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A demonstration by a youth making a mechanical olar dryers facilitated by EBAFOSA Innovative Volunteerism Ghana to showcase the adoption of solar dryers technology to help with preservation of produced items inorder to reduce post harvest losses in the agro-value chain.

TRAINING IN ADOPTION OF AFFORDABLE & EFFICIENT SOLAR DRYERS TO AVERT EFFECTS OF POST HARVEST LOSSES : THE CASE OF GHANA

About 52 % of the labour force in Ghana is engaged in agriculture, 29 % in services and 19 % in industry. Approximately 39 % of the farm labour force is women. Agriculture contributes to 54% of Ghana's GDP, and accounts for over 40 % of export earnings, while at the same time providing over 90 % of the food needs of the country. One of the major challenges against agriculture as a business in the continent, Post Harvest Losses (PHL) is said to be costing Africa about 37 per cent of its total production, with various estimates showing that the figure rises to more than half of annual output in the case of perishable food crops. This work demonstrates how mitigation actions can be used to optimize adaptation to drive socio-economic resilience using Ecosystems Based Adaptation (EBA) approaches to be climate resilient and enhance susainability.

ADOPTION OF AFFORDABLE & EFFICIENT SOLAR DRYERS TO AVERT EFFECTS OF POST HARVEST LOSSES : THE CASE OF GHANA

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An exhibition by the lead trainer on solar dryers fabrication program. The training was facilitated through EBAFOSA Innovative Volunteerism Ghana to equip more youths in various districts to adopt the technology that will help local farmers in their produce preservation.

One of the major challenges against agriculture as a business in the continent, PHL is said to be costing Africa about 37 per cent of its total production, with various estimates showing that the figure rises to more than half of annual output in the case of perishable food crops. A farmer and the Chief Executive Officer of the Chamber of Agribusiness Ghana, Mr Anthony Morrison, said the solutions to PHL in Ghana were "well known and easy" although the challenge persisted. "We have always said that while we are talking about productive policies, make sure you bring on board post-harvest facilities to support the market-entry strategy," he said.

Despite rolling out production enhancing programmes such as the Planting for Food and Jobs (PFJ) and other similar initiatives in the past, Mr Morrison said the country had failed to prioritise post-harvest management, resulting in a chunk of its produce wasting away. "Combined harvesters for maize and other facilities are the things that farmers need. Also, we need to train our farmers in new food management strategies to help reduce these losses," he added. Cassava is a main food commodity in Ghana of all food crops grown, cassava occupied the second highest proportion of the total area cultivated (21.6 %) and national production reached 14.2 million metric tons contributing 49.5 % of total food production in 2011 (MoFA, 2011).

The conformation of cassava flour ("kokonte") to national quality standards was estimated at 58.7 % and common defects detected included the presence of foreign matter and undesirable smell. The lack of strict adherence to quality militates against competitiveness in internal and external markets that will make the real-value of the crop be verified.

This work demonstrates practically how mitigation actions can be used to optimize adaptation to drive socio-economic resilience using Ecosystems Based Adaptation (EBA) approaches known to be climate resilient as a preferred method to produce cassava and ensure yields can be enhanced under the changing climate. In addition, clean energy has been put at the forefront to mobilize cassava farmers to use solar dryer technology to produce quality cassava which could be used for flour and other confectioneries.

The solar dryers has benefitted about a combined 500 plus cassava farmers in both villages to engage the cassava value chain

The training methodology and process of solar drying

Peeling of the cassava is mainly done at the traditional level using sharp knives. In household peeling of cassava, the peels are removed from the edible parts by opening up the peel and carefully removing it to leave the edible part intact. However, it was observed that the women slice the peels from the whole roots which took off some of the edible white parts. The processors indicated that slicing the peels off was a faster method and although they tend to lose some of the edible parts, the amount lost is minimal in terms of time conserved for other processes.

The washing process

Washing of the cassava is usually done by vigorously cleaning the peeled roots in bowls of water to remove dirt and soil. Clean jute sacks were used to scrub the cassava. Water is scarce in the community and therefore poor practices were observed in terms of dirty water used to wash the peeled cassava roots

Grating Traditional grating of cassava is carried out by rubbing the root on the rough surface of a perforated galvanised metal sheet fixed to a wooden board support. This method of grating is very labour intensive and time consuming. To reduce time and labour, medium-scale motorised cassava graters will be introduced. This work being introduced and tested has come as a big game changer as a climate action solution in Africa called solar dryers. These dryers are locally fabricated by youth using local material. Poor postharvest handling leads to low produce quality; most of the postharvest losses are reported by farmers during harvest, processing and during storage. In order to reduce postharvest losses, we introduced solar drying technology to help farmers reduce post-harvest, poor storage practices and poor processing which cause losses.

Youth demonstrating the process of solar dryer fabrication. The solar dryers are made of steel to reduce use of wood which also means it is not made from trees thus also preserve forest ecosystems.

> "Two locations have been mapped out to install giant solar-drying centers in Apeguso (Asuogyaman District,Volta Region) and Akortekrom (Birim South District, Eastern Region) respectively"

Display of the final product of a mechanical solar dryer that will be distributed among local agro actors to help them reduce post harvest losses.

The innovative volunteerism actors who were trained on solar drying technology having a chat with Dr. Richard Munang, the UNEP climate change coordinator for Africa. The EBAFOSA training initiative to fabricate solar dryers to curb post harvest losses among small scale farmers in Ghana.

However, low levels of awareness, poor storage practices, and poor processing in these communities have led to the introduction of these dryers to reverse the post-harvest losses. The decentralisation of solar dryers to power preservation and primary processing of cassava into varied products is the key ground action that we have sought to expand and undertake.

Accordingly, youth have been structurally guided and mentored under the EBAFOSA Ghana framework to develop and improve solar dryer designs that are applicable to the current user base–farmers.

Through a series of iterations, we seek to partner with the overseeing bodies to develop solar dryers proving to be several times faster at drying raw cassava to the recommended Ghana Standard Authority (GSA) moisture content of 10% or less. A level which is critical to making high quality cassava flour.

Unlike open sun-drying, use of the solar dryer does the job of drying faster, more efficiently and hygienically as produce is not soiled by dust, animal droppings and other debris that is a challenge with open sun drying. The result being a quality dried product that fetches more in the market. In addition, the target is health, climate, environment, and quality conscious consumer niche markets.

These are growing with increased linkage of what people eat and their health.

Way forward & Interventions

Youths have retooled their skills to fabricate solar dryers: To drive climate action in a continuum, skills are a prime premium. Against this backdrop youth were engaged through the process of EBAFOSA Innovative Volunteerism and the willing youth skills were retooled to fabricate solar dryers as local climate action solutions to bring impact to scale.

Against this backdrop, through this work close to 12 youth skills have been retooled and adapted to fabricate solar dryers in Ghana to help in reduction of post-harvest losses in villages where there's been very high records of post-harvest losses. Youth have been trained on how to innovate and fabricate portable and durable detachable metallic solar dryers.

Conclusion and way forward;

- At the end of the training, it became evident based on available data from different sources and even from our own experiences the extent to which post-harvest losses affect farmers and also contributes to low food security in the country as a whole
- We also realized that local solutions had the ability to address the challenges of farmers using locally sourced materials.
- The solar dryers have the potential of increasing the value for produce to farmers, hence increase quality

- The youth of Africa can be solution provider and all they need is guidance and mentoring which has been provided by the EBAFOSA framework on the principles of Innovative Volunteerism
- There is great potential for Agriculture even as we address the issue of climate change from an enterprise perspective where the youth can address the issue of climate change and equally make some money.

Impacts of UNEP EBAFOSA intervention in the Ghana solar drying training program

Adoption of solar drying technology among cassava farmers; All farmers surveyed dry the cassava in direct sunshine after peeling and slicing into chips. This work mapped and identified cassava farmers in two districts in Ghana to help them dry their cassava in a solar dryer.

Promotion of Climate Action Driven Agribusiness Enterprises; youth trained to fabricate solar dryers utilized the free training offered to them by EBAFOSA innovative volunteerism Ghana to cascade this climate action solutions of solar dryers technology to villages and women agribusiness groups.

Ready market for the cassava flour; this work has trained farmers to clean cassava, chip it intosmaller sizes for drying in a solar dryer for 3 to 4 sunny days.

Gender mainstreaming: women were trained on how to operate solar dryers, use the solar dryers to dry their cassava chips.This work has encouraged cassava famers engage in value addition

Reduction in losses during storage of dried chips: Loss of dried chips under storage was minimized by adequate drying of chips through the use of community solar dryers, and individual solar dryers, farmers interviewed by EBAFOSA innovative volunteerism Ghana outreach department said that they can now store and sell quality pure quality cassava flour and chips to the market.

Impacts to upscaling EBA approaches

The work in Ghana demonstrated how key enablers of sustainability – especially, willing people, policy anchors and operational level incentives - can be leveraged to upscale application of EBA

a) *Decentralization of solar dryers to cassava growing areas*, provided an accessible means by which cassava farmers using EBA could preserve their harvest. Through this preservation, postharvest losses were reduced providing an incentive for farmers to increase their area under EBA produced cassava. As a result, 500 more farmers took up cassava farming and were trained in using EBA approaches.

b) *Human capital is one of the key enablers for upscaling EBA*.In Africa, the youth are the majority of the population including in Ghana. These youth were structurally guided and trained to adapt and apply their skills in an area of their interest that can be aligned to buttress upscaling of EBA – which is the fabrication of solar dryers applied in cassava preservation. Up to more than a dozen youths were trained and they produced dryers capable of dehydrating cassava to the threshold of below 12% needed to prevent cassava spoilage.

These accessible technologies were what was applied to cut cassava PHLs and encourage the cultivation of more cassava using EBA approaches.

c) *EBA produced cassava, dried using solar dryers*, was processed into finished goods – cassava flour. The trade of the flour resulted in an up to 200% increase in income, providing a financial incentive for increased application of EBA at the farm level.

A frame of a mechanical solr dryer thai is still under construction.

Strengthening the institutional capacities for the delivery of clean energy increases the mobilization, access and utilization of innovative energy adoption. Increase better health and welfare of our environment using ecosystem based adaptation approaches and awareness campaigns using various available channels. UNEP-EBAFOSA has enhanced capacity building of insitutions necessary to spearhead sustainable production and climate action enterprises in Ghana.

Register to become an Innovative volunteerism actor at : Registration link (Click)

Join our continental platform of agro-industry actors and fill your GAP at : Registration link to join MeBAFOSA (Click)

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