LOCAL RESOURCES FOR: Agroecology – Health – Education



Activity Report 2016

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FOREWORD

We are marking two years of the existence of EMAUA organization with the publishing of this 2016 annual report. Our year has been marked by growth in execution capacity and an improved understanding of the immediate community we aim to impact. Our work aims at improving the living standards of people by raising their self-reliance, especially in terms of food production, basic health and the use of simplified technology. We hope you will find this report informative and inspiring.

By working with the locals at the grassroots level, we have appreciated the main challenges they face. This led us to begin a community education program that has shown a significant potential for creating impact among cummunities. The work we started through the Isegeretoto School self-sufficiency project in 2015 is meant to be presented as a working model that can be replicated. Furthermore, we have developed positive relationships by engaging the local people as workers and the main agents in our projects.

Working with communities has led to a deeper understanding of the principles presented by agroecology. In our opinion, an increase in people's self-reliance doesn't only mean an increased food production per acre; it also implies an improved diversity in the food production; less energy inputs through the use of local resources and improved agroecological techniques; and a healthier ecosystem which necessitates an increase of soil organic matter though appropriate production of compost, the use of agroforestry techniques and cover crops.

Our work also has a strong aspect of rigorous on-farm trials. These are aimed at testing and adapting scientific and traditional knowledge that is relevant to the region. To achieve continuous innovation we are developing partnerships with various organization and individuals on our diverse goals. Therefore, we are inviting all kinds of collaborations to the work we are engaging in as we foresee a promising future in the achievement of decent living standards through the effective utilization of local resources.

Julien Kauer Chairman and Founder Local Resources Integration Open Source Traditions Science Agroecolgy Biodiversity Peer Teaching sustainability Education Research for Development Education Open Source Agroecology Food Local Empowerment Collaborative Sustainibility Design Local Resources Health Open Source Carbon Farming Resources Local Better Living Integration Development Sustainable Goals Biodiversity Transdisciplinary

SITUATIONAL FACTS & Key Figures



Teso North sub-county region experiences a tropical climate marked by two rainy seasons, long rains (March to May) and short rains (September to November). This weather patterns support agriculture as the main socio-economic activity. However due to **climate change**, there have been harsher dry seasons resulting in food insecurity and water scarcity.

The economic demographic is characterized by a large part of the population living with **low incomes** (12\$ per month according to County Government Reports). The main activity practiced is **small holder subsistence agriculture** with an average of 0.6 ha landholding per household. Other income generating activities include daily wage casual labour, motorcycle transportation and small-scale entreprises selling general commodities.

In the context of the situational facts of Teso North subcounty, EMAUA finds its niche in the community by focusing on the following aspects:

Better Living

Addressing the levels of people living in critical poverty by improving food security, enhancing income generating activities and developing capacity of the members of the community.



Climatic action

Addressing climate change through innovative climatic action and other environmental friendly practices (eg. agroforestry, soil organic matter content increment, etc.)

Local resources

Researching with a focus on development various techniques and technologies that leverage locally available and affordable resources.

Knowledge dissemination

Integrating the traditional and modern development in order to achieve a better standard of life through efforts in *education and knowledge dissemination, medicine and health, agricultural practices* and *soft engineering.*

ESSENTIAL FACTS

EMAUA organization celebrated its first year of existence in 2016. In this year the improved execution of Isegeretoto self-sufficiency project was one of our major accomplishments, in which we appreciated the lessons learnt in 2015. We also enjoyed hosting a number of volunteers and guests, who stimulated us with their contribution to our work.

During the year, EMAUA was invited to participate in a number of **conferences and seminars** in Switzerland and France. We are also proud to have started our **commu-nity education program**, through which we managed to reach 2000 people.



TEAM AND ORGANIGRAM



Emaua's Team

Julien Kauer	President and Founder
Omuse Geoffrey Okou	Field Manager
Michael Obwa Odieka	Responsible for Community Education
Christine Tata	Responsible for Welfare & Vegetable Production
Eunice Mukade	Food Production Collaborator
Evans Chemiat	Food Production Collaborator
Leonard Aserwa	Food Production Collaborator
Basirio Epidi	Food Production Collaborator

LOCAL RESOURCES FOR BETTER LIVING

Driven by the urge to address local challenges in the community, EMAUA identifies the main recurring concerns being: low food production and security, inadequate health care and degradation of the natural environment. Due to the high occurence of low income earners in the community, solutions requiring high cash inputs are not viable. In that regard, an opportunity of inovative use of local resources (e.g. plants) as a main input, is presented.

These inovations include low-tech, practically free, home-based production of **fertilizers**, **insecticides** and the practice of **traditional medicine**. These methods can, in turn, positively change the life of a family by enabling it to produce sufficient amounts of food for itself and avoid some costly hospital visits.

Ecological practices also enhance the **fertility of soils**, contribute positively to **water management**, amongs other benefits. Economically, local resources provide a low-capital investment ground for small family-run businesses to pay the school fees and meet other needs.

EMAUA's methodology of addressing these challenges consists of gathering, developing or adapting potential solutions, followed by small-scale implementation and finally dissemination to the community.

<u>Agroecology</u>

D E V E L O P M E N T AND ADAPTATION OF TECHNOLOGIES

1

Agroecological technologies based on the use of local resources (eg. push-pull) are gathered and adapted to the needs of the community. Secondly, development of new techniques (eg. organic notill) is pursued through trials and continuous learning.

IMPLEMENTATION (eg. Isegeretoto Organic Food Self-sufficiency Project)

Technologies are implemented in two stages: initially, in an experimental capacity to observe yields and challenges followed by integration into an existing program such as the organic food self-sufficiency project and partnership projects with different facets of the community.

DISSEMINATION (Community Education)

3

Realised knowledge is then shared to community members through forums, seminars and collaborated projects. To achieve sustainability, EMAUA has a focus on the youth and school children, who are highly adaptive and open-minded to novel solutions and ideas. AGROECOLOGY

Adaptation of Techniques

In our approach to adressing the challenges faced by the community in the concern of farming productivity, ecological sustainability and creating stable community systems, we use the approach of agroecology. We understand this scientific discipline as one that involves a global outlook on agriculture and the environment in a context of human livelihood.

We encourage the appreciation of beneficial indigenous practices used in agriculture such as: non-mechanized agriculture, use of drought resistant varieties and handling farmwork as a community. The development of techniques focuses on the use of scientific knowledge applied to local resources in soil fertility, pest-control, etc. to complement existing practices.

ORGANIC INSECTICIDE & FERTILIZER

Fertilizing the soil and controling insects are essential requirements in the production of cereals, legumes, vegetables, fruits, etc. Therefore, since 2015, EMAUA has used *Tithonia diversifolia*, a wild shrub known for its soil fertilizing properties, to produce organic food on 8 acres of land.

An extraction from *Capsicum annuum* (a wild variety of hot pepper) and *T. diversifolia* has shown promising results on the control of aphids on vegetables and fruits. Experimentations to expand the spectrum of the insecticide to other crops and insects is on-going.

PUSH-PULL TECHNOLOGY

ICIPE's push-pull technology consists of intercoping Desmodium ssp. between raws of maize for control of straiga weed, a parasitic plant and insect pests. Desmodium's nitrogen fixing properties also fertilize the soil. Fields are surrounded by Mulato grass to pull the insect on it. The adoption of push-pull over 1 acre enabled to get rid of the parasitic plant and played a key role in the research on organic no-till technics.

ORGANIC NO-TILL

Worldwide, soil erosion is as big a problem as climate change, according to GIEC experts. Hence the necessity of developing new agricultural technics that enhance soil conservation and boosts fertility. In 2016, we conducted trials that involved the planting of maize without prior tilling in a field that had been covered with *Desmodium uncinatum*. The main challenge observed concerned rodents destroying infant plants. Further experiments will have an aim at extending no-till technics to other cereals (eg. fingermillet, sorghum and amaranth).

MUSHROOM PRODUCTION

The potential of mushrooms as a source of proteins as well as a high income generating activity led EMAUA to explore a low-tech production of Rei-Shi and Pleurotus mushrooms. We observed challenges related to: maintainence of the sterile environment, sourcing of viable inoculant and insufficient capacity training of the team. Despite negligible results, we intend to address these difficulties for future developments.

AGROECOLOGY

ISEGERETOTO ORGANIC FOOD SELF-SUFFICIENCY PROJECT

Isegeretoto Organic Food Self-sufficiency Project is EMAUA's pilot project. It has been conducted since 2015 on the school's 8 acres of land. The goal is to achieve a significant food self-sufficiency rate as well as producing nutritious organic food for the pupils and staff. Apart from the direct beneficiaries, it provides a realistic scale for the application of agroecological techniques, as well as a source of income for our casual labourers in times where it is most needed.

	Needs (t)	Supply (t)	2016
Maize	5.10	1.16	23%
Beans	1.32	0.15	11%
Green Grams	0.15	0.09	60%
Finger Millet	0.32	0.15	48%
Sorghum	0.32	0.11	35%
Cassava	0.08	0.03	36%
Wheat Flour ¹	1.81	0	0%
Rice ¹	3.78	0	0%
Meat ¹	1.58	0	0%
Milk			0%
Tomatoes ¹			0%
Onions ¹			0%
Cabbages	0.72	0.2	28%
Kales	0.5	0.34	68%
Kunde	0.46	0.3	65%
Tea Leaves ¹		0	0%
Cooking Oil ¹	4.20	0	0%
Salt (kg) ¹		0	0%
Total Rate			21%
Production Rate			42%

HISTORY

The ideas of starting the Isegeretoto Self-sufficiency Project were first conceived in pursuit of alternative food production methods that would mitigate and prevent reoccurrence of the harsh food shortages and hunger, such as the one experienced in 2008. Its main objective was to produce organic food for the pupils and staff in the school, using means that are ecologically responsible, high yielding and gives space for the intangible cultural aspects of life. Furthermore, it serves as a model for food self-sufficiency, which we intend to replicate with other institutions in the area. It also provides a source of much needed income for the locals as well as serving as demonstrations and learning grounds for EMAUA's techniques.

Table 1: Isegeretoto's Food self-sufficiency rate 2016

This table shows the total school needs of the school. It also contains items that can't be produced locally. The project analysis showed a 21% self-sufficiency rate for the total food needs of the school. For the crops produced within the project, a rate of 42% was achieved.

¹Food items marked are not produced by the project.

METHOD & PRODUCTION

The project is formulated to utilize local resources for soil fertility, pest control and post-harvest preservation of farm produce.

The mexican sunflower (*Tithonia diversifolia*), a wild shrub that is found in abundance in the region, presented itself as a promising option as a green manure for soil fertilization. There was a substantial increase in the amount of T. diversifolia incorporated in our maize fields in 2016 as compared to 2015.

The project also aims at producing a diverse range of food, both in dietary terms as well as for ecological stability. We opted to grow local varieties of crops, with exception for those that were not available i.e. cabbage and kale.

There was a 17% increase in production as compared to 2015 due to favorable rainfall in the first season (March-May long rains). However, the second season (October-November short rains) showed insignificant rainfalls in the whole of the East-African region, which lead to reduced yields.



A group of children from Isegeretoto Primary School, while eating their lunch under a tree. The food that is provided by EMAUA to their school serves as a good basis to enter into discussions about organic farming with children.

FUTURE PROSPECTS

The dependency on rain-fed agriculture comes with some expected and unexpected challenges. We have experienced some low yields due to flooding and inappropriate drainage, extended dry periods as well as some pillaging of vegetables.

To address these, we intend to make improvements in the areas of concern. Some of these include improvement of drainage systems, incorporation of low-cost irrigation systems (especially in vegetable production) as well as putting up appropriate fences.

The positive effects demonstrated by the project, which is still in its infancy, are also quite significant.

The participation of students in our activities, the camaraderie developed amongst EMAUA's team, and inquisitions on the technologies we practice, have also served to show relevance of this project.

We are gathering information that would allow the projects to be modelled for replication by individual farmers and institutions.

Therefore, despite the challenges, we have not been deterred from our mission of improving living standards through local resources. We have gained an appreciation of the dynamics of the livelihood in the region and this will provide better insight towards formulating improved methods.

AGROECOLOGY

COMMUNITY EDUCATION

Our strategy for sustainable impact in the community involves **engaging the community through teaching and demonstrative forums**. We find it prudent that the researched knowledge and insight gained in on farm trials is shared and put in practice.

The year 2016 was the maiden year of this program. We managed to engage 2,000 people in forums organized by churches, self-help and other community based groups, as well as students in primary and secondary levels. The receptiveness and interest demonstrated by our audiences showed that there was a significant need for empowering knowledge on multi-beneficial agricultural systems.



LOCAL RESOURCES FOR BETTER FOOD PRODUCTION

Our main subjects in the short forums focused on:

- 1. Soil health: the use of Tithonia diversifolia as a viable source of soil nutrient when used as green manure
- 2. Biological pest control: a technique based on the use of plant extracts to control harmful insects. The technique taught involved the use of an aqueous extract of Capsicum annum and Tithonia diversifolia to control aphids and other larvae.

Our strategy consists of **focusing on the youth in secondary and primary levels**. Reason being that they are more receptive to new ideas as well as being the practitioners of agriculture in the future. The lessons learnt this year in the project would enable us to improve on multiple aspects of this program, key being to customize the teaching to the relevant audience with an effective use of logistical resources.

HEALTH

Health care and medicines are a main component towards achieving a decent standard of living for communities. In the modern context, where western medicine has made significant developments towards controlling and healing various ailments, traditional and herbal medicines have been given inadequate attention. This poses the risk of losing precious knowledge found within these systems.

Since 2015, we have undertaken deliberate steps to gather knowledge on herbal medicine practiced by traditional healers from around the region. We aim to preserve, scientifically evaluate and disseminate herbal medicine techniques based on the use of local resources that have the ability to prevent and cure ailments. Furthermore, we encourage the conservation of indigenous plant species. Our work in 2016 involved visiting and learning from traditional medicine practitioners and investigating through secondary sources the identified medicinal species.



Kapchorwa, Uganda

We got the opportunity visit a couple of traditional healers based in Kapchorwa, Uganda. The visit involved teaching and gathering of information concerning their practice. These healers possess knowledge based on 20 years of experience of practicing skills inherited from their parents. Their success in healing their patients over the years has made them well known, making their practice a viable source of income.

The lessons learnt during the 7-day visit included: basics of traditional diagnosis of ailments and diseases, identification of plant medicines, processes of preparation of medicines, dosing and administration. The demonstrations featured plants used as disinfectants, anti-inflammatory, cures for common maladies such as Malaria, diarrhea, tooth-aches, stomach-aches, ear infections, etc.

Kakamega Tropical Rainforest

Our trip to Kakamega forest, Kenya's largest tropical forest, also featured elements of traditional medicine. The large diversity of flora and fauna in the forest provides a favourable ecosystem for some rare plant species used as medicines. We managed to interact with traditional healers from the community around the forest and appreciated a number of indigenous species that are becoming rare in East-Africa. A number of these species need to be proactively grown as part of the ecosystem to conserve and utilize them. Some of these species include *Prunus africana*, *Ocimum kilimandscharum*, *Bersama abyssinica*, etc.

ENGINEERING

The pursuit of sustainable self-reliance can only be complete when the technologies involved are adapted and adopted at the community level. Reduction of the complexity and increasing accessibility of relevant technologies that improve the living standards is implicit in the mission of EMAUA.

Our methodology involves an understanding of pertinent issues, exploring the existing solutions and adapting the technologies, with a focus on local resources where feasible. The arena provided by open source movement and the internet has made this fairly easy to accomplish. Some of the initial trial projects we addressed in 2016 are in the areas of human waste management, Improved cooking stoves and traditional building technology.

Human Waste Management

In 2016, EMAUA adopted the use of Urine Diverted Dry Toilets (also known as UDDT or Dry toilets) as an alternative to the predominant pit latrines used in the region. The technology shows sustainability in terms of biogeochemical cycles and it allows the recycling of nutrients within a farm system as well as the ease of construction.

We constructed a single unit at our headquarters, which allowed our team to understand the principles of operation as well as to gain the skill of construction. The unit has led to positive inquisition on the technology and we are looking forward to its adoption by some of our visitors.

TRADITIONAL BUILDING

We have adopted the traditional methods of construction in order to better understand the challenges faced. The use of traditional materials such as grass thatched and mud based walling (e.g. adobe, wattle and mud) has exposed challenges in the form of termites, rotting grass and rodent infestation. We believe further research that integrates traditional and modern architecture will lead to achieving a sustainable and decent shelter system that uses local resources and preserves culture.

ENERGY CONSERVATION

The cooking stoves used in the area, especially by the low income earners in the community, is predominantly made of three stones that use firewood as fuel. This system has shown disadvantages such as inefficient use of fuel, smoke that is harmful for the health of the women folk who cook and the risk of fires (in the grass thatched homesteads).

The research and trials have led us to the path of evaluating appropriate cooking stoves that meet a set criteria. The most important of these selection criteria are a reduction the amount of fuel used, smoke produced and the use of free local resources. We are currently running trials on prototypes of rocket stoves made using clay from termite mounds.



COMMUNITY EDUCATION

The year 2016 was the maiden year of this program. We managed to engage 2,000 people in forums organized in churches, self-help and other community based groups, as well as students in primary and secondary levels.

FINANCIAL REPORT

EMAUA CBO experienced a positive turnover in its donations in 2016. There was an increase of \$ 2,941 making the actual total contributions reach \$ 17,216 compared to \$ 14,275 in 2015, marking a 20% increase. The organization ran a bootstrapped finance allocation system focusing on the projects and programs expenses while finding alternative resources to enable it achieve its administrative duties and goals.



Table: distribution of expenses 2016.

Allowances Farm inputs	\$ 5,552 \$ 2,982	Wages Program Miscellaneous	\$ 3,615 \$ 1,471
CSR	\$ 1,294	Food for Workers	\$ 889
Capacity Building	\$ 786	Community Education	\$ 625

The Isegeretoto School Self-sufficiency Project took a large share of the budget as EMAUA's main project for 2016. The internally audited accounts shows the financial activity in 2016 as follows.

> The allowances shared across all the personnel needs were tagged at 32% of the total expenditure for the year. The organization also engaged a few interns who were given a small allowance to offset the cost of living, while engaged at the organization.

> The cost of casual wage stood at 21%. This allowed the organization to achieve its goals with a small number of regular collaborators which was supplemented by casual help during labor intensive phases of the projects and programs, e.g. ploughing, weeding, natural building construction and harvesting.

> A total of 5% went to the welfare of the workers through the purchase of food. This enabled some of the low-waged members of the neighbouring community to receive meals at work. Breakfast and lunch provided is at times hard to come by for some.

STATEMENT OF FINANCIAL POSITION

As at 31st of December 2016

NON CURRENT ASSETS	\$	The current assets of the organization in terms of farm inputs, which stood at 17% of the total annual expenses, contributed to the increase in the food production by the arrest	
Buildings	1,091	nization.	
Furnitures & fitings	170		
Farm equipments	474	The administrative expenses incurred by the	
Grant equipments	1,240	organization are minor and consisted mainly	
Total	2,975	of legal obligations and office supplies. Si ring of resources e.g. office facilities and int net allowed the administrative costs to be le	
CURRENT ASSETS		Capacity building exercises constituted about 5% of the annual expenses and translated to a better trained team which boosted work mo- rale and gave ground for innovative On Farm	
Cash at hand	124	Research and development of techniques.	
Total Assets employed	3,100	1 1	
		Since the organization conducts its activities	
Financed by consolidated funds	2,975	in an area with high levels of poverty, a Corpo-	
Surplus	124	rate Social Responsibility fund came to about	
Total	3,100	8%, and was committed to the direct benefit of the vulnerable members of the community. The major contribution being to Oku Kaunya	

The community education program required \$ 625. It involved the use of hired motorbikes

for ferrying facilitators and trainers to the training area and allowances for conducting

the teaching and training.

Foundation, a Charity Trust, that directly sponsors orphans and children from destitute families to go to school.

EMAUA wants to thank all donors for their great help towards achieving its aims. The organization intends to keep increasing its financial management capacity as well as keep working on a priority based budgeting system.

OUR NETWORK

EMAUA is grateful to the individuals and institutions who collaborated on and contributed to various projects and programs in this period. This support came in the form of fundraising assistance, collection on input (such as seeds, Information technology equipment) and, the sharing of relevant knowledge and skills. The alliances enabled us to stretch our work as well as evaluate the effectiveness of our mission.

Isegeretoto Association (CH) is our main partner in Switzerland, that organised the fundraising and activities related to the sensitization of swiss people about EMAUA's work.

Isegeretoto School (KE) hosted us on its land since EMAUA's inception, for our several projects.

Anglican Church of Kenya (ACK) and in particular Bishop John Okude of Katakwa diocese.

The Community leaders (KE) in Teso North who supported us since our beginnings: Oku E. Kaunya, Elisabeth Laini, Chief Masai, Chief Musa, etc.

EffectChange Association (CH) is Isegeretoto Association's partner in Switzerland. It assisted the association in finding partners for event organization and fundraising, as well as improving EMAUA's strategy in Kenya.

TREE Association (CH) who invited us to give a "Student Talk" at the EPFL campus.

Mr. and Ms. Juma (UG) shared with us their deep

knowledge about medicinal plants.

Abraham Imbai (KE) guided us severally within Kakamega Rainforest and assisted us on several occasions with his immense knowledge about plants and animals of the region.

Mr. Zakayo Kinyanjui from **ICRAF** (KE) provided us with suitable varieties of tree seeds for agroforestry systems from the ICRAF seed bank.

Terre & Humanisme (FR) showed interest in our work and invited us to give a presentation to the members of their comitee.

Le Hameau des Buis (FR) showed interest and invited us to give a speech to a class of their primary school and another to the parents and members of their community.

All people in Switzerland and worldwide who make our work possible through their support and encouragements.

EMAUA is a community based organisation based in Teso North, Kenya, that has an aim at increasing the self-reliance of the low-earning communities of its region. With regards to that, it adapts and develops techniques based on the use of free, local resources and spreads them among the community.



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