

THE AFRICAN ORPHAN CROPS CONSORTIUM (AOCC)



**Bridging the Gap to end
Hunger, Malnutrition and Stunting in Africa**



Delivering Nutrition and Economic Growth

The Problem

Africa is suffering a nutrition crisis. While rates of chronic hunger and malnutrition averaged 7.8% around the world in 2025, 20% of Africa's population faced hunger, up from 16% ten years ago¹. Since 2015, moderate to severe food insecurity has increased in Africa by more than 25%; today, 877 million people across the continent do not have access to a healthy diet.

In Africa, food insecurity hits women the hardest, with 55.9% and 20.5% of women aged 15 years or older experiencing moderate-to-severe and severe food insecurity, respectively. This sets up an intergenerational cycle of malnourished mothers raising malnourished children. Malnutrition in the first 1000 days of life puts children at high risk of stunting, with profound, *irreversible* effects including increased child morbidity and mortality, impaired development, and higher disease risk.

Across Africa, the burden of stunting is alarmingly high, particularly in Sub-Saharan Africa (SSA). The prevalence of stunting among children under five years of age averaged 30% and, across 35 SSA countries, ranged from 17% to 59%². In Nigeria, the most populous country on the continent, 36.5% of children under five are afflicted.

The Gap

Healthy diets are central to achieving nutritional security; and agricultural productivity is central to healthy diets. The UN's Food and Agricultural Organization (FAO) cites the need for long-term enhanced agricultural productivity and expanded R&D focus on food groups that drive healthy diets as effective nutrition interventions.

Healthy diets can only be achieved through year-round access to locally available, nutritious foods supplying the full range of essential vitamins, minerals, protein, healthy fats, fiber, and energy. For most African communities, this means access to foods that nutritionally complement diets anchored on maize, rice, or wheat. Traditional African food crops fit the bill, being nutritious as well as resilient to harsh climatic conditions that come with climate change. And traditional crops already hold a place in African diets.

However, many traditional African food crops have not received the research attention necessary to maximize their productivity; these are the "African orphan crops." They are also the "African opportunity crops" to facilitate healthy diets. For example, simply adding resistance to a harmful pest can make all the difference in harvest size. After all, "abundance" together with "diversity" is necessary to solve the nutrition crisis.

The challenge to produce sufficient, diverse, nutritious food is made tougher by the need to use less land and avoid negative environmental impacts. New crop varieties must fit with sustainable, low-input systems suited to smallholder farmers.

The Solution

The African Orphan Crops Consortium (AOCC) began operations in 2013 with six partners,

¹ FAO, IFAD, UNICEF, WFP, WHO. 2026. *The State of Food Security and Nutrition in the World 2026*. <https://doi.org/10.4060/cd8306en>

² Molero et al. 2026. PLoS One 21(3). <https://doi.org/10.1371/journal.pone.0344358>

including the African Union - New Partnership for Africa Development. Now, given contributions from its 48 members, the AOCC's professional development programs have empowered 183 national agricultural research system (NARS) scientists (some featured in photos below) working in 28 African countries with the knowledge, skills, and tools to *accelerate* development of high-performance crop varieties for sustainable agri-food systems. They realize that speed is of the essence in managing the nutrition crisis and nourishing the communities they serve.



These game-changing scientists represent a Pan-African movement! 151 plant breeders are forging ahead to improve performance of more than 125 crops with combinations of traits that smallholder farmers want and consumers need. Empowered by the AOCC course that equips African NARS plant breeders with the latest cutting-edge approaches, technologies, and free-license tools, these scientists benefit from industry-proven models for high efficiency in new variety development.

The AOCC course teaching gene editing to NARS molecular biologists has enabled 32 lab-oriented scientists to develop sources of vital traits not readily accessible to breeders using more traditional breeding approaches.

Together, these 183 scientists form multi-disciplinary crop teams essential to speedy, effective development of diverse, highly productive varieties to supply nutritional needs.

All are determined to crush malnutrition in their communities!

Results and Impacts

The achievements to date of the AOCC's Pan-African movement have been extraordinary! The \$6.5 million raised to fund the AOCC's Academy and other innumerable in-kind contributions from its 48 consortium members have empowered 183 NARS scientists representing 28 countries (93% PhDs, 40% women) with the latest knowledge, skills, and tools to combat hunger and malnutrition and transform agri-food systems. And this dynamic African crop improvement workforce is doing it!

A roadmap for breeding orphan leafy vegetable species

Further demonstrating their leadership in African crop improvement, AOCC scientists have established and led the African Plant Breeders Association (APBA), Africa's largest network of crop improvement professionals and academics. Aiming to support continuing education of crop improvement scientists across the continent, the APBA has held biennial conferences since its start in 2019, and has recently launched its own journal, the *African Journal of Crop Improvement* (AJCI), to disseminate research results to improve crop productivity and sustainability and to showcase innovative research addressing Africa's agricultural challenges.

The Next 5 Years

The AOCC will establish Regional Hubs in East and West Africa with NARS. These hubs will be anchored by Centers of Innovation in plant breeding and gene editing technology and will feature several multi-disciplinary teams functioning in a hub-and-spoke design, focused on crops/traits of high regional importance. Already 14 NARS institutions are in the running as Centers of Innovation, as 24 gene editing projects are mentored and assisted through AOCC coordination with NARS breeding programs.

For example, an AOCC-facilitated Center of Innovation is being established at the Biotechnology and Nuclear Agriculture Research Institute at the Ghana Atomic Energy Commission. Three molecular biologists - Dr. Samuel Amiteye, Dr. Andrew Appiah, and Dr. Nusrat Afful (right to left in top photo below), all alumni of the AOCC's CRISPR Course - are applying gene editing to create sources of vital traits demanded by rice farmers in irrigated and rainfed lowland ecologies in Ghana: Rice Yellow Mottle Virus resistance, soil salinity tolerance,

and nitrogen use efficiency. They are collaborating with AOCC breeder alumnus Dr. Maxwell Asante (lower right photo this page) and his team at CSIR (Council for Scientific & Industrial Research) to move these essential traits into farmer-preferred varieties for both growing seasons in Ghana.

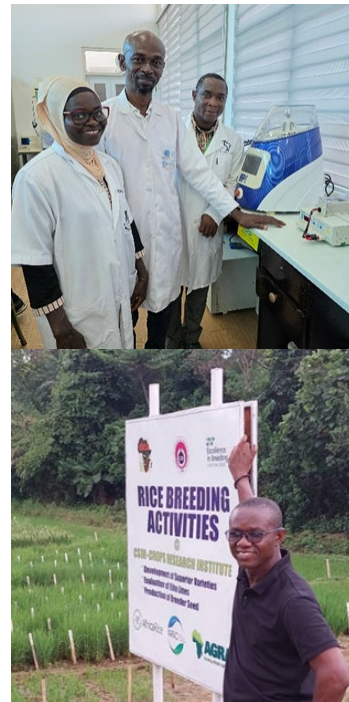
The West Africa Hub will also include Centers of Innovation in Benin at the University of Abomey-Calavi and in Nigeria at the National Biotechnology Research and Development Agency, the National Horticultural Research Institute, and the University of Calabar, among others. Crops of focus include fonio, tomato, amaranth, and taro, as well as rice, and link to breeding programs in Senegal, Sierra Leone, Cote d'Ivoire, Burkina Faso, and Niger.

Similarly, the East Africa Hub, anchored by Centers of Innovation in Ethiopia and in Kenya, will focus on finger millet, sorghum, and common bean to start. Traits developed through gene editing include sustainability characteristics important to smallholder farmers, like the ability to fix nitrogen in the soil and resistance to root rot diseases.

The AOCC hubs will bring together the various aspects of the crop value chain, to deliver nutrition from lab to plate. AOCC welcomes new consortium members, particularly those successful in aspects related to quality commercial seed production, extension services to smallholder farmers and communities, market growth, and food distribution networks from rural to urban areas. Surveys to identify the specific nutritional gaps at various times of the year by subregion are needed, as well as surveys to understand nutritional and economic impacts of the new improved varieties.

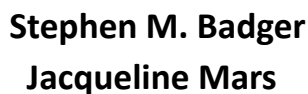
Furthermore, we are organizing a new course for professional development of early-career plant breeders to start in April 2027. Designed as Version 2.0 of the AOCC's breeders' course and co-led by previous Academy graduates from NARS, this program will promote the latest proven tools for data collection and management, high-throughput phenotyping for field performance evaluation, speed breeding techniques, genomic applications, and AI. It will foster skills in leading multi-disciplinary teams, as the plant breeder will continue to be the pivot point to bring together all the traits for high performance as required by farmers, processors, and consumers in varieties farmers want to buy.

"The original idea was to help African scientists work with African farmers to manage an African crisis," said AOCC founder Dr. Howard-Yana Shapiro. "That logical idea has grown into an unstoppable, successful African-led movement that is transforming agriculture across the continent."





An uncommon collaboration, 48 members strong



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