

REPORT OF WORKSHOP ON TRIPLE BOTTOM SUSTAINABILITY ANALYSIS IN THE CIRCULAR ECONOMY OF THE AGRICULTURAL FOOD VALUE CHAIN



**HELD AT
CSIR-FOOD RESEARCH INSTITUTE, ACCRA**

20TH OCTOBER 2020

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1.0 INTRODUCTION

The CSIR-Food Research Institute (FRI), in collaboration with Sheffield University and Gold Coast Sustainability and Governance Institute organized a stakeholder's workshop at the CSIR-Food Research Institute on Tuesday, 20th October 2020. The theme for the workshop was, "**The Triple Bottom sustainability analysis on the circular economy of the Agricultural food value chain in Ghana**". The objective of the workshop was to reduce post-harvest losses and create zero waste in the system.

Thirty-one (31) persons representing various Institution/actors participated in the workshop. Twenty-One (21) of the participants were physically present whilst ten (10) participated online. Participants were drawn from Research and Academia, Government and Policy Agencies, Non-Governmental and CSOs, actors in the food value chain, climate change and agricultural waste businesses.

2.0 OPENING REMARKS

In her opening remarks, Prof. (Mrs.) Mary Obodai, Director of the CSIR-Food Research Institute indicated that, the fundamental principle of the circular economy was to ensure that the value chain of production systems is self-sustaining and supports the re-use of resources to avoid wastage. She explained that a circular economy in agri-food chain linked production, consumption, and supply chain activities to reduce food wastes, promote global food security whilst ensuring a zero waste in the environment. In line with CSIR-FRI's mandate, Prof. Obodai indicated that the objective of the workshop would inevitably reduce post-harvest losses and create zero waste in the system, which will consequently accrue financial benefits to producers, processors and increase nutritional benefits to consumers.



**Prof. Mary Obodai, delivering
the opening address**



A section of the participants

3.0 PRESENTATIONS BY VARIOUS SPEAKERS

3.1 Introduction to the Triple Bottom Sustainability Analysis

Introducing the triple bottom sustainability analysis to participants, Ms. Eunice Oppon of Sheffield University, United Kingdom, distinguished between the linear, recycled, and circular economy. According to her, the linear economy had a throwaway approach, where materials were produced, used, and disposed of. The recycled economy introduced products back into production. However, a circular economy where products are used, recycled and the waste re-used was the preferred option. This, she said, was the best way to avoid disposing items into the environment.

She indicated that nearly 1.3 billion tonnes of food are lost and wasted each year, meanwhile, approximately 805 million people worldwide are chronically undernourished with a majority in Africa. *Again, she revealed that* as global population growth rate increases, the need to produce more food can be balanced dramatically by reducing the amount of food wasted and adopting an agri-food circular economy approach. *She said, though* development on Agri-food circular economy was being implemented worldwide, especially in Europe and China, extensive empirical evidence of the concept through research

analysis had not been conducted and documented in the Africa region to allow effective policy development on addressing food loss in agri-food sector. She said, discussions around the above specifically in Gold Coast Sustainability and Governance Institute (GCSGI), led to the current funded project which focused on circular economy in Agri-Food sector in Ghana.

She emphasized that for a circular economy to be built, all stakeholders, i.e. actors in the food value chain, research and academia, financial Institutions and the Government have roles to play in building a circular economy for food in the cities.

3.2 Trends in Global Agricultural Economy and its relevance in the Era of COVID-19 Pandemic

Prof. Lenny Koh of the Advance Resource Efficiency Center, Sheffield University gave the above titled presentation online. The presentation covered was on the, "Impact of Covid-19 on people's livelihoods, health and food systems, a joint statement by ILO, FAO, IFAD and WHO issued on 13 Oct 2020; Covid-19 Impact: Security of Supply; Global trends and priorities shift from Covid-19; Covid-19 Global Impact Supply Chain, circular economy and climate change; Green recovery trends and futures Global Agriculture Economy In The Era Of Covid-19; Green recovery trends and futures: Examples Global Agriculture Economy In The Era Of Covid-19. Core Role of Life Cycle Sustainability in the Era of Covid-19.



A section of the participants

3.3 The Agriculture Economy Landscape: The Ghanaian Perspective

In a presentation by Mrs. Mariam Oppong, on behalf of Dr. Emmanuel Frimpong Boamah of the Gold Coast Sustainability and Governance Institute, she indicated that Ghana had instituted programmes which are geared towards increasing food production to ensure food security in the country. However, there were lots of post-harvest losses along the food value chain. She said, the objective of a circular economy is to ensure that wastes along the value chain are taken care of. This, she said would create new models and bring along new job opportunities. She stated that environmental impact was important in a circular economy such that if wastes were being re-used as material resource, the environment stands to benefit.

She indicated that for Ghana to take advantage of a digitization and innovations in a circular economy system, both the Public and Private Sectors must come together and work towards it. Government must make conscientious efforts towards investing in Circular Economy models such as providing biogas centers, and institute policies which would encourage the use of waste. She stressed that gender be incorporated in the new models and women included in the adoption of new technologies developed.

Mrs. Mariam Oppong stated that a circular economy in the Agricultural landscape of Ghana will enable Ghana to meet the Sustainable Development Goals of no hunger, gender equality and environmental protection, among others.



Presentation by Miriam Oppong

3.4 CSIR's Role in the Agribusiness Sector of the Ghanaian Economy

Prof. (Mrs.) Mary Obodai, Director of the CSIR-Food Research Institute made a presentation on CSIR's role in the Agri-business sector of the Ghanaian Economy. By way of introduction, she stated the vision, mission and mandate of the CSIR and the fact that the CSIR is the foremost public Science and Technology (S&T) Research Institution in Ghana which generates applied innovative technologies, and efficiently and effectively exploits S&T for socio-economic development in critical areas of agriculture, industry, environment, some aspects of public health and social sciences.

With the agribusiness trend in the CSIR, Prof. Obodai indicated that the CSIR engaged in Animal, aquaculture and food crop production, product development and food processing, export-oriented agribusiness, local equipment fabrication and technology business incubation. She mentioned that through research, technologies which range from soil to the plate and beyond are developed. She mentioned some of the CSIR Institutes and the activities they are involved in.

On crop production, she said the CSIR Crop Research and Savana Agricultural Research Institutes had developed high yielding varieties of crops which had been released to Extension Officers of MoFA for transfer to farmers.

Regarding agro-processing space, she said the CSIR-FRI does a lot of processing of cereals, legumes, and root and tubers, to support the export of non-traditional commodities to the diaspora to improve the Ghanaian economy.

Concluding her presentation, Prof. Mary Obodai indicated that, the CSIR, through its role in the food value chain has played an important role, to boost the economy of Ghana through the development of the agribusiness sector in ensuring food security. These are achieved by enhancing yields through high yielding varieties, pest resistant varieties, drought resistant varieties, best agronomic practices, best storage systems/practices, innovative food processing strategies, and best animal breeding and aquaculture practices.



Presentation by Prof., Mrs. Mary Obodai

Open Forum

After the presentations, there was an open forum where participants were given the opportunity to ask questions on the presentations. Below were questions from participants:

1. Why is Ghana not moving from the use of Wheat flour to Composite Flour? (Miriam Oppong, GCSGI), if there is a cost-benefit analysis
2. What mechanisms have been put in place for easy adoption of technologies that have been developed by the CSIR? (Roderick, FDA)
3. Is there any project for waste separation (NSS, CD)
4. What is the CSIR doing to assist farmers in handling and disposing of poisonous/toxic agricultural waste from chemicals they use? (Alex Johnson, Agro Input Dealers Association).
5. Is there any collaboration between CSIR and other Institutions such as Kwadaso Agricultural College to ensure synergy/sharing of knowledge on new technologies (Mr. Ishak Shaibu, Kwadaso Agric College)
6. Does the CSIR-FRI assist entrepreneurs they have trained to commercialize in securing certification from the regulators, i.e. FDA/GSA Certification to get their products on the shelves of supermarkets, etc? (Joseph Narh, NSS)
7. When are we going to see and promote the vegetable seeds developed by the CSIR? (Fred Sagoe)



Question time



Question time

Open Discussions

Participants discussed the potential benefits that could be derived from a circular economy and the barriers limiting a circular economy initiative. The following listed points were raised by participants:

Potential benefits from a Circular Economy Programme

1. New product development from recycled materials
2. More job opportunities for all
3. Cut down on importation
4. Add more value to products
5. Bring about a new dimension in the environment
6. Increasing in benefits

Potential Barriers Limiting Circular Economy Initiatives

1. Inadequate information sharing about ideas on-going
2. Competition which disallow investments
3. Legislation and its enforcement
4. Championing in investments and advocacies
5. Lack of funding
6. Marketability of products
7. Improper market research on new products
8. Low rate in adoption of technologies
9. Timing for the disposal of waste is of essence

Workable Action

1. Information sharing
2. Budgetary Allocation for creativities
3. Stakeholder involvement

The Second part of the workshop was the, "**Discussion Session**" where participants formed groups to discuss the topic, "*Identify the key constraints limiting the circular economy of Ghana's agri-food value chain from the stakeholder's perspective*".

Group 1:



Members of this group were Mr. Kwasi Abaka Quansah, Mr. Abeshi Matthew, Mrs. Thelma Saakwa-Mante and Mrs. Akua Boatemaa Arthur.

Key points raised by the group included on topic were as follows:

1. Quality of product

There is constant competition of our local products with an already existing similar product from the international market.

Cause

Poor marketing skills, the use of low-quality raw materials, consumer perception

Solution

Product quality should be able to compete with similar products from the international market. Good publicity and marketing strategies.

2. Information/ training

Adequate information/ training should be given concerning the technology to be adopted to ensure consistency and continuity.

Cause

- Inadequate training or information about the technology to stakeholders.

Solution

- There should be continuous training of personnel and out flow of information about the technology involved.

3. *Resource Availability*

Availability of required infrastructure, improved facilities and human resource

Cause

- Poor planning
- Lack of adequate facilities and trained/knowledgeable personnel in the technology to be implemented

Solution

- Proper planning of venture with adequate facilities in mind
- Availability of training and continuous training of personnel

4. *Funding*

Unavailability of funding from the government and agro- funding agencies stall the start up or progress of the venture

Cause

- Lack of government commitment to the improvement of the agri-food value chain
- Inability of farmers and processors to convince funding agencies to invest.

Solution

- Development of a clear plan for the venture

5. *Citing/Location*

Wrong citing of facility or unit can cause societal disputes or difficulties in the future. Can be waste management or drainage issues

Cause

- Encroachment, citing at residential areas.

Solution

- Government strictly allocating lands for such purposes

6. *Ethical issues/Registration*

The difficulties associated with getting clearance to initiate or register a product may deter producers from starting a venture

Cause

- Lack of commitment and impact of the venture by appropriate bodies responsible for issuing clearance or registration certificate.

Solution

- Competent people should be employed in such bodies

7. *Lack of Incentives*

Difficulty or unavailability of assessing tax breaks, subsidised utility bills, affordable loan payments and soft loans.

Cause

- Lack of government commitment

Solution

Government should make accessibility of these incentives easy for farmers and producers.

8. *Illiteracy*

Lack of education make it difficult for new ideas or ventures to be accepted and adapted.

9. *Research and development*

Most stake holders in the agro-processing industry do not know the importance or show interest in research for improvement and financial growth.

Cause

- Most stake holders are not motivated to do R&D because of the research cost involved. Some also lack the expertise in carrying out such projects.

Solution

- Players in the food industry especially producers to invest in research and development to diversify, improve and maintain their lines. They can also make use of opportunities identified from research.

Group 2:



Members of this group were Mrs. Abena Otu, Mr. Alex Johnson, Mr. Koranteng Owus Nana Yaw, Mr Joseph Narh and Ms. Juliet Vickar.

Some of the points raised by the group were as follows:

1. Farmers (Constraints)

- Low levels of knowledge on waste management among farmers
- The lack of awareness among this group.
- Lack of knowledge on the use of available resources.
- Post-harvest losses

Why

- Information dissemination to the farmer groups is lacking
- Solution
- Orienting farmers on these sustainable farming practices
- Support from extension officers, equipment and resources

Solution

Providing farmer groups the needed support and resources to carry out their activities. Reduced loan rates, etc.

2. Financial Institutions (Constraints)

- Non-payment of loans by customers (farmers) restrain them from lending help to other farmers and value chain operators
- Poor collateral security policy from the borrowers limit them from giving out loans
- Lack of innovation by the financial institutions

- Encourage farmer groups to secure loans instead of individual; e.g. a farmer association can get a loan to purchase a tractor for farming activities
- A group with the same needs can come together to access loans. Eg. A group of rice farmers.

3. Research Institutions (Constraints)

- Little or no priority for research and information dissemination by the government
- Low proactivity by researchers in acquiring grants and funds from other agencies and organizations

Solution:

- Government institutions to prioritize research
- Seek funds for research from other agencies

4. Consumers

- Lack of knowledge by consumers on the effect of their actions and inactions on Ghana's agri-food value chain.
- Poor performance on the side of waste management systems and other organizations in contributing their quota to the food value chain.
- Reluctance of customers to pay high charges on waste disposal.
- Inadequate space of consumers to take up certain agronomic initiatives.

Group 3:



Members of this group were Mr. Sebastian Ashigbui, Ms. Agnes Adwoa Safua Amoah, Mr. Abeeku Dzokoto and Mr. Frank Peget

Points identified by the group were as follows:

Constraints by food value chain stakeholders:

Farmers

1. Education
2. Dissemination of information
3. Unsustainable farming practices
4. Technology
5. Lack of policy

Marketing

1. Education
2. Low patronage or purchasing power of consumers
3. Lack of proper waste management system

Processors

1. Lack of postharvest technology and equipment
2. Improper maintenance culture

Research institutions/universities

1. Lack of funds to carry out research work
2. Cost benefit analysis
3. Knowing the demand of the market

Why the constraints

1. Limited scope of knowledge
2. Unnecessary bureaucracy
3. Low adoption rate of new innovations
4. Lack and high cost of technology
5. Lack of government policy and framework to support circular economy
6. Insufficient number of waste recycling companies
7. Not enough funds to carry out research work on circular economy

Solutions

1. Regular training sessions, workshops for stakeholders, extension services for farmers, teaching students about circular economy
2. Involving society leaders and main technical people in decision making

3. Education
4. Adopting new technology through education and funding by government
5. Investing in waste management solutions
6. Researchers working hand in hand with marketers to understand what consumers need
7. Adopting new postharvest technology to improve sustainable agriculture

Group 4:



This group was made were Mrs. Mariam Oppong, Mr. Jeremiah Larrey-Brown, Mr. Ofosu Eric, Ms. Rosemond Agyeiwaa Appiah and Dr. Ethel Blessie.

Points raised by group members were as follows:

Constraints

1. Lack of information on the proposed circular economy and the information to be used, e.g. bio-degraders
2. Raw materials are expensive hence unwillingness of people to buy these materials
3. Variations in Consumer taste and preferences, e.g. cassava flour pastries and wheat flour pastries
4. Lack of requisite technology and machinery
5. Difficulty in establishing new business due to government policies most people would prefer investing in government shares / treasurer bills
6. Fear of failure/ fear of taking risk
7. Lack of government support for research

8. Financial constraints
9. Low market drive/ lack of publicity
10. Cultural practices and habits which are not easily changed
11. Lack of knowledge on what to use waste for. There is no technical know how on how to use waste
12. Lack of protection for innovations
13. Lack of concern for the environment. (Wrong mind set of the environment)
People in the western world may be willing to pay more for environmentally friendly products
14. Lack of private investment in the science, technology, and agriculture sector
15. Our love for exotic / foreign things prevents us for looking inward
16. Religious strong holds. People are unwilling to go against their religious practices and habits
17. Outmoded farming practices
18. Corruption

Why Constraints

1. Educational system is focused on theory with little practical activities. People keep information to themselves. Fear of competition which prevent knowledge sharing
2. Lack of technology makes cost of labour expensive and this cost is transferred to the material price. The finish product of a circular economy is more expensive
3. People are not willing to try new things. Fear of change and brand loyalty
4. Ghana does not support research into technology
5. Bureaucracy and bottle necks in policies.
6. People go into business for money.
7. High interest rate on loans as much as 30% on Agricultural loans
8. Government not interested in science research
9. High bank interest rates
10. Cost of doing business
11. Lack of waste management policies
12. Weakness of the legislation and lack of enforcement of intellectual property laws
13. Initial cost involved in these sectors
14. Orientation is key
15. Lack of exposure
16. People want to make quick money

Solution

1. Educational system should be restructured to include more practical activities. Stakeholder must create more awareness through workshops and sponsor science-based competitions. CSIR should be at the forefront of information sharing.
2. Government should subsidize the circular economy activities to remain competitive
3. Education and awareness creation. Consumers need to be involved in product development and design
4. Information sharing, extension services
5. Information on how to start businesses
6. Interest rate should be reduced
7. Banks should lend money to circularized models
8. Prioritization of government spending. Futuristic thinking
9. Reduce interest rate
10. Develop policies to reduce importation making citizens look inward.
11. Education and involvement of community and religious leaders should understand that science and religion are not enemies. Popular figures to champion the course.
12. Education on waste management
13. These laws should be enforced
14. Education and re-orientation of citizen
15. Promote made in Ghana goods and celebrate Ghanaian goods. Parents prevent their children going into Agriculture
16. Religious leader must be involved. Market segmentation eg Pork products being sold to Muslims
17. Education of the best farming practices available
18. Perpetuators must be punished. Education through practical application will enable people grab concepts
19. Government subsidy.

Group 5:



This group consisted of Mr. Fred Sagoe, Prof. Irene S. Egyir, Ms. Nafisatu Ibrahim Mohammed, Ms. Oduro Lydia and Mr. Eric Ofori.

The group identified the following constraints, why the constraints and the possible solutions

Economic Constraints:

Constraints	Why	Solution
Lack of favorable legislation and Policy	Limited flow of information, i.e intellectual property	Government should be more conscious and committed
Inadequate capital leading to low investment, market research, advertising and promotion, etc.	High interest rate charged by the banks	Business networking /Government subsidy
Global Market Competition	High Cost of Production	Quality product development/ Cooperative marketing and investment

Social Constraints

Constraints	Why	Solutions
Disability barrier	The practices are manually dependent	Mechanisation/Digitization of practices
Women exclusion	The nature of the practice is disincentive if the circular practices are sometimes physically involving.	Mechanisation/Digitization of circular practices
The Youth perception	The perception of the youth constraints the adoption of circular economy	Mechanisation/Digitization of practices
Religion and Cultural Beliefs	Some religious beliefs can cease the	

	adoption of some circular economy	
Poverty, illiteracy	Lack of capital/resources	Government/NGO support

Environmental Constraints

Constraints	Why	Solution
Rainfall Patterns	Dependent on Nature; i.e rainfall, drought, etc	Irrigation/ Digitization/ Mechanization of practices
Pest & Diseases	No control on Natural phenomenon, pest invasion and diseases	Integrated Pest Management system / Digitization & Mechanization of practices
Topography of the Land	The land may be rocky, hilly, muddy, etc. which are	Mechanized Agricultural practices.

Group 6: Members of this group were the virtual participants which consisted of:

1. Prof. Lenny Koh (Sheffield University, (U.K)
2. Ms. Eunice Oppon (Sheffield University, (U.K)
3. Ms. Joyce Asheley Tuakly (Blue Skies Limited.)
4. Mr. Roderick Daddey Adjei (Food & Drug Authority, Ghana)
5. Dr. Victor Antwi (AGRA)
6. Mr. Barnabas Ampaw
7. Mr. Evans Amartey (National Investment Bank, Ghana)
8. Mr. Ishak Shaku (Kwadaso Agricultural College)
9. Nana Yeboah
10. Wuni

Key points identified by the virtual participants are as follows:

1. Improving human resource capacities (curriculum revision, sensitization, information sharing, reward schemes)
2. Strengthen institutional collaborations (government leadership, setting agendas for Institutions, Division of labour and focus, knowledge sharing, technology, and innovation capacities via research)
3. Policy design (designing innovative policies addressing circularity, PPPs, decentralized management of circularity)

Participants converged at the Director's conference room and presented their findings.

CLOSING REMARKS

In her closing remarks, Prof. Mrs. Obodai stressed on the importance of embracing a circular economy. She was optimistic that participants at the workshop, which had been interactive, educative and informative would spread information on the need for a circular economy in order to benefit from the numerous advantages associated with it.

She thanked members for their time, involvement and suggestions for the success of the workshop. She also thanked all the presenters and the Global Challenge Research Fund for sponsoring the workshop.

The workshop ended at 1:15pm with Dr. Mrs. Charlotte Oduro-Yeboah offering a closing prayer.