



FAO/AOCC Workshop Report

Allen Van Deynze, AOCC Scientific Director

Oct 11, 2024

FAO-AOCC WORKSHOP

Improving Local Agrifood Crops for Enhanced Yield and Nutrition in Africa: Leveraging the Outcomes of the African Orphan Crops Consortium (AOCC) Model for Nutritional and Economic Impact

After a decade of implementation and training, 172 scientists representing nearly 40% women and 28 African countries have been empowered through the AOCC's African Plant Breeding Academy (AfPBA) in the use of genomics-assisted approaches to crop improvement. This unique milestone has contributed important outcomes that the FAO-AOCC Workshop program sessions will explore through an open and transparent assessment by AfPBA Graduates and other experts on the premise that the AOCC's proof of concept has been demonstrated, that the implementation "movement" has begun, and that the development model is ready for further support and investments to expand and amplify the AOCC impacts to help achieve food and nutritional security. See <https://africanorphancrops.org/Reports/> 2023 report for Survey results of AOCC graduates and discussion associated with this report.

A workshop was organized by FAO and the African Orphan Crops Consortium (AOCC) at CIFOR-ICRAF in Nairobi on October 11th, 2024, with following objectives:

Goals of the FAO-AOCC Workshop:

- To demonstrate that the AOCC Movement has established proof of concept and implementation is unfolding through the initial efforts of the AOCC trained graduates at national levels.
- To recognize the importance of AOCC being embedded in national agriculture strategies as an essential component of the transformation of food systems, and the magnificent, increasing, and unlimited stimulants that AOCC provides to the economic, social, environmental, and human development of the people of local communities...farmers, women, consumers, new businesses.
- To identify next steps and plans to take the essential elements of the AOCC model to the next level in African countries and elsewhere.

Moderated by Ambassador Yaya Olaniran, Permanent Representative of the Federal Republic of Nigeria to FAO, the group of 85+ international participants were welcomed by Dr. Alice Muchugi (CIFOR-ICRAF). The agenda (Appendix A) was created to have key speakers to address each of the topics describing the current and imminent pressures on the African continent of stunting due malnutrition exasperated by population growth and climate change.

This was first stressed by FAO Director-General Qu Dongyu and was emphasized by Professor Hamadi Boga, Vice President, Program Delivery, Alliance for a Green Revolution in Africa (AGRA) "We have good scientists, and we have good systems of producing scientists, but we have weak systems of innovation and implementation." AOCC founder Howard-Yana Shapiro, the former Chief Agricultural Officer for Mars, Inc. gave a history of AOCC and stated, "An

unprecedented acceleration is required.” Dr. David Savage, Professor of Biochemistry, Biophysics and Structural Biology, University of California Berkeley / Innovative Genomics Institute (IGI) and main instructor for the African Plant Breeding Academy (AfPBA) CRISPR class underscored that all of the tools must be enabled to achieve success.

The afternoon was led by Dr. Rita Mumm, Director AfPBA, and Director Capacity Development and Mobilisation of AOCC, in three panels featuring AOCC/AfPBA graduates experiences and achievements in their plant breeding and now associated gene editing programs focusing on “Genomic Applications in African Orphan Crops” where Dr. Ghislain Kanfany, Gaston Berger University, Senegal explained how his training and empowerment by AOCC allowed him to develop the first high yielding hybrids in pearl millet by using marker-assisted selection to identify heterotic groups for west Africa.

In the “Partnerships/Collaborations for Crop Improvement” panel Dr. Enoch Achigan Dako (University of Abomey-Calavi, Benin) described how as a result of networking with his AfPBA he co-founded and is now vice-president of the African Plant Breeders Association, a community of practice of over 600 plant breeders, scientists and students working to advance plant breeding and crop development for the continent. In the “Development, Release, and Distribution of New Cultivars along with Resources for Enablement” session, Dr. Samson Gwali, National Forestry Resources Research Institute (NaFORRI), NARO, Uganda described the importance of genebanks for African orphan crop trees, in line with the AOCC/ICRAF goals of incorporating tree fruits and nuts to provide regional nutrition year-around.

Looking forward, a panel led by Dr. Allen Van Deynze, Scientific Director AOCC, and Director, Seed Biotechnology Center, University of California Davis focused on identifying major constraints to advancing crop improvement programs for African orphan crops to complement staple crops to provide nutrition year around. Limitations, thus resource requirements, was identified in structural components such as high-quality field sites and labs; maintaining and hiring a skilled staff across required disciplines for plant breeding, pathology to bioinformatics; policy issues regarding funding of research and variety development programs, as well as registration and operational challenges with accessing supplies.

Dr. Ibrahim Mayaki, co-Founder of AOCC, the African Union Special Envoy for Food Systems, former Prime Minister of the Republic of Niger and former CEO of the AUDA-NEPAD called for “African Countries to embed AOCC into national strategies for sustained impact and a Green Revolution for Africa”. He affirmed that AOCC is proving that investment in nutrition and crop improvement will promote development and that it is critical to define concrete projects to attract both private and public investments from African states.

Dr. Heidi Kühn, Founder of Roots of Peace, and 2023 World Food Prize Laureate, announced a new partnership with AOCC, describing the atrocities of farmlands being “held hostage” due to conflict and landmines and the importance of their removal and planting to improved African crops to make these lands productive again.

A final panel lay foundation for next steps for FAO/AOCC and discussions the following day. Tailored communication of local successes to policy makers and actors at all levels was deemed

essential for State and private funding and engagement including importance of business models for the value chain.

Finally, Dr. Chikelu Mba, Deputy Director of Plant Production and Protection Division, FAO summarized the meeting re-emphasizing that the AOCC model has shown to be successful; has laid the foundation for future initiatives; and that “The time is now” to engage and invest in the AOCC to deliver improved crops for nutrition year-around to combat stunting and promote development in Africa.

Sincerely,

A handwritten signature in blue ink, appearing to read "A. Van Dyke". The signature is stylized and written in a cursive-like font.

Appendix A. Agenda for FAO/AOCC workshop, CIFOR-ICRAF, Oct 13, 2024

- 1:00-1:10p Introduction by Moderator, Ambassador Yaya Olaniran, Permanent Representative of the Federal Republic of Nigeria to FAO
- 1:10-1:25p Welcome to ICRAF by Dr. Alice Muchugi, Team Leader, Biodiversity and Tree Genetic Resources, CIFOR-ICRAF
- Congratulatory speech by Professor David Savage, Professor of Biochemistry, Biophysics and Structural Biology, University of California Berkeley / Innovative Genomics Institute (IGI)
- Congratulatory video from Director-General QU Dongyu , FAO
- 1:25-1:40p Keynote Address: Professor Hamadi Boga, Vice President, Program Delivery, Alliance for a Green Revolution in Africa (AGRA)
- “The Future of Science and Technology for Africa”
- 1:40-1:45p Dr. Tony Simons, former Director General of ICRAF, Member of the World Agriculture Forum Council
- Introduction to Dr. Howard-Yana Shapiro
- 1:45-2:05p Keynote Presentation by AOCC Founder, Dr. Howard-Yana Shapiro, former Chief Agricultural Officer for Mars, Inc. (video)
- “From the origins of the AOCC to the AOCC model and the unfolding Movement in the fight for Nutritional Security across Africa”
- 2:05-2:10p Q & A
- 2:10-2:15p Introduction to the African Plant Breeding Academy (AfpBA) and its professional development programs, the AfpBA Breeders’ Course and the AfpBA CRISPR Course, and progress to date by Professor Rita Mumm, Director AfpBA, and Director Capacity Development and Mobilisation, AOCC
- 2:15-3:45p “The AOCC Proof-of-Concept in Action”, featuring 5 segments on various aspects of achievement by AfpBA Alumni
- “Genomic Applications in African Orphan Crops”**
- Panel led by Prof. Rita Mumm, with AfpBA Alumni, discussing applications of DNA sequence and molecular markers in orphan crops
- Dr. Kelvin Kamfwa, University of Zambia, Zambia: marker-assisted introgression of disease resistance into common bean
 - Dr. Ghislain Kanfany, Gaston Berger University, Senegal: Marker-assisted applications to identification of heterotic groups in pearl millet
 - Dr. Jane Cheserek, KALRO CRI, Kenya: genomics-assisted approaches in coffee to develop dwarf variety and resistance to Coffee Berry Disease (*Colletotrichum kahawae*)

-Dr. Elelwani Ramulifho, Agricultural Research Council (ARC), South Africa: creating a source of resistance to Black sigatoka disease in banana through gene editing

“Partnerships/Collaborations for Crop Improvement”

Brief presentations by AfPBA Alumni on various collaborations developed with AfPBA colleagues and internationally, garnering significant external funding for R&D in shea, okra, tomato, sorghum, finger millet, and orphan crops as well as graduate-level training

-Dr. Enoch Achigan-Dako, University of Abomey-Calavi, Benin

-Dr. Agyemang Danquah, University of Ghana / West Africa Centre for Crop Improvement (WACCI), Ghana

-Dr. Dorcas Ibitoye, National Horticultural Research Institute, Nigeria

-Dr. Emily Gichuhi, KALRO, Kenya, and Dr. Mathews Dida, Maseno University, Kenya

“Development, Release, and Distribution of New Cultivars along with Resources for Enablement”

A glimpse of the 143+ new, improved cultivars across an array of crops that have been developed and released by AfPBA Alumni and contributing to nutritional security for nations/regions as well as efforts to develop tree gene banks, genomic databases, SNP marker sets, etc.

-Dr. Happiness Oselebe, Ebonyi State University, Nigeria: white yam and water yam

-Dr. Tewodros Mulualem, Jimma Agricultural Research Center, Ethiopia: avocado

-Dr. Pavithravani Venkataramana, The Nelson Mandela African Institution of Science and Technology, Tanzania: lablab bean

-Dr. Samson Gwali, National Forestry Resources Research Institute (NaFORRI), NARO, Uganda: Genebanks for African Orphan Crop trees

“Building/strengthening the Crop Improvement Workforce for Africa”

Brief presentations by AfPBA Alumni featuring examples of leadership in the African Crop Improvement Community, developing the private sector seed business in Zimbabwe, and multi-disciplinary teamwork for sorghum improvement

-Dr. Edmore Gasura, University of Zimbabwe, Zimbabwe

-Dr. Charles Mutimaamba, Tocek Zadzamura, Zimbabwe

-Dr. Hortense Noelle Mafouasson Apala, Institute of Agricultural Research for Development (IRAD), Cameroon

-Dr. Erick Amombo, University of Mohammed VI Polytechnic, Morocco and Dr. Eduardo Mulima, Mozambique Agricultural Research Institute (IIAM)

-Dr. Enoch Achigan-Dako, University of Abomey-Calavi, Benin, and VP, African Plant Breeders Association

3:45-4:00p Q & A

4:00-4:25p Break, Group Photo

4:25-4:55p “Constraints Limiting Impact”

Panel led by Dr. Allen Van Deynze, Scientific Director AOCC, and Director, Seed Biotechnology Center, University of California Davis, including AfPBA Alumni:

-Dr. Kelvin Kamfwa

-Dr. Jane Cheserek

-Dr. Samson Gwali

-Dr. Dorcas Ibitoye

4:55-5:10p Dr. Ibrahim Mayaki, co-Founder of AOCC, the African Union Special Envoy for Food Systems, former Prime Minister of the Republic of Niger and former CEO of the AUDA-NEPAD (virtual)

“Call for African Countries to embed AOCC into national strategies for sustained impact and a Green Revolution for Africa”

5:10-5:20p Heidi Kühn, Founder of Roots of Peace, and 2023 World Food Prize Laureate,

“Uniting efforts to restore and enhance food system productivity”

5:20-5:50p Panel led by Dr. Tony Simons, former Director General of ICRAF, Member of the World Agriculture Forum Council, with audience participation to brainstorm regarding Actions to support, extend, and amplify AOCC results and impact for farmers, women, consumers, new businesses going forward

Heidi Kühn, 2023 World Food Prize Laureate, Founder of Roots of Peace

Dr Ralph Roothaert, Africa Director for World Vegetable Center

Dr. Ruth Oniang’o, 2017 Africa Food Prize Laureate, Editor-in-Chief at African Journal of Food, Agriculture, Nutrition and Development(AJFAND); Founder, Rural Outreach Program

Purity Njiagi, Innovative Small holder farmer from Embu, Kenya

5:50-6:00p Closing remarks by Dr. Chikelu Mba, Deputy Director of Plant Production and Protection Division, FAO

6:00-7:00p Cocktail Reception