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Joyce Agyei-Amponsah is a Food Research Scientist working at the Radiation Technology Centre of the Biotechnology and Nuclear Agriculture Research Institute (BNARI) in Accra where she conducts Research and Development (R&D) activities in the area of irradiation technology, food quality analysis, food safety and food biotechnology. She holds a MSc. in Food Science and Technology from University of Lincoln, UK and a BSc. in Nutrition and Food Science from University of Ghana. Her research focuses on Postharvest Management, value-addition and shelf-life extension of neglected and underutilized roots and tubers to reposition them in the food chain and ultimately help improve the livelihoods of the rural small-scale farmer. She enjoys collaborating with other scientists from different disciplines to develop new skills. Joyce is currently a mentee on the African Women in Agriculture Research and Development (AWARD) fellowship programme.

Neglected and Underutilized Crops (NUC): Empowering the livelihood of smallholder women farmers in Africa

Global food security intervention has become overly dependent on major food crops, namely maize, wheat, potato and rice for our nutrition and caloric need. Our over dependence on these food crops raises concerns about the sustainability of feeding the world today and in the future. Africa is expected to increase its food production by up to 230% by the year 2050 to make the continent food secure. This is a huge challenge with the implication that Africa needs to exploit all plant species abundantly available to us.

Neglected and Underutilized Crops (NUC) will play a vital role in contributing to enhancing food security in Africa. NUC are known to be of minor importance in terms of production, consumption and utilization, with their full national economic potential not fully exploited. NUC are often referred to as ‘orphan’ crops because they are not classified as major crops of high importance. Examples of neglected underutilized crops are Pearl millet, Fluted pumpkin, Yellow yam, African bitter yam, Forest yam, Folio and African rice. These crops have considerable benefit to man in agriculture, medicine and industry and have the potential to reduce poverty and alleviate hunger. NUC play a significant role in contributing to household food security and income. There is, therefore, the need to reposition NUC as a key livelihood asset for the rural poor especially women and children. NUC differ from staple crops in a number of

fundamental ways. They tend to be managed with traditional systems, use informal seed sources and involve a strong gender element. Their processing can be laborious, with grading and packaging of these crops being very primitive. The products are marketed locally with limited involvement of large enterprises. Many of these species along with a wealth of traditional knowledge about their cultivation and use, have long been neglected by mainstream agriculture for a variety of agronomic, genetic, economic, social and cultural reasons and these crops are going extinct at an alarming rate. Thankfully, over the last ten years, an increasing number of research projects have been towards the significance of NUC in improving nutrition, generating income, promoting cultural diversity, maintaining ecosystem health and empowering the poor and marginalized. In many areas women are the main custodians of these crops with its associated traditional knowledge while men concentrate on producing staples and commercial crops. Thus NUC can be particularly important for empowering women.

The 2014 World Food Day brought to the world's attention the significant role of family farming in eradicating hunger and poverty, protecting the environment, and improving livelihoods particular in rural areas in Africa. To help achieve this, the role of the small holder women farmer cannot be overlooked. Women make about 50% of farmers in the sub-Saharan Africa, producing about 60 – 70% of food. There is, therefore, the need to reposition smallholder women farmers in Africa to enable them increase their incomes and improve their livelihoods. Globally, there has been a rising interest in foods that can contribute in novel ways to human health and nutrition. This interest can be exploited to develop markets for non-staple crops which poor communities can benefit from, providing incentives for farmers to plant these crops.

NUC face a number of challenges mainly because agricultural research and policy makers have paid little attention to these species resulting in the creation of major gaps in our knowledge and capacity to conserve and improve them. There is also the problem of genetic erosion, marketability and inevitably the issues with climate change. We do not know enough about their agronomy and the improvement of their yield and quality. Little has been done to identify the most effective commercialization, marketing and policy frameworks to promote their use and maximize their economic value. All of these factors represent at various levels, bottlenecks for successful promotion of NUC. Producers and researchers must participate in networking to secure the genetic resource base of these species, increase the value of these crops and make them more widely available. This would broaden the resource base and increase the livelihood options for rural communities. There is need to change the mind sets of farmers and consumers alike, about NUC with a view to change its image of being seen as the poor man's food. Many neglected and underutilized crops are nutritionally rich and hence food scientists, caterers and school matrons can use them to create new value-added products to improve the nutritional status of rural folks.

There is need to train farmers, particularly rural women farmers, who are custodians of NUC to empower them in playing active role in taking and increasing their access to markets and also to keep preserve cultural diversity. When women farmers are given the same resources (such as training, loan facilities and inputs) as men, they could increase agricultural productivity by up to 30%. For instance, a smallholder farmer in Nigeria,

Susan Goodwin, upon receiving training on new farming methods doubled her yields of groundnut and yam in a year. A Cocoa farmer, Mariam Kamo from Sierra Leone, has been growing from strength to strength since she received training and technical advice from Biolands Intl., Africa. Mariam now gets much higher prices for her produce and can pay school fees for her four grandchildren. There is also the need for training facilitators to bring participants together and give them the tools they need to create effective cooperatives. This is particularly relevant for empowering women to help them establish self-help groups. The Zimbabwe Agricultural Income and Employment Development program (Zim-AIED), in partnership with Better Agriculture, working with smallholder farmers in Zimbabwe helped Esther Fatachi to turn chillis into cash. With input loans and training, farmers like Esther Fatachi saw their profits soaring. Importantly, if we are to feed 9 billion people in 2050 in a sustainable way by providing healthy and nutritious food for all then we need more diverse agricultural food systems. The Government should put in place legal frameworks, policies and financial incentives to promote NUC and also find ways to replicate these success stories to many more rural women farmers who are involved in cultivation of NUC. This will help improve the production of NUC and contribute significantly to addressing Africa's food challenge.

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