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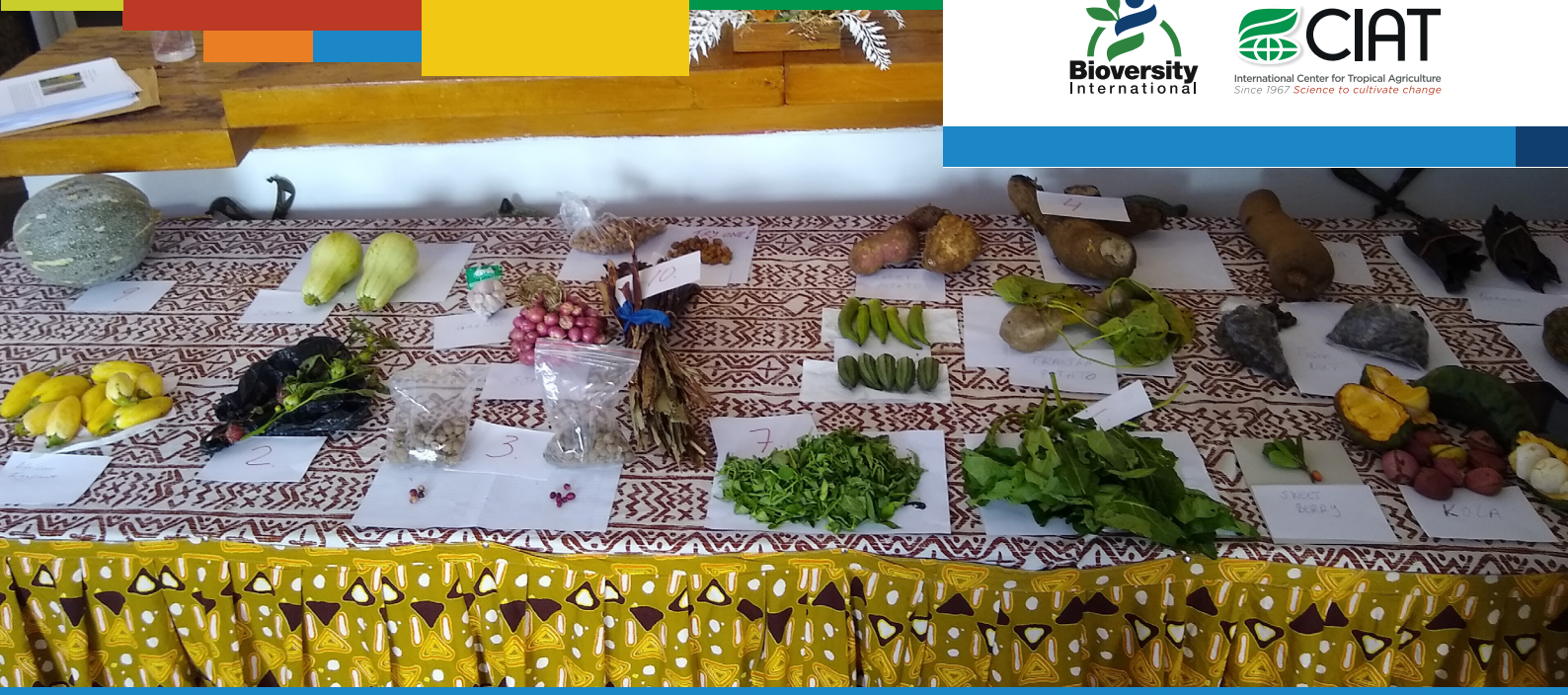

Roundtable: The Conservation and Sustainable Use of Neglected and Underutilized Species (NUS) in Ghana -Highlights-

Photo: NUS diversity on display at the Roundtable.
Credit: The Alliance of Bioversity International and CIAT/R.Vernooy

Ronnie Vernooy, the Alliance of Bioversity International and CIAT
Daniel Nyadanu, NUS Ghana Limited

Background

In Africa, farming communities have conserved neglected and underutilized species (NUS), also known as minor or orphan crops, as part of local food systems for centuries. NUS are important for food and nutrition, animal feed and medicinal use; playing a role in socio-cultural traditions and contributing to income generation. NUS also contribute to securing non-food related ecosystem services from agriculture, including climate mitigation, water flow and water quality control. For rural communities in Ghana, neglected and underutilized crop species are particularly important for nutrition, food security and income generation (Photos 1-4). However, very little is known about their diversity and potential; not much has been published about NUS in Ghana. Ghana's key agricultural policies and related programs and projects point to a very strong focus on major staple crops and commodities, with very limited attention paid to NUS.

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Photo 1-4: Some NUS of Ghana: African eggplant; Cocoyam leaf and turkey berry; Kola nut; Yellow yam.
Credit: The Alliance of Bioversity International and CIAT/R.Vernooy

As part of a development initiative *The potential of agrobiodiversity for improving diets and nutrition in Ghana* to contribute to the transformation of food systems for healthy and sustainable diets and environmental sustainability, a Roundtable on the conservation and sustainable use of NUS in Ghana was organized in Accra on 28 October 2021, with participation of representatives of government institutions, private sector entities, and civil society organizations (see Box). The goals of the development initiative are to:

1. Present an overview of current use and conservation practices and related knowledge of NUS species, that hold significant potential for improving diets and nutrition, increased cultivation, promotion and marketing, climate change adaptation and biodiversity conservation;
2. Describe the interventions of stakeholders (government, knowledge institutes, private sector and civil society) undertaken to increase the knowledge, appreciation, awareness, utilization and sustainable use of NUS;
3. Identify effective interventions for prioritized NUS to mainstream them into consumption and production.

The development initiative and the Roundtable are supported by the Government of the Netherlands and implemented by the Alliance of Bioversity International and CIAT, in collaboration with NUS Ghana Limited.

This brief presents the highlights of the Roundtable.

Motivation to work on NUS

In the opening session, participants shared their motivation and interests to work on NUS:

- Assuring the conservation of NUS for future generations
- Characterizing NUS, including through gene-sequencing
- Identifying which NUS grow well in which sites
- Working on NUS improvement and finding new opportunities to add value to NUS (e.g. product development)
- Developing improved varieties that are high yielding, nutritious, and easier to harvest and process
- Fighting malnutrition and promoting more diverse food/ diets

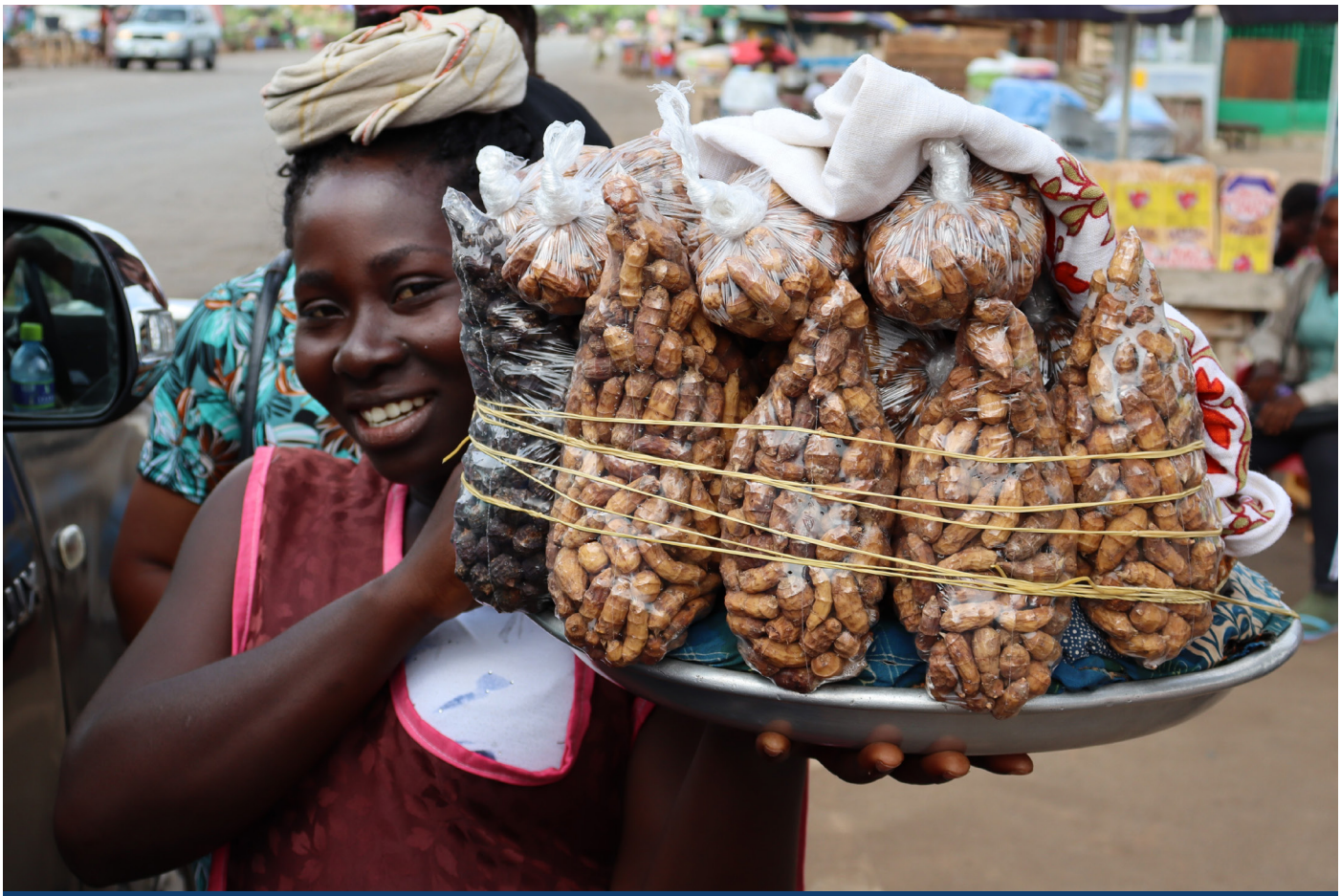


Photo 5: Selling tiger nut along the Accra-Kumasi highway. **Credit:** The Alliance of Bioversity International and CIAT/R.Vernooy

- Improving Ghana's food system and promoting Ghanaian cuisine, land, people and culture
- Using NUS for climate change adaptation and resilience

NUS species collected from local markets and farmers were displayed during the Roundtable for participants (photo top of the brief).

NUS in Ghana: insights from the literature

Ronnie Vernooy presented the insights gained from a literature review of NUS in Ghana.

Ghana has a high number of documented NUS (72, in a 2015 study), which is about 60% of the total number (126, in a 2021 study) identified for all of Africa. These include 21 indigenous vegetables, 8 root and tuber crops, 7 cereals, 12 legumes, and 24 edible wild fruit trees. There are about 20 very popular species (most marketed and consumed) (Photo 5).

However, studies observe that NUS cultivation is under pressure due to socio-economic changes, modernization of agriculture (mono-cropping, mechanization and use of chemical inputs), agrarian conflicts (e.g. livestock infringement on cropland), changing eating habits and policies that are not favoring NUS production and consumption.

NUS are distributed throughout the country, but their location-specific presence is related to agro-ecological, climatic, socio-economic (e.g. distance to markets), and socio-cultural characteristics (e.g. ethnic identity). NUS are reported to suffer from genetic erosion (in particular, loss of varieties). There has hardly been any crop improvement (plant breeding) conducted on NUS in the country.

Photo 6: Roundtable participants prioritize NUS. **Credit:** The Alliance of Bioversity International and CIAT/R.Vernooy

NUS and leafy vegetables in particular, are still important parts of eating habits, as studies in rural areas and in Accra show, with most of the supplies coming from rural Ghana, complemented with import from Togo. However, NUS can only be purchased at fresh markets and not in supermarkets (as is the case in Kenya, for example). It is not known what the impact of COVID-19 has had on production and market supplies and, as a result, on consumption.

Only very few detailed crop species studies could be found in the literature; this makes observations about current production and consumption (and trends) very difficult. There is a lack of knowledge about effective conservation and storage practices. This hinders the design of effective on-farm conservation strategies, for example, by community seed banks or similar organizations at community level.

There is no national research program on NUS and there is no supportive policy environment for NUS, which largely have been neglected by government, extension and research.

Envisioned outcomes of a national NUS action plan

From experience in other countries, it is known that a viable NUS action plan should make use of a food systems or value chain approach, *from farm to fork and from fork to farm*. Such an action plan combines three major activities: 1) providing evidence through participatory research, e.g. inventories and characterizations, identification of NUS with good potential and exploration of ways to add value to NUS; 2) influencing policy and markets to create demand, mainstream and support NUS; and 3) creating awareness about the multiple benefits of NUS.

Participants brainstormed about the design of a national action plan for NUS and identified the following envisioned outcomes.

Better knowledge about NUS

- Produce and make available a national NUS catalogue

Improved management of NUS

- Develop/improve NUS that are more nutrient rich, adaptive (to climate change) and more resilient
- Prescribe good NUS management practices along the value chain
- Develop/improve a sustainable seed system for NUS
- Attract private sector investment for NUS seed production

Improved sustainable use of NUS

- Include NUS in school feeding programs, contributing to more diverse and healthier food intake of children and adolescents
- Include NUS in health and nutrition curricula
- Promote new NUS-based products as a means to contribute to employment and income generation
- Promote a novel Ghanaian (NUS) cuisine to be celebrated nationally and globally

Better support for NUS

- Create a supportive policy environment

Priority NUS

Participants reviewed 70 NUS found in Ghana and, based on their knowledge and expertise, did an initial ranking exercise of the various NUS by crop type, based on the following criteria: contribution to food, nutrition and health; potential of income generation; culinary interest; urgency of conservation; climate change adaptation capacity; and opportunities for women/youth empowerment (Photo 7). The following NUS were identified as high priority across these seven criteria:

Cereals: African rice (*Oryza glaberrima*); white fonio/fonio millet (*Digitaria exilis*)

Fruits: African locust bean (*Parkia biglobosa*); baobab (*Adansonia digitata*); bush mango (*Irvingea gabonensis*); miracle/sweet berry (*Synsepalum dulcificum*); velvet tamarind (*Dialium guineense*)

Indigenous vegetables: African eggplant/nightshade; bush okra/ Jew's mallow (*Corchorius olitorius*); chayote (*Sechium edule*); egusi (*Cucumeropsis edulis*); Ethiopian eggplant (*Solanum aethiopicum*); pea eggplant/turkey berry/devil's fig/susumber/platebrush (*Solanum torvum*)

Legumes: Bambara nut (*Vigna subterranea*); lima bean; pigeon pea (*Cajanus cajan*)

Roots and tubers: Yellow yam (*Dioscorea cayensis*)

This is a rather long list, which could be further analyzed and prioritized.

Next steps

Participants concluded that the interactions and discussions during the Roundtable were very valuable, creating new linkages among social actors interested in and working on NUS, generating new ideas for collaborative activities, as well as a very first "draft" of a possible follow-up initiative. They remarked that a holistic and dynamic food system or value chain approach is very promising to chart a new avenue in the country for the promotion of NUS. They concluded by expressing interest to work together on exploring opportunities to make this a reality.

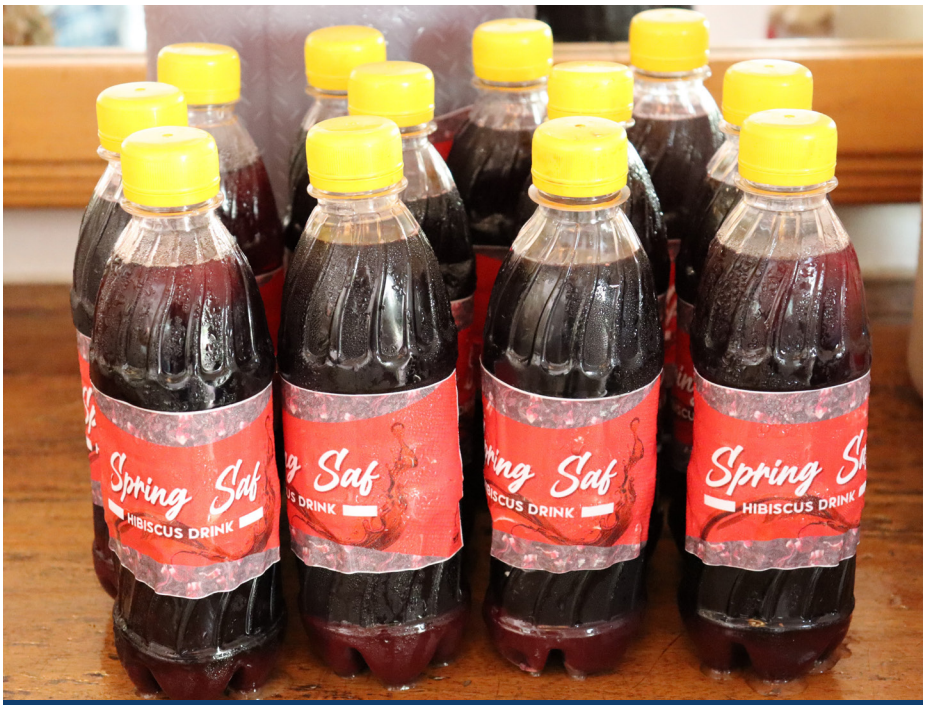
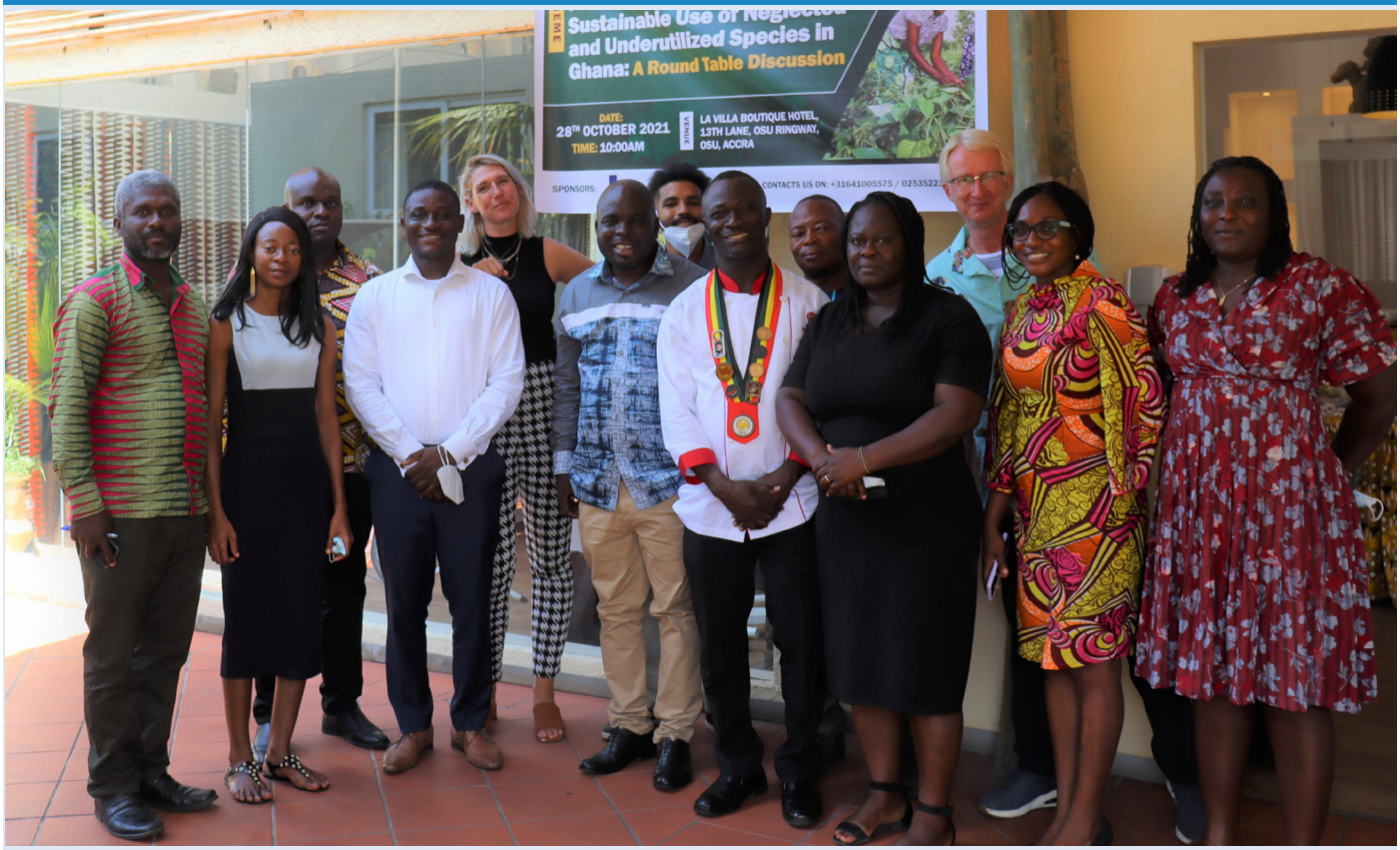


Photo 7: A new NUS –based product: Hibiscus (Roselle) drink (juice) developed by Sodji Safura.
Credit: The Alliance of Bioversity International and CIAT/R. Vernooy

Box 1. Roundtable participants (Photo 8)



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- Bram Smits, Agricultural Counselor, Embassy of the Kingdom of the Netherlands, Accra
- Daniel Nyadanu, Director, Ghana NUS Limited
- Esther Fobi Donkor, University of Energy and Natural Resources (UENR), Sunyani
- Kwame Fia-Foli, chef, member of the Ghana Food Movement
- Lotte Wouters, Co-founder/Head of Programs & Partner Engagement, Ghana Food Movement, Accra (www.ghanafoodmovement.com)
- Matilda Bissah, Council for Scientific and Industrial Research/Plant Genetic Resources Research Institute, Bunso
- Pearl Exornam Selormey, Head of Nutrition Department/Nutrition consultant (Hortifresh), St Elizabeth Hospital, Accra
- Rashied Tetteh, Council for Scientific and Industrial Research/Plant Genetic Resources Research Institute, Bunso
- Richard Amoah, chef, Production manager of Talmond foods Ltd., Accra (www.talmondfoods.com)
- Ronnie Vernooy, Senior Scientist, the Alliance of Bioversity International and CIAT, Wageningen, the Netherlands
- Sodji Safura, Post-harvest Technologist, Akim Afosu
- Wonder Nunekpeku, Biotechnology and Nuclear Agriculture Research Institute, Legon-Accra

Photo 8: . Group photo of the Roundtable participants (not on the photo: Bram Wits). **Credit:** The Alliance of Bioversity International and CIAT/R.Vernooy

Acknowledgements

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Alliance

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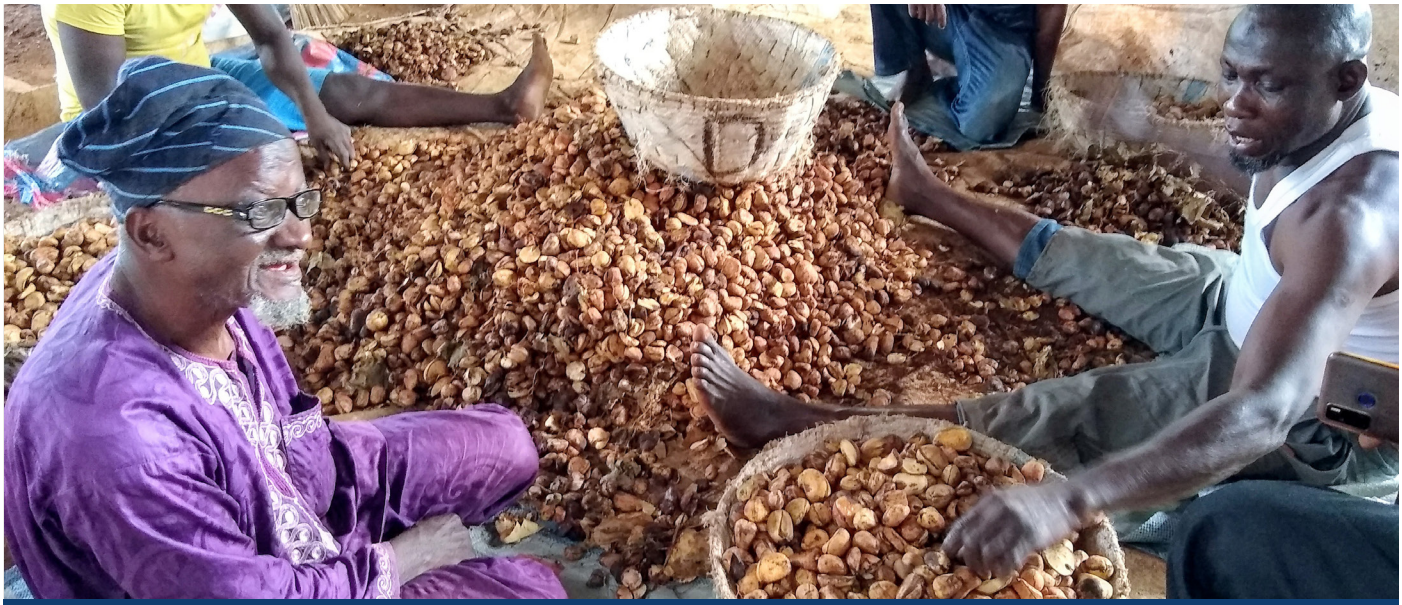

Photo 9: Preparing kola nuts for sale (Kwahu-Fodoa village). **Credit:** The Alliance of Bioversity International and CIAT/R.Vernooy