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In this issue

NEWS

- **CEFTER wins the World Bank ACE impact grant**
- **CEFTER trains BSU staff on innovative university techniques**
- **CEFTER awarded contract for production of Yoghurt**

FOR THE RECORDS

- **Communique**
- **CEFTER Food Week and Exhibition: Setting the pace in sustainable agriculture and food security in Nigeria**

POST - HARVEST LOSSES

- **Assessment of post - harvest losses of fresh fruits and vegetables in Nigeria**
- **Food insecurity, food healthy concerns and government intervention**
- **Urbanisation: A threat to food security in Nigeria**

PERSONALITY

- **Miss Tessy Udegboka: Giving hope to rural Africa**

Upscaling of post-harvest activities in West and Central Africa

The challenges posed by post-harvest losses to the socio-economic development of the West and Central Africa sub region came to the fore during a four-day Post-harvest Congress and Exhibition organized by Centre for Food Technology and Research (CEFTER) in partnership with Nigeria Stored Products Research Institute, and Agro Nigeria.

The event which took place at the Shehu Musa Yar' Adua Centre, Abuja between the 17th to 21st September, 2018 drew stakeholders from the academia, private sectors and agricultural practitioners in Nigeria, Ghana, UK, US and Denmark.

Concerned by post-harvest losses by farmers in the sub-region, the Centre organized the event with the theme *Upscaling of Post-Harvest Activities in West and Central Africa* as a platform for

all stakeholders to come together and share notes and brain storm on the way forward.

In a key note address, the chairman of the planning committee, Professor Olufemi Peters defined Post-Harvest losses as: "Measurable quantity and quality loss in a product including deterioration that occurs between the point of harvest and consumption".

Professor Olufemi Peters' address titled "Stemming Post-Harvest Loss: An African Agricultural priority" highlighted the negative effect of Post-Harvest losses on the world economy in the face of increase in global population.

According to him, global food production must increase by 70% by 2050 so as to meet with the astronomical increase in

Cont. on P. 2



Group photograph of resource persons and participants during the congress.

world population adding that “the food being produced now must be efficiently made available, accessible and not lost after production.

He expressed appreciation to the World Bank for choosing CEFTER, BSU to be a Centre of Excellence for control of Post-Harvest losses; he equally thanked the Africa Development Bank, NSPRI, Agro Nigeria and other institutions for their sponsorship roles which had made the event a success.

Declaring the occasion open, the Benue State Governor, Dr. Samuel Ortom noted with regret that Post-Harvest losses impede the socio-economic status of people of the West and Central Africa sub-region adding that there is need for an all inclusive approach to tackling the menace.

Represented by the Vice Chancellor, Benue State University, Professor Msugh Moses Kembe, he expressed delight at the set-up of the event where the academia, government representatives, industries and farmers have all come together to interact stressing that “I believe by the time the event is over, participants would have shared and gained a lot of experience to handle Post-Harvest issues within our farming communities and markets”.

In a goodwill messages, the Deputy Vice Chancellor, Academic, Professor Edward Omudu pointed out that the theme of BSU's Africa Centre of Excellence which is control of Post-harvest losses in the sub region is deliberate given the obvious fact that as the Food Basket of the Nation, Benue State produces in large quantities almost all types of food produce but most of which do not get the needed treatment that would add more economic value.

Professor Omudu maintained that the unfortunate development has made it pertinent for “an intervention to promote training, research/development of African Students and key players in agro value chain with the aim of enhancing the skill level of farmers, food marketer's industry players and policy makers” he said.

During the four-day event, about twenty papers were presented on a wide range of topics in the post-harvest agenda: -

- Achieving a new Post-Harvest Order for African Agriculture
- Understanding the Post-Harvest challenges in West and

Central Africa

- Training the Next Generation of Post-Harvest Technologists: Innovative Approaches

- Network, Linkages and Access to markets

- Deploying cold chain systems for Post-Harvest Loss Reduction

- Food safety: The

Battle against contamination

-Post-Harvest Transportation in the Sub-Region: A case for a uptick.

At the end of the paper presentations and the robust discussion that followed, participants identified the following as the major challenges or causes of Post-harvest losses:

- a. Inadequate storage facilities for handling perishable crops;
- b. Lack of adequate infrastructure such as power, roads;
- c. Inclement weather;
- d. Poor distribution infrastructure;
- e. Unwillingness of government to explore locally developed technologies for post-harvest handling of crops;
- f. Lack of access to technical knowledge on processing and value addition;
- g. Information dissemination challenges of post-harvest techniques to farmers.

Participants equally advanced solutions or recommendations to the post-harvest menace:

- a. Government should explore the use of locally developed technologies to solve post-harvest problems;
- b. Research in the area of post-harvest losses should be development driven and tailored towards solving the problem and not just an academic exercise;
- c. There is need to change the mind set of all stakeholders towards realizing that combating post-harvest losses is the concern of all;
- d. Farmers should be encouraged to consider farming a business with commercial value and not just for subsistence purposes;
- e. Research findings should be made available to farmers who are the end users;
- f. There is need for collaboration between the academia, farmer and the industries;
- g. The government should develop both transport and energy infrastructure to reduce post-harvest losses;
- h. Farmers should be assisted to have access to simple technologies that do not cost;
- i. Funding in form of scholarship to students to encourage them to take up post-harvest courses.

The event also witnessed exhibitions by the following:

- a. Centre for Food Technology and Research (CEFTER);
- b. Nigeria Stored Products Research Institute (NSPRI) Ilorin;
- c. Syngenta
- d. Global Alliance for Nutrition (GAIN);
- e. NICERT;
- f. Federal University of Technology, Akure;
- g. Federal University of Agriculture, Umudike

Participants at the event were delighted with the organiser for putting together such a forum as an avenue to highlight all the issues surrounding the Post-Harvest agenda.

To most of them, the congress and exhibition was a huge success especially concerning the array of resource persons and the rich content of their presentations.

Participants gained a lot from the congress as they were able to compare notes, share experiences and most importantly, participants established linkages and networks for sustainable discourse on the Post-Harvest agenda in the sub-region.



Prof. Msugh Kembe
VC, BSU

CEFTER wins World Bank ACE impact grant

The World Bank ACE impact On-Site visit Team has expressed satisfaction with the performance of Centre for Food Technology and research (CEFTER).

Presenting its exit report to the Vice-Chancellor, Benue State University, Prof. Msugh Moses Kembe after the impact assessment visit, the Team leader, Prof. Richard Kirby noted with delight the entrepreneurial spirit of CEFTER Students.

According to Prof. Kirby, “of all the ACE projects we have visited one thing we have discovered that is very striking and noteworthy in CEFTER is the belief among the students to be self-employed after their respective programmes.”

He pointed out that the CEFTER curriculum is working even as he commended the standard of the laboratories.

The Team's interaction with the students, staff, partners and other stakeholders according to him was very fruitful as the Team was satisfied with the answers they provided.

He however advised that when writing the next proposal to the World Bank, CEFTER should endeavor to be more detailed by providing adequate information.



Prof. Fichard Kirby and Dr. Hinda Kada during the interaction with the university management and Cefter leadership.

Responding to the Vice-Chancellor Prof. Msugh Moses Kembe expressed appreciation to the team and indeed the World Bank for the grant that led to the establishment

of CEFTER.

He appealed to the World Bank to give a favourable consideration to Benue State University's request for an extension of the grant which would enable CEFTER to achieve its goal of training manpower in the area of Post-Harvest losses.

He said the team's observations and advices were noted and promised that the University would take appropriate corrections to ensure the smooth operations of CEFTER.

Earlier during an interactive session with the University Management and CEFTER management, Prof. Kirby explained that his Team is on an evaluation exercise with a two (2) phase process.

The first phase according to him is to carry out a desk review, through documents and consider information in terms of logistics and laboratories; while the second phase has to do with evaluation giving advice on how CEFTER can implement its goal better and most importantly how the center fits into the University over- goals.

He disclosed that the World Bank is concerned about the sustainability of the Centre as well as the steps being taken to realize the goals of CEFTER.

Responding to the issues raised by the Team, the Deputy Centre Leader (Operations), Dr. Barnabas Ikyo explained that the University has assumed total ownership of the Project.

This ownership according to him is exemplified by the University's donation of a building that is housing the CEFTER project; payment of salaries of CEFTER staff; all programmes of the Center are domiciled in the Departments of the University and most importantly, the University has placed the Center on a budget line for sustainable funding.

He maintained that the goals of the Center have been captured in the University Strategic Plan with the planned establishment of the Institute of Technology by the first quarter of 2019.

Prof. Richard Kirby was accompanied by Dr. Hinda Kada and Frank Osefnah.

CEFTER trains BSU staff on innovative university teaching

In continuation of its drive towards enhancing academic excellence through modern Teaching Techniques, the Centre for Food Technology and Research (CEFTER) recently sponsored eleven (11) BSU staff as well as two (2) University of Agriculture Makurdi staff to Denmark for a training programme for academic staff.

The programme which is titled “Innovative University Teaching” was aimed at exposing participants to modern techniques and key elements of teaching so as to make African Universities true Centers of Excellence.

Speaking to CEFTER News shortly on his return from Copenhagen, Dr. Sylvester Adejo, Deputy Centre Leader for Research and Collaboration explained that during the 8 day programme, participants were exposed to 5Es of teaching which are – eliciting, engaging, exploring, explaining and engaging.

The core essence of the training according to Dr. Adejo is to enhance the ease of teaching and learning so that University

research will be geared towards solving problems in the society.

He maintained that CEFTER is committed to up scaling University teaching and learning by constantly availing Lecturers of innovative teaching methods, adding that the training would be stepped down to the other staff of the University.

The BSU team was led by Professor Godwin Achinge, Deputy Vice-Chancellor (Administration) with eight (8) lecturers from the Faculties of Sciences and three (3) from Social Sciences respectively.



The BSU team under the leadership of Prof. Godwin Achinge (DVC Administration) in a group photograph in Denmark.

CEFTER Awarded Contract for Production of Yoghurt for FG School Feeding Programme

The Centre for Food Technology and Research, (CEFTER) Benue State University has been awarded contract for the production of soyabean yoghurt for the Federal Government School Feeding Programme.

Consequently, the Centre has acquired the premises of Final Yoghurt Company, Makurdi on a one year lease agreement for the production of the product to be supplied to primary schools in 19 Local Government Areas of the State.

Speaking during an inspection visit to the premises by the University Management, the Centre Leader, Prof. Daniel Adedzwa explained that the soyabean yoghurt is a product of students' annual Food Week and Exhibition by CEFTER.

According to him, the initiative is as a result of collaboration between the Centre and the Social Investment Office of Benue State which is the agency directly in charge of the Federal Government School Feeding Programme.

In a remark, the Deputy Centre Leader, (Operations) Dr. Barnabas Ikyo disclosed that under the terms of the contract, CEFTER is expected to produce 574,000 sachets of soyabean yoghurt to be supplied to 19 Local Government Areas of the State every Wednesday of the week.

He pointed out that in view of the fact that the Final Yoghurt Company premises had been abandoned for some time, it is presently being rehabilitated to make it habitable. "Already, the water treatment and yoghurt sections have been revamped preparatory to the commencement of production", he said.

Dr. Ikyo further explained that a new section meant for the grinding of the soyabean is under construction stressing that the Centre had already deployed five academics, three Ph.D students as well as 10 CEFTER students on internship to the factory.

Responding, the Vice-Chancellor, Professor Msugh Moses Kembe commended CEFTER for the initiative adding that the product is another revenue stream for the University.

According to him, the venture is a positive mark on the image of the University even as he enjoined the Management of CEFTER to begin to explore other avenues of sustaining the project in case of policy change on the part of government.



Prof. Kembe (I) and Prof. Adedzwa during the inspection visit.



Dr. Ukeyima explaining a point during the visit.



The site for the installation of the grinding machine under construction.



Dr. Barnabas Ikyo explaining a point to the V.C, Prof. Kembe and DVC (Administration), Prof. Achinge while others listen.



Dr. Ukeyima introducing a sample product of the Soya Yoghurt to the visiting university management.



Variety of sample products of the Soya Yoghurt on display in the laboratory.



Premises of the CEFTER Yoghurt factory.



The water treatment machine at the factory.



The Cold Room facilities at the factory.



L-R: Prof. Godwin Achinge, Prof. Msugh Kembe, Prof. Daniel Adedzwa, Dr. Barns Ikyo during the visit.

COMMUNIQUE ISSUED AT THE END OF THE WEST AND CENTRAL AFRICAN POST-HARVEST CONGRESS AND EXHIBITION HELD AT THE MUSA YAR' ADUA CENTRE, ABUJA BETWEEN MONDAY 17TH – FRIDAY 21ST SEPTEMBER, 2018.

OPENING CEREMONY

The event commenced on Tuesday 18th September, 2018 with the opening ceremony. The chairman, Central Planning Committee, Prof. Olufemi Peters welcomed participants to the ceremony.

He pointed out that the event is a platform for experts to brainstorm on issues that concern Post-harvest losses with a view to fashion out policies towards addressing the challenges posed by the menace.

Benue state Governor, Dr. Samuel Ortom declared the event open and reaffirmed the resolve of his administration to boost agriculture production through incentives to farmers in Benue State.

Represented by the Vice-Chancellor, Benue State University, Prof. Msugh Moses Kembe noted with regret that Post-harvest impede socio-economic growth of the region adding that there is need for an all-inclusive approach to provide a lasting solution.

GOODWILL MESSAGES

There were goodwill messages from the following:

- Benue State University



A cross section of participants.

- Nigerian Stored Products Research Institute (NSPRI)
- SYNGENTA and
- Global Alliance in Nutrition.

KEYNOTE ADDRESS

The key note speech was given by Prof. Olufemi Peters, the Executive Director, NSPRI with the title “*Stemming Post-Harvest Loss: An African Agricultural Priority*”. He pointed out that, in the face of increasing population globally and in the sub-region, the obvious solution of increasing production activities to match population growth may be inadequate due to inherent restricting and limiting factors of land, water and energy and therefore solicited for upscale in postharvest activities to ameliorate reduction in post-harvest losses.

ATTENDANCE AND PARTICIPATION

There were 183 participants during the congress drawn from across many universities, Research Institutes from both within and outside the country.

It is pertinent to note that some of the resource persons were from Ghana, USA, UK and Denmark. There was a high level of participation by the participants in all the sessions.

EXHIBITIONS/PRODUCTS

The congress attracted exhibition of variety of food products and machinery from seven different institutions.

ISSUES RAISED

- ❖ There must be conscious effort to increase agriculture production to match the ever increasing world

Cont. on P. 7

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- population
- ❖ There has to be a change of mindset and total transformation by all stakeholders such as policy makers, farmers and the industry in investment towards mitigation of post-harvest losses.
- ❖ Causes of post-harvest losses range from poor transport and energy infrastructure to the attitude of farmers.
- ❖ The need for government to increase funding in the agriculture sector
- ❖ A significant percentage of food products are lost between the point of production before it gets to the table.
- ❖ Greater synergy between the government, farmers and the industries for a wholistic approach to combating post-harvest losses.
- ❖ Review of our educational curriculum to tailor it towards problem-solving.
- ❖ The need for continuity and sustainability of resolutions arrived at during the congress.

RECOMMENDATIONS

- Research in the area of post-harvest losses should be development driven and tailored towards solving the problem and not just an academic exercise.
- There is the need to change the mindset of all stakeholders towards realizing that combating post-harvest losses is the concern of all.
- Farmers should be encouraged to consider farming as business with □ Research findings should be made available to farmers who are the end users.
- Practical problem-solving should be the basis for training future Postharvest technologists.
- There is the need for collaboration between the

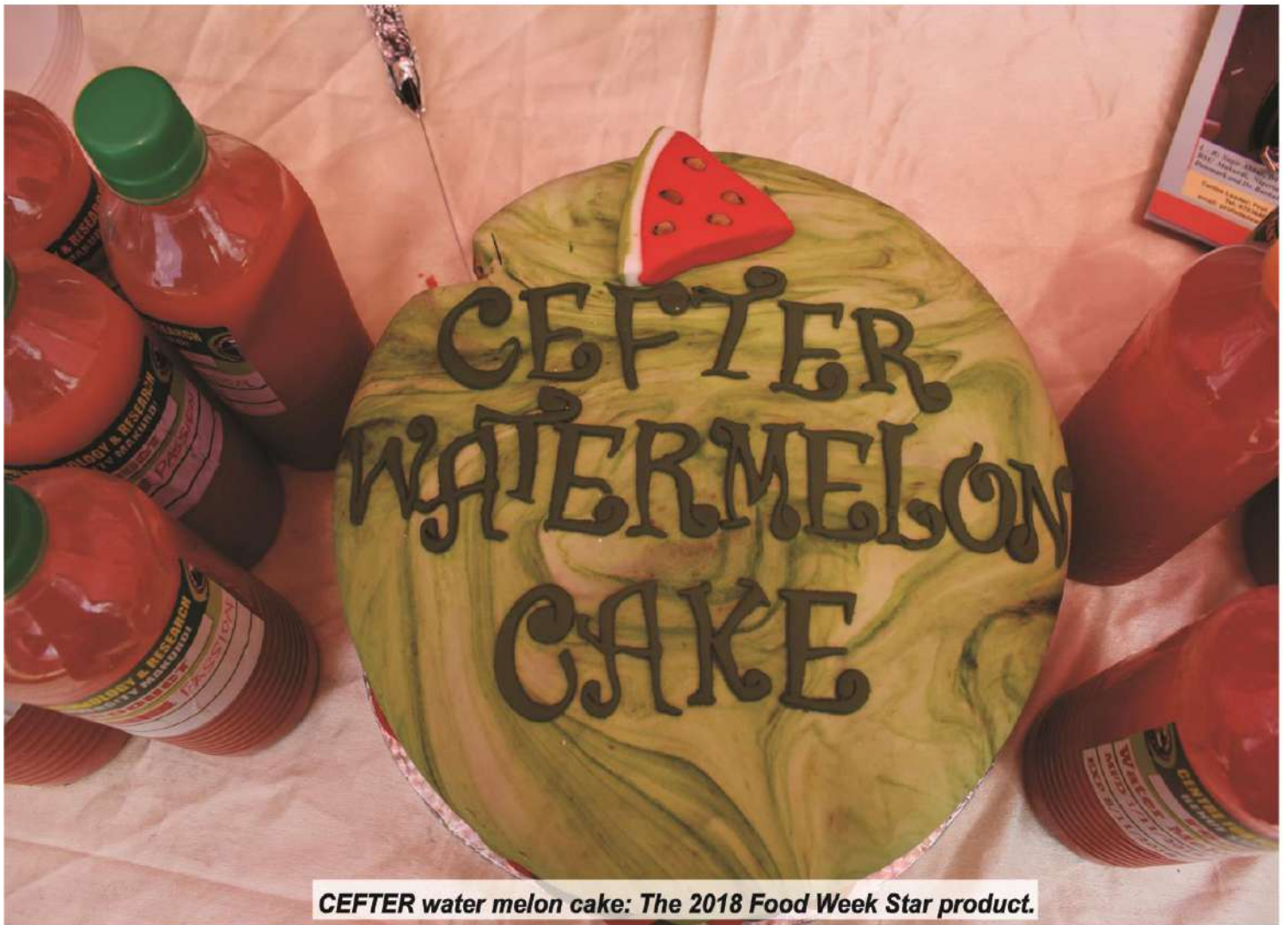
academia, farmers and the industries

- The government should develop both transport and energy infrastructure to reduce post-harvest losses.
- Government should encourage the establishment of small and medium scale industries that would add value to the food production chain
- Farmers should be assisted to have access to simple technologies that are affordable.
- Establishment of 6 farmers market at the 6 geopolitical zones of the country.
- Hemetic storage bags should be more widely adopted for improved food quality and security.
- Training of future post-harvest technologists should be through industrial attachment with private actors that have been trained in post-harvest management.
- There is need for development of African regional standards for the benefit of the people.
- The gap in teaching and learning skills in Nigeria can be addressed by introducing new teaching and learning methods.
- Partnering with direct stakeholders e.g farmers and industries by attaching students to work with them for knowledge transfer.

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Dr. Barnabas Ikyo, Deputy Centre Leader (Operations).



CEFTER water melon cake: The 2018 Food Week Star product.



From L – R: Mr Michael Aondoakaa, Prof. Edward Omudu, Prof. Msugh Moses Kembe and Dr. Barnabas Ikyo inspecting food stands during the Food Week.



Mr. Michael Aondoakaa and Prof. Kembe admiring products at the pepper group stand.



The fish group with some fish products on display.



The cassava group with some cassava products on display.



The tomato group with some tomato products on display.



The Cefter Leader, Prof. Adedzwa and Deputy Center Leader, (Research and Collaboration), Dr. Sylvester Adejo in a photograph with the yam group.



Tomato group.



The Cefter Leader, Prof. Adedzwa and Deputy Center Leader, (Research and Collaboration), Dr. Sylvester Adejo in a photograph with the tomato group.



The Cefter Leader, Prof. Adedzwa and Deputy Center Leader, (Research and Collaboration), Dr. Sylvester Adejo in a photograph with the sweet potato group.



The Cefter Leader, Prof. Adedzwa and Deputy Center Leader, (Research and Collaboration), Dr. Sylvester Adejo in a photograph with the cassava group.

Cont. from P. 7

- Polytechnics and colleges of Agriculture should go back to their original mandate of hands-on training. The universities should also align their curriculum to include hands-on training skills.
- Funding in form of scholarship to students to encourage them to take up post-harvest courses.
- Government should ensure that information, finance and education which are the major support required by farmers are readily made available to them.
- There should be partnership with stakeholders to provide storage equipment/infrastructure that is generic in each farming environment.
- Standards available in various countries should be inputted into school curriculum.
- Processing should be monitored so that the final product doesn't lose value.
- Knowledge of what is available and has been done should be made accessible in the right context.
- Formulate policies that will help to manage and stabilize power, preferably renewable energy.



- Smaller units of cold storage should be explored as they are more mobile and manageable.
- Seeds varieties of different plants being used must be of highest quality.
- Chemicals with the lowest residual level should be used in all farm inputs.
- The right protocol in the processing and storage of food items using the best chemicals available should be used to combat Post-harvest losses.



Post-harvest Congress and Exhibition organized by Centre for Food Technology and Research (CEFTER) in partnership with Nigeria Stored Products Research Institute and Agro Nigeria at the Shehu Musa Yar' Adua Centre, Abuja, 17th to 21st September, 2018.

CEFTER: Setting the Pace in Sustainable Agriculture and Food Security in Nigeria

The Centre for Food Technology and Research (CEFTER) is a World Bank funded Africa Centre of Excellence at the Benue State University with the mandate of combating post-harvest losses in West and Central Africa sub-region. The Centre has since inception embarked on training of manpower and developing technologies towards realizing its established mandate.

One of the key activities that the Centre has been conducting is the Annual Food week and Exhibition where food products are produced and displayed by students.

This year's Food Week and Exhibition is the third edition with students grouped into twelve (12) groups and assigned food crops to study and develop products that will add value and increase their shelf life.

Speaking during the event, Chairman of the occasion, and former Attorney General and Minister of Justice, Michael Aondoakaa (SAN) advocated for the establishment of Faculty of Agriculture at the Benue State University.

Declaring the ceremony open, the Senior Advocate of Nigeria called for the conversion of the Akperan Orshi College of Agriculture, Yandev to the Benue State University Faculty of Agriculture to enable it access the 100 million Dollar funds earmarked for cassava processing by the Bill Gates Foundation; stressing that this would enhance Benue State's status as the Food Basket of the Nation and enable the state harness its full potentials in food security.

In a key note address, the Vice Chancellor, Professor Msugh Moses Kembe expressed appreciation to the World Bank for the grant that led to the setting up of CEFTER

adding that “the recent extension of the World Bank grant would further propel the Centre towards realizing its mandate of combatting post-harvest losses”.

He urged the Centre not to deviate from its core mandate of training manpower and developing technology to enhance agriculture productivity, industrial output for socio-economic development of Nigeria and indeed Africa.

In an opening address, the Centre Leader, Prof. Daniel Adedzwa explained that the Food Week is a students' activity aimed at exposing students to practical problem solving platform, targeting product development from common crops.

According to him, “this year's Food Week and Exhibition is slightly different from the previous two editions because the students have taken a step further to enhance the sustainability, durability and viability of the products produced from various crops”.

Prof. Adedzwa also disclosed that plans are at an advanced stage to establish a Post-harvest Technology Centre which shall take off in the first quarter of 2019.

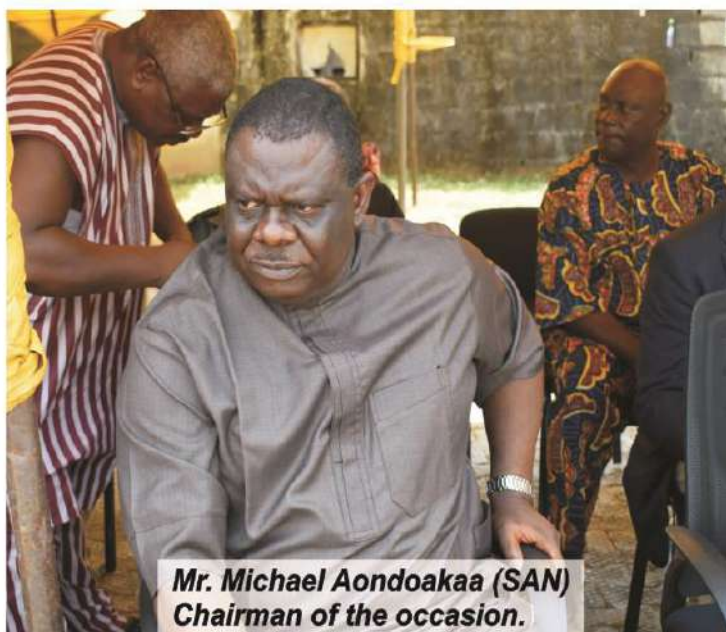
The Benue State Coordinator of Standard Organisation of Nigeria, Samson Makolo and the Manager of the technology Incubation Centre, Makurdi Terseer, Uke in their separate remarks pledged to partner with CEFTER for effective standardisation and higher commercial value of all products produced by the Centre.

The 12 food groups displayed a variety of products such as rice, yoghurt, noodles and flour by the rice group; soyabean group presented spaghetti, oil, cake, cookies etc.

The star prize was won by the water melon group.



Prof. Daniel Adedzwa presenting his opening address.



Mr. Michael Aondoakaa (SAN) Chairman of the occasion.

ASSESSMENT OF POST-HARVEST LOSSES OF FRESH FRUITS AND VEGETABLES IN NIGERIA AND ITS IMPLICATION ON FOOD SECURITY

IORTYER, MSON SAMUEL
BSU/CFTR/M.SC/16/170
POST-HARVEST PHYSIOLOGY AND
MANAGEMENT OF CROPS.

Fresh fruits and vegetables (FFV) are a major source of essential minerals and vitamins, such as vitamin A, vitamin C and potassium, needed for human wellbeing. However, perishable living products that require coordinated activity by growers, storage operators, processors and retailers to maintain quality and reduce food loss and waste. The Food and Agriculture Organization estimated that 32% (weight basis) of all food produced in the world was lost or wasted in 2009. When converted into calories, global losses represent approximately 24% of all food produced.

Post-harvest Food Loss (PHL)

This simply refers to measurable qualitative and quantitative food loss along the supply chain starting at the time of harvest until the food reaches its consumption point by human or other end uses. PHLs can occur either due to food waste or inadvertent losses along the supply value chain. While *Food waste* is the loss of edible food due to human action or inaction such as throwing away wilted produce, not consuming available food before its expiry date, or taking serving sizes beyond one's ability to consume, *Food loss* on the other hand, is the sudden loss in food quantity/quality as a result of infrastructural and management limitations of a given food value chain. All these losses have great implications on Food Security which seems far from being achieved and which has assumed a global disturbing position especially in the developing countries of Africa where the risk factors for its causes are mostly prevalent, such as high temperature and humidity, poor research interest on the causes of food security, lack of technologies to prevent postharvest losses which is the leading cause of food insecurity in Sub-Saharan Africa, etc.

Food Security is said to exist when all people, at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary need and food preference for an active and healthy Life. In others words, Food security refers to the availability, accessibility and affordability of food by all people at all times. While the question of how accessible and affordable food is remains to be answered by the infrastructural deficit in agriculture, the question of food availability is gently answered by crop production and postharvest loss prevention strategies (Postharvest handling procedures).

Post-Harvest Handling

In Agriculture, post-harvest handling is the stage of crop production immediately following harvest. It includes sorting, cleaning, packing, packaging, storage and transportation. The most important goals of postharvest handling are to keep the produce cool, thereby avoiding moisture loss and slowing down undesirable chemical changes and to avoid physical damage such as bruising to delay spoilage.

Loss in quantity and quality has been found to affect

horticultural crops between harvest and consumption, the magnitude of these post-harvest losses in fresh fruits and vegetable is estimated at 5-25% in developed countries and 20-50% in developing countries depending upon the commodity. From the foregoing, it can be observed that in developing countries like Nigeria, postharvest losses of fruits and vegetables are more serious than those in developed countries. This is for the obvious reason that, in most developing countries, the number of



Iortyer, Mson Samuel

scientists concerned with postharvest handling research is significantly lower than those involved in production research. The handling procedures used in technologically advanced nations to reduce post-harvest losses are not fully recognized in developing countries. It can further be observed that, in developing countries like ours, particularly for perishable crops like fruits and vegetables, storage, packaging, transporting and handling technologies are practically non-existent, hence considerable amount of produce are lost. These losses have multiple effects and goes beyond the loss of the actual crop to include loss in the environment, resources, labour needed to produce the crop and livelihood of the individuals involved in the production process. Post-harvest loss tends to prevent adequate supply of and accessibility to fresh agricultural produce, thereby causing an increase in the price of such produce at certain periods in the year. The negative effects of these losses on the Nigerian economy in general and the farmers in particular cannot be over emphasized. For instance, it has been reported that, Nigeria records over 40% post-harvest losses which has led to an unprecedented hike in food importation in the country, on the farmers, post-harvest losses are making Nigerian farmers poorer by the day while on the global perspective, roughly one-third of food produced for human consumption is said to lost or wasted globally amounting to 1.3 Billion tons per year.

MY CEFTER EXPERIENCE

My journey through CEFTER shows that, Fruits, Vegetables and indeed all other Agricultural produce are living tissues subject to continuous changes even after harvest. Although, some changes are desirable, most are not from the consumer point leading to greater losses. Understanding factors that contribute to post-harvest losses of fruits and vegetables is very critical in adopting simple but effective technologies that slow down the rate of deterioration in these perishables. These factors include Biological factors (Respiration, Ethylene production, Growth and Development etc) and Environmental factors (Temperature, Relative Humidity, Atmospheric Composition, Light etc). Others may be mechanical damage during harvesting and handling, improper post-harvest sanitation, unsuitable packaging materials,

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poor cooling and storage practices etc. To achieve self-sufficiency in food, there is a great need to match all efforts at increasing crop production with an equal if not greater efforts of post-harvest technology to save the crops that are produced from deterioration and wastages

Unarguably, fruit vegetables, like tomatoes are grown commercially in the Northern part of Nigeria with consumption of same throughout the country thereby making transportation an integral part of the distribution system. However, transporting this perishable commodity from the production centers to where they are mostly needed is often frustrated by non-availability of vehicles when mostly needed, this has consequently made marketers and distributors who convey the harvested produce to use very harsh, indecent, and unconventional methods such as fastening tomato consignments on top of fuel tankers and other articulated vehicles. This challenge therefore causes unnecessary delays in getting the produce to the market. Meanwhile, any delay between harvest and consumption of tomatoes can result in losses. Losses of up to about 20% are incurred by marketers due to transportation delays. Marketers therefore are forced to make use of any available means of transport for their produce without considering its appropriateness in order to avoid delays. Some modes of transportation include human labour, donkeys, public transport, rented trucks, buses, Lorries, fuel tankers, articulated trucks, and pick-up vans with resultant heavy losses which are mostly unquantified.

In Lorries for example, the containers (baskets) are usually arranged in 5 to 6 layers inside the vehicle with woody planks in-between these layers. Some transporters use leaves to separate the layers, which normally do not prevent compression of the produce from the weight (load) of those on top. This practice is thus one of

the major sources of mechanical damage to the produce. Additionally, proper ventilation is sometimes either non-existent or grossly inadequate. The result is usually that of produce rot arising from high level of physiological activities of the produce occasioned by lack of proper and/or adequate ventilation.

An assessment carried out at a market in Ilorin, Nigeria revealed quite a lot of tomato fruits damage due to transportation. Damaged fruits mainly consisted of bruised, rotten, compressed and water soaked fruits. In particular, an average of 13.89% of fresh tomato fruits was reportedly damaged during transportation. This implies that, in every consignment of 7,500 kg (lorry load) of tomato fruits, about 1041.67 kg (representing 13.89%) of the fresh tomato fruits would be bad. If the tomato in the market is sold at an average price of N200.00 per kg, the losses due to this damage will be put at N200, 000.00 per lorry load should such damaged fruits be completely discarded. It is noteworthy that Ilorin where this assessment was done is situated in Northern Nigeria, the region within which this commodity is produced. The amount of spoiled tomato would further increase substantially by the time they get to markets situated down the southern part of the country like Ibadan, Lagos, Yenagoa, Warri etc.

Conclusion

According to the United Nations, the Current world population is expected to reach 10.5 billion by 2050 translating into 33% more human mouths to feed, with the greatest demand growth in the poor communities of the world. It has been suggested that food supplies would need to increase by 60% in order to meet the food demand in 2050. Food availability and accessibility can be increased by increasing production, improving distribution, and reducing the losses. Thus, reduction of post-harvest food losses is a critical component of ensuring the future global food security

Food Insecurity, Food Health Concerns and Government Intervention

M.SC POST HARVEST PHYSIOLOGY & MGT. OF CROPS. BSU/CFT/M.SC/17/327.

Farmers, private organizations, non-governmental organizations, and government are glaringly aware of the food losses by almost 50% as a result of pre and post-harvest handling and the danger or resultant consequence on the fast growing population of Nigeria.

With improved seeds, other inputs and best agricultural practices, quality and high yields were recorded by farmers but often sell off immediately to middlemen after harvest due to the inability and resources to store such yields for long. The only aim of the middleman is to maximize sufficient profit thereby employing any means available to store the food produce from the time of abundance to that of scarcity. This act was attributed to the recent discovery and poisoning of consumers by the application of 2,2 – Dichlorovinyl dimethyl phosphate (sniper) in large dose to cowpea (beans) to suppress the common field to store pest (*Callosobruchus maculatus*) and many other unhealthy post-harvest practices on foods yet to uncover.

This is the worst type of 'war' close to our door steps. It has no respect for region, religion, age, level of education, gender, and race. It targets all and the most vulnerable are the children. Government at all levels and well-meaning organizations are

encouraged to view food insecurity and safety as a 'war' where necessary resources are appropriated to avert it.

In as much as processing of foods into various acceptable forms with longer shelf life is gaining attention, it is mostly capital intensive to establish such facilities that most farmers and handlers of agricultural commodities cannot afford with the desire of most consumers to

utilize foods in their natural form, however the best practices and processes of extending shelf life in their natural form at the moment could be achieved through vigorous research and funding.

More funding is required from different quotas to assist Research Institutions in areas of post-harvest research with a view to identifying the best and safe method of extending shelf life of agricultural produce for wholesome usage and food sufficiency coupled with the training and equipping of extension agents to assist farmers cum the handlers of agricultural commodities on the value chain on the safe method to adopt.



Urbanization: A Threat to Food Security in Nigeria

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A nation's food security is the state of her citizens having reliable access to a sufficient quantity of affordable, safe and nutritious food. Thus, the major responsibility of the Nigerian institute of food security is to ensure the availability, accessibility and affordability of safe and nutritious food in sufficient quantities for the consumption of Nigerians. As good as the responsibilities of this institute may be, it is confronted by numerous potential threats which if not looked into, may prevent Nigerians from enjoying its dividends.

One major threat worth mentioning is urbanization. The Oxford Advanced Learners English Dictionary defines urbanization as the movement of people from rural areas to urban centers. I.e, it is a population shift from our rural agricultural areas to urban centers.

Agriculture was the backbone of the infant Nigeria and government at all levels was concerned about providing her citizens with the basic materials required to burst agricultural yield. In Benue state where majority of the food consumed in Nigeria is produced, competitions were organized where farmers from different local governments would bring their produce to compete with that of others and prizes were given to those with the biggest and good looking products.

Eventually, Nigeria discovered crude oil and attention was shifted from agriculture to crude oil. Today, we live in a society where nothing is left for the farmer. To be a farmer nowadays is to be Mr. Nobody in the society. As such, able Nigerian youths who though, have no formal education but would have been very useful in helping Nigeria actualize her food security goals by bursting the rate of agricultural production leave their rural villages (agricultural areas) for urban centers in search of pastures greener. This leaves farming business to the elderly who lack the strength to carry out agricultural activities on a commercial scale. Urbanization of these youths has reduced our production strength and subsistence agriculture has become the order of the day.

Dreams of the Nigerian food security programme can only be actualized if production is done on a commercial scale. This call for an urgent attention of

the government to create packages that will once again reward a farmer and make the farming business Lucrative. The government can overcome this threat of urbanization by:

- i. **Bringing Atume Gabriel** agricultural mechanisation to the farmers door step.
- ii. Providing the farmers with adequate chemicals such as herbicides, insecticides and fertilizers which improves the yield of crops at a subsidised rate.
- iii. Organizing annual agricultural harvest competitions during which prizes will be given to farmers with the highest produce. This will motivate the farmers to improve their scale of production.
- iv. Establishing food processing industries;

Non-availability of food processing industries have limited the production of food in the country especially Benue State. It is disheartening that Benue state is the highest producer of fruits in the country but has no fruit processing company established by the federal or state government. The rate of tomatoes, mangoes, oranges, pepper and groundnut production have been limited in the state due to their frequent loss of value through decay at the post harvest stage. Establishing a processing company will add value to these products and the youth will be encouraged to embark on agricultural activities.

The establishment of an African Center of Excellence, Center for food technology and research at Benue state university Makurdi is a step in the right direction as the center has embarked on the training of qualified professionals with the sole aim of combating post harvest losses of crops in the country. The activities of this center if backed up with the establishment of processing industries will create job opportunities, alleviate the people's standard of living, encourage farmers by giving them value for their crops and the desire to migrate to urban centers in search of greener pastures will be subdued.

Until the government defines a fundamental approach to combat urbanization and other factors such as crops diseases, drought, post-harvest losses and insurgence militating against food production, Nigeria will experience a chronic shortage of food come 2025.



Udegboka Nkechi Tessie: Giving Hope to Rural Lives

The 2018 West and Central Africa Post-harvest Congress and Exhibition held in September, 2018 at Abuja drew participants from across Nigeria, West Africa and indeed other parts of the World.

There is no gain saying that the event provided a platform for experts and key stakeholders in the Post-harvest discourse to brainstorm on the causes, economic implications and solutions to the menace of Post-harvest losses.

During the four day event, CEFTER News stumbled on Udegboka Nkechi Tessie, Chief Operating Officer, Centre for Agriculture and Sustainable Entrepreneurship (CASE).

CEFTER News was attracted to her not just by virtue of her participation during the Congress but by her unique appearance. In fact, her 'Africaness' in terms of the attire she wore during the Congress stood her out as a true daughter of Africa. Indeed, CEFTER News engagement with her revealed her burning passion for Africa as she succinctly puts it: "I wasn't just born in Africa, Africa lives in me. Everything I do is all about Africa".

When did it all start?

According to her, before 2010, she didn't have this new perspective about Africa. Just like any average Nigerian youth, she believed in living abroad and making it there.

This orientation however changed when she started travelling around the world and came to the realization that Africa has everything it takes to develop. According to her, "I started developing interest about development in Africa. Having seeing things abroad, I discovered that Africa is a virgin land and Africa has what it takes to be great".

Her world view suddenly changed and she began to wonder why go out there and develop some other society when she has all the resources to develop and better the continent.



Nkechi displaying her 'Africaness' through her outfit.



Tessie Udegboka

This passion for Africa development propelled her to establish CASE as well as a non-profit organisation known as Whispering Hope Africa Initiative (WHAI) with a core mandate of empowering and impacting slum and rural lives.

How is WHAI imparting Rural Lives?

The main thrust of WHAI is working with rural farmers, young people in the slum. She opined that "our people have the gift and talent but are constraint by the gap of inequality and non-inclusiveness".

Nkechi Udegboke is actively involved in making low cost technology and skills available to rural farmers; training those living in slums with the needed skills; empowering them and most importantly creating access to market so that they don't suffer losses from their harvest.

WHAI according to her helps rural farmers to standardize their products; trains them in book keeping; helps them to register their business so that they have a well-structured business set up.

Concerns about Post-harvest losses

In view of the fact that she works with rural farmers, she is concerned about the huge losses suffered by African famers. As she puts it: "I hate losses and wastage. I have learnt a lot during this Congress and when I go back to the farming communities, I will share the ideas gained here with them".



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FOOD WEEK 2018



From L – R: Mr Michael Aondoakaa, Prof. Edward Omudu, Prof. Msugh Moses Kembe and Dr. Barnabas Ikkyo inspecting food stands during the Food Week.

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