

ISTRC



Newsletter

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Contents

Revised serving ISTRC Council from January 2016.....	2
President remarks.....	3
Report on the First World Congress on Root and Tuber Crops and ISTRC General Meeting held in Nanning, China.....	3
ISTRC General Meeting	7
Proceedings.....	7
WCRTC Sponsorship.....	7
18 th Triennial International Symposium in 2018.....	8
Formation of the New ISTRC-Asia Branch.....	8
ISTRC signs a MOU with the Chinese Society for Tropical Crops.....	8
Communications	8
RESEARCH AND DEVELOPMENT UPDATES FROM COUNCIL MEMBERS FROM DIFFERENT REGIONS OF THE WORLD	9
Potato cultivation in SSA.....	9
The sweetpotato for profit and health initiative (SPHI) aims to reach 10 million African families in ten years	11
Report from the ISTRC-Pacific Branch (ISTRCPB).....	12
Ecological approaches to sweet potato production in the Caribbean.....	14
Taro (Dasheen) research in the Caribbean	14
FAO's contribution to cassava development in the Caribbean community	15
Diversity studies of Barbadian sweetpotato	16
News from Eastern and Southern Africa	16
New Champions in Root and tuber crop development underway-in West Africa	17
APP-CARDI drought tolerant field evaluations for root and tuber crops	20
A major book on 'Potato and Sweetpotato in Africa: Transforming the Value Chains for Food and Nutrition Security'	20

Revised serving ISTRC Council from January 2016

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This Newsletter is compiled by Dr Maruthi M. N. Gowda, ISTRC Councillor for Publications, and edited by Prof. Keith Tomlins, ISTRC President.

President remarks

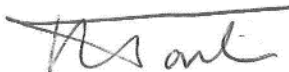
Since the last Newsletter during the 4th quarter of 2015 there have been a number of positive events for the ISTRC. Firstly, the 1st World Congress on Root and Tuber Crops (17th Triennial International Symposium/3rd GCP21 Conference), was successfully held in Nanning, China in January 2016 and a detailed report is given in this newsletter. Many thanks to everyone who supported this event. Special thanks in particular to Prof. Yinong Tian, Prof. Songbi Chen, Prof. Wenquan Wang, Prof. Peng Zhang of the Local Organising Committee and Dr Claude Fauquet for making the Congress a success.

Secondly, I would like to say a big welcome to Dr Jan Low, Dr Maruthi Gowda and Dr James George who have joined the ISTRC Council and a thank you to Dr Richardson Okechukwu, Dr Chakrabarti and Dr Maria Andrade who chose to step down.

The ISTRC is expanding its worldwide network by signing a Memorandum of Understanding with the Chinese Society for Tropical Crops in January 2016 and by the formation of the Asia Branch of the ISTRC which was kindly initiated by Prof. Songbi Chen.

We have some important events to look forward to. Later in 2016 the ISTRC-Asia Branch will hold its first meeting and joint training session. 2017 will be auspicious for the ISTRC because it will be the 50th Anniversary of the society since its formation in 1967. The Africa Branch of the ISTRC will be holding its 13th International Triennial Symposium in Dar es Salaam, Tanzania from 6th to 10th March 2017. Plans are underway so please support this symposium. We are already planning for the 18th International symposium in 2018 and more news will be given at a later date. Finally, the ISTRC has updated its logo to give it a fresher look. We hope you like it.

I hope you enjoy reading this newsletter and thank you for supporting the society.



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Report on the First World Congress on Root and Tuber Crops and ISTRC General Meeting held in Nanning, China

The First World Congress on Root and Tuber Crops (17th Symposium of the ISTRC) was successfully held in collaboration with the 3rd Scientific Conference of the Global Cassava Partnership for the 21st Century (GCP21) at the Wharton International Hotel in Nanning, China, January 18-23, 2016. Dr Claude Fauquet, GCP21 worked with Prof Yinong Tian, Guangxi Subtropical Crops Research Institute who led the Local Organising Committee. This joint meeting was hosted by the Guangxi Subtropical Crops Research Institute, Nanning in partnership with Chinese Academy of Tropical Agricultural Sciences, the Shanghai Institutes for Biological Sciences of the Chinese Academy of Sciences.



Mr. Ribo Huang, Vice Governor of Guangxi Province officially declaring the meeting open at the opening ceremony of the WCRTC Monday 18 January 2016, Nanning, China (Photo credit: Miss Ning, GSCRI, Nanning)

Over 565 delegates from 65 countries attended the Congress; a high proportion were from African countries where root and tuber crops such as cassava, yams,

sweetpotato and potatoes are an important source of diet. More than 37% of delegates were women, increasing the gender balance in this important meeting, and about 25% were students and young researchers.

Opening ceremony and plenary speeches

The opening ceremony of the Congress was held on Monday 18 January 2016. Twelve dignitaries from China led by Mr. Ribo Huang, Vice Governor of Guangxi Province and other organisations (Mr. Changhua Li, Vice Director of Science and Technology Department of Guangxi Province, Mr. Xianjin Bai, President of Guangxi Academy of Agricultural Science, Mr. Shaojian Ma, Vice President of Guangxi University, Mr. Yubiao Lv, Vice Director of Guangxi Academy of Science, Mr. Weilin Yang, Vice Director of Guangxi State Farm Bureau, Mr. Xuejun Wang, Vice president of CATAS, Mr. Xiaoping Lu, director of Asian and Pacific Ocean office of CIP, Mr. Kaimian Li, Director of Tropical Crops Genetic Resources Institute of CATAS, Mr. Ji Jiang, Director of Guangxi Foreign Expert Bureau, Mr. Fang, Vice President of Guangxi Science Association and Mr. Qiang Huang, Director of Guangxi Subtropical Crops Research Institute)



Mr. Ribo Huang, Vice Governor of Guangxi Province (Photo credit: Miss Ning, GSCRI, Nanning)

were at the ceremony. The Vice-Governor of Guangxi Province officially declared the First World Congress on Root and Tuber Crops open by striking a traditional gong from the province.

Dr Pamela Anderson delivered the opening presentation of the congress, highlighting the importance of root and tuber crops for mankind as energy source and nutrition, and the challenges in growing them. Ten additional keynote speeches were delivered on the first day of the congress on key topics covering production, processing and utilization of root and tuber crops worldwide. The past president of ISTRC Prof. Andrew Westby, Natural Resources Institute, University of Greenwich, UK, delivered a keynote speech on post-harvest issues affecting root and tuber crops.



ISTRC current President Prof. Keith Tomlins, Director of GCP21 Dr Claude Fauquet, past President Prof. Andrew Westby, and Dr. Pamela Anderson speaking at the WCRTC, Nanning China on 18 January 2016. (Photo credit: Miss Ning, GSCRI, Nanning)

The last but not least keynote speech of the day was delivered by Prof. Hans Rosling, Gapminder Foundation, Sweden on human growth demographics and comparing developed and developing nations. He gave a rousing presentation using his fascinating data-bubble software that makes statistics easy to understand and follow. He also stressed the role of root and tuber crops for mankind.

The first day was successfully concluded by dinner, traditional Chinese tea ceremony and dance from a local cultural troop.

Scientific Sessions

On the next three days from Tuesday 19 to Thursday 21, six concurrent scientific sessions were held each day with a total of about 300 oral presentations and more than 250 posters. This covered a large range of topics, from root and tuber crops biodiversity, gene discovery, agronomy, physiology, breeding, pests and diseases, abiotic stress, climate change, markets, processing, and value addition among other topics. Twelve additional plenary sessions, again covering many diverse topics concerning root and tuber crops were delivered on Friday the 22nd, the last scientific day of the Congress.

Congress workshops, events and field visit

Five workshops were held in the evenings of Tuesday 19 and Thursday 21 by specialist research groups on varying topics such as identifying cassava cultivars with reliable

genetic markers, establishment of surveillance networks or viable seed systems. Unlike the main scientific sessions where Q&A opportunities are limited, the evening sessions provided extended time and informal atmosphere to discuss each topic in detail. The workshops were moderated by two senior persons guiding the debate by the enthusiastic attendees on the advances made, constraints remained and the way forward on each topic. It is expected that useful conclusions and decisions will be made and the specialists groups will continue to communicate on respective topics.

Five "crop conversations" were held on each of the five congress days, during the lunch or poster session hours. The main aim of this was to discuss eight important current topics on root and tuber crops by a group of 4-5 experts to answer questions and share their opinions. These conversations are video recorded and will be uploaded on to social media sites to get across important messages on root and tuber crops to a larger audience worldwide.

The congress had several social events throughout the week. It started on Monday 18 with an advanced celebration of the Chinese New Year with dragons and drummers, followed by the Chinese Banquet. On Wednesday 20 evening, all participants visited the



Professor Yinong Tian, Joint Organiser of the Congress, speaking to the Media about the meeting
(Photo credit: Miss Ning, GSCRI, Nanning)

Guangxi Museum of Nationalities with traditional dances and dinner. On Tuesday 19 and Thursday 21, at the time of the evening workshops, we had open bars with waitresses in traditional costume. Finally, on Saturday 23, more than 330 people made the field trip to visit the Guangxi

Cassava Research Institute and a cassava starch factory in the morning and to a cassava field in the afternoon to witness the mechanical harvesting of cassava in farmer fields.



The LOC (local organizing committee) is thanked by the ISTRC President and GCP21 Director. (Photo credit: Miss Ning, GSCRI, Nanning)

Awards presented at the Congress



Congress awards

WCRTC awards were made for three best oral and poster presentations as follows:

Oral presentations:

1st prize - Narayanan, Donald Danforth Plant Science Center, USA: *Biofortification of iron and zinc in cassava storage roots to nutritionally significant levels*

2nd prize - Mengbin Ruan, Institute of Tropical Bioscience and Biotechnology, China: *Genomics approaches to unlock the high yield potential of cassava, a tropical model plant*

3rd prize - Gemma Arnau, CIRAD, France: *Progress and challenges in genetic improvement of yam (*Dioscorea alata* L)*

Poster presentations:

1st prize - Xia Zhiqiang, Institute of Tropical Bioscience and Biotechnology, China: *AFSM sequencing approach a simple and rapid method for genome-wide SNP and methylation site discovery and genetic mapping*

2nd prize - Wanlee Amonponi, Thailand: *Nutrient management in 3 of cassava varieties under Susunin Huaipong loamy soil in Thailand*

3rd prize - Willard Kamowa Mbewe, Rutgers State University, USA: *Variability in P1 gene redefines phylogenetic relationships among cassava brown streak viruses*

ISTRC awards

ISTRC awards were given on Friday 22nd during the closing ceremony of the Congress

ISTRC Lifetime achievement for contribution to cassava

The ISTRC lifetime achievement for contribution to cassava was awarded to Prof. Li Kaimian, Director of the Institute of Tropical Bioscience and Biotechnology, CATAS and Chief Scientist of the Chinese Cassava Agro-technology Research system, Ministry of Agriculture, China. Prof. Kaimian worked on cassava integrated breeding, and presided over more than 20 national and provincial key projects. He has released 11 new cassava varieties of South China Series, and published over 200 publications.



ISTRC Lifetime achievement for contribution to Potato

The lifetime achievement for contribution to potato was given to Prof. Jin Liping from the Institute of Vegetables and Flowers, Chinese Academy of Agricultural Sciences. Prof. Liping is the Chief Scientist of Chinese Potato Agro-technology Research system, Ministry of Agriculture, China. She worked on potato genetic breeding and production of virus-free potato seed, and presided over more than 10 national and provincial key projects. She has released 17 new potato varieties of China Potato Series, has gained six national and provincial level awards, and more than 110 publications. She was an expert advisor to FAO and UNDP on potato cultivation.



ISTRC Lifetime achievement for contribution to sweetpotato

The ISTRC lifetime achievement for contribution to root and tuber crops on sweetpotato was given to Prof. Ma Daifu. Prof. Daifu is the chief scientist of China Agricultural Research System for Sweetpotato, a breeder by specialism, working on management of sweetpotato cultivation in China. He's a member of several professional bodies and Govt. advisory committees in China.



ISTRC Lifetime achievement for contribution to root and tuber crops



Professor Conrad Bonsi, Tuskegee University receiving the Lifetime Achievement Award from Professor Keith Tomlins, President ISTRC. (Photo credit: Miss Ning, GSCRI, Nanning)

The ISTRC lifetime achievement for contribution to root and tuber crops was awarded to Prof. Conrad Bonsi, Associate Dean for research at Tuskegee University, Alabama, USA, and previous ISTRC Secretary / Treasurer (1984 to 2003). Conrad

started as a plant breeder for improved pest and disease resistance in the early 1980's. Then Tuskegee University started work on the suitability of sweetpotato for space missions and his work on this in his capacity as Associate project director. This involved sending sweetpotato on **two space missions** and the results proved to be highly encouraging, including the development of a sweetpotato variety suitable for space missions. This also included two patents. In the USA he was the breeder of sweetpotato varieties in Alabama. He worked simultaneously in several countries in Africa including Ghana, Tanzania, Kenya, South Africa, Uganda, Mali, Burkina Faso and Nigeria among others. In these countries he was among the first pioneer researchers to introduced orange sweetpotato in the 90's, involved in germplasm exchange, and product development.

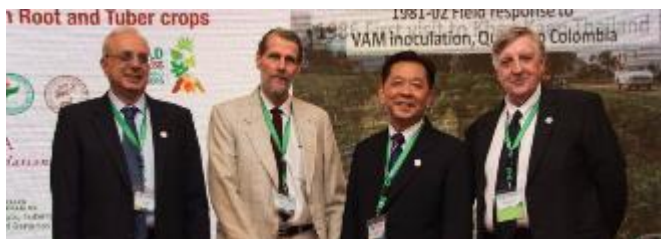
Pat Coursey Prize for Yam Research

The Pat Coursey Prize for Yam Research and US\$100 in money was awarded to Jacinta Akol for a paper entitled diversity of viral pathogens infecting yams in Uganda.

GCP21 awards

Golden Cassava Awards

GCP21 Golden Cassava Awards were given to two cassava experts from Southeast Asia; Dr. Chareinsuk Rojanaridpiched, a cassava breeder from Kasetsart University, Thailand and a Board Member of the Thai Tapioca Development Institute (TTDI), and Dr. Reinhardt Howeler, a cassava agro-physiologist from CIAT, Colombia who worked many years tirelessly to improve the adoption and cassava in Southeast Asia. Together their work has benefited millions of smallholder farmers and contributed to the development of a multi-billion dollar industry based on cassava processing



From left to right; Dr Joe Tohme, Dr. Reinhardt Howeler, Dr. Chareinsuk Rojanaridpiched, and Dr. Claude Fauquet (Photo credit: Georgina Smith, CIAT-Hanoi)

NextGen Special Fellowship

NextGen Special fellowships were awarded to four female African scientists who were selected from more than 40 applicants. The awardees were: Sally Mallowa, Iowa State University, Kenya; Nneka Okereke, National Root Crops Research Institute, Nigeria; Teddy Amuge, NaCRRI, Uganda; and Sarah, Nanyiti, University of Bristol, United Kingdom.

ISTRC General Meeting

A general meeting of the society was held at the WCRTC. Councillors representing ISTRC branches from around the world provided an update on their activities through power point presentations.



ISTRC General meeting; President Prof. Keith Tomlins introducing ISTRC; and Prof. Yinong Tian introducing the local organizing committee to ISTRC members. (Photo credit: Miss Ning, GSCRI, Nanning)

The members present re-elected the current President Prof. Keith Tomlins for the second term, and the ISTRC welcomed new members on the council; Prof. Yinong Tian, First vice president World Congress on Root and Tuber Crops
Dr. Claude M. Fauquet, Vice President GCP21
Dr Jan Low, Vice President Fund Raising,
Dr Maruthi M N Gowda, Councillor for Publications
Dr. James George, Councillor for South Asia

ISTRC also very much like to thank the recently stepped down councillors, Dr Chakraborty (Councillor for South

Asia), Dr Maria Isabel Andrade (Fund Raising), and Dr Richardson Okechukwu (Publications) for volunteering their time and energy to make the society a continuing success.



Some of the ISTRC council members at the WCRTC China, left to right, Prof. Andrew Westby, Dr Maria Isabel Andrade, Dr Dominique Dufour, Prof. Satish Chandra, Dr Gregory Robin, Prof. Songbi Chen, Dr Claude Fauquet, Prof. Keith Tomlins, Associate Prof. Mohammed Umar, Dr Maruthi M N Gowda, and Dr Chidiozie Egesi. (Photo credit: Prof. Songbi Chen, TCGRI, Hainan)

Proceedings

The Congress proceedings are being published electronically at <http://www.gcp21.org/wcrtc/proceedings.html> (financial support from FAO). This will include all plenary and scientific session presentations along with the posters (where the authors gave consent to do so).

Photographs taken at the WCRTC

A comprehensive set of photographs can be found at the ISTRC Facebook Group at <https://www.facebook.com/groups/221619034612519/photos/>

WCRTC Sponsorship

All of the partners who hosted and organised the World Congress on Root and Tuber Crops and the participants, would like to thank the sponsors who kindly supported this event in many ways from supporting the attendance of early career scientists to Congress events and activities.

Sponsors Of the World Congress on Root and Tuber crops



18th Triennial International Symposium in 2018

The ISTRC is approaching a number of countries for an expression of interest to host the next ISTRC symposium in 2018.

Formation of the New ISTRC-Asia Branch

The ISTRC-Asia Branch was formally launched during the World Congress on Root and Tubers Crops, Nanning in January 2016. It was initiated by Professor Songbi Chen, Deputy Director, Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agricultural Sciences, Hainan Province, China. The formation of the ISTRC-Asia Branch fills a significant gap for root and tubers crops in this region since this will be the only regional forum that covers all of the root and tuber crops and will facilitate the exchange of information and ideas across the crops. More news about the ISTRC-Asia branch will be released during 2016.



ISTRC signs a MOU with the Chinese Society for Tropical Crops

The Chinese Society for Tropical Crops and the ISTRC signed a Memorandum of Understanding on 24th January 2016. Prof. Liu Guodao, Vice President of CATAS signed on behalf of Prof. Lifu Yang, vice Secretary of Chinese Society of Tropical Crops (CSTC). Both ISTRC and CSTC have a common interest in fostering, stimulating and supporting any type of activity leading to the general improvement of the production and utilization of tropical root crops. The societies wish to collaborate to

complement each other's efforts by jointly developing and sharing forums, training and projects on the application and dissemination of modern science and technology. CSTC is already starting to work with the ISTRC-Asia Branch to develop joint meetings and training sessions.



Prof. Liu Guodao, Vice President of CATAS and Prof. Keith Tomlins, ISTRC signing the MOU (Photo credit: CATAS, Hainan)

Communications

As well as this Newsletter, and website the ISTRC has other forms of communication.

- **ISTRC Website.** The ISTRC website is an open resource for members as well as general public to obtain information on the society. council regularly updates important developments on root and tuber crops, advertise conference and symposia announcements and <http://www.istrc.org/>
- **ISTRC Facebook Group.** The ISTRC Facebook group has over 400 people signed up and is free to join. Here you can post news about your work on root and tuber crops, projects, share information and request information. <https://www.facebook.com/groups/221619034612519/>
- **ISTRC LinkedIn Page.** The ISTRC LinkedIn page has similar information to the Facebook group but has a wider circulation, in particular in China.

More information about ISTRC can be found at <http://www.istrc.org/> and <https://www.facebook.com/groups/221619034612519/> More information about the WCRTC can be found at <http://www.gcp21.org/wcrtc/index.html>.

RESEARCH AND DEVELOPMENT UPDATES FROM COUNCIL MEMBERS FROM DIFFERENT REGIONS OF THE WORLD

Potato cultivation in SSA

By Elmar Schulte-Geldermann

Potato is the world's most important tuber crop, and the fourth most important staple crop. It thrives in mid- to high-altitude regions, and yields more calories per unit area and growing time compared to grain crops, such as rice, maize, and wheat. Potato's short cropping cycle is well suited to the double cropping seasons in the African highlands, particularly in rain-fed systems. In sub-Saharan Africa (SSA) growth over the last decade in area planted to potato has been tremendous. From 1993 to 2020, demand for potatoes is projected to increase by 250%, with an annual growth in demand of 3.1%. However, it is troubling that farmers are meeting this growing demand by increasing the areas under production, rather than increased productivity (yields per hectare). Current yields are around 14t/ha, with South Africa having 35t/ha and North African countries (Egypt, Morocco and Tunisia) achieving yields of about 25t/ha, yields in most SSA countries are below 10t/ha way below attainable yields. As more land is given over to agriculture, forested mid- and high-altitude regions are lost, with consequential threats to the carbon sinks that these forests represent and, in many cases, to wildlife habitats and biodiversity.

The potato cropping cycle varies from three to four months. Harvestable tubers are available 60 days after the onset of the rainy season. By contrast, grains require six to nine months. This makes potato one of the first crops that can be harvested in a given growing season, thus an important crop for the "hunger months" -- that is, a period of several months between harvests when people lack enough food to satisfy meet basic caloric and nutritional needs. The prices of potato, as with other root and tuber crops, fluctuated much less than those of cereals during the food crisis of 2007–2008. Because potatoes are largely traded locally and nationally, their prices are less susceptible to international food price speculation than cereal prices. Potato is also a cheap but nutritionally rich staple food for the fast growing cities of SSA, contributing protein, vitamin C, zinc, and iron to the diet. These qualities and nutritional benefits make potato the smallholder food security and cash crop of the

future for the densely populated highlands of Eastern and Southern Africa (ESA).

There are many compelling reasons for encouraging more wide-scale adoption of potato into the livelihoods of Africa smallholder farmers. Potato is multifaceted as a staple crop that addresses food security and a horticultural crop for its high value per unit area of land. Potato thrives in mid- to high altitude regions, and its short cropping cycle of three to four months is well suited to the double cropping seasons in the African highlands, particularly in rain-fed systems. Potato further distinguishes itself for its water-use efficiency, yielding more food per unit of water than any other major crop. With a yield potential of more than 51,000 calories/ha per day in a short growing season, its productivity in terms of energy produced is the highest of all major arable crops, almost double that of wheat and rice. Along with groundnut, onion, and carrots, the "nutritional productivity" of potato is especially high: for every cubic meter of water applied, 5,600 calories of dietary energy are produced, compared to 3,860 in maize, 2,300 in wheat, and only 2,000 in rice. For the same cubic meter, potato yields 150 g of protein; double that of wheat and maize, and 540 mg of calcium, double that of wheat and four times that of rice.

Although opportunities exist along the potato value chain, some basic challenges prevent farmers from benefiting fully from potato. First is the minimally functional seed potato system, which currently is only slowly delivering genetic gains. The limited supply of high-quality seed potato is far below ever increasing demand. Farmers often keep and replant their seed with insufficient attention to quality. Poor quality seed lowers yield potential and continually keeps smallholder incomes low. Good agricultural practices for both seed and ware potato, including the ability to select quality seed, best production practices, and postharvest handling and storage, are not well understood or routinely applied. This underdeveloped value chains, marketing and information systems prevent farmers, traders and processor from fully utilizing the crop's value.



Female representative of the Mbale Potato Traders Association with potato supplies at the Mbale marketplace in Uganda (Credit: S. Quinn/CIP)



Female potato farmers harvesting the crop in Lushoto, Tanzania (Credit: S. Quinn/CIP)

Creating wealth with seed potatoes in Ethiopia

In Ethiopia the lives of potato farmers have been transformed through a Common Funds for Commodities-funded, CIP-implemented project (2008-13) to improve the wealth and livelihoods of potato producers.

The project resulted in a wide range of positive livelihood changes for participating farmers, including increased availability of high quality seed potato at affordable prices, and improved yields food security, and market linkages - all leading to increased income.

Before the project, the concerns of the farmers centred on problems of unemployment and low income. These days, farmers are thinking about marketing, inputs and industry as the project has led to a revitalization of potato production in the area. The project transformed the market so that potatoes became a powerful cash crop as well an important food security and nutrition crop. Five years ago respondent households reported

consuming 3 meals a day for an average of 3.9 months - 3 years later this increased to 7.59 months a year. Now virtually all respondents have at least 2 meals per day throughout the year. Using income generated from potatoes, respondents purchased corrugated iron for houses, mobile phones, radios, and electricity connections. They invested in oxen, dairy cattle, horses and sheep and were able to afford school fees.

"Most of our income is from potato – potato kick-started everything here. With the money we earned from potato, we invested in other enterprises and crops. There was very little in the way of cash crops before (this) project". (Gumer Burdena Dember, potato farmer)



Kisima Farm: A Private Sector Success Story

In Kenya, the USAID funded 3G project supported Kisima Farm to specialize in early generation seed production. Kisima Farm began with field multiplication on 8 ha from minitubers obtained from another private sector enterprise, Genetic Technologies International Ltd, which specializes in tissue culture and was supported under the 3G project to invest in aeroponics. Since these early beginnings in 2009, Kisima Farm has;

- i) expanded field multiplication to 80 ha, producing 1600 tonnes of seed potato each season
- ii) invested in aeroponics, beginning with 150m² and expanding to 240 m² to produce 200,000 minitubers annually, and
- iii) invested in cold storage facilities.

Technical backstopping and early efforts to encourage investment were essential for their success. Kisima Farm recently dropped seed prices from 2000 to 1500 Ksh per 50 kg bag. Comparatively, the national program sells seed at 3000 Ksh per bag, emphasizing the importance of supporting private sector investment in seed production.

The farmer pictured below purchases seed from Kisima Farm and recently stated *"Using quality seed from Kisima Farm has greatly improved my yields. Why would I maintain seed quality on farm, when I can now afford to purchase all of my seed requirements each season?"*



The sweetpotato for profit and health initiative (SPHI) aims to reach 10 million African families in ten years

By Christine Bukania, Jan Low, Julius Okello, and Norman Kwikiriza

The Sweetpotato for Profit and Health Initiative (SPHI) was launched in 2009 to reposition sweetpotato in African food economies, especially in expanding urban markets by changing the image of sweetpotato as a poor man's food. In the six years since then, sweetpotato has continued to expand significantly compared to cereals. This is not surprising. The growth of the crop is often associated with growing population density, as sweetpotato gives a higher energy output per unit time per unit area of sweetpotato compared to cereals like maize. The growth of the crop is also a result of concerted efforts of the stakeholders who form the SPHI.

The SPHI is a multi-partner, multi-donor initiative that seeks to reduce child malnutrition and improve smallholder incomes in 10 million African families in 17 sub-Saharan (SSA) countries by 2020. The first five-year phase (2010-2014) concentrated on proving the potential, and placed great emphasis on breeding and seed systems research and testing models of delivery of improved varieties to producers and consumers. The second five-year phase (2015-2019) focuses on achieving the potential, ensuring that effective seed systems are delivering improved planting material to the targeted households.

Seventeen countries are targeted by this initiative. Of these, twelve currently have projects delivering improved sweetpotato varieties: Burkina Faso, Nigeria, Ghana, Ethiopia, Rwanda, Uganda, Kenya, Tanzania, Zambia, Malawi, Mozambique, and South Africa. The other target countries are Benin, Democratic Republic of

Congo, Angola, Madagascar and Burundi. It is expected that the initiative will improve diet quality by 20% and crop incomes by 15% among beneficiary households in these countries. For the nutrition objective, emphasis is placed on promoting pro-vitamin A rich orange-fleshed sweetpotatoes (OFSP).

Progress towards the SPHI goal

In 2009, each country set a target number of beneficiaries to reach by 2020. Figure 1 below presents progress towards SPHI beneficiary targets, numbers reached and percent of target achieved in SPHI countries. By September 2015, 1.9 million households in total have been reached. Uganda, Ethiopia and Malawi are the three leading countries in terms of the number of beneficiaries reached to date. Among all countries, Ethiopia and Kenya have made tremendous progress, and are close to their original targets, with 95% and 91%, respectively, of the target reached. This is because relatively low target values were set. The first phase of the SPHI was focused on breeding and resolving key questions in seed systems, not going to scale. So it is not surprising that key producing countries like Uganda and Malawi have reached only 21% and 16% of their targets, respectively.

The SPHI partners are working to standardize tools so that survey data is collected and analysed across countries, which will enable more accurate quantitative reporting. Table 1 shows how the change of the percentage of households producing OFSP is monitored between endline and baseline in different projects.

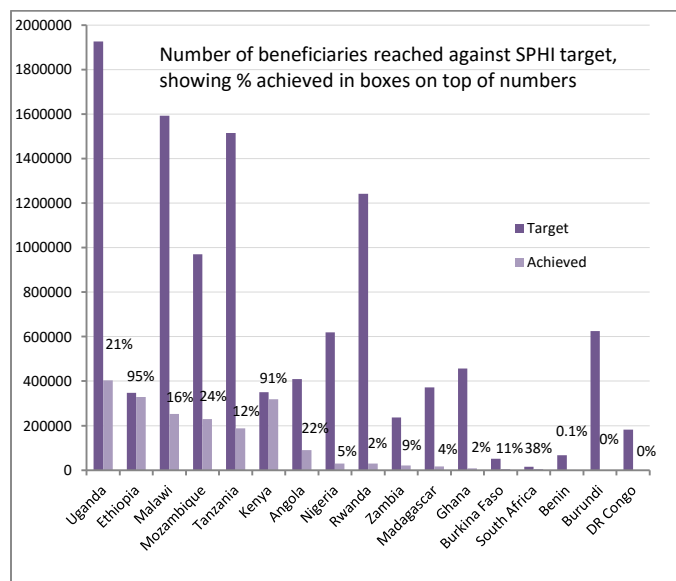


Figure 1: Progress towards SPHI beneficiary targets, numbers reached and percent of target achieved

Table 1: Proportion of households growing OFSP in intervention areas: Recent results from SPHI countries

Country	Project	OFSP Production (% of households producing OFSP)	
		Baseline	Endline
Rwanda	Rwanda Superfoods (SASHA)	10	91
Mozambique	Mitigating Disaster	47	89
Ethiopia	Irish Aid	4	22
Tanzania	Marando Bora (SASHA)	7	69
Kenya	Mama SASHA (SASHA)	3.7	54.6

Source: Project baseline and endline reports

Access to good varieties is key to being able to go to scale

Availability and easy access to good quality sweetpotato planting material is essential to increased production and consumption of sweetpotato. Much effort has therefore been directed at breeding for virus and drought tolerance in addition to biofortification and market-preferred traits (namely dry matter content, taste, and sweetness). Since 2009, 53 orange fleshed sweetpotato (OFSP) varieties and 31 non-OFSP varieties have been released in 14 of the 17 target countries. In Benin and the Democratic Republic of Congo, some varieties of OFSP are in use, although they have not been formally released. This progress has been due to a partnership established between the International Potato Center (CIP) and the Alliance for a Green Revolution (AGRA) at the start of the SPHI. AGRA has provided direct financial support to 10 national sweetpotato breeding programs. CIP's Sweetpotato Action for Security and Health in Africa (SASHA) project hosts an annual Sweetpotato SpeedBreeders' meeting and provides additional technical backstopping.

One of the challenges faced in improving farmer access to quality sweetpotato planting material is the perishable nature of vines. Moreover, because sweetpotato vines are easily shared between farmers, to date, private sector agro-dealers have showed little interest in engaging in sweetpotato vine sales. To facilitate access, many projects have engaged in identifying and training vine multipliers to serve more localized areas, so-called decentralized vine multipliers (DVMs). Between 2014 and 2015, a mapping exercise was undertaken in nine of the SPHI countries. This information yielded a total of 568 vine multipliers (411

men, 141 women and 16 groups). Their contact details and locations have been published as a searchable database on the [Sweetpotato Knowledge Portal](#).

A new governance structure to spur progress towards the 10 million mark

To guide implementation of Phase 1, the SPHI Executive Steering Committee was established with the mandate to provide advice to the SPHI Senior Management Team concerning the scientific and organizational components of the overall SPHI. However, as the initiative continued to grow, it was deemed important to develop a new governance structure that would be inclusive of the varied interests and organizations involved in sweetpotato. At the 6th Annual SPHI meeting held from 29 September to 1 October 2015 in Kigali Rwanda, the new Executive Steering Committee was inaugurated. The committee is co-led by CIP, represented by Dr. Jan Low and Forum for Agricultural Research in Africa (FARA), represented by Dr. Yemi Akinbamijo. Its role is to provide strategic guidance on progress toward target, based on the annual report on *Status of Sweetpotato in SSA*; undertake high level advocacy and resource mobilization for SPHI agenda; review of and guidance of functioning of Communities of Practice (CoPs); review and guide on impact of regional technical backstopping; and support the broadening of SPHI membership.

In addition to CIP and FARA, the Committee members are Farm Concern, Helen Keller International (HKI), PATH, Natural Resources Institute (NRI), Roots, Tubers and Bananas CGIAR Research Program (RTB), and North Carolina State University (NCSU), the Bill & Melinda Gates Foundation (BMGF), the United States Agency for International Development (USAID), the Department for International Development (DFID)/UKAID, Irish Aid, and AGRA. Through the stewardship of this Executive Steering Committee, the SPHI is looking forward to intensifying efforts at resource mobilization and advocacy towards the target of reaching 10 million households by 2020.

Report from the ISTRC-Pacific Branch (ISTRC-PB)

By Prof. Satish Chandra, Councillor South Pacific, ISTRC

Major Achievements during 2012 – 2015

1. The formation of the ISTRC – PB in March 2012

- The formation of the ISTRC-PB has been a spectacular success.

- The Branch has over 120 individual members and organisations from various countries in the South Pacific Region.
- The President is Associate Professor Mohammed Umar, Head of the School of Agriculture and Food Technology, and Director of the Institute of Research, Extension and Training in Agriculture (IRETA), University of the South Pacific (USP), Alafua Campus, Samoa.
- The Vice President is Professor Abdul Halim, Head of the Department of Agriculture, University of Technology (Unitech), Lae, Papua New Guinea.
- The other Executive Members of ISTRC-PB are located in various countries of the South Pacific.

2. International Training Workshops Held in 2013 and 2014

- The IRETA, together with ISTRC-PB, organised two one-week international training workshops for root and tuber crop workers from Fiji, Samoa, Tonga, Cook Islands, Vanuatu, Solomon Islands and Papua New Guinea. The training workshops were held in October 2013, and in November 2014 at the Tanoa International Hotel, Nadi, Fiji.
- Both training workshops were funded by the Technical Centre for Agriculture and Rural Cooperation (CTA).
- The theme of the first training workshop was Policy Development for Root and Tuber Crops Value Chains in the Pacific. Proceedings of this workshop have been published by the USP, Samoa.
- The theme of the second training workshop was Maximising Value Chains in Root and Tuber Crops in the Pacific Region: Issues, Constraints and Policy Directions. Proceedings of this workshop have been published in a special issue of the Journal of South Pacific Agriculture, Volume 18, Number 1, 2015, USP, Samoa.
- Altogether 48 participants and resource persons participated in these two training workshops.
- Professor Satish Chandra was the lead facilitator at both these training workshops. He was assisted by Associate Professor Mohammed Umar, President of ISTRC-PB.
- Both workshops were considered extremely successful.
- The ISTRC-PB has begun new research cooperation activities in the Pacific Region, involving national Ministries/Departments of Agriculture, and local Universities.

- An European Union – Africa, Caribbean and Pacific (EU-ACP) scientific development project funded a one-week training course in February/March 2012 on how to write winning research proposals. The course was held at the Department of Agriculture, University of Technology, Lae, Papua New Guinea. Around 57 root and tuber crop workers from various organisations, universities and institutes from Papua New Guinea participated in this training which was considered extremely successful. This training followed a similar one-week EU-ACP funded project training at the USP, Suva, Fiji in September 2011 in which 17 participants from six countries attended including Fiji, Samoa, Tonga, Cook Islands, Vanuatu and Solomon Islands.

3. Mentoring Young Research, Extension and Technical Staff in 2014

- Following the November 2014 international training workshop in Fiji, two mentoring training programs for root and tuber crops policy-makers, scientists, technicians, and field staff were held at the Sigatoka and the Koronivia Research Stations in Fiji.
- Altogether 45 individuals participated from both Stations.
- These mentoring training courses were considered extremely useful and timely.

Future Plans for ISTRC-PB from 2016 – 2018

- The ISTRC-PB is growing in strength, status and influence as an important organisation promoting the important merits of the root and tuber crops in the Pacific Region.
- The importance of root and tuber crops to the Region has been officially recognised and endorsed by the USP through its Vice Chancellor and President, Professor Rajesh Chandra.
- The ISTRC-PB will continue to promote research cooperation activities, interactions and exchange of views between the various Departments/Ministries of Agriculture and local Universities in the South Pacific Region.
- Research scientists, extension workers, students and academics will continue to undertake specific research and extension activities that promotes the merits of root and tuber crops.
- The ISTRC-PB will continue to work with the private sector, industries and organisations towards maximising value-adding for local and export markets.

- The ISTRC-PB will continue to seek international/national funding for some of the major training workshops that are planned in the future.
- The First Symposium of ISTRC-PB is being planned for 2017.

Concluding Remarks

- The root and tuber crops play a very important role in the livelihoods of Pacific Islanders in:
 - creating food security,
 - improving nutrition,
 - raising farm and agribusiness incomes,
 - assisting the development of new enterprises,
 - helping to reduce the impact of climate change.
- The ISTRC-PB will continue to address these major and important issues in future through supporting training, research, and extension activities in the South Pacific Region.

Ecological approaches to sweet potato production in the Caribbean

By Andrea Viera, PhD scholar in the Department of Biological and Chemical Sciences, at the University of the West Indies, Cave Hill Campus, Barbados. E-mail: akveira@gmail.com

In the Caribbean, inputs of synthetic fertilisers and insecticides in agriculture can be reduced by potentially useful plant species such as *Azadirachta indica* A. Juss. (neem) and *Gliricidia sepium* (Jacq.) Kunth ex Walp. (*Gliricidia*). Neem has pest-repelling properties while *Gliricidia* can fix nitrogen in the soil. Hedges and mulches of these species were tested for effects on crop growth and yield of sweet potato (*Ipomoea batatas* (L.) Lam.). A survey on organic inputs and agronomic practices of sweet potato farmers in St. Vincent was also conducted. In an experimental study, mulch material (10 t ha⁻¹) was applied at planting and 12 weeks thereafter to the variety 'Black Vine'. In another study, the performance of two sweet potato varieties ('Black Vine' and 'Lovers Name') was compared at different distances from a 0.5m tall hedge of alternating neem and *Gliricidia* plants. In both studies, no synthetic fertilizer was used but the synthetic insecticide (Actara) was applied.

Gliricidia mulch increased sweet potato yields (at 24 weeks) with only marginal effects observed for the neem mulch. However, yields declined when the two materials were combined in a 1:1 ratio at the same total mulch application rate. Organic nitrogen inputs and possible nitrification inhibitor effects of Neem can alter nutrient

ratios in the soil at the time of tuberization, which can influence yield. In the second study, yield was reduced by proximity to the neem/*Gliricidia* hedge for the 'Black Vine' but not for the 'Lovers Name' variety.

The neem mulch and Actara pesticide decreased the percentage of pest damaged tubers. The survey showed 80% of farmers observed pests (rats and white grub) attacking their sweet potatoes. Over 70% believed that chemical pesticides and gramoxone were dangerous to their environments and that plant and animal manures were safer. However, just below 55% disagreed that NPK fertilizer can be dangerous to the environment. Organic inputs from mulches and hedges of neem and *Gliricidia* can be beneficial for sweet potato production in the region. The mechanisms by which mulches and organic extracts affect the crop growth, tuberisation and marketable yields are currently under further investigation.

Taro (Dasheen) research in the Caribbean

By Dr. Gregory Robin: gregrobin7@gmail.com
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Activities continued under the South Pacific Commission (SPC) / La Recherche Agronomique pour le Developpement (CIRAD) – EU Funded Taro Project, implemented by the International Network of Edible Aroids (INEA). The project is implemented in **St. Vincent and the Grenadines** and **St. Lucia**, where 50 and 35 genotypes were introduced and validated, respectively. To date, on-station validation and on-farm participatory trials in St. Lucia and St. Vincent and the Grenadines (Table 1), has resulted in the selection of a pool of 15 genotypes that will be used to conducting crosses with local and selected introduced genotypes. Genotypes from the selected pool, are undergoing drought tolerant validation trials in St. Lucia (Plate 1).

Table 1. Corm characteristics recorded from the genotypes yielding one kilogram and over from the farmer participatory trial in St. Vincent and the Grenadines

Farm	Genotype	Weight (kg)	Shape	Flesh colour	Number of suckers	Plant height (cm)
1	BL/SM/83	1.8	Dumb-bell	White	12	173
	BL/SM/80	1.6	bell	White	4	127
	CE/IND/24	1.0	Dumb-bell	White	1	102
	BL/PNG/10	1.0	bell	Yellow	5	127
			Dumb-bell			
2	CE/IND/24	1.0	Dumb-bell	Pink	3	102
	BL/SM/80	1.2	bell	Pink	4	96

			Dumb-bell			
3	BL/SM/83	1.5	Dumb-bell	White	7	160
	CE/IND/24	1.3	Dumb-bell	White	3	127
	BL/PNG/10	1.2	Elliptical	Yellow	23	149
	BL/SM/80	1.0	Elliptical	White	3	103
4	CE/IND/24	2.1	Dumb-bell	White	10	167
	BL/SM/80	1.2	White	White	11	140
	BL/SM/152	1.0	Elliptical	White	4	138
5	CE/IND/24	1.4	Dumb-bell	White	2	135
6	BL/SM/80	1.1	Dumb-bell	White	6	68
	BL/SM/13	1.2	Dumb-bell	White	7	76



Plate 1. Taro drought tolerance trials in St. Lucia.

FAO's contribution to cassava development in the Caribbean community

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The Strategic Plan (2015 – 2019) of the Caribbean Community (CARICOM) has identified the agricultural sector as a key driver of economic and rural development. Roots and tubers, specifically cassava, have been earmarked as priority commodities for

development. To achieve this, shifts in the agriculture food and feed systems are required, from traditional approaches to more innovative, efficient, sustainable models with improved and expanded market access, and responsiveness to emerging market opportunities. FAO, in close collaboration with regional partners¹, has supported the development of the cassava industry as an emerging pillar in Caribbean agriculture. This has included:

Capacity building for increasing production



- 60 farmers and 15 extension officers from 3 countries were trained in best practices for selecting, handling and multiplying propagation materials and for

crop and pest management throughout the growth cycle for improved cassava production and productivity. Specifically two varieties were identified, characterized for suitability: for use in fresh or processed form and starch content, harvesting quality and commercial processing (for starch / beer).

- Piloting of mechanization for planting and harvesting in cassava production has been introduced to two countries (Jamaica and Grenada).



Developing plant health standards

- To address a critical constraint, a protocol was developed and endorsed for movement of clean, disease-free planting material within the Caribbean.

Strengthening market linkages and the value chain

Agriculture, the Caribbean Agribusiness Association (CABA), the Caribbean Farmers Network (CaFAN) among others

¹ Regional partners include the CARICOM Secretariat, the Caribbean Agricultural Research and Development Institute (CARDI), the Inter-American Institute for Cooperation on

- Forty stakeholders from across the region have been trained in farmer - buyer linkages, building capacity for stronger contractual arrangements and improving the relationship between producers and first-stage processing markets. Five countries have hosted national workshops on improving cassava farmer buyer linkages with processors to expand existing markets, and create new markets and market opportunities.

Creating market demand and developing new market outlets

- 25 bakeries from 6 CARICOM countries have been trained to use grated cassava and/or cassava flour to replace 40% wheat flour in making bread. Supermarkets in Barbados, Grenada and Trinidad now sell sliced bread that is 40% cassava and 60% wheat.



Networking and Coordination

- To drive industry development across several countries, regional and national Cassava Working Groups have been established and meet regularly. These groups include public and private sector, working together to address multiple aspects of industry development including investment for field production, processing and marketing. FAO has provided technical and financial assistance to support this development.
- A Regional Strategic Road Map for cassava industry development was endorsed by the CARICOM Agricultural Food and Nutrition Security Cluster. It will be used as a framework to guide industry development at the regional and national levels.



Diversity studies of Barbadian sweetpotato

By Ms Jacklyn Broomes, PhD student at the University of the

West Indies, Cave Hill Campus in Barbados

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At the Agronomy Research and Variety Testing Unit of the Barbados Agricultural Management Co. Ltd. in conjunction with the University of the West Indies, Cave Hill Campus, Ms Broomes is pursuing graduate research entitled "Diversity studies of Barbadian sweet potato (*Ipomoea batatas*) cultivars: Towards the development of a core collection" is being undertaken.

The study aims to improve the food and nutrition security of Barbados, and it became essential that a crop be identified that is versatile in agronomy, post-harvest processing, post-production storage and marketing and most importantly, economically viable. The sweet potato has been identified as an ideal crop for expansion in production as it can serve as both a cash and food crop, grows well in Barbados and can be cultivated year-round once irrigation is available. However, there has been inadequate information on cultivars currently being grown in terms of yields and crop descriptors, resulting in poor cultivar selection by Barbadian producers and consumers. This hampers their ability to select the correct cultivar for establishment and future end-use.

A major objective of Ms Broomes research is crop enhancement and that includes the collection, characterization, evaluation and conservation of the genetic diversity within the particular crop species. As such, the specific objectives of this current study are:

- To establish a germplasm collection of sweet potato cultivars currently under production in Barbados.
- To characterize the morphological, molecular, physicochemical, sensory and yield traits of the cultivars in the sweet germplasm collection.
- To determine a core collection of sweet potato cultivars based on characteristics as identified by producers and end-users.

News from Eastern and Southern Africa

Understanding collective action and women empowerment in potato groups in Malawi.

By Netsayi N Mudege

Picture 1: Farmer group members showing off their new potato varieties

The RTB gender team at CIP managed to analyse and publish findings from a potato seed system study conducted in Malawi in 2013. Findings from this study demonstrated that while farmer groups that CIP works with to disseminate new potato technologies have the

potential to empower women, reproduction of societal gender roles within groups may result in male bias, constraining the ability of groups to empower women. Therefore to benefit both men and women CIP interventions targeted towards farmer groups should engage non-traditional partners to address underlying social issues that result in gender inequality. While CIP works closely with the extension system in Malawi to ensure that farmers get the correct and timely information and knowledge, gender norms related to household decision-making impact the ability of women to access training opportunities. This means that agricultural extension should not be a purely technical program focusing only on good agricultural practices. Agricultural training should also embed modules aimed at addressing social practices that disadvantage some people, particularly women, as well as adopt gender sensitive recruitment methods that do not rely on male-biased recruitment channels. The research also demonstrated that that gender dynamics shape and influence the nature of participation in, as well as the ability to benefit from agricultural markets. Agricultural market interventions that do not address underlying social structures —such as those related to gender relations and access to key resources may fail to benefit women. To successfully integrate gender therefore approaches in roots and tuber crops should seek to understand gender roles and relationships within communities and households as these should the development of strategies to ensure that men and women benefit.

1. Netsayi N Mudege, Ted Nyekanyeka, Eliya Kapalasa, Tafadzwa Chevo and Paul Demo Understanding collective action and women's empowerment in potato farmer groups in Ntcheu and Dedza in Malawi' *Journal of Rural Studies* (2015), pp. 91-101 <http://authors.elsevier.com/a/1RwQ62eyKFOArS> (Available for free on line until December 13 2015)
2. Netsayi N. Mudege, Tafadzwa Chevo, Ted Nyekanyeka, Eliya Kapalasa & Paul Demo (2015):
3. Gender Norms and Access to Extension Services and Training among Potato Farmers in Dedza and Ntcheu in Malawi, *The Journal of Agricultural Education and Extension*, DOI:10.1080/1389224X.2015.1038282
4. Netsayi N Mudege, Eliya Kapalasa, Tafadzwa Chevo, Ted Nyekanyeka, Paul Demo (2015) Gender norms and marketing of seed and ware potato in Ntcheu and Dedza in Malawi. *Journal of Gender Agriculture and Food Security* Vol 1, Issue 2, pp 18-41, 2015 <http://www.agrigender.net/views/marketing>

[-of-seeds-and-ware-potatoes-in-Malawi-JGAFS-122015-2.php](#)

New Champions in Root and tuber crop development underway-in West Africa

The improving the livelihood of small scale farmers through access to Growth Markets (Cassava Growth Markets) a project funded by European Union Food Security Thematic Programme (FSTP) led by Natural Resources Institute, University of Greenwich, UK while the local partner institutions are Federal University of Agriculture, Abeokuta, Nigeria; Council for Scientific and Industrial Research – Food Research Institute, Ghana; Tanzania Food and Nutrition Centre, Tanzania; Africa Innovations Institute, Uganda; University of Malawi, Chancellor College, Malawi; and Naliendele Agricultural Research Institute, Tanzania started in May 2012 and will end by March 2017. The overall objective of the project is 'to provide knowledge and technologies to allow the development of value chains linking smallholder farmers to growth markets for High Quality Cassava Flour (HQCF) and related products in the context of climate change and variability'.



Two PhD students and four M.Sc. postgraduate students are beneficiaries of this project from two colleges in FUNAAB, carrying out research studies to assist the focus of the project. The project also provided funds for procurement of Universal Texture Analyser (Model: Tex-300 XPH 30 kg load cell) installed at the Postgraduate Lab, Department of Food Science and Technology, which is enhancing the quality of research, capacity of technologists, students and staffs of the university.

Gains from losses of Root and tuber crops (GRATITUDE)

led by the Natural Resources Institute (NRI), University of Greenwich, UK and 15 organizations in Europe (UK, the Netherlands and Portugal), Africa (Ghana and Nigeria)

and Asia (Vietnam and Thailand) supported 10 MSc and 4 PhDs students.



The following are some of the capacity development achievements of the project in FUNAAB:

1. Rapid visco-analyser (RVA) to the department of Food Science of Food Science and Technology.
2. Sponsorship of 23 participants (13 scientist sand 10 graduate students) to Accra, Ghana to attend the 12th International symposium of the International Society for Tropical Root Crops-Africa branch.
3. Sponsorship of a PhD student to do part of her laboratory work in Portugal in 2014.
4. Sponsorship of 23 participants (20 scientists and 3 graduate students) to Lagos to attend the 38th Annual conference of NIFST in 2014.
5. One of our graduate students emerged as the best oral presenter for Young Scientist Category (Ife Olotu) at the 2014 IUFoST annual conference in Canada. She is also awardee of AWARD (2014/2015 set). She is currently doing her PhD in University of Pretoria, SA.
6. 10 and 2 PhD graduates benefitted from the Project.

The Cassava: Adding Value for Africa Phase II project in Nigeria funded by the Bill and Melinda Gates Foundation for a 5-year period (2014 – 2019) in five African countries—Nigeria, Ghana, Uganda, Tanzania and Malawi under the leadership of the Federal

University of Agriculture, Abeokuta, Nigeria provides avenues for early career scientists for internship. Natural Resources Institute (NRI), UK; International Institute of Tropical Agriculture, Ibadan (IITA); Federal College of Agriculture, Akure and Oyo State College of Agriculture, Igbo Ora play technical back stopping.



Improving Quality Nutrition and Health Impact of inclusion of Cassava Flour in Bread in West Africa project is geared towards improving the nutrition and health impact of HQCF in bread in West Africa and it is being implemented in collaboration with Royal Institution of Learning of McGill University, Canada; IITA, Ibadan, Federal University of Agriculture, Abeokuta, Michael Okapara University of Agriculture, Umudike and University of Agriculture, Makurdi, Nigeria. Already, 13 postgraduate (MSc and PhD) students are the beneficiaries of the projects.



Final Project meeting held in KNUST, Kumasi, Ghana, 1-2 March 2016

UDESWA (Upscaling the Nigerian Flash Drying Experience for Sustainable Regional Trade and Income generation in West Africa)

Upscaling the Nigerian Flash Drying Experience for Sustainable Regional Trade and Income generation in West Africa (UDESWA) project led by FUNAAB is being executed in 4 West African countries (Nigeria, Ghana, Sierra Leone and Benin Republic). The main project partners are; Federal University of Agriculture, Abeokuta, Nigeria, Sierra-Leone Agricultural Research Institute, Sierra-Leone, Njala University, Sierra Leone, CSIR-Food research Institute, Accra, Ghana and

University d'Abomey-Calavi, Benin Republic. The main objective of the project is to promote efficient and proven drying technologies for sustainable food security and poverty alleviation in West Africa.



A baseline survey of actors in the root and tuber crops value chain was conducted with the following key findings:

1. The dominant age categories of farmers showed that most of them are within their active age except in the case of Benin Republic where farmers are predominantly aged.
2. Characteristically of peasant farming, the farm size and level of education of the root and tuber farmers is low, thus having implication on their productivity and understanding of latest breakthroughs in roots and tubers development.
3. Cassava takes the largest chunk of root and tuber crops cultivated by the farmers.
4. Dried products from root and tubers predominant in study areas were *gari*, *lafun*, yam chips (*Gbodo*), *elubo*, High quality cassava flour, starch, tapioca, *kokonte* and dried cocoyam chips.
5. Drying technique and processes adopted by root and tuber processors in the countries under focus showed similarity. The predominant drying technique was sun drying with pockets of improved drying methods such as flash dryer, cabinet dryer and bin dryer.
6. In Benin, the most important opportunity in root and tuber production was access to ready market for root and tubers produced by respondents. In Ghana, it is

access to micro-credit while in Nigeria and Sierra Leone; it is availability of arable land.

7. The major challenges facing root and tuber farmers in Benin was lack of agricultural machinery while in Ghana and Nigeria, lack of finance occurred most, but in Sierra Leone, labour inadequacy was rampant.
8. The major challenges facing root and tuber processors were; unsuitable drying equipment for Republic of Benin and Sierra Leone, while in the case of Ghana, market access and in Nigeria financial problem.
9. Across the four countries under study, the stages of technological development are not uniform. However, the skill gap is common across board as is evidenced by the low awareness and practical knowledge of improved drying technology among the fabricators of all the four countries.

The project is currently installing 4 cyclone flash dryers in Nigeria, Ghana, Sierra-Leone and Benin Republic.

Enhancing the competitiveness of High Quality Cassava Flour (HQCF) Value Chain in Nigeria

High Quality Cassava Flour (HQCF) Value Chain project is supported by the International Fund for Agricultural Development (IFAD) and led by the International Institute of Tropical Agriculture (IITA). HQCF Value Chain project aims at enhancing the competitiveness of high quality cassava flour value chain project in Nigeria. In a bid to actualize and enrich this aim, the project is working towards:

- Providing reliable database and partnerships for prioritizing actions towards the full commercialization of HQCF in Nigeria.
- Training and partnering with the major value chain actors including extension agencies and community based organizations (CBOs) in Nigeria to introduce modern cassava production methods such as improved varieties and planting material handling techniques, mechanical planting methods with use of fertilizer, agronomic methods and mechanical harvesting methods.
- Support to HQCF processing plants to improve the technical efficiency of their processing plants and overcome operational logistic hindrances in order to increase competitiveness.
- Provision of adequate training to users of cassava flour such as Master Bakers Association of Nigeria, in

order to increase the technical usability of HQCF in bread and other confectionary products.



Training Bakers Partner cassava field youth engagement/ Training

A value chain approach has been adopted and currently, four innovation platforms, comprising of actors in HQCF value chain, are engaged in the project activities. Each platform is made up of:

- (i) Cassava producers (youth farmers, smallholder farmers, out-grower farmers)
- (ii) Processor (a HQCF processing plant)
- (iii) End-user 1 (at least one Wheat flour plant), and
- (iv) End-user 2 (Bread bakers and caterers).

We are currently investigating the smallholders' ability to adapt mechanization into their traditional farming practices. Challenges and opportunities of mechanized cassava production at smallholder's level are being documented. The costs of manual planting versus mechanical planting methods are being compared.

APP-CARDI drought tolerant field evaluations for root and tuber crops

By Dr. Gregory Robin: gregrobin7@gmail.com

The Caribbean Agricultural Research and Development Institute (CARDI), under the 10th European Development Fund (EDF) "Caribbean Action under the Programme

entitled Agriculture Policy Programme (APP) with focus on the Caribbean and Pacific", are conducting crop evaluation trials for adaptability to extreme weather condition, specifically, drought tolerance. These trials are being conducted in Antigua and Barbuda (sweetpotato), Belize (corn and red beans), Dominica (taro and sweetpotato), Jamaica (sweetpotato) and Trinidad and Tobago (cassava). At least three varieties of each crop have been selected for the trials, which are known high yielding varieties. Trials have been established and are in various stages of development. Results will be available after harvest, which will begin May / June and August / September 2016. Results will be made available in a subsequent article.



Figure 1 Sweet potato drought tolerant trial, established at the CARDI Betty's Hope Research Station in Antigua and Barbuda.

A major book on 'Potato and Sweetpotato in Africa: Transforming the Value Chains for Food and Nutrition Security'

Potato and sweetpotato are two important crops in the CGIAR Research Program on Roots, Tubers and Bananas portfolio and of rapidly increasing importance in sub-Saharan Africa. As highly versatile nutritionally rich crops they can contribute both to income generation and improving food security in the continent and contribute to addressing climate change.

Capturing the recent advances made in tackling the bottlenecks facing potato and sweetpotato value chains,

this newly published book reviews six main themes. It begins with recent advances in breeding, before addressing potato and sweetpotato seed systems, disease and crop management, and innovations in marketing, processing and value chain management.

Concluding by comprehensively reviewing the literature on nutritional value and product acceptance, it forms a complete reference on recent research concerning potato and sweetpotato in Africa for researchers of agricultural economics, international development and tropical agriculture. Also covering policies for germplasm exchange, food security and trade, this book provides a valuable roadmap for private sector companies and public sector actors looking to invest in the crops.

The book was edited by Jan Low, International Potato Center, Kenya, Moses Nyongesa, Kenya Agricultural and Livestock Research Organization, Sara Quinn and Monica Parker, both International Potato Center, Kenya. The International Potato Center is the lead Center of RTB.

You can order the book at a 20% discount online at <http://cipotato.org/press-room/blogs/potato-and-sweetpotato-in-africa-transforming-the-value-chains-for-food-and-nutrition-security/> by entering the code CCPSA20 at the checkout.

