processors using OFSP puree or flour in producing nutritious and affordable foods at scale. • Operationalization of the African Investment Bank – disbursing finance to nutrition-sensitive agricultural projects such as those for OFSP training, seed systems development and processing marketing.
<p>Commitment to ending hunger in Africa by 2025 (zero hunger)</p> <ul style="list-style-type: none"> • Double agricultural productivity – using disease-free planting materials and new crop varieties can triple yields. Also, 50–70% of agricultural labour is provided by women, and OFSP generally is considered a women’s crop. • Create conditions for access to quality inputs – capacity building for sweetpotato vine multipliers and investment in small-scale irrigation where appropriate. • Supply appropriate knowledge, information and skills – intensive agricultural and nutrition training of field agents and farmers, including women and the youth. • Halve current postharvest loss levels – improved root curing, handling, transport, storage and processing. • Target priority locations and groups – low input and resilient crop that is grown over a wide range of agroecologies from sea level to 2,500 metres. • Encourage consumption of locally produced food – locally grown nutritious OFSP foods. • Reduce child stunting to 10% – through advocating for the production and consumption of a diversified diet with adequate macronutrients and micronutrients and providing practical nutrition education.
<p>Commitment to halve poverty by 2025 through inclusive agricultural growth and transformation</p> <ul style="list-style-type: none"> • Sustain annual agricultural GDP growth of 6% – improved nutrition and economic productivity. • Strengthen public–private partnerships for five value chains linked to smallholder agriculture – opportunities in small- to large-scale food processing, fresh root marketing and seed systems. • Create agricultural job opportunities for 30% of youth – marketing and processing in both rural and urban areas. Typically, entry costs for informal sweetpotato fresh root trade and processing are low. • Preferential participation for women and youth in agribusiness opportunities – root marketing and processing opportunities at different scales, as well as in production of disease-free planting material.
<p>Commitment to boosting intra-African trade in agricultural commodities and services</p> <ul style="list-style-type: none"> • Triple intra-African trade in agricultural commodities by 2025 – data collection on the role of informal cross-border sweetpotato trade in regional food security and economic development. • Create conditions to increase and facilitate investment in markets and trade infrastructure – improved market information and linkages, and quality requirements. • Strengthen platforms for multi-actor interactions – multisectoral, nutrition-sensitive agriculture.
<p>Commitment to enhancing resilience of livelihoods and production systems to climate variability and other related risks</p> <ul style="list-style-type: none"> • Build the climate resilience of farming systems – early maturing, drought-tolerant crops that can be grown by all on poor soils to reduce climate-related food insecurity. • Mainstream resilience in policies and investment plans – drought-tolerant, early maturing, nutrient-rich crops; strengthened adaptive capacity via multi-stakeholder hands-on learning and experimentation; and targeting women and youth in vulnerable areas with multisectoral initiatives.
<p>Commitment to mutual accountability to actions and results</p> <ul style="list-style-type: none"> • Strengthen knowledge and data management capacities to support evidence-based planning, implementation, monitoring and evaluation – lesson learning, monitoring and evaluation training and implementation, sharing of knowledge through the Sweetpotato Knowledge Portal (www.sweetpotatoknowledge.org). • Biennial review process monitoring and reporting – indicators from OFSP promotion that can be used for monitoring other nutrition-sensitive agricultural initiatives.

Investing in orange-fleshed sweetpotato to sustainably improve the food and nutrition security of over 40,000 households

Opportunities exist throughout the orange-fleshed sweetpotato (OFSP) value chain for increasing the exploitation of this crop's multifaceted potential. The *OFSP Investment Guide* features a decision tool to assist investors in identifying their OFSP investment opportunities. The guide also highlights the key investment areas in the OFSP value chain (listed as 'activities' in Table 3), discusses the reasons that each is important and proposes the types of activities and resources required to transform it.

The representative OFSP value chain investment programme was designed to directly reach 10,500 beneficiary households, improving their food and nutrition security through practical agricultural and nutritional training, providing them high yielding OFSP planting materials, and developing sustainable seed systems to enable their communities to continue accessing disease-free OFSP planting materials. In-built spillover activities enable the programme to reach a further 33,000 households indirectly with OFSP planting materials and nutritional information within a three-year time span. The main benefits for these households and their nations will be improved food security, reduced vitamin A deficiency, improved dietary diversity and nutrition education, sustainable sweetpotato seed systems, increased extension capacity, and improved markets and incomes from marketing and value addition of OFSP roots and vines through processing.

The OFSP investment programme deliberately builds the capacity of all those involved along the OFSP value chain so that these transformations continue beyond the initial three-year phase. Adopting a multisectoral approach will positively influence the success of the programme, as will high level political support and involvement of the media. The resources required for the OFSP investment programme are summarized in Table 3. This multi-benefit, cost-effective, nutrition-sensitive agricultural intervention costs just US\$ 45 per household if the direct and indirect beneficiaries are considered, or US\$ 185 per household if only the direct beneficiaries are taken into account.

Table 3 – Summary of resources required for the three-year OFSP investment programme

OFSP investment programme budget summary	Total budget (US\$)
Salaries (across activities)	344,151
Common expenses (across activities)	85,645
Equipment (across activities)	189,900
Activity costs (total for all activities)	1,157,404
Activity 1. Understanding the role of sweetpotato in the food system	15,000
Activity 2. Availability and acceptability of OFSP varieties	125,868
Activity 3. Strengthening the capacity of OFSP service providers	76,546
Activity 4. OFSP vine conservation, multiplication and dissemination	415,179
Activity 5. Improving sweetpotato production and postharvest management	28,688
Activity 6. Promoting OFSP to improve health and wealth	63,568
Activity 7. Nutrition education for behavioral change at the community level	72,360
Activity 8. Strengthening OFSP marketing	52,240
Activity 9. Processing OFSP	22,560
Activity 10. Enhancing multisectoral collaboration	4,800
Activity 11. Monitoring, measuring and sharing the impact of your investment	280,595
Subtotal	1,777,100
Overhead costs	177,710
Grand total budget	1,954,810

Beneficiaries of orange-fleshed sweetpotato investments

AN IMPROVED DIET PLUS TWO NEW GOATS – Rehema’s husband died leaving her three dependants to support in the Mara region of Tanzania. Through the Marando Bora project she learnt how to conserve sweetpotato vines during the dry season, then multiply them to grow OFSP. The vitamin A rich roots have improved her family’s health and well-being. In 2011, she sold four bags of surplus OFSP roots and then bought two goats, one of which provides milk for the family and for sale locally. The goat manure has improved her soil, allowing her to multiply her vines more quickly, which has helped her to plant her crop at the onset of the rains.



A HIGHLY PROFITABLE CROP – Bakiri Lozzane, a large entrepreneurial farmer in Boane district of Mozambique planted OFSP on 6 of his 170 hectares. The larger OFSP roots are sold for human food at his farm gate along the road to Maputo, and the smaller roots are used for animal feed, mostly for pigs. He also sells OFSP vines to farmers in Gaza, Inhambane and Maputo. He harvests 1 hectare per month from which he makes a profit of over US\$ 10,000. He has recently increased his area under OFSP to 12 hectares and contracted 10 outgrowers in response to a contract with a large trader who exports OFSP roots to UK.



SCHOOL FEES AND FOOD – Mary is a 47 year old mother of five living in Bunda district of Tanzania. Through the Marando Bora project she learnt to produce clean sweetpotato planting materials and became a decentralized vine multiplier, starting out with just 200 sweetpotato cuttings. Mary’s signboards placed along the Mwanza–Musoma road attracted the attention of a non-governmental organization that later became one of her planting materials’ customers. She sold the roots in the local market. Mary invested her first year’s profit of US\$ 327 in paying school fees for her children, who now head happily to school after a healthy breakfast of OFSP roots or porridge.



VITAMIN A RICH BISCUITS – Through the Rwanda Superfoods project, SINA Enterprises tested different OFSP recipes and packaging with consumers, and then began to purchase OFSP roots grown by local farmers’ groups trained by project personnel. At the SINA factory, the OFSP roots were processed into a puree and used to produce the Akarabo Golden Power biscuits, replacing 43% of wheat flour, and mandazi. The products sold well, and in 2012/13 SINA Enterprises made factory gross sales of US\$ 146,490 from the products. The sales rose to US\$ 195,384 in 2013/14.



ROOTING OUT VITAMIN A DEFICIENCY – In Uganda and Mozambique, a HarvestPlus-led project that ran from 2007 to 2009 distributed vitamin A rich OFSP planting materials to 24,000 farming households. Within two years more than 60% of the households had adopted OFSP, leading to an almost doubling of the vitamin A daily intake among the women and young children.

ANTENATAL OFSP – In Kenya, the Mama SASHA (Sweetpotato Action for Security and Health in Africa) project is linking agriculture with health care. Pregnant women are leaving antenatal visits with an unusual prescription: a voucher for OFSP vines that they redeem from local farmers and then grow their own nutritious roots. The women also attend pregnant women’s clubs for more nutrition training. This combined approach has led to a 10% reduction in child stunting.

This *OFSP Investment Summary* is part of a set of three OFSP investment products:

The *OFSP Investment Guide* is targeted at national level technical experts in public, private and development institutions. It unpacks the investment opportunities along the OFSP value chain, offering a decision tool for identifying where they exist and the activities needed to transform them, including details on the human, financial and physical resources (see www.sweetpotatoknowledge.org/projects-initiatives/reaching-agents-of-change-rac/ofsp-investment-guides).

The *OFSP Investment Implementation Guide* is targeted at those involved in the implementation of OFSP investment programmes such as local government or NGO field staff. It provides a brief overview of the reasons for investing in pro-poor, nutrition-sensitive agricultural growth and vitamin A deficiency reduction programmes such as the promotion of OFSP. It presents a decision tool for identifying the key opportunities for that along the OFSP value chain. It then unpacks each of the investment areas in more detail and presents the activities for achieving its transformation and details on the human, financial and physical resources required (see www.sweetpotatoknowledge.org/projects-initiatives/reaching-agents-of-change-rac/ofsp-investment-guides).

The *OFSP Investment Summary* has been developed to help inform policy-makers (see also www.sweetpotatoknowledge.org/projects-initiatives/reaching-agents-of-change-rac/ofsp-investment-guides).

This set of OFSP investment products has been developed by the Reaching Agents of Change (RAC) project.

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