

Solar dryers report from EBAFOSA Uganda Cleaned
Leveraging Climate Action Solutions of Solar Dryers to drive
NDCs implementation in Uganda



Introduction

Uganda is an agrarian country where farming employs more than 70% of the population¹. Given the dominance of agriculture as a source of livelihood, agro-industrialization driven using climate action solutions offers a great opportunity for Uganda to embark on its long-term aspiration of transitioning into a modern industrial economy. Uganda National Development Plan three goal of Agro-Industrialization is to increase commercialization and competitiveness of agricultural production and agro processing (NDP111, 2020).

Uganda's NDCs commit to a 22% emission cuts on a business as usual basis by 2030 due to a series of policies and measures in the energy, forestry and wetland sectors and complimented by additional measures in climate smart agriculture and transport. As of 2016, Uganda is ranked as the 14th most vulnerable country and the 48th least ready country to address climate change by the ND-GAIN Country Index. According to a study by CDKN (2015), the cost of inaction on climate change will range between 3.2 billion and 5.9 billion per annum by 2025 with the biggest economic impact in the sectors water, energy, agriculture and infrastructure². In its NDC, Uganda puts strong emphasis on adaptation actions, to ensure all people and communities are resilient to climate impacts³.

If adaptation measures are not put in place. Climate extremes will continue to affect the country's GDP, especially the agriculture sector (Irish Aid, 2018). According to the Economic Assessment of the Impacts of Climate Change 2015, Climate change damage estimates in the agriculture, water, infrastructure and energy sectors will collectively amount to 2-4% of the GDP between 2010 and 2050⁴.

According to FAO's Energy in and from agriculture in the African Nationally Determined Contributions (NDC)⁵ Uganda encourages efficient biomass energy production; Uganda is interested in expanding the use of off-grid solar systems to support food value addition and irrigation. It also wants to foster value-added food processing, post-harvest handling, storage and access to markets for agricultural products, including through micro-finance.

Against this backdrop, UNEP EBAFOSA Uganda initiated the drive to showcase how climate resilience can be implemented in a continuum leveraging on mitigation actions to power

¹ Making Farming More Productive and Profitable for Ugandan Farmers:
<https://www.worldbank.org/en/country/uganda/publication/making-farming-more-productive-and-profitable-for-ugandan-farmers>

² UGANDA NATIONAL BASELINE STUDY SEPTEMBER 2019
http://www.inforse.org/africa/pdfs/EASE_CA_Uganda_Baseline_UCSD_2019.pdf

³ <https://ndcpartnership.org/news/uganda-releases-first-ndc-partnership-plan-climate-action-africa>

⁴ Uganda Country Climate Risk Assessment Report
https://www.climatelearningplatform.org/sites/default/files/resources/uganda_climate_risk_assessment_report_-_final_version.pdf

⁵ FAO. 2019. Energy in and from agriculture in the African Nationally Determined Contributions (NDC) - A review. Rome.

adaptation resilience where both socio-economic and biophysical resilience is achieved simultaneously. Uganda losses huge amount of food as a result of post-harvest losses. Reducing these post-harvest losses among cassava farming communities is crucial. Studies show that commercialization of the cassava value chain, has potential to recoup up to \$300million in import substitution with wheat. Cassava is the second most important staple crop in Uganda farmed by over 70% of the population – making it economically inclusive. Adding value to this through leveraging accessible technologies like solar dryers - is recorded as capable of increasing incomes by 50 – 80% at the farm gate level. Beyond the farm-gate, solar-dryer powered value addition is an opportunity to increase production of quality value added products like cassava flour up to 200 times.

Value addition is recorded capable of creating livelihoods for over 6 million of Uganda's youth under 25years, who can tap income opportunities through creating market, supply and production opportunities along the value chain. It is an opportunity to enhance profitability across various confectionary enterprises. For example, biscuit manufacturers in Uganda can save over \$130,000 each year by substituting 35% of wheat flour with cassava flour. Rural bakeries, that consume about 2/3 of wheat in Uganda, can reduce raw material costs by 25%, by substituting wheat flour with high quality cassava flour. All these socioeconomic benefits are realized along climate resilient benefit. Where cassava being a resilient crop, has the lowest failure risk under harsh climate – just 8% - compared to the nearest challenges which is at 20%.

This work demonstrated practically how mitigation actions can be used to optimized 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 was put at forefront to mobilize cassava farmers use solar drying technology to produce quality cassava chips and flour. According to Uganda's third National Development Plan (NDP III) 2020/21 – 2024/25 Value addition to cassava in Uganda is low as most processors mill cassava into flour and package it for local consumption. However, there is potential for import replacement of starch and ethanol if there is more value addition to cassava. Of all the imported starch and ethanol, 53 percent is for pharmaceutical industries, 32 percent for Paperboard industries, 13.5 percent for food processors and 1 percent for laundry operators (NDP111, 2020)

This work has introduced and tested a big game changer climate action solution in Africa called solar dryers⁶. These dryers are locally fabricated by youth using local material. Poor postharvest handling leads to low produce quality, most of the postharvest loss are reported by farmers during harvest, processing and during storage. In order to reduced postharvest losses, this work introduced solar drying technology to help farmers reduce post-harvest, poor storage practices and poor processing which cause losses⁷.

⁶ Locally fabricated Solar dryers a big game changer in agriculture development in Africa. Available at https://drive.google.com/file/d/11_nw4KS9g4Is4SnaN-AUz7_6pAm136AS/view?usp=drivesdk

⁷ Patrick Luganda President EBAFOSA explaining the logic of solar dryers and the systems thinking approach: <https://drive.google.com/file/d/1nZJmrCTZMIAYrdaTOPsAEL0rQvscMygs/view?usp=sharing>

Five solar drying centers have been established in cassava farmers groups in the Buganda Kingdom of Nakisunga, Ggera, Nakifuma, Nagojje and Kawolo in Kyaggwe county benefiting 300 cassava farmers to engage cassava value chain. Those farmers are distributed in five VSLAs with 60 farmers per VSLA, 12 members are clustered per village and among receiving EBA training, briquettes training, currently they are planting one acre of cassava disease resistant variety of NAROCAS 1 per village using EBA approaches supplied by EBAFOSA Uganda. . The decentralisation of solar dryers to power preservation and primary processing of cassava into varied products is the key ground action that we have undertaken. Accordingly, youth have been structurally guided and mentored under the EBAFOSA Uganda incubation structure to develop and improve solar dryer designs that are applicable to the current user base –farmers. Through a series of iterations, they have developed solar dryers proving to be 48times faster at drying raw cassava to the recommended Uganda National Bureau of Standards (UNBS) moisture content of 12% 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.

Interventions

Youth skills have been retooled 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 58 youth skills have been retooled and adapted to fabricate solar dryers in Uganda to help in reduction of post-harvest losses in villages. Youth have been trained on how to innovate and fabricate portable and durable metallic solar dryers⁸

“As a youth in EBAFOSA Uganda we started fabricating metallic solar dryers last year, right now we have the capacity of fabricating 10 in a day. We made one chamber solar dryer, which holds four trays, but now we able to make giant communal solar dryers which holds 16 trays at a go”
Amos Kasenge EBAFOSA Uganda innovative volunteerism actor from Kyaggwe county⁹

⁸ Solar dryers fabrication under EBAFOSA Uganda work :

<https://drive.google.com/file/d/1VKOoiZroHKhXiLwIWgOF8GFckyrr4Vb/view>

⁹ Youth fabricating solar dryers in Buganda kingdom:

https://drive.google.com/drive/folders/13DBGfCN_Mu75GOkZprUHhPdD3ehdxGMF?usp=sharing



Figure 1 EBAFOSA Uganda innovative volunteerism Actors fabricating a community solar dryer in Ggera farming community. Photo; EBAFOSA Uganda

Establishment of Solar Drying Centers; this work set up Village Savings and Loans Association (VSLAs) anchored within the traditional structures of the Buganda Kingdom Cooperative known as the PEWOSA to help farmers access credit to get climate action solution inputs like bio-fertilisers, solar dryers, cassava cutting and training to use solar drying centres in their villages. This is very crucial in that it allows many members of the community to have access to a climate action solution of solar drying which helps to reduce their postharvest losses and helps bring impact to scale. This work has so far managed to fabricate five (5) drying Centre in Kyaggwe county of the Buganda Kingdom for example Nakisunga, Ggera, Nakifuma, Nagojje, Lugazi all those are solar drying centres ready in use by farmers¹⁰.

“We thank UNEP EBAFOSA Uganda for sending us a technical team which constructed for us a solar dryer. Now we are able to produce high quality cassava flour” says Gorriet Nassanga chairperson Ggera development society

¹⁰ Cassava farmers under training at Nakisunga solar drying centre:
<https://drive.google.com/drive/folders/1wiORjv0ak5eD8UIVrfez5mJN9NOAgd5g?usp=sharing>

Training of cassava farmers to use solar dryers; leveraging on the cooperative communal structures and applying the VSLA models, this work has conducted mapping and selection of farmers with cassava and trained to add value on the cassava to produce quality cassava chip without foreign matter.

Lydia Nakabugo, a cassava farmer, a member of Nsonga saving association, says “*UNEP EBAFOSA Uganda has trained us to add value on the cassava we grow by making small cassava chips. We now have 4 acres of cassava ready for harvesting and right now we plan to plant 10 acres of cassava diseases resilient from EBAFOSA multiplication garden in Ngogwe*”. This work has promoted reduction of cassava losses by providing technical guidance to cassava farmers and value addition actors¹¹.



Figure 2 Cassava farmers in Nakisuunga sub county train on using a solar dryer to dry their cassava installed by EBAFOSA

¹¹ Farmers in Nakisunga trained on using a solar dryer:

<https://drive.google.com/drive/folders/1wiORjv0ak5eD8UIVrfez5mJN9NOAgd5g>

<https://drive.google.com/drive/folders/1wiORjv0ak5eD8UIVrfez5mJN9NOAgd5g>

Executing the [Climate action market incentives for agro- industrialization compliance guideline](#)¹² ; the guide intends to inspire and mobilize climate actions in a way that drives low emissions development¹³. This Climate Action Market Incentive Guide informs the optimal implementation of UNBS standards in a way that leverages climate action solutions to achieve compliance. And the focus of the guide in the agro-value chain further enhances this complementarity with the UNBS strategy. The Climate Action Market Incentives Guide guides on how climate solutions of EBA and clean energy plus ICT can be used to achieve a cascade of standards benchmarks critical to achieve market competitiveness – for example food safety, health, organic, climate action solutions and also informs on efficient market linkages..

Increase earning along the value chain, how to add value and create enterprises without compromising the environment and how to do so without re-inventing the wheel, but rather leveraging what they already have which is leveraging on its people skills, talents, passion and their enterprising resourcefulness in engaging value chains has been the hallmark basis in which this Climate Action Market Incentive is being leverage to drive climate action implementation in a composite cascade. Leveraging on the locally available raw materials and most importantly, leverage on the existing standards and benchmarks of UNBS. This work grew cassava using EBA approaches, used clean energy to dry the cassava without any emission produce and packaged cassava branded as EBAFoods Uganda¹⁴.

Decentralization of solar dryers; fabrication of five (5) Giant community solar dryers along Village savings and Loans Association (VSLA) in Kyaggwe county¹⁵.

“So far, this work has managed to organize youth in a very structured and guided approach to fabricate community solar dryers to help farmers who can’t afford to buy individual dryers. Each Solar drying centre has a catchment area of at least five Village groups staggered in villages surrounding the solar dryer centre” says Patrick Luganda EBAFOSA president¹⁶.

Cassava farmers within a five kilometers radius can access the center to dry their cassava as well as meet at the Village Savings and Loan Association (VSLA) meeting point on a regular basis as will be determined by the group members. This may be weekly so as to enable updating of plans and activities as well as to carry out activities related to the Savings and loans association¹⁷

¹²Climate action market incentives for agro-industrialization — Compliance guideline:

[file:///C:/Users/David/Desktop/EBAFOSA/UNBS%20-%20EBAFOSA%20STANDARD/US_2241_2020%20\(9\).pdf](file:///C:/Users/David/Desktop/EBAFOSA/UNBS%20-%20EBAFOSA%20STANDARD/US_2241_2020%20(9).pdf)

¹³ Innovative Volunteerism Inspiring the Implementation of Climate Action in Uganda:

<https://ebafosa.org/attachments/article/1149/BugandaDigest-Finale.pdf>

¹⁴ Operationalizing the Climate Action Market Incentives Guide For Cassava Value Chain In Buganda Kingdom:

<https://www.ebafosa.org/index.php/medias/138-climate-action-digest/1156-buganda-kingdom-cassava-value-chain>

¹⁵ Youth Fabricating solar dryers in Kyaggwe county:

https://drive.google.com/drive/folders/13DBGfCN_Mu75GOkZprUHhPdD3ehdxGMF?usp=sharing

¹⁶ https://drive.google.com/file/d/11_nw4KS9g4ls4SnaN-AUz7_6pAm136AS/view

¹⁷ https://drive.google.com/file/d/1F9u_BAlrEQosenzta0svVsWSlZLvuzbQ/view?usp=sharing

Linking cassava farmers to community solar drying centres, cassava farmers in the Buganda Kingdom region have been suffering from post-harvest losses and the cause of these post-harvest losses include limited availability of suitable varieties for processing, lack of appropriate processing technologies, inadequate commercialization of new technologies and lack of basic infrastructure, inadequate facilities and infrastructure, and insufficient promotion of processed to dry their food fast, this work introduced a game changer of community solar drying centers. Through VSLA UNEP EBAFOSA has established cassava farming cluster to help them feed the community solar drying centre with cassava and raw materials for briquettes making. Sixty (60) cassava farmers congregate as a VSLA made of five villages with each sending 12 members to plan and execute the activities of the VSLA jointly guided by the EBAFOSA¹⁸.



Figure 3 Cassava farmers washing cassava behind an unfinished solar dryer in Nakisuunga sub county. Photo credit EBAFOSA Uganda

Linking different value chains to solar dryers; this work has enhanced innovation of youth who have started developing the mushroom value chain by using solar dryers to increase its value by drying in a way that enhances quality and hygiene.

¹⁸ Nakisuunga VSLA preparing cassava to dried using a solar dryer:
<https://drive.google.com/drive/folders/1EWRg7ByLEluJ3ixt4xksQ2Y9XwvUNwhg?usp=sharing>

“We no longer sell rotten and poor-quality mushrooms to our customers. After the training with EBAFOSA Uganda I started making solar dryers for adding value by drying mushrooms. This resulted in developing the mushroom value chain with women groups in Kyaggwe county,” says Rachel Najjuoko¹⁹



Figure 4 Ms. Racheal Najjuuko linking solar dryers to Mushroom value chain: photo credit EBAFOSA Uganda

Establishing of Innovative Financing facility to drive climate solution actions of solar dryers; this work is mapping cassava farmers, value addition actors and clustering them into Village Savings and Loan Association to access credit from PEWOSA Uganda SACCO which is within the traditional structures of the Buganda Kingdom. The aim of this facility is to de-risk financing of operations along the entire cassava chain where climate action solutions from farming to drying using the solar dryer and adding value is applied. Micro -finance institutions have been identified to help farmers and value addition dealers. The solar dryers will form part of the collateral. This makes the investment in cassava value addition very affordable. Cassava farmers will be able to access quality cassava stems which are drought resistant and disease free.

Impacts

¹⁹ Racheal Najjuuko linking solar dryers to Mushroom value chain:
<https://drive.google.com/file/d/1m5YUjeBZlPqdRkZkVg95KOITFd-1rrD/view>

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 Kyaggwe county to help them dry their cassava in a solar dryer. Cassava farmers in Kyaggwe and Busiro county dry cassava in open sunshine, and the drying process is sometimes interrupted by rainfall during the day or made inefficient by cloudy weather not to talk of the contamination that occurs from dust and other flying particles.

“EBAFOSA has helped us with communal Solar dryers, now we are able to produce high quality cassava chips. As a group we expect to start producing quality products, including food, flour, animal feed, pancakes, bread. We encourage cassava farmers to start using solar dryers and stop drying their cassava on bare ground” says **Lydia Nakabugo a cassava farmer**. Drying on bare ground can expose the cassava chips to aflatoxin contamination²⁰.

Promotion of Climate Action Driven Agribusiness Enterprises; youth trained to fabricate solar dryers utilized the free training offered to them by EBAFOSA Uganda to cascade this climate action solutions of solar dryers technology to villages and women agribusiness groups. For example, **Racheal Najjuuko** who is an EBAFOSA Uganda Innovative Volunteerism Youth actor has managed to train women and youth the benefits of solar drying²¹.

Racheal Najjuuko has put cassava and mushroom value chain at forefront of her business and trainings in villages. Racheal a resident of Mukono district explains that, she used to dry mushrooms in open sun drying, and used to get one kilogram after drying which costed 13.8 dollars in a month. After acquiring a solar dryer, she can now get 14 kgs per month after drying each kilogram costing USD16.6 earning a total of USD232 in a month and annually USD2,789 on average.

*“After receiving a two weeks solar dryer fabrication training from EBAFOSA Uganda, we were tasked to champion solar dryer fabrication in Kyaggwe county Villages, I managed to train over 15 unemployed youths how to make solar dryer making. I have managed to earn some income from people I train and the mushroom value addition I have developed “*says Racheal Najjuuko ²².

²⁰ **Mould and Aflatoxin Contamination of Dried Cassava Chips in Eastern Uganda: Association with Traditional Processing and Storage Practices:** <https://scialert.net/abstract/?doi=jbs.2010.718.729>

²¹ Racheal Najjuuko training youth in Value addition. Available at <https://drive.google.com/drive/u/2/my-drive>

²² Rachel Najjuuko developing the mushroom value chain. Available at https://drive.google.com/drive/folders/1ek_Yy7kyi_NvxCaSKORXuQlo5sS21_qO?usp=sharing



Figure 5 Murungi Nathan (Left) , Rachel Najjuko (middle) and David Luganda (Right) holding mushroom products

Ready market for the cassava flour; this work has trained farmers to clean cassava, chip it into smaller sizes for drying in a solar dryer for 3 to 4 sunny days, according to the interviews with Nakisunga village savings and loans association members explain that; **previously we dried two tons of cassava chips using open sun drying, it was very tiresome and cumbersome but with this solar dryer the drying has been very fast than before and we have clean cassava chips dried in a short time and we are able to store it for future market opportunity. In three weeks, we now have 500 kilograms dried so far says Robert Mugerwa**

“For decades we have been drying our cassava chips on bare ground, our cassava has been rotting and cassava flour has been containing foreign material after milling hence bought cheaply on the local market. EBAFOSA’s introduction of solar drying technology will help the 60 members at CBS

PEWOSA fansclub Nsonga group in Nakisunga sub county to supply quality cassava chips to those who produce cassava flour” says Peter Ssekizivu - cassava famer



Figure 6 Women in Nakisunga washing cassava to be dried using solar dryer

Gender mainstreaming: women were trained on how to operate solar dryers, use the solar dryers to dry their cassava chips. The cassava groups and drying centre are dominated by women²³. This work has encouraged cassava famers engage in value addition for example Safe space for Girls Initiative in Buloba village, Busiro county women were trained to add value on cassava.

” EBAFOSA Uganda trained us how to use cassava to bake products like cakes make Daddies, Pan cakes, Cookies from cassava flour. We have managed to make these products using 90% cassava flour and 10% wheat. “says Mary Gorret Kwagala value addition actor. Most times women are more disadvantaged than men in the context of value chain operations.

²³ VSLA preparing cassava chip for drying. Available at <https://drive.google.com/drive/folders/1EWRg7ByLEluJ3ixt4xksQ2Y9XwvUNwhg?usp=sharing>



Figure 7 Inspecting Cassava value addition products in Sentema Show

Employment opportunity among youth in rural areas. According to (UBOS, 2019) report, the overall unemployment rate (UR) was 9.2 percent in 2016/17 with the females experiencing higher unemployment rate (14%) than males (6%). There were differentials by residence with the levels of unemployment being higher among rural residents (10%) than urban residents (8%). In this work, youth were trained to fabricate solar dryers acquired employment opportunities in rural farming communities. For example, Ms. Racheal Najjuuko has so far fabricated 20 solar dryers for Mushroom value addition women groups in Kyaggwe²⁴, Murungi

²⁴ Rachel Najjuuko has managed to train fellow youth in solar dryers making:
https://drive.google.com/file/d/1i0_3dqrrh2GHP57TClvNj10Qv9ExK_y/view?usp=sharing

Nathan managed to fabricate his dryers for mushroom and vegetable value addition groups in Kyaggwe county²⁵

Ssekadde Peter the head of fabrication and training at EBAFOSA Uganda with his technical team have trained 58 youth in Uganda and 13 others in Kenya under this work's arrangement²⁶. **Mary Gorret Kwagala** says, *"The cassava value addition training we received from EBAFOSA helped us create self-employment opportunities, we now make wedding cakes, make daddies and Cookies for boarding schools but due to COVID-19 pandemic our market reduced because students are not at school."*

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 Uganda outreach department said that they can now store and sell quality pure quality cassava flour and chips to the market. *"For decades we have been facing post-harvest losses during open sun drying of cassava chip, those chips are washed away by rain and some contain foreign matter, but now ever since EBAFOSA Uganda introduced a communal solar dryer in our village we now achieve 100% quality cassava chips dried"* says **Gorret Nassanga from Ggera village**²⁷. Drying allows safe storage of cassava chips over a long period by reducing the biological degradation rate of raw cassava chips²⁸.

Establishment of Africa Youth Agro-Industrialization Academy (AYAIAcademy)²⁹; this academy has managed to mentor and retool 58 youth from Buganda kingdom, 13 youths in Kenya³⁰ *"Youth were trained to develop the dryers and are now the lead designers and fabricators of quality dryers made from locally available material, to make them affordable to local cassava farmers"* says Peter Ssekadde³¹

The academy has invested in continuous climate Action Product development and improvement, the solar dryer design is being improved to ensure moisture reduction thresholds of 12%, ensure faster drying and further lower development costs³².

²⁵ Murungi Nathan solar dryer fabricator: <https://drive.google.com/file/d/1j4rb-yKRZA7DoTH9xb8mxArmv6F385JS/view?usp=sharing>

²⁶ Benefits from EBAFOSA Uganda training: <https://drive.google.com/file/d/11Rt-gALKBWbK53st1SkXQi7VJr1Gn9s/view?usp=sharing>

²⁷ Farmers training on use of communal solar dryer: https://drive.google.com/drive/u/2/folders/13DBGfCN_Mu75GOkZprUHhPdD3ehdxGMF

²⁸ Effect of temperature and shape on drying performance of cassava chips: <https://www.sciencedirect.com/science/article/pii/S2452316X16302617>

²⁹ <https://drive.google.com/file/d/1IVKOoiZroHKhXiLwIWgOF8GFckyr4Vb/view?usp=sharing>

³⁰ <https://drive.google.com/file/d/1sAAj9OzzWG1w3Bz64tEtILzRIT7NF7q5/view?usp=sharing>

³¹ Solar dryers fabrication in Uganda : <https://drive.google.com/drive/u/2/folders/12AcABnWuYYzAuaIMK1Afxk7Fmn52SowD>

³² https://drive.google.com/file/d/1F9u_BAIEQosenzta0svVsWSIZLvuzbQ/view?usp=sharing

Reduced losses of cassava during storage of dried cassava chips; According to the farmers, mold/rotting, development of abnormal smell and spillage, contribute to loss of the cassava. Other losses are due to insect, rodents, birds and domestic animals damage or eat up, extreme breaking and foreign matter attachment. This work has helped farmers dry their cassava in three days and stored for future consumption and sale.



Figure 8 Farmers training on use of communal solar dryer

Conclusion

Summary the action and the impacts

ACTIONS	IMPACTS
Youth skills retooling to fabricate solar dryers	Gender mainstreaming integrated and women now able to use solar dryers and youth able to fabricate solar dryers
Establishment of solar drying centers	Adoption of solar drying technology among cassava farmers
Training of cassava farmers to use solar dryers	Ready market for those who use cassava flour as quality cassava flour
Executing the UNBS market incentive compliance guide	Uphold quality of cassava value addition chain products
Decentralization of solar dryers	Promotion of agribusiness
Linking cassava farmers to community solar drying centres	Employment opportunity among youth in rural areas
Promotion of emissions free solar dryers	Less emissions released into the atmosphere
Linking different value chains to solar dryers	Employment opportunity among youth in rural areas
Establishing of Innovative Financing facility	Losses during drying of cassava chips minimized

Next steps

- Consolidating the VSLA to function optimally in Kyaggwe so they can become learning centers for other counties
- Collate and record more solar dryer development data and analyses for trends in efficiency, safety, quality, and production cost.
- Data collection to inform UNBS Climate action Market incentive guide
- Clear additional measurements of the solar dryers' performance in moisture content as benchmark by UNBS standards
- Continuous establishment of Village savings and Loans Association (VSLA) to bring people together- farmers, women and youth for the common purpose to tap opportunities in the agro-value addition using climate action solutions.
- Work with the University Centers in Uganda for entrepreneurship to develop and share relevant data on our work to inform improvements in entrepreneurship curriculum towards integrating climate action entrepreneurship aspects.
- Scaling out of the programme to other cassava growing areas in Buganda kingdom counties beyond Kyaggwe and Busiro. Using the VSLA approach.

- Introduction of environmentally friendly storage bags which can protect cassava chips for more than one year like *air tight super grain storage bags*
- Training of more youth innovative volunteers to fabricate solar dryers in villages.
- Drying items other than cassava. We propose to include other viable enterprise value addition chains such as pineapples, mushrooms and vegetables.
- Conducting research study on the applicability and impacts of solar dryers in the farming system with a reputable university like Makerere university Strengthen the institutional capacities for the delivery of agro-industrialization. Increase the mobilization, access and utilization of innovative agricultural finance. Increase market access and competitiveness of agricultural products in domestic and international markets using the existing UNBS approved Standards Markets Compliance Guide education and awareness campaigns using various channels on the work we are executing.
- Supporting Africa Youth Agro industrialization Academy innovation and invention work.

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