



CLIMATE ACTION INNOVATIVE FINANCING REPORT:

**CBS - PEWOSA
COOPERATIVE VILLAGE
SAVING AND LOANS
ASSOCIATION GOMBA
COUNTY**

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CONTEXT

Agriculture is the core sector of the Ugandan economy and the primary employer, engaging up to 70% of the working population. The **sector contributes** up to 22% of GDP and 34% of export earnings. The sector is also tagged as the centre of future growth in the country's high-level development blueprints. The 3rd National Development Plan (NDP3), a derivative of the vision 2040, prioritises agro-industrialisation as the critical pathway to enhance the productivity of Uganda's economies to middle-income status. One of the fundamental ways this sector can become the transformation engine is through the value addition lens. The country experiences on average up to **17.6% in annual** post-harvest losses (PHLs), which reach **a high** of 45%. These losses represent millions of dollars in lost food security, income, enterprise opportunities, jobs, and overarching economic competitiveness critical to catapult the country into middle-income status. Uganda produces a wide range of agricultural products, including coffee, tea, sugar, livestock, fish, edible oils, cotton, tobacco, plantains, corn, beans, cassava, sweet potatoes, cassava, millet, sorghum, and groundnuts.

At the same time, Uganda remains one of the most vulnerable countries to climate change, especially in areas like agriculture. This is characterised by erratic rains, flooding, frequent and prolonged droughts, inhabited by communities dependent on rain-fed crop and livestock production systems. The poor and the marginalised are the most affected by limited productive assets¹. Therefore, the core of building this much-needed resilience is socioeconomic towards actualising the ideals of the NDP3.

Integrating value addition to cut post-harvest losses and maximise earnings of all these value chains is critical towards driving ideals of the NDP3. Simple climate action solutions of solar dryers have proven effective in dehydrating food to threshold levels needed to prevent the growth of aflatoxins, yeast, molds, and other mycotoxins. Accordingly, climate action solutions of solar dryers made using locally available material have been shown to **cut aflatoxin** by 53%, post-harvest losses and enhance food safety and incomes. These solar dryers have proven effective in increasing the shelf-life of perishables for longer. This reduces losses and increases revenues of informal market traders who deal in perishables by **up to 30times**. In addition, Uganda is also among countries that have submitted **revised** climate commitments popularly called Nationally Determined Contributions (NDCs), where it aims to reduce emissions by up to 22%. Increased investment in solar is among priority actions. Therefore, the solar dryer stands out as an accessible climate action solution to drive the building of climate resilience while actualising key socioeconomic & climate strategic objectives of the country. In Uganda, the Cooperatives structure is crucial to ensure low-risk investment in these climate action solutions. **A majority of 46.4%** are engaged in food & agriculture, offering a low-risk structure of savings & investment to enhance uptake of these climate action solutions to strategically drive both the NDP3 & NDCs through the agriculture sector as the most inclusive.

Against this backdrop, UNEP EBAFOSA Uganda, in collaboration with the Buganda kingdom to implement their cassava agro-industrialisation policy, is working with local cooperatives to drive uptake of climate action solutions of solar dryers in a low risk and accountable way. Through decentralised groups called village savings and loans associations (VSLAs) that convene cooperatives members at the community, solar dryer solutions are taken up as a shared service. Each VSLA has up to 30 persons convening to cooperate around accessing & using one solar dryer. This enhances the affordability of solar dryer services that would otherwise be unaffordable if each community

1 <https://www.fao.org/uganda/news/detail-events/zh/c/1201051/>

member were to purchase one. These VSLAs cascade upwards and are linked to the CBS PEWOSA as the host cooperative.

In Gomba county, there were 6 VSLAs engaged in implementing this strategy by taking up climate action solutions of solar dryers. The Gomba VSLAs in the Buganda Kingdom established solar drying centres at the communal level to enable households to have food security, access value addition. Get training to develop agriculture product value chains. Facilitate skill retooling of the youth to fabricate and decentralise solar dryers to reduce post-harvest losses faced by rural women. Create employment opportunities for youth and women while promoting climate action enterprises that can fetch more money for their village savings and loans associations and increase their savings with CBS PEWOSA Cooperative every week. UNEP-EBAFOSA Uganda has been providing technical support to these VSLAs through training & capacity enhancement in the development, uptake, and application of climate action solutions of nature-based Ecosystems Based Adaptation approaches (EBA) at the ground level and complement with solar dryers, a mitigation solution, to cut measurable PHLs. Specifics include providing, retool, and training farmers to take up income-generating activities that don't degrade the ecosystem. These included Ecosystem-Based Adaptation Approaches² (EBA) implemented to enhance farmers capacity of adapting to climate change by harnessing nature-based solutions³ and ecosystem services, and solar dryers decentralised to cut post-harvest losses and create incomes as incentives to invest in more EBA. Among actions promoted were EBA- Approaches include planting improved cassava varieties, planting crop in line, intercropping, digging trenches in the gardens, gro-forestry, mulching, and use of weather information to make decisions.

THE POPULATION SIZE OF AREAS OF WORK

A recent study by the National Population and Housing Census 2014 (NPHC, 2016) indicate that Gomba district has a total population of 159,922, a total male population of 82,167 at the percentage of 51.4% and a total female population of 77,755 at the percentage of 48.6% with a sex ratio (males per 100 females) 105.7. Gomba District has an entire household of 35,240, composed of 73.2% male-headed and 26.8% female-headed households.

Figure 1 POPULATION SIZE

Table 1.1: Total population by Age Group and Sex, Gomba District, 2014

Age group	Male	Female	Total
0-9	28,775	25,998	54,773
10-19	22,172	19,725	41,897
20-39	18,433	18,409	36,842
40-59	8,968	9,059	18,027
60+	3,819	4,564	8,383
District	82,167	77,755	159,922

- 2 According to the Convention on Biological Diversity (CBD), «the ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way» and which aspires to maintain the natural structure and functioning of ecosystems.
- 3 Nature-based Solutions (NbS) are defined by IUCN as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”.

90.4% of the households engaged in crop growing with a total of 31,850 farmers and with 78.8% households that depend on subsistence farming as a primary source of livelihood, the total number of 27,761 people (Uganda Bureau of Statistics, 2017).

Project beneficiaries/Target Groups

- ▶ Women Village Savings and Loans Association (VSLA)
- ▶ Smallholder farmers
- ▶ Small and Medium Enterprises
- ▶ Value addition actors
- ▶ Youth and women
- ▶ End-user industries, i.e. Breweries, composite four enterprises
- ▶ Policy leaders



figure 2 cassava farmers holdings some of cassava roots harvested

SUMMARY OF THE INTERVENTIONS

Interventions focused on driving uptake of climate action solutions of solar dryers and EBA through the structure of cooperatives. Specific actions involved skills retooling, especially of youth in the development and deployment of climate action solutions of solar dryers; decentralisation of cassava cuttings for planting through EBA approaches;

training and capacity enhancement of beneficiaries in the uptake of these climate action solutions through the structure of communal cooperatives. Actions resulted in the decentralisation of clean energy to rural Village Savings and Loans Association, fabrication of 2 solar dryers, the establishment of 40 acres of cassava multiplication gardens, training EBA-Approaches to farmers, Value addition training for agriculture products of cassava and vegetables. Ecosystem-Based Adaptation approaches training was undertaken in 6 Village Savings and Loans Association (VSLAs) consisting of 180 farmers to enable field adaptation practices for cassava farmers. UNEP EBAFOSA Uganda milestones are targeting more households and more people after the first year of work. When the cassava stems grow, they will be shared within members of the VSLA to enable continuity and suitability of those activities in the CBS -PEWOSA Cooperative groups. Those interventions will build the resilience of the rural people and ecosystem-based approaches that are adaptive to climate change while leaving no behind through the power of innovative volunteerism to create transformative change and change the mindset of farmers.

CLIMATE ACTION INTERVENTIONS

Youth were guided to retool their skills – i.e. to improve, refine, and adapt their skills towards developing/fabricating and deploying climate action solutions of solar dryers, and decentralise/deploy the same to communities through the VSLAs structure. Youth engaged were unemployed youth, and they were guided in fabricating solar dryers to enable the decentralisation of those dryers to the county and village level. By thins, they enhance experience building opportunities to drive climate action enterprises while also curbing post-harvest losses of cassava and other agriculture products and driving the implementation of NDCs and NDP3. Through this skills retooling and guidance to engage the community as beneficiaries and markets, an approach called Innovative volunteerism retooled the skills of 4 youth in fabricating and maintaining solar dryers. These youth were then guided to work with communities and decentralise the dryers through the structure of communal cooperatives.



Youth retooling on fabricating solar dryer at Gomba

UNEP-EBAFOSA Uganda trainer instructing youth to insert timber on the solar dryer



Tightening edges of the solar dryer to allow proper transportation and UV polythene dressing



Youth offloading solar dryer at Kakoma Women & Men group



Youth dressing a solar dryer with UV polythene at Kakoma Women & Men group



solar dryer fabricated by the youth of Gomba installed at Kakoma Women & Men Group

Decentralisation of renewable energy technologies of solar dryers to rural women Village Savings and Loans Association

In rural areas of Uganda, smallholder farmers often lack access to modern equipment, value-added training, and approaches that stifle efforts to reduce poverty, post-harvest losses, food waste, and improve food security. Despite the country's reliance upon the agricultural sector, UNEP-EBAFOSA Uganda guided the young people to decentralise solar dryers to 2 Village Savings and Loans Association (VSLAs). The established dryer centres are communal solar drying centres with VSLA members to dehydrate and process their EBA cultivated cassava and other value chains. The dryers have 350kilograms drying capacity, while the beneficiaries VSLAs include; Twekembe Kakoma Women and Men Group at Kakoma Village and Kifampa Nezikokolima CBS Fans Club group at Kifampa village in Gomba county. Furthermore, UNEP -EBAFOSA decentralisation of Renewable energy of solar dryers enables smallholder farmers to improve agricultural production, processing, drying, thus enhancing post-harvest handling of agriculture products. A total of 49 community members benefitted from the solar dryers and are members of these VSLAs. They represent 238 households. The table below presents the details of those accessing solar dryer centres and trained in its appropriate use.

THE TABLE ON SOLAR DRYER BENEFICIARIES

No	Name	Gender	Phone number	Value chains farmed include Cassava & Beans	Average harvest	Total PHL in Kilograms		Total PHL in UGX (According to the prices of farm products in Gomba)		Number of households members		
KIFAMBA NEZIKOKOLIMA FANS CLUB CBS -PEWOSA COOPERATIVE GROUP												
					Fresh Cassava harvest from the previous season Each Bag costs=30,00 UGX)	Beans harvest from the previous season	cassava PHLS in Kgs	Beans PHLS in KGs (Nambale Beans	Cassava Bag = 30,000 UGX & Dried chips = 400 UGX	Beans Price=1200 UGX		
							Fresh cassava (1 Bag=30,000 ugx)	Cassava chips (1KG=400UGX)				
1	Kisakye Florence	Female	0758232578		5 bags	100kgs	1 bags	----	3 kgs	30,000	3,600	7
2	Nakizito Janat	Female	0752804976		3 bags	30kg		100kgs	2 kgs	40,000	2,400	8
3	Kyeere Stephen	Male	0752914318		1 bag	40kg	----	-----	5 kgs	-----	6,000	7
4	Nagenza Phiona	Female	0750571690		5 bags	50kg	Half a bag left in the garden		2 kgs	15,000	2,400	5
5	Nalunga Ruth	Female	0758206784		4 bags	120kg	-----	-----	20kgs	-----	24,000	3
6	Nantaba Jalia	Female	0706663410		7 bags	150kg		200kgs	8kgs	80,000	9,600	4

No	Name	Gender	Phone number	Value chains farmed include Cassava & Beans	Average harvest		Total PHL in Kilograms			Total PHL in UGX (According to the prices of farm products in Gomba)		Number of households members
7	Nabatanda Debula	Female	07517761383		6 bags	15kg	1 bag		---	30,000	-----	5
8	Mutebi Sula	Male	0754310674		11 bags	400kg	2 bags lack market and starts rotting		30kgs	60,000	36,000	7
9	Nante Yurita	Female	0753102586		4 bags	100kg	Half a bag because of Delays during transportation		----	15,000	-----	4
10	Namutebi Mary	Female			8 bags	160kg	-----		20kgs	-----	24,000	2
11	Ssenaduka Johnmary	Male	0759902898		10bags	150kg	2 bags and half		5kgs	75,000	6,000	4
12	Mebba Kakazi	Male	0702539425		7 bags	110kg	1 bag		50kgs	30,000	60,000	8
13	Nakaweesi Grace	Female	0756702503		4 bags	40kg		300kgs	----	12,000	-----	8
14	Kaliisa Paul	Male	0753479994		4 bags	130kg		----	----	-----	-----	9
15	Katere Abdul	Male	0755288480		12 bags	500kg	-----		30kgs	-----	36,000	4
16	Wasula Mahad	Male	0708523665		8 bags	40kgs	-----		----	-----	-----	5
17	Namale Halima	Female	0700546383		4 bags	50kgs	Half a bag		----	15,000	-----	2
18	Nakabulwo Nusula	Female	0757374247		6 bags	80kg	-----		4kgs	-----	4,800	4
19	Nakazibwe Sylvia	Female	0756410538		3 bags	----	-----		----	-----	-----	3
20	Waswa Mahady	Male	0752323535		11 bags	----	2 bags		----	60,000	-----	5

No	Name	Gender	Phone number	Value chains farmed include Cassava & Beans	Average harvest	Total PHL in Kilograms			Total PHL in UGX (According to the prices of farm products in Gomba)		Number of households members	
TWEKEMBE KAKOMA MEN AND WOMEN GROUP												
CBS PEWOSA GROUP												
1	Kyazze Simon Peter	Male	0702147203		12 bags	150kgs	-----		20kgs	-----		4
2	Kabunga Herbert	Male			8 bags	350kg	-----		----	-----	----	6
3	Sebunya Fred	Male	0750983131		5 bags	140kg	2 bags		----	60,000	----	4
4	Kawesi Godfrey	Male	0751059305		8bags	75kg	-----		----	-----	----	5
5	Ssekawanga Yudaya	Male	0704673561		5 bags	100kg		250kg	15kgs	100,000	18,000	7
6	Kawooya Penegiliwo	Male	0753266171		5 bags	150kg		130kgs	----	52,000	-----	7
7	Njita Hadija	Female	0787948161		4 bags	50kg		50kg	4kgs	20,000	4,800	6
8	Nakabugo Taatu	Female	0775618151		3 bags	40kgs		150kg	-----	60,000	-----	5
9	Babirye Firida	Female	0753713200		10bags	80kg	2 & half bags		-----	75,000	-----	4
10	Namyalo Gaudensia	Female	0782179333		5 bags	100kg		250kg	-----	100,000	-----	3
11	Komugisha Joniva	Female	0773512457		----	30kg		-----	----		-----	7
12	Mwanje Edirisa	Male	0773520648		-----	60kg		----	-----		-----	5
13	Namirembe Jaliya	Female	0779303986		-----	100kg		-----	5kgs		6,000	5
14	Nabbale Annet	Female	0775826209		7 bags	30kg	1 bag		-----	30,000	-----	7
15	Magale Hassah	Male	0704840893		2 bags	90kgs	----		-----	-----	-----	4

No	Name	Gender	Phone number	Value chains farmed include Cassava & Beans	Average harvest		Total PHL in Kilograms			Total PHL in UGX (According to the prices of farm products in Gomba)		Number of households members	
16	Nakawuki Fatuma	Female	0784226320		6 bags	110kg		100kgs	13kgs	40,000	15,600	4	
17	Namutebi Malusi	Female	0780784778		-----	70kg		-----	-----	-----	-----	5	
18	Kayongo J	Male	0702983311		-----	---	-----		-----	-----	-----	7	
19	Mukliti Ali	Male	0704632070		5 bags	45kg	Quartey of bag		-----	7,500	-----	5	
20	Nabatessa Angie	Female			----	----			-----		-----	6	
21	Nabasumba Joweria	Female	0703897089		4 bags	----	-----		-----	-----	-----	8	
22	Kiyimba Richard	Male	0754605208		7 bags	----		20kg	-----	8,000	-----	5	
23	Nakirijja Aidah	Female	0703895168		3 bags	----	-----		-----	-----	-----	4	
24	Male Livinstone	Male			30kgs	-----		10kgs	-----	12,000	3	
25	Eribu Martin	Male	0774507588		7 bags	40kgs	1 bag		-----	30,000	-----	---	
26	Nabeyemba Margret	Female	0788827922		4 bags	30kgs	2 bags		-----	60,000	-----	2	
27	Namuddu Lillian	Female			4 bags	15kgs	-----		-----	-----	-----	3	
28	Kobinge Betty	Female	0750342248		7 bags	50kgs	2 bags and half		7kgs	75,000	8,400	
29	Mbyewuza Richard	Male	0704161230		4bags	60kgs	-----		19kgs	-----	22,800	3	
Total								23 BAGS	1,550 KGS	272 KGS	1,179,500	302,400	238

Women in Gomba VSLA using their solar dryer



Women using a solar dryer to dry vegetables in Gomba



- i. Cassava Cuttings Distribution⁴: EBAFOSA Uganda distributed 120 bags of cassava cutting of NAROCAS1 variety to smallholder farmers of Gomba CBS – PEWOSA Cooperative Village Savings and Loans Associations (VSLAs) to benefit 6 VSLAs⁵ including; Tweekembe Kakoma Men and women Group; Kifamba Nezikokolima CBS FANS Clubs; Obumu Gemanyi Katete CBS PEWOSA Group, Zibula Atudde CBS PEWOSA Kabulasoke, Kiggasa Akilimu CBS Bukandula, Kyosimba Onanya CBS PEWOSA- Mpunge located in Gomba county. This cassava is to be planted using EBA approaches and, once harvested, will be value-added using a solar dryer. The total area covered by the cassava cuttings to be planted using EBA is 40ha.

TABLE OF CASSAVA CUTTINGS BENEFICIARIES

No	Name of Village Savings and Loans Association	Village	Number of beneficiaries			Casava bags distributed	Number of Acreage
			Male	Female	Total		
1	Tweekembe Kakoma Men and women Group	Kakoma	14	15	29	27	9
2	Kifampa Nezikokolima CBS FANS Clubs	Kifampa	8	12	20	18	6
3	Obumu Gemanyi Katete CBS PEWOSA Group	Katete	6	19	25	18	6
4	Zibula Atudde CBS PEWOSA Kabulasoke	Kabulasoke	11	19	30	12	4
5	Kiggasa Akilimu CBS Bukandula	Bukandula	3	12	15	15	5
6	Kyosimba Onanya CBS PEWOSA- Mpunge	Mpunge	18	3	21	30	10
Total			60	80	140	120 bags	40 acres

⁴ Testimonials ; https://drive.google.com/file/d/1_59DSiNGK9SM8pKAD55utOy3tjw-AcF/view?usp=sharing

⁵ Testimonial Gomba VSLA Leader on cassava cuttings; https://drive.google.com/drive/folders/15Jcqy7txP2woxkdT-Gdekg1M_E1MfSLM?usp=sharing

To ensure long term sustainability and ownership, beneficiary farmers not only plant for their use but also were guided to establish cassava multiplication gardens cultivated using EBA. This is to be providing planting material for themselves and additional farmers in the coming season. A total of 40 ha are envisaged will be planted with multiplication site material. This strategy ensures increased and continuous availability of free cassava planting materials for more farmers in the Gomba Village saving and loans association. In 2022, the season B of October - November to December

Fig 4. Cassava stems distribution at CBS-PEWOSA Gomba region offices at Bukandula

Gomba VSLAs receiving cassava cuttings from UNEP-EBAFOSA Uganda at CBS-PEWOSA SACCO Gomba



akoma VSLA taking transporting its cutting



ii. **Ecosystem-Based Adaptation approaches (EBA) training** enabled the Establishment of EBA Cassava Gardens for rural village savings and Loans Association (VSLAs). This work enabled the planting of 40 acres of multiplication gardens of clean cassava cutting of NAROCAS1 variety. These were planted using EBA approaches meaning an uptake of EBA covering up to 40ha. The cassava planted in multiplication gardens will be distributed to fellow VSLAs members to also plant on their land; the motive is to enable the supply of cassava to the solar dryer centre by VSLA members. According to National Agricultural Research Organisation (NARO), the NAROCAS1 variety yield up to 25-45 Tons/Ha with a Stem yield (1st Crop) of 40-60 bags, Stem yield (Ratoon crop): 100-150 bags⁶. In addition, NAROCAS 1 is highly resistant to Cassava Brown Streak Virus (CBSV), and cassava takes 9-12 months for the roots to be ready for harvesting⁷. CBSV is a viral disease that causes severe yield losses in cassava of up to 100%, thereby persistently threatening farmers' food and income security (Mukiibi et al., 2018).

- iii.
- Farmers were trained in Ecosystem-Based Adaptation (EBA) approaches they can plant in the cassava garden, including; intercropping cassava with beans at an early stage of 1 to 3 months, cassava agronomy, advised farmers to get cassava cuttings from a garden with no history of the disease, advised farmers to use improved varieties such as NASE 2, NASE 3, NASE 14, NASE 19, NAROCAS 1, and NAROCAS 2, which are resistant to cassava mosaic disease, use of climate information services.
 - This training found that the majority of these farmers – up to 80%- were not applying the EBA approaches covered in the most applicable training to the area with its major crops.

Figure 5 Training VSLA beneficiaries ecosystem-based adaptation approaches (EBA)

Farmers trained cassava agronomy practices by EBAFOSA Uganda trainer



6 CASSAVA AGRONOMY https://cng-cdn.oxfam.org/uganda.oxfam.org/s3fs-public/file_attachments/Cassava%20Agronomy%20Brief.pdf
7 NARO Uganda <https://twitter.com/narouganda/status/1380427557665914881?lang=en>



Gomba CBS PEWOSA Village saving and loans associations of Tweekwembe Kakoma Women and Men group. Planting NAROCAS1 variety on their 9 acres

A total of 140 farmers were engaged, and the gender distribution was 57.15% female and 42.85%, male. In addition, only two village savings and Loans Association of **Kifamba Nezikokolima Cbs Fans Clubs and Tweekembe Kakoma Women and Men group** were trained

Table breakdown of those trained, gender, the technique covered

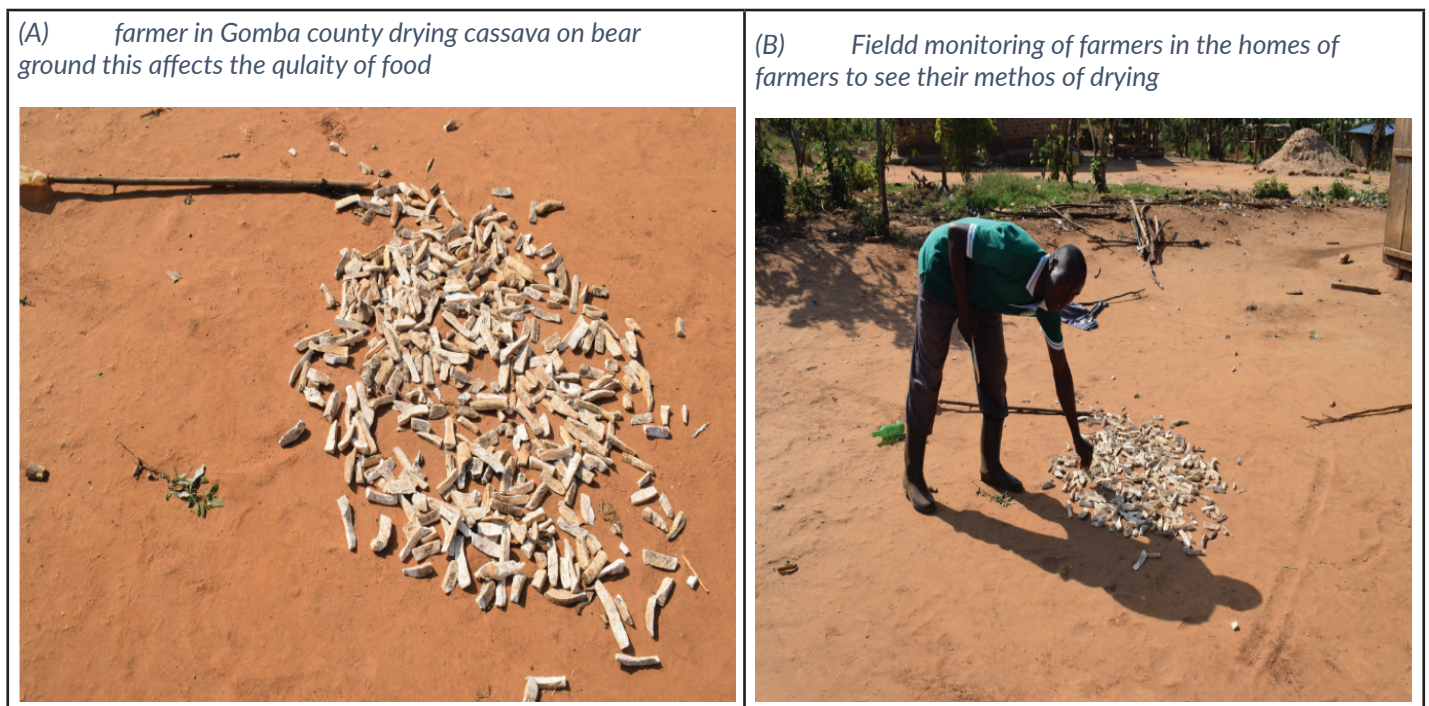
KIFAMBA NEZIKOKOLIMA CBS FANS CLUBS				
No	Name	Gender	Phone number	Enterprises trained
1	Kisakye Florence	Female	0758232578	Cassava value addition
2	Nakizito Janat	Female	0752804976	
3	Kyeere Stephen	Male	0752914318	Pumpkin value addition
4	Nagenza Phiona	Female	0750571690	
5	Nalunga Ruth	Female	0758206784	Ecosystems Based
6	Nantaba Jalia	Female	0706663410	
7	Nabatanda Debula	Female	07517761383	Adaptation approaches including, mulching, digging trenches, planting drought resistant varieties, use of climate information services
8	Mutebi Sula	Male	0754310674	
9	Nante Yurita	Female	0753102586	Solar dryer maintenance
10	Namutebi Mary	Female		
11	Ssenaduka Johnmary	Male	0759902898	
12	Mebba Kakazi	Male	0702539425	
13	Nakaweesi Grace	Female	0756702503	
14	Kaliisa Paul	Male	0753479994	
15	Katere Abdul	Male	0755288480	
16	Wasula Mahad	Male	0708523665	
17	Namale Halima	Female	0700546383	
18	Nakabulwo Nusula	Female	0757374247	
19	Nakazibwe Sylvia	Female	0756410538	
20	Waswa Mahady	Male	0752323535	

TWEKEMBE KAKOMA MEN AND WOMEN GROUP			
No	Name	Gender	Phone Number
1	Kyazze Simon Peter	Male	0702147203
2	Kabunga Herbert	Male	
3	Sebunya Fred	Male	0750983131
4	Kawesi Godfrey	Male	0751059305
5	Ssekawanga Yudaya	Male	0704673561
6	Kawooya Penegiliwo	Male	0753266171
7	Njita Hadija	Female	0787948161
8	Nakabugo Taatu	Female	0775618151
9	Babirye Firida	Female	0753713200
10	Namyalo Gaudensia	Female	0782179333
11	Komugisha Joniva	Female	0773512457
12	Mwanje Edirisa	Male	0773520648
13	Namirembe Jaliya	Female	0779303986
14	Nabbale Annet	Female	0775826209
15	Magale Hassah	Male	0704840893
16	Nakawuki Fatuma	Female	0784226320
17	Namutebi Malusi	Female	0780784778
18	Kayongo J	Male	0702983311
19	Mukliti Ali	Male	0704632070
20	Nabatessa Angie	Female	
21	Nabasumba Joweria	Female	0703897089
22	Kiyimba Richard	Male	0754605208
23	Nakirija Aidah	Female	0703895168
24	Male Livinstone	Male	
25	Eribu Martin	Male	0774507588
26	Nabeyemba Margret	Female	0788827922
27	Namuddu Lillian	Female	
28	Kobinge Betty	Female	0750342248
29	Mbyewuza Richard	Male	0704161230

iv. Value addition training for agriculture products of cassava and vegetables

Over the past decades, farmers in Gomba have been facing challenges of food wastage, and low-quality farm produces, leading to heavy post-harvest losses, and limited knowledge on markets where to sell their agricultural communities. However, after harvest, the cassava roots start deteriorating within 2 to 3 days and rapidly become of little value for consumption or industrial use; cassava has been rotting in gardens, mainly during rainy days. To cut post-harvest losses (PHLs), food waste and enhance income opportunities, solar dryers were developed and decentralised for farmers in the Buganda kingdom through the VSLAs framework. Farmers in Gomba were clustered into VSLAs and solar dryers decentralised for communal use. This strategy has enhanced access to solar dryers, which are otherwise capital assets beyond the affordability range of many smallholder farmers who need to recoup their PHLs, increase incomes & savings urgently. Through these communal solar dryer centres, farmers engaged in cassava and other crucial value chains in Uganda continue to benefit with notable impacts. Farmers Photo A, B, C, & D show the methods farmers previously used to dry cassava. Because of lack of value addition, the farmers register post-harvest losses of cassava in 23 bags, and 1,550 Kilograms of cassava chips equivalent to UGX 1,085,000 and 272 KGS of beans lost equal to 302,400 UGX

Figure 6 methods of drying agricultural products in gomba county



(C) *Hadija Njita smallholder farmer in Gomba- Kakoma village drying coffee on bear ground*



(D) *Drying of coffee below is on polythene and tarplines*



Cumulatively, average post-harvest losses experienced by the farmers in Gomba county for these major value chains were 1550kgs equivalent to UGX 1,085,000 for cassava; 2000kgs equivalent to UGX 6 million for pumpkin chips; and 800 kgs equivalent to UGX 2,200,000 for coffee;

v. Cassava value addition training

Adding value to cassava increase the gross margin by 300 Uganda shillings; therefore, it has a gross relationship with gross margin. According to the training delivered by EBAFOSA Uganda to farmers through their village savings and loans association, farmers are trained to produce quality cassava chips that bargain for the high market. According to the study from Makerere University, adding value to cassava increases the gross margin by 230.777 Uganda shillings. Therefore, it has a positive relationship with the gross margin. Access to training has a significant positive relationship with the gross margin, which influences the variation in the gross margin ($P = 0.005$)⁸.

- ▶ Furthermore, according to the study conducted in Gomba farmers, 90% of farmers were found drying cassava using open sun traditional drying. Against this backdrop, farmers were trained on adding value to agricultural commodities by the new solar drying method. In addition, two village savings and loans associations of Tweekembe Kakoma Men and women Group in kakoma village and Kifampa Nezikokolima CBS FANS Clubs were trained to add value to cassava and vegetables to reduce post-harvest losses and produce quality food for the market.
- ▶ Training farmers on the maintenance of solar dryers by agreeing on a small fee of 100 Uganda shilling to act as a maintenance fee and enhance community ownership.

Figure 7 solar drying method of drying agriculture commodities trained to VSLA beneficiaries



8 The influence of value addition on the profitability of cassava production among farmers in Alito Sub-County, Kole District; <http://dissertations.mak.ac.ug/handle/20.500.12281/4467>



Farmers spreading cassava chips on solar dryer trays



vi. Vegetable and pumpkin value addition training



Figure 8 Kokoma Women group spreading pumpkin chips in the solar dryer

Pumpkin is one of the underutilised fruit vegetables in Uganda despite its wide spectrum of both nutritional and medicinal values.⁹ Before introducing the solar dryers, farmers were losing over 1,500 UGX. At the farm, raw pumpkins are sold 500 UGX. If they chip the pumpkin and use the solar dryer to dry them, they sell 1 kilogram of pumpkins at 3,000 UGX. Farmers lose up to 75% of pumpkin by value without solar dryer value addition.

The following table summarises the beneficiaries of value addition training

KIFAMBA NEZIKOKOLIMA CBS FANS CLUBS			
No	Name	Gender	Phone number
1	Kisakye Florence	Female	0758232578
2	Nakizito Janat	Female	0752804976
3	Kyeere Stephen	Male	0752914318
4	Nagenza Phiona	Female	0750571690
5	Nalunga Ruth	Female	0758206784
6	Nantaba Jalia	Female	0706663410
7	Nabatanda Debula	Female	07517761383
8	Mutebi Sula	Male	0754310674
9	Nante Yurita	Female	0753102586
10	Namutebi Mary	Female	
11	Ssenaduka Johnmary	Male	0759902898
12	Mebba Kakazi	Male	0702539425
13	Nakaweesi Grace	Female	0756702503
14	Kaliisa Paul	Male	0753479994
15	Katere Abdul	Male	0755288480
16	Wasula Mahad	Male	0708523665
17	Namale Halima	Female	0700546383
18	Nakabulwo Nusula	Female	0757374247
19	Nakazibwe Sylvia	Female	0756410538
20	Waswa Mahady	Male	0752323535

TWEKEMBE KAKOMA MEN AND WOMEN GROUP

No	Name	Gender	Phone Number
1	Kyazze Simon Peter	Male	0702147203
2	Kabunga Herbert	Male	
3	Sebunya Fred	Male	0750983131
4	Kawesi Godfrey	Male	0751059305
5	Ssekawanga Yudaya	Male	0704673561
6	Kawooya Penegiliwo	Male	0753266171
7	Njita Hadija	Female	0787948161
8	Nakabugo Taatu	Female	0775618151
9	Babirye Firida	Female	0753713200
10	Namyalo Gaudensia	Female	0782179333
11	Komugisha Joniva		0773512457
12	Mwanje Edirisa	Male	0773520648
13	Namirembe Jaliya	Female	0779303986
14	Nabbale Annet	Female	0775826209
15	Magale Hassah	Male	0704840893
16	Nakawuki Fatuma	Female	0784226320
17	Namutebi Malusi	Female	0780784778
18	Kayongo J	Male	0702983311
19	Mukliti Ali	Male	0704632070
20	Nabatessa Angie	Female	
21	Nabasumba Joweria	Female	0703897089
22	Kiyimba Richard	Male	0754605208
23	Nakirijja Aidah	Female	0703895168
24	Male Livinstone	Male	
25	Eribu Martin	Male	0774507588
26	Nabeyemba Margret	Female	0788827922
27	Namuddu Lillian	Female	
28	Kobinge Betty	Female	0750342248
29	Mbyewuza Richard	Male	0704161230

IMPACTS

- i. They have trained four innovative volunteerism actors in fabricating solar dryers. Youth gained skills to make solar dryers, a new innovation to their community.
- ii. Two solar dryers were fabricated and distributed to two VSLAs of Tweekembe Kakoma Men and Women group and Kifampa Nezikokolima CBS Fans Club in Gomba county. Those Solar dryers were decentralised to the rural farming community to enable farmers to reduce post-harvest losses and food waste. The total number of beneficiaries were 49 members, and taking 5 – 10 persons as average household size, total beneficiaries were 490 persons.
- iii. They established 40 acres of cassava stems planted using EBA approaches. These benefit 140 members directly from 6 Village Savings and Loans Associations (VSLAs) in Gomba County¹⁰. The beneficiaries of the cutting include Tweekembe Kakoma Men and women Group; Kifamba Nezikokolima CBS FANS Clubs; Obumu Gemanyi Katete CBS PEWOSA Group, Zibula Atudde CBS PEWOSA Kabulasoke, Kiggasa Akilimu CBS Bukandula, Kyosimba Onanya CBS PEWOSA- Mpunge located in Gomba county. These come from households with an average of 5-10 persons. The total number of persons benefiting is up to 1400.
- iv. NAROCAS 1 cassava stems variety distributed to farmers in Gomba¹¹; 120 bags of cassava were, supplied to Gomba county from the support of UNEP-EBAFOSA Uganda; this enabled farmers to acquire quality clean planting material that is cultivated using EBA. The total number of beneficiaries was 140, covering 40 acres with EBA uptake.
- v. Trained in Value addition of agriculture commodities of cassava and vegetables, two village savings and loans associations consisting 49 members were trained in value addition to enable reduction of post-harvest losses and food waste, increase on quality of the product so that to fetch more amount. VSLA of, Tweekembe Kakoma Men and women Group; Kifamba Nezikokolima CBS FANS Clubs were trained¹².
- vi. Nature-Based Solution (NBS) of EBA – Approaches adapted by farmers in Gomba county. Those include mulching of garden, intercropping of cassava with beans, maize at an early stage of planting. A total of 140 farmers have switched to start applying these EBA approaches to their gardens
- vii. Acceptability of the program in Gomba by leaders and community.

IMPLICATIONS ON LOCAL FINANCE AND INVESTMENT

A total of 140 persons drawn from 6 VSLAs, which are offshoots of the CBS PEWOSA cooperative, were engaged to uptake climate action solutions of EBA, clean energy, i.e., solar dryers, towards enhancing their productivity. These farmers engaged in diverse value chains – including cassava, pumpkin, beans, coffee etc., and experienced total post-harvest losses valued at UGX 1,481,900. These were monies that would have ended up in their savings accounts to enhance their liquidity and, hence, their ability to invest in more EBA and invest in more value addition to expand their cycles of saving and investments in these climate action solutions.

10 Testimonial from Ssekadde Peter at Gomba <https://drive.google.com/file/d/12YkvVXUfUUBvPZkIW1LuZIVKUdSpOgCc/view?usp=sharing>

11 Testimonials from beneficiaries; https://drive.google.com/file/d/1_59DSiNGK9SM8pKAD55utOy3tjw-AcJF/view?usp=sharing

12 Value addition training <https://drive.google.com/drive/folders/1fluVpYSM8ToAWcZvCStEErT8Lyf9C0?usp=sharing>

In addition, 65% of the farmers were not engaged in applying the EBA approaches covered in training. These EBA trainings are relevant not only to the majority of crops farmed in the Gomba county but also critical to protecting the soils against erosion and leaching risks and enhancing the organic and nutrient content of these soils.

Therefore, these climate action interventions have come to prove to the cooperative how climate action presents opportunities to improve the financial bottom-line. As a result, through the structure of the PEWOSA cooperative, the amount of land under EBA has increased by 40 acres in the immediate term. Over the period when the cassava is harvested and marketed, the savings of members are projected will increase through the preservation and processing of cassava using solar dryers to reduce PHLS and create incomes. In the long run, these benefits will expand as more members of the target VSLAs adopt these climate action solutions informed by the short-term successes of their peers. These benefits are set to be adopted by neighbouring VSLAs in different counties as the PEWOSA management takes up lessons from Gomba for replication in VSLAs of other counties. This is creating a structure for saving and investing in expanding coverage and uptake of climate action solutions of EBA & clean energy through an enterprising market-driven lens that ensures longevity.

Based on these initial steps with members taking up EBA & solar dryers to drive cassava enterprises, the PEWOSA cooperative also has re-channelled investments into cassava production and value addition using climate action solutions. The first start clients registering impact will generate more data that will be used to formulate more targeted financing products for climate action solutions to expand uptake across the entire kingdom.

CBS – PEWOSA Cooperative has also taken up these climate action solutions to become part and particle of their investment areas. For example, PEWOSA has trained these VSLAs who are talking up these climate action solutions to be financially literate on financial literacy. This has enabled PEWOSA Prioritization to focus on competitive loans products for climate action solutions¹³.

What has CBS PEWOSA done to take up climate change solutions like solar driers and making briquettes, and how has this increased revenue of VSLAs and prioritisation to focus on competitive loan products

- ▶ CBS PEWOSA Cooperative has maintained the approach of training and replicating community Managed microfinance (CMMF) groups to ease the adoption of technologies, sensitising members into climate action solutions, learning to make fuel briquettes. Over 1,000 Saving Groups from different counties have been keen to learn climate solutions, financial literacy, financial education and digital literacy to ease their business transactions in their communities. So far, seven solar driers have been received in Kyagwe and Gomba and six groups amounting to 180 members. And now, over 40 acres of cassava is under cultivation only in Gomba County.

How have CBS POWESA groups increased their incomes from climate change solutions

- ▶ CBS Pewosa Cooperative offers its members a variety of products ranging from savings and affordable credit services, fixed deposits, money transfers, agriculture advisory services and a range of digital financial services. However, climate change solutions have emerged that have enabled unemployed youth to start making fuel briquettes and generating some incomes and employing other unemployed

13 How CBS PEWOSA Cooperative is collaborating with EBAFOSA Uganda- <https://drive.google.com/drive/folders/1oerndi75An6URHSjYu6rL5gwOfmEU5S?usp=sharing>

youth. For instance, In Gomba, Savings groups were supported by solar dryers from EBAFOSA, costing over 450 dollars to reduce post-harvest losses by drying cassava, pumpkins, cherries and fruits that are sold as organic products and consumed locally to reduce post-harvest losses. The solar dryer has enabled over 180 members to directly increase the quality of dried cassava which now reduces wastage and poor-quality products.

- ▶ Some poultry farmers have agreed to substitute maize flour with cassava flour in the mixing up of poultry feeds to reduce the incidence of aflatoxins that have caused tremendous losses in poultry farming.

How has EBAFOSA is helped CBS PEWOSA to re-orient their focus on serving the community

- ▶ CBS PEWOSA was initially delivering business loans with minimal intervention in agricultural loans, but the partnership with UNEP EBAFOSA Uganda enabled CBS PEWOSA Cooperative to develop and widen its agriculture loans and services. Predominantly, the women and men groups that save with the cooperative are farmers, but 90% of them have been farming for subsistence consumption. Due to the value addition trainings, the cooperative has started encouraging members to take up climate action solution enterprises to enable an increase in their saving and productivity
- ▶ EBAFOSA has widened our scope in crop agriculture by delivering more loans to cassava farmers, especially non-traditional agriculture and climate-related solution loans. People are now interested in growing cassava on a large scale that will require loans for maintaining cassava gardens. For instance, after EBAFOSA training of the Saving groups of Gomba county, we have a group of farmers saving with PEWOSA in Nakaseke Bulemezi county, having 150 members who now need guidance and training of nature-based solutions of solar dryer climate action solution to enable them to increase cassava chips shelf life. This was not the case before.
- ▶ There have been deliberate strategies to work with poor women and youth who are still not included in the financial sector. Climate action solutions liked the invented briquettes machines fabrication, solar dryer fabrication, fuel briquettes making have made saving easy to the groups, for instance, CBS-PEWOSA Cooperative groups in Mukono town kyetume village youth have been trained in briquettes making to enable an increase in incomes and saving, reduction of poverty and unemployment.

Moving forward, how will CBS PEWOSA bring in more CMMF groups, VSLA to tap into climate change solutions.

- ▶ CBS PEWOSA has five satellite offices in Kyaggwe, Gomba, Busiro and Masaka- Budu , Gayaza where we mobilise new groups, individuals and outreach. We encourage our field officers to share information about cassava growing, making fuel briquettes with the youth, and other climate change solutions. The cooperative's community facilitators and coordinators of PEWOSA offices in Buganda have been champions of sharing knowledge to the group members about the EBAFOSA/Buganda kingdom Cassava Agro – Industrialisation drive and the importance of value addition.
- ▶ Due to the existing works of EBFOSA Uganda in different VSLAs, and group Currently we have the Nakaseke cassava Farmers group in Luwero North totaling 200 members from different groups with

a cassava acreage of over 500 acres of mature cassava crop ready for harvesting and drying which came to PEWOSA office requesting for EBAFOSA Uganda training and retooling in value addition and Ecosystem Based Adaptation Approaches.

How is the risk sharing facility that EBAFOSA facilitated helping PEWOSA CMMF, VSLAs to access climate action solutions like solar dryers and now briquettes innovations

This is yet to help over 2,000 farmers access loans as originally many farmers were engaged in subsistence farming, thus not accessing agriculture loans, but now many farmers have increased their acreages, management of their gardens, and venturing into climate change solutions. Farmers in the Buganda region lack capital to access solar irrigation pumps, solar dryers, briquettes machines, yet they save with CBS PEOWSA Cooperative. The exiting risk Finance Facility has come in the right time to enable farmers to access agri-inputs to enable an increase in productivity

LESSONS LEARNT FROM THE COLLABORATION

- ▶ EBAFOSA and CBS PEWOSA cooperative intervention is speeding the attainment of Sustainable development goals in the grassroots communities, especially in the reduction of hunger, vulnerability and poverty and increasing gender equality
- ▶ This partnership integrates the youth and women back in the production and private sector-led economy by finding their space along the value chains.

The collaboration with UNEP EBAFOSA has enabled the CBS PEWOSA cooperative to increase membership because of new avenues of income generation. Climate action solutions of fuel briquettes and solar dryers have been a source of income that enables members to increase savings in the cooperative. As a result, CBS PEWOSA is now working with UNEP EBAFOSA to mobilise and engage more members into taking up these climate action solutions. For example, the combination of solar dryers and cassava cuttings distribution has enabled farmers who were initially farming only for subsistence to now start leveraging earning opportunities from cassava value addition. They have begun drying their cassava to trade it to confectionaries and flour makers and earn more to grow their savings with the cooperative. Members of the community, such as youth who have low savings and are unable to raise capital to invest in enterprises, have also taken up the non-capital-intensive area of fuel briquettes. They are trading and generating cashflows to grow their savings with the cooperative. This means that CBS PEWOSA has developed a new investment line of climate action solutions that are recommended to members to take up as a strategy for enhancing their earning opportunities and their ability to grow their savings with the cooperative.

NEXT STEPS

- a. Increasing smallholder farmers' cassava productivity through value addition training.
- b. Scaling out to more village savings and Loans Associations (VSLAs) in a Gomba because out of 30 VSLAs, EBAFOSA Uganda impacts only 6 VSLAs.
- c. Expanding cassava products options, market opportunities and geographies
- d. Monitor field cassava fields and solar dryer centres.
- e. Establish post-harvest handling mainly on storage and transportation.
- f. Ecosystem-Based Adaptation Approaches Training on individual gardens/ farmers
- g. Purchase of high quality solar-dried cassava chips by EBA foods Uganda for cassava flour production to enable the value chain.
- h. Train Smallholder Farmers agronomic practices and support them to access improved cassava varieties and good quality planting materials from Gomba Cassava multiplication gardens
- i. Strengthen the capacity of equipment fabricators through learning visits to other countries and trainings from other fabricators.
- j. Information and Knowledge sharing

CONCLUSION

Intervention	Impact
Youth retooled to fabricate solar dryer	Trained four innovative volunteerism actors in fabricating solar dryers.
Decentralisation of renewable energy technologies of solar dryers to rural women Village Savings and Loans Association.	Two solar dryers were fabricated and distributed to two VSLAs. The total number of beneficiaries was 49 direct beneficiaries and 490 in directing benefitting, who used to face PHLs amounting to UGX 1,481,900
Cassava Cuttings Distribution	NAROCAS 1 cassava stems variety distributed to farmers in Gomba
Ecosystem-Based Adaptation approaches (EBA) training undertaken	Established 40 acres of cassava stems planted to benefit 140 members directly from 6 Village Savings and Loans Associations (VSLAs) in Gomba County.
Value addition training for agriculture products of cassava and vegetables	Trained in Value addition of agriculture commodities of cassava and vegetables

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Annex

List of VSLA planted cassava

<https://docs.google.com/document/d/1j1bw18WDK-8SXusnpatNHNmzA36rEN5/edit?usp=sharing&oid=101411984631064665927&rtpof=true&sd=true>

List of Innovative volunteerism actors trained

<https://docs.google.com/document/d/1NGgqkDhn56z6ikM2Jpx3rdAYAEONC2FS/edit?usp=sharing&oid=101411984631064665927&rtpof=true&sd=true>

List of VSLAs which received solar dryers

<https://docs.google.com/document/d/1jzf6bcGTlqnI09kS3WQ8oFtrgVwJ3T1V/edit?usp=sharing&oid=101411984631064665927&rtpof=true&sd=true>

Testimonials from CBS PEWOSA management

What has CBS PEWOSA done to take up climate change solutions like solar driers and making briquettes, and how has this increased revenue of VSLAs and prioritisation to focus on competitive loan products - <https://drive.google.com/file/d/1PiS-foajxjbLeK9QqM7O67WTqsMVaDOq/view?usp=sharing>

How has EBAFOSA is helped CBS PEWOSA to re-orient their focus on serving the community - <https://drive.google.com/file/d/1wnf-CX1D5sg2RVVqx4oPBBvEWryQaKkX/view>

How is the Finance Risk-sharing Facility that EBAFOSA facilitated helping PEOWSA VSLA, CMMF to access climate action solutions like solar dryers and now briquettes innovation https://drive.google.com/file/d/1aAFflrQalGIZEoaCOWjNnpm_52XpGoaV/view

Lessons learnt to form the EBAFOSA and CBS PEWOSA Cooperative partnership <https://drive.google.com/file/d/1kgoT2YDBoKlpRtw8HuOL6S2wYI-WZ9ob/view?usp=sharing>



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