ACP Science
and Technology II Programme

Strengthening capacities and informing policies for developing value chains of neglected and underutilised crops in Africa

Bambara groundnut (Vigna subterranea), one of Africa's many neglected and underutilised species, is a priority crop for value chain development: a local market in Lomé, Togo. © P. Rudebjer

GRANT
EUR 992,789.06

CONSORTIUM
- International Plant Genetic Resource Institute (IPGRI, operating under the name of Bioversity International), Italy
- African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE), Kenya
- Africa University, Zimbabwe
- International Foundation for Science (IFS), Sweden
- Laboratoire d'Agrobiodiversité et Amélioration des Plantes Tropicales (LAAPT) - Université d'Abomey-Calavi, Benin
- University of Nairobi, Kenya

Associated partners:
- Excel Hort Consult Ltd (EHC), Uganda
- Global Horticulture Initiative (GlobalHort), Tanzania

PROJECT IMPLEMENTATION PERIOD
January 2014 - December 2016

CONTACT THE PROJECT
Bioversity International
Via dei Tre Denari 472/a
00054 Maccarese (Fiumicino)
Rome
Italy
Tel: +39 06 61181
E-mail: bioversity@cgiar.org
www.bioversityinternational.org

PROJECT WEBSITE
http://www.nuscommunity.org/research/projects/acp-eu-value-chains/

SUMMARY OF RESULTS

Three National Action Plans for value chain upgrading of amaranth (*Amaranthus* spp.) and Bambara groundnut (*Vigna subterranea*) in Benin, Kenya and Zimbabwe were developed and promoted at national and regional levels. 70 young scientists upgraded their skills in designing interdisciplinary research projects on value chains of neglected and underutilised species, and 74 enhanced their capacity to communicate results to scientists and non-scientists. A curriculum guide on neglected and underutilised species was published and distributed to agricultural universities and technical colleges in sub-Saharan Africa. Three policy briefs were published on amaranth, Bambara groundnut and neglected and underutilised species education. Results were shared at three sub-regional workshops involving 23 African and three European countries, and at an international conference in Kenya. An expert meeting outlined the way forward for mainstreaming neglected and underutilised species in agricultural development in sub-Saharan Africa.

BACKGROUND

Since colonial times, agricultural research and development in Africa has focused on a few staple crops, particularly maize, wheat and rice, and commodities such as coffee, tea and tobacco. Some roots and tubers, bananas, legumes and pulses have also been a priority. Yet, hunger and malnutrition remain high in a rapidly growing population. Africa's rich diversity in neglected and underutilised species (NUS) is now being highlighted due to their nutritional properties and resilience to pests, diseases and climate change. However, weak capacity in research, extension and education, policy constraints, and low consumer awareness currently limit their wider use.

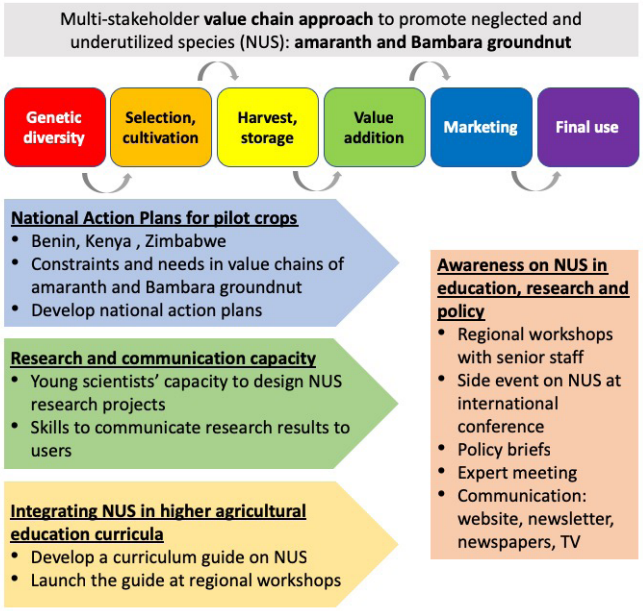
An earlier project under the ACP S&T I Programme showed, among others, that:
- Many young scientists in Africa work on NUS, but are constrained by weak individual and institutional capacity.
- Young scientists are unfamiliar with value chain or food systems approaches, so research projects often lack such perspectives.
- NUS scientists have limited contacts with the private sector during research design and implementation.
- Training in proposal writing, scientific writing, research design and communication in the context of NUS is in high demand.
- Better insights in the practical application of research results and how to communicate these are needed.
- NUS topics need to be introduced in higher education curricula.

Based on these lessons, the project hypothesised that:
- Amaranth (*Amaranthus* spp.) and Bambara groundnut (*Vigna subterranea*) could serve as model crops for developing NUS value chains in Benin, Kenya and Zimbabwe, and lessons could be replicated for other species and countries.
- NUS scientists would increase their development impact if trained in project design and communication of research results.
- Universities and technical colleges in Africa are interested in teaching NUS, but lack a curriculum guide.
- Policy makers are receptive to information on the role of NUS in addressing malnutrition, adaptation to climate change, poverty and youth employment.

The direct beneficiaries of the project were: *Value chain stakeholders* in amaranth and Bambara groundnut value chains, including small-scale farmers, farmers' organisations, processors, traders and entrepreneurs; *Young scientists* who design and implement NUS research and publish results that need to be communicated; *Higher agriculture education institutions* interested in teaching NUS, and; *Policy actors* across Africa seeking options to meet the UN's Sustainable Development Goals.

Bioversity International
anafe African Network for Agriculture, Agroforestry & Natural Resources Education
AFRICA UNIVERSITY A United Methodist-Related Institution
IFS INTERNATIONAL FOUNDATION FOR SCIENCE
LAAPT
University of Nairobi
EXCEL HORT CONSULT EHCL
Global Horticulture Initiative www.globalhort.org

METHODOLOGY



A national workshop in each country identified problems in value chains of amaranth and Bambara groundnut and prepared action plans for improving the situation, Cotonou, Benin (July 2014). © P. Rudebjer

Science communication training: school visit to create awareness on benefits of neglected and underutilised crops, Benin (October 2015). © P. Rudebjer

National action plans for pilot crops

A multi-stakeholder value chain approach was used for two pilot crops: amaranth, a pseudo-cereal and leafy vegetable; and Bambara groundnut, a protein-rich African legume grown in semi-arid regions. National workshops in Benin, Kenya and Zimbabwe analysed constraints in the value chains of these crops, identified opportunities for upgrading and agreed on priorities for action. National Action Plans (NAPs) were then developed covering six areas: Market access and consumer demand; Input supply; Agronomy; Technical and product development; Organisational management; Regulatory and policy environment; and Finance. The NAPs were promoted at exhibitions and agricultural fairs, in the press and on TV, and at agricultural conferences and meetings.

Research and communication capacity

Two training courses were offered in each of the three sub-regions to early career scientists from 19 countries who were involved in NUS research, in particular on amaranth and Bambara groundnut:

- Research proposal writing with a focus on upgrading value chains of NUS plants.
- Scientific communication with a focus on NUS plants.

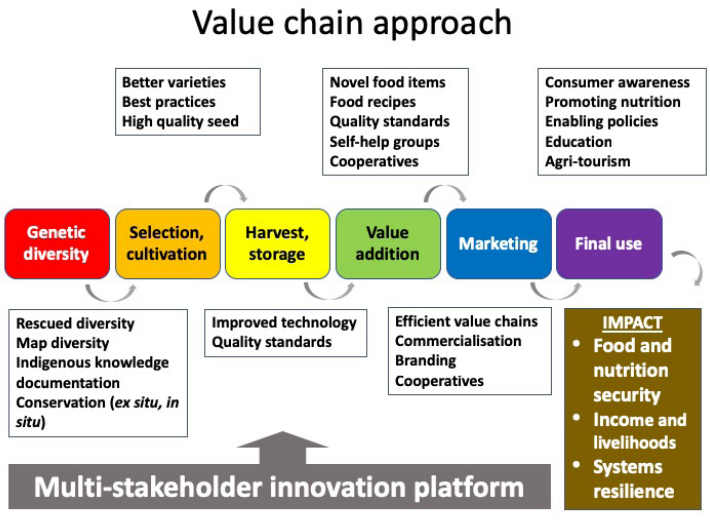
Applicants' own research proposals or draft scientific papers – and their subsequent revisions – served as highly motivating key learning materials. Equally appreciated was the use of the trainees' own research results when practicing outreach of key scientific messages to different stakeholders.

Integrating NUS in higher agricultural education curricula

A regional workshop with participants from universities, research organisations, the private sector and international organisations assessed NUS training needs and developed a curriculum framework for NUS education. A NUS curriculum guide was produced with five modules: introduction; vegetables; fruits and nuts; edible insects; and rodents. The guide, in English and French, was widely distributed in sub-Saharan Africa and published online. It was launched at three sub-regional workshops.

Awareness on NUS in education, research and policy

At national level, project results were shared at agricultural fairs, and on the radio and TV. At sub-regional level, project experiences and products (policy briefs, NAPs, NUS curriculum guide) were shared at three workshops with mostly senior staff from research, higher education, policy/government and the private sector. The project reached out to a broader African and international audience at a side event on NUS at the African Agri-Business Incubation Conference & Expo 2015 in Kenya. Policy briefs communicated key messages on amaranth, Bambara groundnut and NUS education. The end-of-project expert meeting shared project results with a group of influential stakeholders from African universities, national and international research institutes, NGOs and private businesses. The project website and those of project partners disseminated information on project activities and products.



The value chain approach for promoting neglected and underutilised crops was the focus for many project activities. Source: S. Padulosi, Bioversity International

Outputs

Stakeholders involved

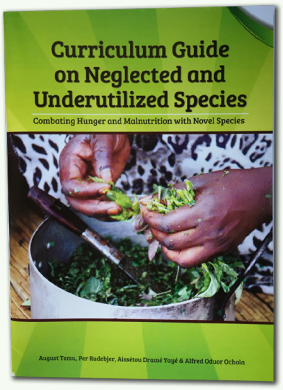
- 320 individuals in sub-regional/regional project activities (including 144 young scientists and 57 university staff).
- 225 value chain stakeholders in national workshops, consultations and events.

Capacity building

- 6 training courses:
  - 70 young scientists (40 male, 30 female) from 18 countries trained on NUS research proposal writing.
  - 74 young scientists (43 male, 31 female) from 14 countries trained in scientific writing and communication with a focus on NUS.
- 23 trainees applying for an individual IFS research grant benefitted from constructive feedback from and networking opportunities with IFS advisers.

Curriculum guides

- Curriculum guide on NUS for tertiary agricultural education.
- NUS curriculum for secondary schools in Benin.



Curriculum guide: a tool for NUS education in universities and technical colleges in Africa (ANAFE, Kenya).

Policy documents

- 3 National Action Plans (NAPs) on value chain upgrading of amaranth and Bambara groundnut in Benin, Kenya and Zimbabwe.
- National report on status and priorities for research and value chain upgrading of NUS in Zimbabwe.
- 3 policy briefs (English and French):
  - Upgrading grain amaranth value chains in Africa.
  - Bambara groundnut, a legume of choice for food security and industry.
  - Improving education on underutilised and neglected plant and animal species.
- Report of expert meeting 'The way forward' with 16 recommendations for following up project results.

144 young scientists from 18 countries were trained in NUS project design and science communication. © P. Rudebjer

Sub-regional work plans

- Work plan for NUS development in Southern Africa (short and long term).

Networks

- Informal sub-regional networks of young scientists working on NUS.

Research proposals

- 35 trainees submitted a proposal to IFS for an individual research grant, of which 12 were approved.
- Some trainees funded their research proposal from other sources.

Visibility

- Project website.
- 2 displays on NUS value-added products.
- 2 newsletters: ANAFE and NUS Community.
- 2 Facebook groups on science writing and communication.
- 2 webstories from side event on NUS in Kenya (28 September 2015):
  - http://coastweek.com/3840-agriculture-03.htm
  - https://www.voanews.com/a/africa-agricultural-experts-promote-non-traditional-food/2986111.html
- 1 webstory on Scientific Writing and Communication workshop.
- Newspaper articles in Zimbabwe, Kenya and Benin.
- TV coverage in Benin and Togo.

Publications

- Gbaguidi A.A. et *al.*, 2015. Strategic action plan for the promotion of Amaranth and Bambara groundnut value chain in Benin. LAAPT/BIORAVE, FAST Dassa (University of Abomey-Calavi).
- Chemining'wa G.N., 2015. National action plan for the promotion of amaranth and bambara groundnut in Kenya. Department of Plant Science and Crop Protection University of Nairobi.
- Chiteka Z.A. et *al.*, 2015. Strengthening capacities and informing policies for developing value chains of neglected and underutilized crops in Africa - Zimbabwe National Action Plan.
- Temu A. et *al.*, 2016. Curriculum guide on neglected and underutilized species: Combatting hunger and malnutrition with novel species.
- Chemining'wa G. et *al.*, 2016. Upgrading grain amaranth value chains in Africa. Policy brief.
- Dansi A. et *al.*, 2016. Bambara Groundnut, a legume of choice for food security and industry. Policy Brief.
- Yaye A. et *al.*, 2016. Improving education on underutilized and neglected plant and animal species. Policy brief.
- Gbaguidi A.A. et *al.*, 2016. Promotion de la chaine des valeurs des espèces négligées et sous-utilisées au Bénin: cas du voandzou (Vigna subterranea L. Verdc.) International Journal of Neglected and Underutilized Species (2016) 2: 19-32. University of Abomey-Calavi, Benin.
- Agre A.P. et *al.*, 2016. Plan d'actions stratégiques pour la promotion de la chaine de valeur de l'Amarante (*Amaranthus* spp) au Bénin. International Journal of Neglected and Underutilized Species (2016) 2: 33-41. University of Abomey-Calavi, Benin.
- Hall R.A. and Rudebjer P. (eds.), 2016. 3rd International conference on neglected and underutilized species (NUS): for a food-secure Africa. Accra, Ghana, 25-27 September 2013. Proceedings. Bioversity International, Rome, Italy and International Foundation for Science, Stockholm, Sweden.
- Tiburce Odjo T. *et al.*, 2015. Utilisation des plantes négligées et sous utilisées (NUS) dans les programmes d'enseignement des lycées et collèges du Bénin. LAAPT/BIORAVE, FAST Dassa (University of Abomey-Calavi).
- Hall R. *et al.*, 2014. Upgrading value chains of Bambara groundnut and amaranth in Zimbabwe, Kenya and Benin. Conclusions and recommendations from three national innovation platform workshops, June-July 2014.
- Rudebjer P. and Kasolo W. (eds.), 2017. Report from expert meeting on NUS value chains in sub-Saharan Africa, 29-30 November 2016, IITA, Cotonou, Benin. Bioversity International, Rome, Italy.
- Proceedings of a sub-regional education and policy multi-stakeholder workshop on NUS 2016. ANAFE.

RESULTS

Outcomes

- The partners in Benin, Kenya and Zimbabwe play a key role in implementing the NAPs by linking them to national processes. They also strengthen the NUS profile in their own universities, in teaching, research and outreach.
- 5-6 additional countries in each sub-region were exposed to the project results. The scaling up of the results depends on the actions of the participants from these countries, the availability of funding and on 'NUS champions' to take the lead.
- 70 young scientists in 18 countries applied their new skills in the design of a NUS research project proposal, increasing their success rate. At least 12 alumni have funded new NUS research projects after the training.
- 74 young scientists in 14 countries have used their new skills in communicating research results. IFS reported that alumni had published 18 scientific papers of relevance to NUS.
- Trainees influence their home institutions as they inform colleagues on the training course results.
- ANAFE published a training manual on NUS in 2018, to be used by universities and technical colleges, along with the project's curriculum guide.

Impacts

Usage

- LAAPT (Benin) is leading a group of young scientists involved in value chain upgrading work and support to local entrepreneurs. In Kenya, the project linked up with the Kenya Agriculture and Livestock Research Organization (KALRO), involved in a national initiative on NUS. Both are mechanisms for implementing the NAPs.
- Universities and technical colleges in Africa have started to use the NUS curriculum guide to review and update courses and programmes.

Policy implications

- The project contributed to an on-going policy dialogue on the role of NUS in contributing to the Agenda 2030. For example, the Commission on World Food Security featured several talks on NUS in its 45th session on 15-19 October 2018, FAO, Rome, Italy. Experts stated: "We wish to see NUS at the centre of global efforts on nutrition, sustainability and climate change adaptation. We wish to see NUS contributing to Agenda 2030. This vision should be reflected in the way we allocate funds, engage with donors, research value chains and develop capacity, for a transformative continuum."

Sustainability

- The sustainability of the capacity developed in 144 young scientists under the project will be reflected in their future actions to design new NUS projects and communicate results for development impacts.
- The sustainability of the project's educational activity is linked to efforts in universities and technical colleges to introduce NUS into courses and programmes, offer thesis research on NUS and link with the private sector in promoting NUS value chains.
- Strong endorsement of the project's value chain approach by stakeholders in the three sub-regions was evident. Project results can be sustained by implementing the NAPs in Benin, Kenya and Zimbabwe, and other countries in the three sub-regions can follow.

The project's final expert meeting reflected on the results and developed a way forward for promoting NUS in sub-Saharan Africa, Cotonou, Benin (December 2016). © P. Rudebjer

TESTIMONIAL

Olusegun A. Yerokun, former Vice Chancellor, Zambian Open University, Zambia

"Africa is blessed with rich biodiversity. Several plant species that have previously played a significant role in nutrition are now overlooked. They were relatively easy to access, affordable, nutritious, and hardy. However, the narrowing of diets with wide adoption of continental menus led to their neglect. The NUS project was beneficial to raise awareness of these crops and the nutrition and economic roles they could play, especially when we are experiencing the harsh effects of climate change. I feel the project created a platform for specialists and practitioners to network. This will bring more attention to re-introducing NUS crops."

ACP-EU Co-Operation Programmes in the fields of Higher Education and Science, Technology and Research
http://www.acp-hestr.eu/

Implemented by the ACP Secretariat
Financed by the European Union