

Projectupdate

Geographical focus:	Sierra Leone, Ghana, Nigeria
Call reference:	Innovative approaches to process local food in Sub-Saharan Africa and Southeast Asia, which contribute to improved nutrition as well as qualitative and quantitative reduction of losses
Project titel:	UPGRADE Plus: Decentralised postharvest processing of underutilised species into innovative value added products for improved food and nutrition security in West Africa
Cooperating partners:	The University for Development Studies (Ghana), Njala University (Sierra Leone), the National Horticultural Research Institute (Nigeria), German Institute for Tropical and Subtropical Agriculture, and Innotech Ingenieursgesellschaft mbH
Duration:	15-10-2017 until 31-12-2020
Budget:	Approx. 1,100,000 €

please insert a map of the target region¹



Figure 1: Map of West Africa – target regions of UPGRADE Plus project namely Nigeria, Ghana and Sierra Leone are highlighted in dark yellow colour (Picture Copyright: World Atlas, 2019)

Aim of the project:

The project aims to improve the diets of women, infants and young children while at the same time creating income generating opportunities for women’s self-help groups in West Africa and reducing post-harvest losses in underutilized agricultural produce. Specifically, the project seeks to:

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- i) develop innovative small-scale modular, decentralised photovoltaic and solar thermal driven post-harvest food processing units suitable for local conditions,
- ii) utilise high-value underutilised species for the production of innovative and diverse nutrient-rich processed food products with extended shelf-life,
- iii) to empower women, especially those in self-help groups, in order to prevent micronutrient deficiencies in children as well as increase the health status of pregnant and lactating women,
- iv) stimulate the rollout of the technologies and processes through training of local artisans who will build the systems using mainly locally available materials and selected members of women groups who will train new users.

Additionally, the project seeks to enhance the development of innovative processed food products with extended shelf-life, and stimulate the local uptake of such products in close partnership with women's self-help groups. In doing so, the project seeks to add to the growing evidence suggesting USs can play a central role in nutrition, income generation, and empowerment of women in Sub-Saharan Africa.

Results

The UPGRADE Plus project kicked off with initial fieldwork surveys in each of the partner country – Sierra Leone, Ghana and Nigeria. This included identification of stakeholders, women's groups/ mother support groups and of the available/cultivated underutilized species in the targeted region.

NU in Sierra Leone began preliminary investigations/ pre field work to identify the target mother support groups (MSGs), primary and secondary stakeholders and perform barrier analysis. Over, the period of one year NU narrowed down to 9 communities (3 more than initially drafted so as to give a wide range and scope) in the northern and southern areas of Sierra Leone, performed 24 hr food recalls with 100 adults to identify the food consumption pattern, performed analysis to identify potential or known barriers and identified the key stakeholders in the targeted region. The results thus obtained provided an understanding of the role and potential of Mother-Support-Groups in improving nutritional and food security, the interactions and potential of VSL (village and savings loan) groups as well as FBO (farmer-based organisations). The investigations performed also provided a deeper insight to improved nutrition in the target stakeholder groups, including the influence of husbands and especially mothers-in-laws and the role of knowledge (or rather lack thereof) on under-utilised species, thus, successfully completing WP 1 of the project.

DITSL which focuses on fieldwork in Ghana and Nigeria, launched its engagement with women's groups in Ghana and Nigeria shortly after the project kick-off meeting in March. This included visiting of 22 women's groups from Oyo, Osun and Ogun States including 328 women participants in Nigeria and in Ghana, 27 women's groups with 523 women. In Ghana, the groups were situated near Tamale including Central Gonja, Savelugu, Nanton, and Tolon Districts. Group discussion, activities, interviews and surveys were performed to identify and narrow down women's groups in Nigeria and Ghana. With data and information collected from the conducted fieldwork, the overall number of women's groups were shortlisted to 6 for both Nigeria and Ghana. Fieldwork was aided by UDS and NIHORT.

NIHORT in consistence with DITSL and NU conducted focus group discussions to identify the barriers in diverse diet, conducted surveys of local craftsmen in South West Nigeria as major stakeholders and performed preliminary evaluation of some identified underutilized species. The results obtained from the barrier analysis have revealed a severe lack of knowledge, high seasonality, economic constraints and personal choice as some of the major drawbacks within the groups. The study also revealed that the dietary diversity of children during the complementary feeding phase is limited and little diverse resulting in malnutrition among children in Iseyin communities, thus, justifying the need to target stage of life for food products development. Preliminary nutritional data obtained in collaboration with UDS for certain underutilised species will aid in the development of innovative value added products.

UDS kick started the project with a literature review of the available under-utilized plant species in Northern Ghana. The outcomes of this study were incorporated in the underutilized species database which was jointly developed by the entire UPGRADE Plus project team and coordinated by Uni Kassel. Following the above, UDS proceeded with preliminary research work and numerous laboratory experiments for the characterization of key

quality attributes and processing steps of some underutilized species in Ghana for novel food products development. For the time being the products in focus include Orange Fleshed Sweet Potatoes (OFSP), Pumpkin, Frafra potato, Air yam and Gardenia erubescens fruits. Based on the preliminary investigations, conditions for the production of high quality peeled and unpeeled OFSP flour have been established.

INNOTECH informed the project (UDS) on topics related to the development of low-cost food processing systems for the usage in the three partner counties. INNOTECH has further conducted extensive investigations on the usage of plastic film collectors for warm water generation as a low cost and reliable technology. Preliminary investigations on the reduction of specific energy demand of technologies and machine components for the planned processing system were conducted.

Uni Kassel developed and regularly updates the data base of underutilized species and has extended the information from the partners with nutritional values for said species available from published studies. This information is now supplemented by measured data from the project partners. The data base will be made available to the research community through the project website. Processing needs were defined for all partner countries based on the location and the underutilised species under investigation. Preliminary investigation of local crafts men have been performed for capacity building. Furthermore, Uni Kassel has established close contacts to both, NGOs and government organizations in the partner countries and Germany. Uni Kassel has come to an agreement with the University of Göttingen to collaborate between the UPGRADE Plus and FruVaSe projects. This includes a jointly organized workshop for all projects in the program in early 2020 and collaboration regarding the supervision of the PhD students involved in the two projects. The latter includes provision of laboratory space and support with research questions.

Key statements

- Women's groups are interested in the project and its outcomes
- There is a great variety of underutilized species which could support the increase of nutritional security
- Processing of underutilised species can be combined with the processing of established food stuffs to reach the goal of yearly technology utilisation
- Modularity of the systems allows for the use of the different stages individually if necessary
- Specific energy demand can be significantly reduced in comparison with established systems

Policy advice

We are not in a position to give political advice (politische Empfehlungen) at this stage of the project

Please insert 2-3 photos (jpeg)¹



(a)

(b)

(c)

Figures 2: (a) Women's groups discussing different species, their cultivation, processing and consumption (b) Women selling Amaranth green in Nigeria, (c) Dried food products currently being sold on the market in Oyo State, Nigeria. (Picture Courtesy: (a) Ojo, 2018 (b),(c) Lelea, 2018)