

TUTEGRATED PROJECT

TUJIINUE TENA INTEGRATED PROJECT

SCALING UP TUJIINUE TENA INTEGRATED (TUTEGRATED) PROJECT FOR ENHANCED INCOME DIVERSIFICATION IN THE CONTEXT OF CLIMATE CHANGE AND COVID 19 PANDEMIC





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BACKGROUND

SMALLHOLDER PRODUCERS AS CENTRAL PILLAR OF CLIMATE ADAPTATION AND RESILIENCE



The role of smallholder farmers as key actors in addressing challenges related to climate change, food security and nutrition such as extreme poverty and inequality in Kenya cannot be underestimated. However, Kenyan commodity producers, majority of who, are smallholder producers constituting 65% of the Country's labour force, have largely been unable to take advantage of opportunities in the changing economic and demographic landscape triggered by the inevitable global transition to low-carbon, climate-resilient economic development trajectory.

In the context of the changing climate and Covid-19 pandemic, smallholder farmers who rely on rain-fed agriculture found themselves rendered destitute. They faced other challenges such as limited access to information, appropriate technology, access to business models for increased scales of production and other means of production, including land and capital, but also market for their produce. In addition, SMEs that are dependent on nature for production such as Agro-industries are also not spared.

While companies might be frustrated by the lack of quantity and quality agricultural produce which are tied to seasonal cycles of production on the one hand, the small-scale producers are stuck with large quantities of produce that lack competitive markets, infrastructure and management of post-harvest losses. The direct link between the companies and the local producers is hampered by the lack of knowledge of one by the other, their locations and ways of working.

This is exacerbated by the existence of exploitative intermediary buyers who have thorough knowledge of both operators and reap excessive profits at the expense of the local producers. Disintermediation that help break the cycle of poverty can happen - facilitated by regulatory authorities, responsible private businesses and new technological solutions that enhance access to market information in partnerships with development actors.

Introducing complimentary commodities that withstands harsh climatic conditions and ones, which are not susceptible to such crises such as COVID-19 should be explored. This would be complemented by all efforts to connect producers to direct market, guaranteed price for their produce and ensuring that they get value for their investment.



TACKLING THE TWIN-CRISIS OF CLIMATE AND COVID-19 THROUGH INNOVATIVE PARTNERSHIP – THE CASE OF TUTEGRATED PROJECT

Mooted at the height of the Covid-19 in 2020, the Tujiinue Tena Integrated (TUTEGRATED) Project is a post-Covid19, locally led climate action intervention designed to address physical, social, environmental, and economic vulnerabilities and shocks occasioned by two pressing crises of our times – climate change and Covid-19. “Tujiinue tena”, literally and loosely translated as “We lift ourselves, once again”, acknowledges the struggle people and countries are going through in the outbreak of the corona virus pandemic, which resulted into economic disruptions never witnessed in recent times.

The lockdowns claimed millions of lives, triggered untold sufferings, disruptions and collapse of enterprises and livelihoods, as well as social behaviors, which will take decades to recover. The Covid-19 pandemic struck when communities, especially in Africa, were confronting climate-related disasters, manifested by shifting seasons, erratic rainfall, torrential floods and disappearance of rivers, hurricanes and tornadoes, which have become frequent.

Such disruptive was the Covid-19 pandemic that all global processes to build consensus on the transition to low-carbon, climate-resilient, ecologically just, fair and equitable development pathways – notably the COP26 in UK – had to be postponed by a year as countries instituted containment travel bans to contain the spread of the corona virus.

Though the spread of the virus was eventually contained through a combined rapid development and deployment of vaccines, together with strict lockdown measures, its aftershocks will be felt for a longer period, with some sectors of the economy never to recover again. Pulling the people and communities out of the quagmire of desperation, and with climate crisis exacerbating the pandemic crisis, governments as well as non-state actors are undeniably confronted by a conundrum of disproportionate magnitude.

It behooves the governments to institute locally adaptable, pragmatic strategies to address acute constraints on the struggling smallholder producer-based SMEs and households to revive diminished production and ensure citizens access to sufficient food and nutrition. This means that the stimulus

(in some instances called green recovery) packages proposed by Government Agencies or devolved units of governments as well as non-state actors should be as diverse as possible, taking into consideration geographical, cultural, political and social orientation.

The Tutegrated Project is a popularly embraced innovative post-covid green recovery initiative tailor-made to help smallholder producers diversify their livelihood options, and utilize their nature-based resource – land - through a diverse collaborative effort that brings together mutually beneficial Actors across commodity value chain. The choice of the commodity is dependent on the ecological and economic orientation of the target community, as well as the potential benefit accrued by the partners in the commodity in question.

Goal



To diversify smallholder producer income streams in the Tutegrated Project for enhanced resilience to climate change and COVID -19 pandemic recovery.

Objectives

1. To catalyze partnerships in the commodity value chain for a rapid resilient, greener recovery from the twin shock of covid-19 and climate crisis
2. To mobilize smallholder producers and communities at the bottom of the pyramid as key anchors in the Tutegrated Project so as to expand and diversify their income and livelihood options
3. To develop a replicable public-private sector enterprise model that capable of enhancing adaptive capacity of smallholder producers affected by climate change and Covid-19 pandemic.



THE TUTEGRATED SUNFOLWER VALUE CHAIN PROJECT

Healthy sunflower crop grown under Tutegrated project. Sunflower crop is drought tolerant and matures within 4 months

The collaboration sought to encourage local people whose reliance as commodity of choice is maize, and who have faced challenging times occasioned by exceedingly harsh weather events, to try other crops that are drought-resistant. The target community used to experience adequate rainfall, but due to the changing climate, successive seasons have been characterized by erratic to no rainfall, thus affecting their crops.

The partnership started with consultation between PACJA and BIDCO-Africa, Africa's leading edible oil processor, which culminated with the signing of a memorandum of understanding between the two, to define areas of joint collaboration. Through this partnership, BIDCO assured farmers of ready market, thus completing the entire value-chain of sunflower.



Aggregated Sunflower produce ready for transporting to the off taker-Bidco Africa

Next was mobilization and awareness creation of farmers through local leaders, especially Chiefs and Members of County Assembly in the target community, Meru County. Successive meetings were convened where trainings were conducted by extension officers and community volunteers (youth recruited and trained) seconded by Bidco and recruited by PACJA. This was followed by listing of farmers willing to cultivate the crop, realizing a record number of around 3000 with an average acreage of 5000.

PACJA and BIDCO-Africa combined their synergy as a way of enhancing the adaptive capacity of farmers through the Project using an agribusiness SME model that enabled them to grow Sunflower for sale at a guaranteed price. The partners sought to promote the formation of successful and sustainable rural farmer-led businesses well placed to exploit market opportunities through greater linkages to buyers, business and service providers.

While PACJA used its known prowess in community and resource mobilization, BIDCO provided farmer technical and extension services for the crop cultivation. The company also guaranteed the farmers of the market for the entire sunflower cultivated, with a guaranteed price.

The Project focused on strengthening on-farm activities through a systemic approach to market strengthening. This means, jointly, PACJA and BIDCO periodically assessed the overall value-chain to gain

a stronger understanding of where the gaps and challenges were that needed to be addressed in order for rural farmers to benefit. These revolved around not only production and quality, but also on farmers accessing kind of other related services to build confidence in the Project, such as financing, quality assurance, inputs and processing.

The Project built on PACJA's desire to re-orient the private sector through a mutually beneficial social enterprise partnership, facilitate access to the niche resources coming out of the evolving climate-resilient- low-carbon-green economy; including impact investors and social finance - and support the establishment of niche market financing to groups thus cushioning them from climate variability and commodity price volatility.

So remarkable was the Project's success that it saw a bumper harvest of over two hundred (200) tons of sunflower in a single season, enabling farmers to earn around 10 million Kenya Shillings (US\$100,000). Sixty (60) Tons of the produce were delivered to BIDCO-Africa, while internal-bilateral trade among farmers consumed forty (40) Tons locally as livestock feeds while hundred (100) Tons were consumed by proliferating Cottage Industries that locally process sunflower to edible oils.

Comparatively, farmers who opted to remain with the maize cultivation counted their losses, as the crop could not withstand the harsh weather conditions. This attracted more farmers to embrace sunflower farming in the second season. Total rainfall failure however resulted to reduced harvest, which affected the morale of farmers.

Expansion (diversification) of the commodity base from sunflower was agreed after the consultation with producers, who resolved to try other fast-maturing, drought-resistant crops adaptable to the local climatic conditions.



Weighing sunflower crop



Growing sunflower crop in Meru county





INTRODUCTION OF SORGHUM CULTIVATION IN TUTEGRATED STABLE

The demand for sorghum is high in the local beer industry such as East African Breweries Limited (EABL). Through linkage, collaboration and partnership with Kenya Breweries, the Project guaranteed producers of a ready market and stable price in case they opted to cultivate it.

A series of consultative meetings between PACJA and EABL resulted into a partnership under Tutegrated Project,

where farmers mobilized to cultivate sunflower were encouraged to consider an additional crop, sorghum. Through a series of consultative meetings, farmers were convinced and embarked on the registration process to reach a critical mass capable of producing the quantity sufficient to make business sense.

By diversifying the farm enterprises to include sorghum production alongside sunflower farming, Tutegrated Project producers essentially increased their sources of income and definitely moved towards food security in an effort to improve their standards of living.

Sorghum - A fast-maturing, alternative crop

Sorghum is adapted in a wide range of agro-ecological zones, and requires less water other seasonal staple crops thus offering great potential for supplementing food and feed resources. It is a drought tolerant and fast-growing crop, which requires minimum low initial cost outlay. It requires less amount of rainfall than alternative staple crop such as maize. It has a short life cycle of three to four months hence has ability to escape the adverse effects of low erratic rainfall and subsequent drought.



Youthful farmers receive seeds in the previous seasons. Engaging women and youth in Agribusiness creates job opportunities and boosts food security.

Sorghum crop maturing in 105 days. The short payback period and ready market makes sorghum a popular venture among the farmers

Therefore, it is a suitable enterprise for farm income diversification and promotion of biodiversity at the farm level.

Moreover, sorghum production ensures food and feed security to the community because of its multiple uses. Traditionally, the crop was ground and used for making of gruel (special porridge for lactating mothers). The grains were pounded with a mortar and pestle for preparation of a special diet commonly known as “muthikore” in Meru local dialect. It is an effective fallback plan for farmers in the event of other crops failure, which was evident in the Project area when maize failed due to insufficient rainfall. Farmers who planted sorghum had a field day as the price tripled, with majority withholding the produce for domestic use instead of delivering it to EABL. In the short rains season of October to December 2022, PACJA has supported farmers with 8,122 Kgs of sorghum seeds, expected to cover close to 4000 acres of land in Meru and Embu counties of Kenya.





INTEGRATING APICULTURE IN THE PROJECT



Bee keeping (Apiculture) is a livestock subsector with great potential of contributing to Kenya's food basket as well as foreign earnings. Apiculture is essential for small-scale farmers and resource-humble communities due to the fact that it's completely sustainable, has better income and needs less input as compared to other agricultural enterprises. It is low in terms of initial cost outlay in that it requires low start-up capital, land and labour.

Bee keeping enhances the environment through pollination hence increasing the crops yields and ecological regeneration. There is a direct link between honey production and environmental conservation since bees require trees for shade, nectar, pollen, propolis and shelter. On the other hand, trees and crops need bees for sexual reproduction (pollination). This link has seen most beekeepers turn into environmental conservationists in order to boost their honey yields. There is a financial incentive for maintaining the ecosystem which in the long run, results in mitigation of climate change since trees sink carbon dioxide; thus reducing the green-house gas emissions.

Apiculture is a means of farm diversification, an important climate adaptation element. Honeybees need food (nectar and pollen) to survive, grow, and multiply. Thus, the provision of bee floral resources throughout different months of the year is a primary demand for bee farming. The success of a beekeeping enterprise depends on the provision of floral resources that are in bloom through different months of the year. More honey yield is realized if apiculture is established in a region with abundance of honey/ bee plants within a five-hundred-meter radius of the

bee colony. Tutegrated Sunflower/sorghum farms are thus natural complement for bees. Therefore, integrating honey production in the farm complimented other existing enterprises since there is no competition amongst the enterprises.

Reduction of Human-wildlife conflict in the Project area

Recent studies have linked bees with addressing the human-wildlife conflict. Where hives are lined along the boundaries of game parks and reserves, a buffer zone is created in which elephants are prevented from accessing the farms. This has been a sustainable and long-term solution to animal-human conflict along the wildlife conservation areas.

Tutegrated Project borrows from Dr. Lucy King's model of bee 'fences', which is a cost-effective, nature-based solution to reconcile the elephant with people with whom they share land.

The innovation provides direct incentives to keep farming communities from infringing on protected areas and which would spark clashes with elephants and other native wildlife because of economic competition. Similarly, these buffers between human activity and designated wilderness areas eradicates much of the negative human/wildlife interaction. Notably, humans and wildlife are already intertwined, thus these deterrence methods successfully protect crops hence eliminating the need for poisons snares and rifles.

One of the many Apiaries established along the Meru National park border. Beehive buffer zones deter elephants from encroaching the farmlands thereby reducing the imminent human/wildlife conflict



Around 300 modern Langstroth beehives were distributed to farmers who are members of the Project. Though the honey harvesting has not yet commenced as the colonies keep building in the farms, indications are that Apiculture is a suitable alternative to compliment sunflower and sorghum production in the Project area. In five to eight months, farmers will be harvesting honey, which has inexhaustible market in the local community.

Beekeepers inspect one of their hives. The process of hive colonization is taking place in all the Apiaries with some groups reporting 80-90% colonization rate



LESSONS LEARNT IN PILOT PHASE OF TUTEGRATED PROJECT:

The Tutegrated Project has been in its pilot phase since its inception in the last half of year 2020. Many lessons have been learnt from implementation of the Locally-Led Climate Action as follows:

1. Active participation of the local community in the Project design and decision-making at all levels is essential to ensure ownership and sustainability of the Project.
2. Sorghum/sunflower crops are highly profitable crops since labour and management practices are minimal. Where disease and pest resistant cultivars are used, it is cheaper to produce the crops. These cultivars are also high yielding.
3. Sorghum/sunflower are highly drought resistant crops. In the emerging trends of erratic, short rainfall cycles and prolonged drought, the crops are able to withstand and survive. These are emerging as alternatives to traditional grain crops like maize. The short maturing cycle of the crops (usually 3-4 months) ensures that they utilize even the most limiting growth factors such as water.
4. Any agribusiness model succeeds where there is a guaranteed market prices and ready market for the produce. The Tutegrated Project success is anchored on a private public partnership that links farmers to market opportunities for the produce.
5. Both sorghum and sunflower crops are heavy consumers. There is need to replenish the soils with minerals from organic or inorganic fertilizers. Other practices such as conservation agriculture, crop rotation and intercropping with legumes have been observed to boost and sustain the yields as well as ensure biodiversity in the farms.
6. Apiculture is emerging as another venture to integrate in the sunflower and sorghum farms. This requires minimum land, labour and inputs. The bees are vital in pollination of crops as they obtain food among other benefits from the plants. The local communities reap much benefit from this symbiotic relationship and are essentially, turning out to be natural conservationists as they plant and nurture more trees around their apiaries.

SCALING-UP THE PROJECT

There is need to replicate the best practices from the implementation of Tutegrated Project to additional counties in Kenya as well other Countries with similar climatic conditions and potential public-private partnerships in Africa.

Literature review shows that several counties in Kenya are suitable for production of Sorghum. These fall mostly in the rift valley, western, coastal and eastern belt.

COUNTY	Year	Harvested Area (HA)	Production (MT)	Yield (MT/HA)
Baringo	2016	1,017	2,821	2.8
Bomet	2016	1,565	3,170	2
Busia	2016	9,777	17,377	1.8
Elgeyo/Marakwet	2016	670	1,027	1.5
Embu	2016	4,564	8,271	1.8
Homabay	2016	16,950	18,256	1.1
Kajiado	2016	56	63	1.1
Kakamega	2016	504	563	1.1
Kericho	2016	588	877	1.5
Kisumu	2016	13,921	4,329	0.3
Kitui	2016	71,032	14,060	0.2
Kwale	2016	419	109	0.3
Laikipia	2016	621	1,060	1.7
Machakos	2016	6,513	6,287	1
Makueni	2016	4,299	4,255	1
Meru	2016	7,694	9,664	1.3
Migori	2016	418	260	0.6
Taita/Taveta	2016	264	140	0.5
Tana River	2016	115	52	0.5
Tharaka-Nthi	2016	19,732	12,906	0.7
Trans Nzoia	2016	292	275	0.9
Turkana	2016	2,702	2,251	0.8
Uasin Gishu	2016	65	114	1.8
West Pokot	2016	413	373	0.9

Source: <http://kilimodata.developlocal.org/dataset/kenya-sorghum-production-by-counties>

On the other hand, several countries in Africa are traditionally net producers of world sorghum. The table below represents sorghum production by country in metric tons:

Sorghum Production by Country in (1000 MT)		
Rank	Country	Production
1	United States	11,375
2	Nigeria	6,800
3	Ethiopia	5,200
4	Sudan	5,000
10	Burkina Faso	2,150
12	Niger	1,900
13	Mali	1,500
14	Cameroon	1,200
16	Chad	950
18	Egypt	750
19	Tanzania	750
20	Uganda	400
21	Togo	280
22	Ghana	280
23	Senegal	275
24	Kenya	250
25	Zimbabwe	244

Source: <https://www.indexmundi.com/agriculture/?commodity=sorghum&graph=production>



CONCLUSION:

Following successful implementation of Tutegrated Project in Meru County, it is imperative to scale-up, replicate and expand the same to other parts of the country and continent. The best practices and lessons learnt in pilot phase are invaluable and will be used during the Project scale-up phase. In this regard, and drawing from the statistics above, it is highly recommended to scale-up the project to other Counties in Kenya with untapped potential for integrated commodities production. In 2016, for instance, Kajiado County produced only 63 MT and has a yield of 1.1 MT per hectare of Sorghum, higher than Tana River County, which produced 52 Tons, but with a lower yield of 0.5 Tons per hectare. Moreover, there is a high potential of integrating Apiculture and Ecotourism in Kajiado County, which has an entrenched African culture and which borders Amboseli National park with a rich ecosystem stretching to Mt Kilimanjaro in Tanzania. Other counties high potential counties for expansion include Kilifi, Embu and Baringo.

In Africa continent, Nigeria has the highest potential of sorghum production followed closely by Ethiopia. However, other statistics show that in 2019, Ethiopia emerged as the Africa's top producer of honey followed closely by Tanzania at 50840 MT and 30856 MT respectively (<https://www.nationmaster.com/nmx/ranking/natural-honey-production>.)

Therefore, *Ceteris paribus* (other factors held constant), Ethiopia is the best choice for scaling up the Project since Apiculture will be fully integrated to compliment sorghum production in the country.

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