



Promoting Biodiversity Conservation and Ecosystem Services Enhancement in Agrarian Landscapes

SOLUTIONS AND BEST PRACTICES FROM KENYA

REPUBLIC OF KENYA



MINISTRY OF AGRICULTURE, LIVESTOCK,
FISHERIES AND COOPERATIVES

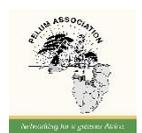


On behalf of:



Federal Ministry
for the Environment, Nature Conservation,
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of the Federal Republic of Germany



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Table of content

Acknowledgements	1
Table of content	1
Foreword by the Ministry of Agriculture, Livestock, Fisheries and Cooperative (MoALFC)	2
Statement by the Alliance of Networks in Agroecology Kenya (ANAK)	3
Project Background	4
SOLUTION 1: Seed sovereignty in arid lands of Kenya	5
SOLUTION 2: Ecosystem-friendly livelihoods for wetland-dependent communities in Kenya	9
SOLUTION 3: Green Action Week campaigns in Kenya	13
SOLUTION 4: Sand dams for climate resilience and food security in arid and semi-arid landscapes	17
SOLUTION 5: Decentralizing networking for impact in PELUM Kenya network	21
SOLUTION 6: Potential for indigenous vegetables in central Kenya	25
SOLUTION 7: Promoting principles of ecosystem-based adaptation in conservation agriculture	29
SOLUTION 8: Holistic grazing land management and restoration	32
SOLUTION 9: Home gardens empower communities	36
SOLUTION 10: Using biointensive agriculture to improve nutrition, income and food security	38

Foreword by the Ministry of Agriculture, Livestock, Fisheries and Cooperative (MoALFC)

Sustainable agriculture ensures the achievement of food and nutrition security in a manner that respects the environment and conserves biodiversity. Promoting sustainable agricultural practices is at the core of the mandate of the Ministry of Agriculture, Livestock, Fisheries and Cooperatives (MoALFC). This catalogue of best practices was put together through the support of the BMU-IKI¹-funded project “Biodiversity and ecosystem Services in Agrarian Landscapes”, implemented by GIZ in collaboration with the Ministry of Agriculture, Livestock, Fisheries and Cooperatives. The collection of best practices also referred to as “Solutions” are from different grassroots farmer organizations and NGOs from different parts of Kenya and cover various agroecological zones (AEZs). The ten (10) “Solutions” published in this catalogue met the criteria and were first published at the PANAROMA platform, a global partnership initiative to document and promote examples of inspiring, replicable solutions across a range of conservation and sustainable development topics, including biodiversity and agriculture, enabling cross-sectoral learning and inspiration.

The catalogue provides insights on how communities together with development agencies are developing and implementing solutions to address various challenges in areas such as conserving agrobiodiversity, ecosystem-friendly livelihoods that enhance food production, technologies that promote crop production in ASALs, and good nutrition at household level. Others are focused on management of rangelands for sustainable livestock production, importance of food campaigns to sensitize communities on conservation of agrobiodiversity and food sovereignty, and practices to enhance general food security and nutrition.

I would like to thank the organizations whose activities are documented in this catalogue for their efforts. The dedicated staff and representatives from the MoALFC, the Ministry of Environment and Forestry, the Alliance of Networks in Agroecology Kenya (ANAK), the Intersectoral Forum for Agrobiodiversity and Agroecology (ISFAA), and GIZ and AMBERO Consulting, who verified the Solutions in the field, guided the organizations, and put together the catalogue are very much appreciated. It is our hope that you will find it a pleasure and informative to read the catalogue and get inspired to take up and/or upscale some of the documented practices and lessons learnt.

Nairobi, November 2020



Prof Hamadi Iddi Boga, PhD, CBS
Principal Secretary, State Department for Crop Development and Agriculture Research,
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¹ International Climate Initiative (IKI - https://www.international-climate-initiative.com/en/?iki_lang=en) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

Statement by the Alliance of Networks in Agroecology Kenya (ANAK)

The Alliance of Networks in Agroecology Kenya (ANAK) is delighted for its contribution in the development of the Panorama Solutions. ANAK is an umbrella body for networks promoting agrobiodiversity, Ecosystem Services and agroecology in Kenya. The current members are: African Biodiversity Network (ABN), Biosafety Biodiversity Association of Kenya (BIBA Kenya), Kenya Organic Agriculture Network (KOAN), Organic Consumer Alliance (OCA), Participatory Ecological Land Use Management (PELUM Kenya) and Schools and Colleges Permaculture (SCOPE-Kenya).

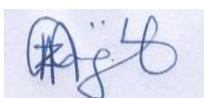
The main Goal of ANAK is to strengthen the networks delivery on biodiversity, ecosystems services and agroecology. The key objectives of ANAK include:

1. To coordinate and amplify their voice on agroecology issues for impact.
2. To strengthen the networks to enhance collaboration between and among them.
3. To strengthen policy engagement with the duty bearers and decision makers on agrobiodiversity, ecosystem services and agroecology.
4. To identify, scale up and document good practices for biodiversity, ecosystem services and agroecology.
5. To increase public awareness on issues around agrobiodiversity, ecosystem services and agroecology and ensuring all stakeholders including farmers and consumers are educated on how biodiversity, ecosystems services and agroecology affect their health and wellbeing.
6. Support the Government of Kenya, and like-minded partners like GIZ / AMBERO in their pursuit to deliver improved services in biodiversity, ecosystems and agroecology.

The Secretariat of ANAK is located at PELUM Kenya who coordinates its functions and operations for and on behalf of its network members.

Some representatives from ANAK members were involved in the verification of the Panorama Solutions. Indeed, this catalogue is saturated with success cases from communities working with members of ANAK. These solutions provide examples of inspiring, replicable solutions across a range of conservation and development topics to enable cross-sectoral learning. The solutions in the catalogue define good practices, approaches, ideas and case studies for promoting agrobiodiversity and ecosystem services within agrarian landscapes. It is our hope that these innovative and practical cases will inspire and facilitate action in biodiversity conservation and agroecology in agrarian landscapes. We appreciate the partnership model in the GIZ-AMBERO and Ministry of Agriculture Livestock and Fisheries since it encourages the multi-stakeholder approach and Public Private Partnership (PPP). It is also greatly values the participation of civil societies and farmers as an integral design of the service delivery to the grassroots communities. We encourage future partnership to be modeled along these key features.

On behalf of ANAK, we take this opportunity to appreciate the support from GIZ and AMBERO Consulting in the development of the Panorama Solutions. It is our hope that whoever reads this catalogue will find the solutions inspiring and impactful. We encourage and urge the farmers and the community members to try out and scale-up the good practices shared in this catalogue.



Zachary Makanya

COUNTRY COORDINATOR, PELUM Kenya

For and on behalf of the Alliance of Networks in Agroecology Kenya (ANAK)

Project Background

The project “Biodiversity and Ecosystem Services in Agrarian Landscapes” is a global project with key activities in India, Kenya, Tajikistan (and Mexico). It is funded by the **German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMU)**, and implemented by the GIZ, in Kenya in cooperation with AMBERO Consulting, and the political partner, the **Ministry of Agriculture, Livestock Fisheries and Cooperatives (MoALFC)**.

In all pilot countries, both biodiversity and agricultural production are declining as a result of current land use practices. The agricultural production systems affect the landscape and biodiversity in various ways (e.g. conversion of woodland to pastureland and agricultural land).

The objective of the project is to strengthen the capacities for enhancing biodiversity and managing ecosystem services in agrarian landscapes of land users and their organizations, technical experts and decision makers in civil society and public institutions.

Key activities focus on:

- capacity development of farmers, civil society, academia, government partners and private sector;
- promotion of mainstreaming agrobiodiversity in policies and strategies;
- awareness creation on the urgency of agrobiodiversity and ecosystem services conservation through discussion and dialogue fora, international conferences and the online platform PANORAMA;
- piloting biodiversity-friendly land use approaches with farming communities (except Kenya).

In Kenya, biodiversity-friendly agricultural approaches and experiences have been gathered among different stakeholders from civil society, government institutions, academia, private sectors and development partners.

A Write-Shop in Nairobi in 2018 familiarized stakeholders with the PANORAMA platform on biodiversity and agriculture and invited participants to publish their best practices as so-called “SOLUTIONS” for biodiversity mainstreaming in agrarian landscapes on the webpage².

To date, PANORAMA presents 177 solutions from around the globe with the brightest ideas bringing together agriculture and nature conservation, among them 23 Solutions from Kenya. Ten of these Solutions have been verified in a joint field mission by representatives of the Ministry of Agriculture, Livestock, Fisheries and Cooperative (MoALFC), the Ministry of Environment and Forestry (MoEF), the Alliance of Networks on Agroecology Kenya (ANAK) and the GIZ/AMBERO project team. They have been presented and valued at an Expert Dialogue Forum in Nairobi in November 2018.

This Catalogue presents the ten Solutions as a Print Version in order to share them among those who might not have access to online sources and as a pdf-document that can easily be shared among stakeholders, students and all interested bodies and people.

² https://panorama.solutions/en/portal/agriculture-and-biodiversity?page=1&keyword=kenya&solution_type=All&sort_by=search_api_relevance&sort_order=DESC

SOLUTION 1: Seed sovereignty in arid lands of Kenya³

Themes

Biodiversity loss, adaptation to climate change effects, Ecosystem services, Food security, Genetic diversity, Traditional knowledge

Ecosystems

Agro-ecosystems, cropland, grassland ecosystems, rangeland / pasture, tropical grassland, savanna, shrubland

Beneficiaries

Young and elderly women, youth, children, men, and the community at large.

Governance type

By indigenous people and local communities.

Location

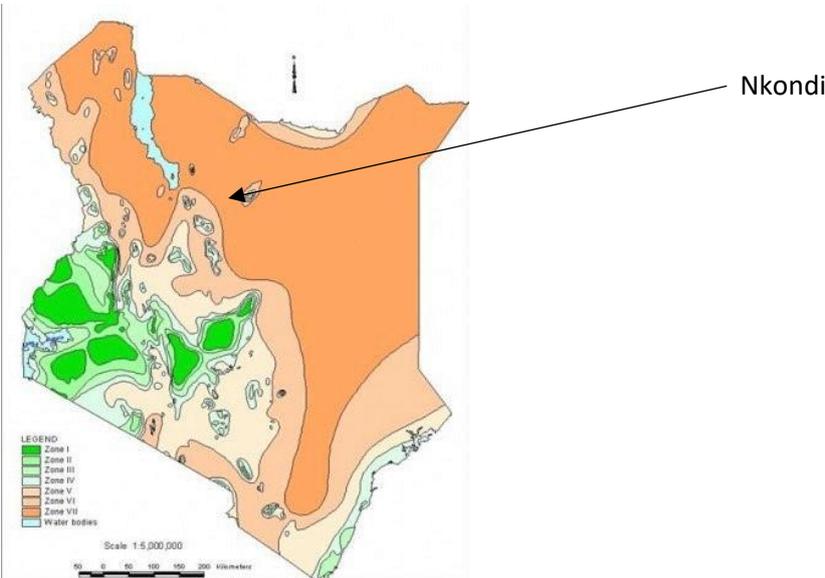


Fig. 1: Location of Nkondi in Kenya AEZ (Source: GTZ Farm Management Handbook of Kenya)

THE CHALLENGE

Communities in rural Kenya often grow maize as their staple food crop without large diversification. However, for example in Nkondi in Eastern Kenya, due to the agroecological conditions, which have been worsened by climate change effects, such as less and unpredictable rainfalls, maize yields are very low or crops fail totally. Nkondi lies within an agroecological zone that is classified as arid with an elevation of around 600-900 meters above sea level annual rainfall of 300-600 mm. High yielding maize varieties for other weather conditions are not adaptable to the harsh and arid conditions of Nkondi. As a result, especially women, as they are the responsible for feeding the families, are forced to buy

³ Solution published at <https://panorama.solutions/en/solution/seed-sovereignty-project> by ANNE MAINA, Biodiversity and Biosafety Association of Kenya

expensive food items, although farm incomes are minimal. Many children cannot attend school because school fees are too high.

Other staples than maize, such as millet and sorghum are considered as minor non beneficial species, although they are more drought-tolerant and provide high nutrient contents. These so-called “orphan crops” do not belong to the staple crops prioritized by political decision-makers.

Over time, many farming families have lost traditional crop alternatives that would help them to cope with climate change and to maintain healthy and diverse ecosystems. Traditionally, they did diversify their crop production to cope with weather changes. Nowadays, the work of seed breeding, saving and multiplication in the region is regarded as a typical work of elderly women and younger mothers are not automatically engaged in it.

Further challenges that affect the farming families

- erratic rainfall, increasing temperatures, inefficient management of financial resources, insufficient public and decision maker’s awareness, poor governance and participation, Unemployment / poverty.

THE SOLUTION

A solution to the problem was developed with the support of the Seed Sovereignty Project, implemented by the Rural Initiatives Development Programme (RIDEP) and the Biodiversity and Biosafety Association of Kenya (BIBA-K) in cooperation with the Kanania women group from Tharaka Nithi County. Two main building blocks were key to the solution.

BUILDING BLOCKS

A. The revival of local and traditional seeds

Training of women on seed breeding and growing climate-resilient crops like millet, sorghum and green grams that cope with the harsh climate in Tharaka Nithi and awareness creation were key to generate changes. In fact, it took some time for the community to change attitudes and to appreciate the benefits of crop diversification for improved nutrition and climate resilience. Therefore, training, awareness creation and support in implementation were accompanied by economic activities and consideration of traditional and cultural values. Through the introduction of new and more nutritious varieties with more economic benefits, like Gadam Sorghum, women can now access markets, such as the East African Breweries Limited, which contributes a major market for Gadam Sorghum in Kenya.

This sorghum variety possesses great qualities for beer brewing due to its high carbohydrate content of 75%, as compared to barley (66%) and maize (67%). Traditional and cultural festivals helped to popularize traditional foods that contribute to food security, dietary gains, and diversity within the community. Cultural norms and values have been passed on to the younger generation in a way that all women engaged in reviving, restoring, breeding, multiplying, and sharing lost traditional seed varieties.



Fig. 2: Community members discussing about seeds in Nkondi © Anne Maina



Fig. 3: Display of locally adapted seed varieties. @ Anthony Njogu.

B. Table banking

Initially, especially young ladies were not convinced on the revival of local “minor” crop species. The table banking as the second building block of the solution offered women support through saving farm earnings and offering affordable loans for businesses and farming activities. In table banking, women meet weekly and save money, which they later borrow from the group to start businesses. The table banking was accompanied by training on financial accounting and loan management. Jane, the chair of the Kanania Women Group stated: “All women look forward to our weekly meetings to save, chat and discuss development ideas. They work in synergy. We believe in leaving no one behind”.

How do the building blocks interact?

The seed sovereignty project was conceived to support farmers to revive lost traditional seeds that are resilient to climate change. This involved a lot of meetings on community dialogue. The table banking responded to an immediate need, it empowered women and brought out social cohesion among the group members – beyond sustainable seed management. The community appreciated the approach and engaged actively.

Enabling factors

Tharaka Nithi County is generally an arid and dry area, where maize does not grow well. Provided with alternative options, farmers were able to gradually change and to focus on climate resilient crops like millet, sorghum, and green grams. The willingness of the community to engage in participatory planning and embrace the proposed strategies were helpful to revive local and indigenous crop varieties.

IMPACTS

The increased use of genetic crop diversity contributed to increased biodiversity, improved food security, enhanced nutritional status and increased resilience to climate change effects. Ecosystem services and resilience improved through making Zaï pits (mini catchments filled with organic material), harvesting surface runoff for food and kitchen vegetable gardens and fruit orchards. Access to affordable loans to engage in business and activities from group savings without relying on expensive bank loans have led to the emergence of small businesses and diversified economic activities. Many women began keeping chicken which they can easily sell in case of urgent needs that require money.

Societal and economic well-being and leadership skills were enhanced with an improved financial accountability and transparency. Women were empowered. The increased income also led to higher school enrolment. Thereby the knowledge and skills within the community could increase. The annual Meru cultural festival has made the younger women and children aspire to learn folk dances and songs which they present every year at local cultural events. East Africa Breweries Limited benefitted from cheaper raw materials for brewing (Gadam sorghum). The government of Kenya has been able to raise tax revenues.

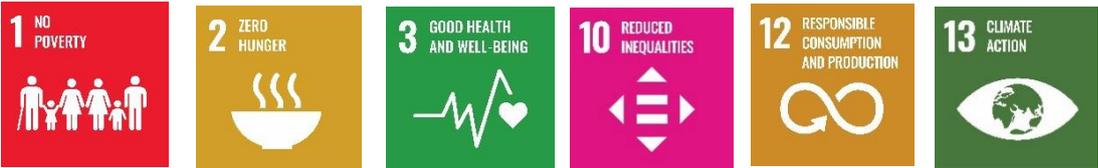


Fig. 4: demonstration plot on harvesting surface water runoff for vegetables gardens and fruits orchards. © Anthony Njogu.

LESSONS LEARNED

- The seed and traditional food fairs revived and enhanced cultural values and practices with the young people thus contributing to intergenerational learning. Collaboration with others, like the National Museums of Kenya, was important in ensuring the continuity of the annual Meru Cultural and Food Festival to date.
- Access to cheap and affordable loans to engage in business and farming activities is fundamental in improving community livelihoods. The table banking, including the training on financial management and accounting, responded to the needs of the community to access affordable loans for businesses and farming activities. It attracted the younger people who were interested in doing farming as a business.
- It is vital to include capacity building in leadership and financial accounting skills to enhance governance on the resources.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 2: Ecosystem-friendly livelihoods for wetland-dependent communities in Kenya⁴

Themes

Adaptation, agriculture, biodiversity mainstreaming, ecosystem services, habitat fragmentation and degradation, sustainable livelihoods, traditional knowledge.

Ecosystems

Agro-ecosystem, Freshwater ecosystems, especially Wetland (swamp, marsh, peatland).

Beneficiaries

Local communities of all genders: women, youth, and men.

Governance type

By indigenous people and local communities.

Location



Fig. 5 : Yala wetlands, Lake Victoria, Kenya

The Challenge

The Yala Swamp is a wetland region of over 200 square kilometers in Western Kenya that covers the north-eastern shore of Lake Victoria in Siaya and Busia counties. The wetland acts as a filter for two major rivers, Nzoia and Yala waters, (regulatory ecosystem services - ES). The wetlands are home to endangered fish species (regulatory ES) that are extinct in Lake Victoria itself. They are habitat for various avian and wildlife species like the sitatunga antelope (*Tragecephalus spekii*), which lives in the swamps' papyrus (habitat support and cultural ES). The swamps are among Kenya's important bird areas.

Yala wetland communities depend almost entirely on the ecosystem services offered by the wetland as source of their livelihoods, such as on the water for fish and vegetable production (provisioning ES),

⁴ Solution provided at <https://panorama.solutions/en/solution/ecosystem-friendly-livelihoods-wetland-dependent-communities-kenya> by MAURICE OGOMA, Ecofinder Kenya

on the rich soils in the wetland areas for seasonal farming, and on papyrus as a wetland fiber plant for weaving mats (provisioning ES).



Fig. 6: Fishing in the wetland. © Maurice Ogoma



Fig. 7: Vegetable production in the wetland. © Maurice Ogoma

However, in the recent past, farmers in the once productive Yala wetlands have experienced continuous drought and floods. Encroachment and livelihood activities, such as uncontrolled wetland farming, drainage of wetland for large-scale farming and use of inorganic fertilizers in farms close to the wetlands had led to a destruction of wetland. On the other hand, due to reduced crop production, poor access to clean water for domestic and livestock use, local farming communities resorted to desperate and destructive activities, such as burning of papyrus vegetation, unsustainable papyrus harvesting, overgrazing, overfishing on remnant water bodies, sand harvesting along river banks and poaching of wildlife in the remaining wetlands. More and more wetland became dry, communities suffered from food insecurity and poverty.

Further challenges that affect the farming families

- Human settlement on wetland habitats, overfishing, human-wildlife conflicts and hunger, erratic rainfall, increasing temperatures, land and forest degradation, loss of biodiversity, wildfires, conflicting uses /cumulative impacts.
- lack of alternative income opportunities, access to long-term funding, technical capacity, public and decision maker's awareness, infrastructure and institutional framework for action.

THE SOLUTION

To reverse some of these effects, with support of a project implemented by Ecofinder Kenya, alternative livelihoods that are less wetland-destructive and environmentally friendly were identified and piloted in a participatory process. Solutions were needed that are ecosystem friendly but contribute to the enhancement of local livelihoods. These included agroforestry, sustainable farming and water harvesting techniques that would be sustainable under the changing climatic conditions. Three main building blocks were key to the solution.

BUILDING BLOCKS

A. Stakeholder involvement and participation

Participation of all stakeholders was key to come up with locally viable solutions that all participants were comfortable with and that contribute to sustainable livelihoods and long-term conservation of

local biodiversity. Stakeholders at the County level and at the local community level were involved. First, the project engaged representatives of the Siaya County government departments and civil society representatives working at the local and regional levels. Government and non-government actors discussed the challenges in agriculture and biodiversity in relation to climate change. Secondly, community members, local leaders and resource persons including elders, retired government staff, health workers and conservation enthusiasts discussed their challenges in agriculture and local biodiversity and suggested potential solutions. These were analyzed to come up with the overall challenges and agreed solutions. Three main climate and ecosystem-friendly livelihoods were identified: agroforestry, sustainable water harvesting and sustainable farming suitable to the prevailing drier conditions. Training manuals were developed and used to train more than 90 community members in three villages.



Fig. 8: Participatory community group discussion in Yala wetlands. © Maurice Ogoma

analyzed to come up with the overall challenges and agreed solutions. Three main climate and ecosystem-friendly livelihoods were identified: agroforestry, sustainable water harvesting and sustainable farming suitable to the prevailing drier conditions. Training manuals were developed and used to train more than 90 community members in three villages.

B. Community based action plans

This process followed a participatory community-wide assessment and validation. The assessment identified livelihood and climatic trends and impacts. In planning meetings sustainable coping and adaptation strategies were developed for each challenge and included in the overall community-based adaptation plan. Three community-based climate adaptation action plans (CBAP) were developed. The community-based climate adaptation action plan matrix included the following sections:

- livelihood and adaptation options.
- duration of implementation, actors and required resources.
- key expected results.
- estimated amount to implement each adopted strategy or action.

C. Community exchange visits

Exchange visits were organized to introduce drought-tolerant crop species. *Ecofinder Kenya* facilitated visits of Yala wetland community representatives to the Tangokona community in Busia County. Yala famers learned about improved cassava and sweet potato varieties, which were grown by local communities in non-wetlands. They adopted the model and purchased seedlings of drought tolerant cassava and sweet potatoes.

How do the building blocks interact?

Local stakeholders can best identify their local areas that need resilient and sustainable livelihood activities. Through the brought stakeholder engagement, livelihoods and climate challenges were identified and potential solutions reached, leading to the development of community-based action plans with prioritized sustainable livelihood options. Local stakeholders themselves identified the best places for learning and exchange. Exchange visits proved to be a successful tool to learn practically how livelihood resilience activities have worked elsewhere. They helped farmers to develop skills and sustainable agricultural practices that enhance biodiversity conservation and increase resilience.

Enabling factors

The readiness of local stakeholders to engage in a participatory process applying participatory instruments, as well as the availability of adequate data were helpful factors to develop the solutions.

IMPACTS

The use of certified drought tolerant cassava and sweet potato crops have been replicated by farmers at a local level to ensure food security. These crops grow fast, are more nutritious and require almost no external inputs.



Fig. 9: Improving water harvesting techniques in Yala wetlands. © Maurice Ogoma

A new water well sunk in Nyadorera village is used for small scale irrigation and provides a watering point for community members during the dry season. A water storage tank that has been installed at the local Barolengo Secondary School provides water for tree seedlings, which are planted by students. The community has rehabilitated and managed to fenced farmland, thus reducing human-wildlife conflicts. The agroforestry woodlot brought in multiple ecosystem services, e.g. fruits, firewood and poles. The trees serve as windbreaks and as important habitat for small wildlife species.

LESSONS LEARNED

Adequate involvement of stakeholders, including community members can help to collect baseline data. Community involvement from the beginning contributes to farmers' and other stakeholders' understanding and accepting of planning procedures and results. It leads to their positive perspective and contribution towards implementation. Sharing the community-based plans with local stakeholders and all community members contributes to their ownership for the local level generated action plans.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 3: Green Action Week campaigns in Kenya⁵

Themes

Access and benefit sharing, agriculture, biodiversity mainstreaming, food security, health and human wellbeing, land management, sustainable livelihoods.

Ecosystems

Agro-ecosystem, agroforestry, cropland, orchard.

Beneficiaries

Small-scale farmers, schools and colleges, consumers, government institutions (both local and central), PELUM Kenya member organizations.

Governance type

By indigenous people and local communities.

Location

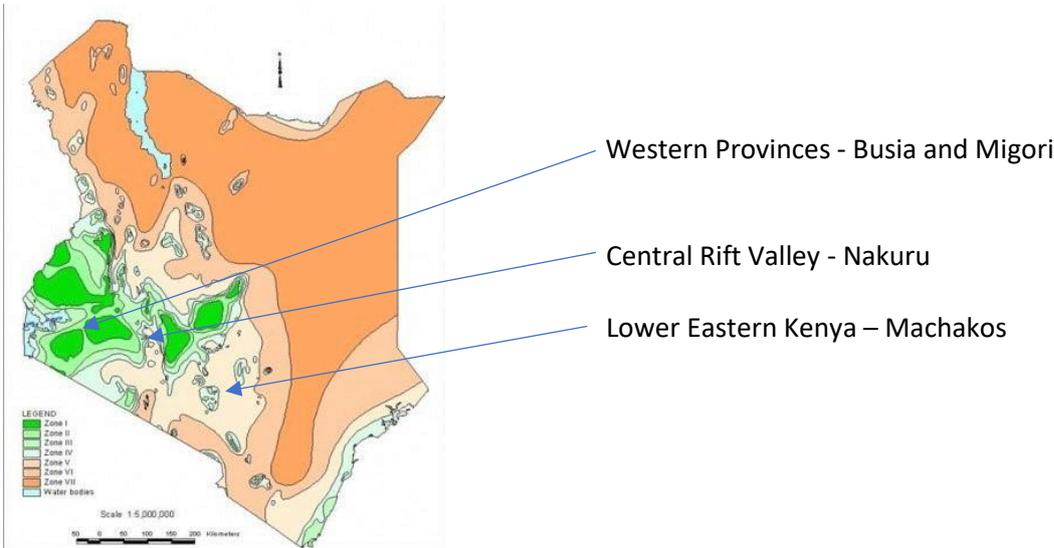


Fig. 10: Multiple locations of the solution

The Challenge

Among the consumer community, the demand for ecologically produced products has continued to grow in Kenya, especially in the major cities. A consumer survey conducted by KOAN and Organic Denmark in 2014 indicated that there are close to 300,000 organic consumers, who are ready and willing to buy organic fruits and vegetables. However, the number of certified organic farmers to supply the domestic market has not grown in tandem with the increased demand. A baseline survey conducted by IFOAM in 2015 indicated that the expansion of organic businesses is currently hampered by lack of organic products. Though there is a clear demand for organic products from the trading

⁵ Solution provided at <https://panorama.solutions/en/solution/green-action-week-campaigns-kenya> by ROSINAH MBENYA, Participatory Ecological Land Use Management (PELUM) Kenya

community and outlets, the consistency of supplying organic products especially from smallholder farmers hinders the flow of products to the market. On the other hand, there is still lack of consumer awareness on the benefits of consuming organic foods among the general population, which is limiting the preference for organic produce among consumers.

Further challenges that affect the farming families

- Land and forest degradation, loss of biodiversity, unsustainable harvesting including overfishing, erosion, inefficient management of financial resources, lack of technical capacity, lack of public and decision maker's awareness, poor monitoring and enforcement, poor governance and participation, lack of food security, drought.
- Lack of recognition and technical extension services support towards raising, growing and processing indigenous foods.
- Lack of adequate certified seed sources for indigenous vegetables.



Fig. 11: Food Fair Exhibition 2016 WFD Celebrations in Machakos. © PELUM Kenya

Sweden and are currently coordinated by SSNC and Consumer International. The campaign has 53 participating CSOs in 29 countries from Asia, Africa, Europe and America. In Kenya, “Organic food and farming for all” has been the campaign focus for the Green Action Week 2013-2017. PELUM Kenya has implemented the campaigns in Nakuru, Machakos and Busia Counties. The key activities have been food fairs, farmer exhibitions and peaceful demonstrations on promoting organic farming and food for all. Three building blocks were key to the solution.

THE SOLUTION

To increase awareness on the benefits of organic products PELUM Kenya and the Kenya Consumer Organization have been participating in the Green Action Week (GAW) Campaigns since 2013. The campaign is a global initiative to promote sustainable consumption of organic products. Each year the campaign picks a joint theme, which is promoted in all the participating countries during the World Food Day celebration period of September and October and is climaxed during the World Food Day on 16th October each year. The campaigns were started in

BUILDING BLOCKS

A. Multi-stakeholder approach

The campaign employs a multi-stakeholder approach by ensuring that relevant stakeholders, (government ministries, schools, private sector, farmers, media, PELUM Kenya member organizations (MOs and other CSOs) are involved in the campaigns as a strategy to improve sustainability of the project beyond the project period. The project targets and involves the wider public through mass awareness creation on the need to grow and consume organic foods. Media is embraced to reach the wider public through both electronic and print media. This includes continuous update of PELUM Kenya's social media sites with organic food and farming messages. The media is invited to cover and air the various activities. Small-scale farmers can enhance their capacities and experiences through

exchange visits to successful organic enterprises and exhibitions to further embrace organic foods and farming for healthy environments. As a way of enhancing the spirit of networking within PELUM Kenya network, all the 53 member organizations of PELUM Kenya are involved in all aspects of this campaign.

B. Strengthening PELUM Kenya zonal networking

Following the devolvement of Kenya in 2010, PELUM Kenya devolved itself into six networking zones namely: Central Rift Valley Zone, Lower Eastern and Coastal Zone, Nairobi/Central Zone, Upper Eastern and Northern Kenya Zone, Western Zone and Nyanza Zone. PELUM Kenya has therefore been focusing on one zone during implementation of the Green Action Week campaigns as a way of promoting horizontal networking. The members of a zone are involved in the planning, implementation and monitoring of the campaigns with one of the member organizations taking the lead and in close coordination by PELUM Kenya secretariat and zonal staff. This provides a platform for learning and sharing among member organizations.

C. Global theme for a common purpose

The Green Action Week campaigns are organized in such a manner that each year there is a common theme for all the participating countries globally. This enhances learning from each other as there are common resources that are shared by the coordinating agencies such as brochures and provision of a common platform for cross learning and sharing amongst participating partners. There are opportunities for joint meetings to review the progress of the campaign and share experiences from various parts of the globe. This provides an opportunity to jointly evaluate what has been working and what has not been working for improvement and learning. Having a common theme around the globe enhances the level of achievement of the anticipated results from various continents. The campaign takes place simultaneously around the world.

How do the building blocks interact?

Global theme for a common purpose is the basis of the GAW campaigns, which is downscaled to Kenya with a focus on the multi-stakeholder approach. The two building blocks relate to each other since having a global theme is part of enhancing partnerships and multi-stakeholder engagement. As a network, the third building block of strengthening zonal networking is part of multi-stakeholder engagement and is core for PELUM Kenya network.

Enabling factors

Having a joint theme for all participating countries facilitates focused working on a new theme every year is the key enabling factor. Common campaign sites i.e. website and social media such as Facebook help to share experiences and to learn from each other. Organized activities around the World Food Day ensures that the agenda of sustainable consumption is implemented in a timely manner.

Impacts

Over the years there has been a steady increase in the number of consumers, producers and decision makers reached directly. For example, between 2014 and 2017, the number of people grew from 1,300 to 5,000 in Kenya. 500,000 people have been indirectly reached yearly through local media, electronic and print media. They have been sensitized on the importance of farming and consuming organic foods hence increasing awareness on sustainable production and consumption. The increase in awareness

could be related to high incidences of noncommunicable diseases (NCDs) in Kenya. There has been great interest and coverage by the media on the Green Action Week events. This has enhanced the level of achievement of the anticipated outputs on increased public awareness on organic food and farming. The campaign has been collaborating with the County Government Departments of Agriculture and Livestock during the implementation of the activities, hence providing an opportunity for further engagement and partnership towards campaigning on organic farming. In 2017, the county executive committee member of Busia graced the World Food Day celebrations and confirmed their support as a County Government on organic food and farming. Zonal networking among PELUM Kenya member organizations in the various regions have been enhanced due to joint planning and implementation of the campaign activities. Further in Busia County farmer groups are supplying boarding schools with indigenous vegetables that are organically produced further enhancing consumption by the youth.



Fig. 12: Farmers exhibiting organic products during 2016 WFD celebrations in Machakos. © PELUM Kenya



Fig. 13: Farmers exhibiting organic products during 2016 WFD celebrations in Machakos. © PELUM Kenya

Lessons learned

- The concept of Green Action Weeks Campaigns is easily replicable in different localities and contexts with the selected themes being suitable everywhere.
- There is need for cross learning and sharing amongst partners on best practices and successes for upscaling in different contexts.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 4: Sand dams for climate resilience and food security in arid and semi-arid landscapes⁶

Themes

Access and benefit sharing, adaptation, food security, restoration, traditional knowledge, water provision and management.

Ecosystems

Agro-ecosystem, Cropland, Freshwater ecosystems, Grassland ecosystems, river, stream, Tropical grassland, savanna, shrub land

Beneficiaries

Communities living in Arid and Semi-Arid Lands (ASALS). This solution has been tested and implemented in three Kenyan counties, benefitting 4,795 households.

Governance type

By indigenous people and local communities.

Location

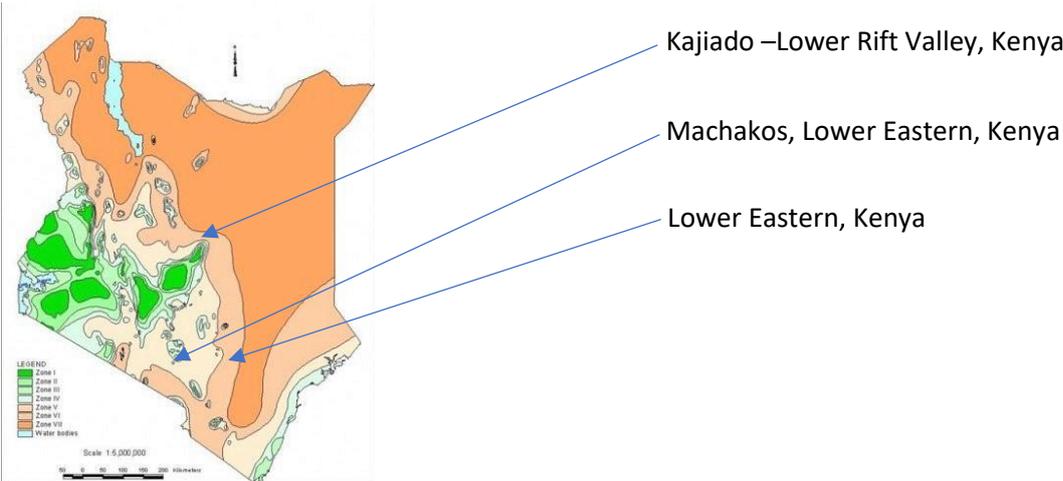


Fig. 14: Location of the counties in Kenya

The Challenge

Climate change in Machakos County has caused erratic and unpredictable rainfalls, rising temperatures, and droughts. Most communities in Machakos County are found in arid and semi-arid lands (ASALS) with very low and unreliable rains, bimodal rainfall and many seasonal rivers. Among the many communities in the region, the Ngwate Ngutuikie self-help group experienced food insecurity and extreme poverty. Farmers depended on rain-fed agriculture with frequent crop failures, because runoff rainwater quickly drains into seasonal rivers and into the Indian Ocean without any water harvesting. Thereby, water for agriculture and irrigation, livestock and household use were lacking

⁶ Solution provided at <https://panorama.solutions/en/solution/sand-dams-climate-resilience-and-food-security-arid-and-semi-arid-landscapes> by KEVIN KAMUYA, Utooni Development Organization

immediately, when the rains stopped as the seasonal rivers also dried. Relief from the government and other relief agencies could not sustain the farming families.

Further challenges that affect the farming families

- Desertification, loss of biodiversity, shift of seasons, lack of access to long-term funding to replicate good practices, lack of public and decision maker's awareness, lack of infrastructure.
- Poor supply of certified and adapted crop varieties.

THE SOLUTION

Through sand dam construction projects implemented with support from Utooni Development Organization (UDO) rural families have managed to abandon suboptimal farming practices and adopt more sustainable agricultural practices, which guarantee them significant farm yields, even with minimal rainfall. Through effective training programs, they have learned about water harvesting using sand dams, irrigation, and conservation agriculture. UDO is a non-governmental organization established in 2002. It is based on the early works of Utooni Development Project, a community-based self-help group formed by Joshua Mukusya in 1978. Its vision is to build peaceful, healthy, and happy interlinked self-sufficient communities through sustainable development. The organization supports disadvantaged communities living in ASALs to transform their environment in a sustainable manner, enabling them to improve water supply, food production, income and health. The project supports farmers across three counties moving from subsistence to sustainability, following a simple logical model of "get water, get food, then get income". Two building blocks were key to the solution.

BUILDING BLOCKS

A. Sand and sub-surface dams



Fig. 15: Almost mature sand dam in Kaiti seasonal river, Makueni County, Kenya. © Utooni Development Organization

Sand and subsurface dams are suitable for rural areas with ASAL conditions. They harvest surface run off (sand dams) or help access aquifer (sub surface dams) in order to avail seasonal water to be used for livestock including bees, raising tree seedlings, minor irrigation as well as for domestic later in dry periods. Sand dams (or groundwater dams) store water under the ground along seasonal rivers. They are sand reservoirs with a wall build across the dry river and anchored into the bottom and sides. After constructing the wall, surface water is obstructed by the wall and accumulates upstream of the dam wall, resulting in

additional groundwater storage capacity. Like sand dams, sub-surface dams obstruct the groundwater flow of an aquifer and store the water below ground level. A mature sand dam holds 40% water and 60% sand. Other benefits include:

- Storage of rainwater runoff in seasonal rivers.
- Minimum evaporation since water is stored under the sand surface.
- Reduction of contamination by livestock and other animals since water is under sand.
- Filtration of water flowing through the riverbed sand improves water quality.

B. Road map for sand dam implementation-involving the community

Building a sand dam requires relatively high investments, it is labor intensive and specific expertise is needed. However, with community participation it can be made less expensive using the following participatory practical steps:

- Site selection with community involvement, including local materials and labor provisioning.
- Engineering and design by a specialist engineer.
- Water use assessment involving an expert and community members.
- Excavation and construction using community labor and an expert for supervision.
- Operation and maintenance (establishment of water management process, including: water committee, care takers and provision of trainings) using community structures.
- Monitoring and evaluation forums by the community and stakeholders.



Fig. 16: Community members walk along a seasonal river to identify potential sand dam site. © Utooni Development Organization.



Fig. 17: Community members carrying stones for sand dam construction. © Utooni Development Organization.

How do the building blocks interact?

The first building block describes technical planning aspects of the solution: from the material that should be used, to visibility and accurate measurements. A site survey with guidance of the community can help to minimize challenges and costs before construction work begins. The second building block focuses on implementation. Community participation and involvement is key to a smooth implementation process.

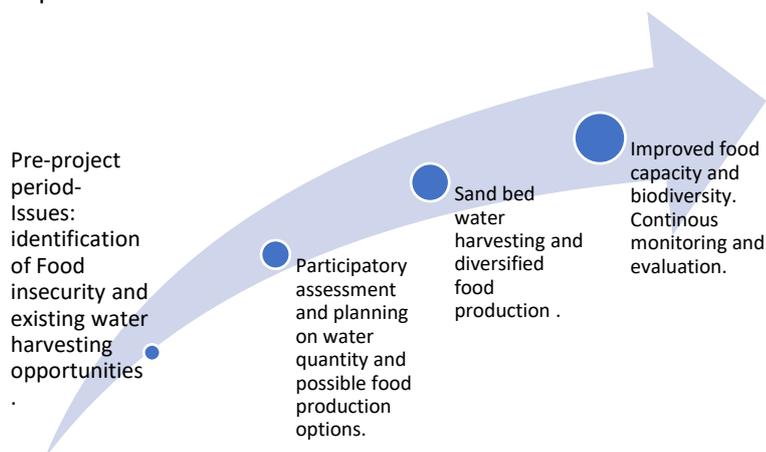


Fig. 18: Participatory implementation framework

Enabling factors

Sand dams can be built with locally available materials and labor through community participation using local knowledge and experiences. Communities (nomads and permanent settlers) are available during the dry period when the sand dam construction takes place.

Impacts



Fig. 19: Vegetables irrigated with sand dam water at Ngwate Ngutuike. © Utooni Development Organization

Water stored in sub surface dams can be accessed by hand pumps and be used for households, vegetable gardens, tree seedlings nurseries and livestock. Improved vegetation positively impacts on beekeeping. The distance to collect water (one way) decreased from an average of 10 kms to 1 km. Thereby, the time to get water decreased from an average of 12 hours to 1 hour. Within three years, the number of farmers practicing conservation agriculture has increased from 5% to 50%, reaching 5,000 farmers. Diversity and crop yields increased due to water availability, while the cost of farm inputs among farmers reduced. This has led to 30% increased income.

Lessons learned

The sand dam construction process is always unique for each site, since it depends on topography, availability of local materials and community participation. The technology is labor and physical capital intensive, which however can be substituted with community participation in assessment, planning, implementation, monitoring and evaluation.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 5: Decentralizing networking for impact in PELUM Kenya network⁷

Themes

Agriculture, biodiversity mainstreaming, food security, land management, legal & policy frameworks, outreach & communications, restoration.

Ecosystems

Agro-ecosystem, agroforestry, cropland.

Beneficiaries

PELUM Kenya member organizations, smallholder farmers, youth and women, service providers.

Governance type

Location

Machakos, Eastern Province, Kenya Molo-Central Rift, Kakamega Western, Awasi Nyanza, Central Thika, Isiolo.

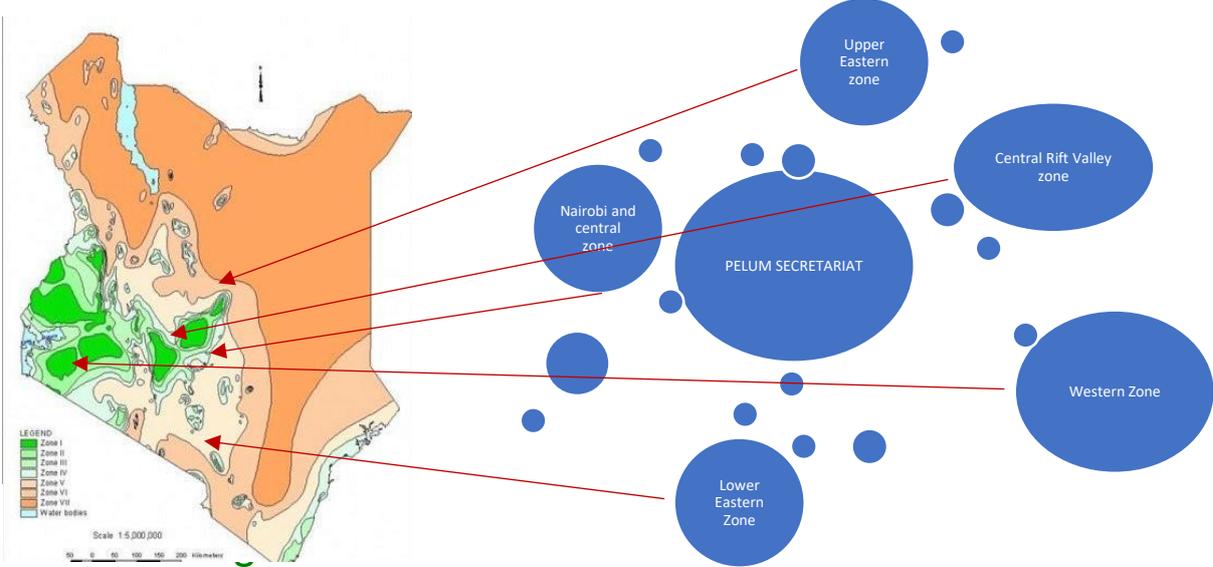


Fig. 20: Locations of the solution in Kenya

The Challenge

In 2010, Kenya passed a new constitution, which resulted into devolvement of a central government and the establishment of County governments. In line with this change, in 2015, the NGO Participatory Ecological Land Use Management (PELUM) Kenya reviewed its networking structure, which consisted of isolated member organizations until then. Networking and horizontal learning were poor, funding for joint activities was limited.

⁷ Solution provided at <https://panorama.solutions/en/solution/decentralizing-networking-impact-pelum-kenya-network> by ROSINAH MBENYA, Participatory Ecological Land Use Management (PELUM) Kenya

Further challenges that affect the farming families

- Desertification, drought, erratic rainfall, increasing temperatures, land and forest degradation, loss of biodiversity, shift of seasons, unsustainable harvesting including overfishing, pollution (including. eutrophication and litter), erosion, ecosystem loss, lack of access to long-term funding, lack of technical capacity, lack of public and decision maker's awareness.

THE SOLUTION

To improve horizontal networking and the impact at the grassroots-level, PELUM established six networking zones with a view of enhancing grassroots networking among Member Organizations and horizontal learning with the support of zonal networking coordinators. Each zone has between four and ten member organizations totaling to 53 member organizations. PELUM Kenya management and governance realized that it would be more impactful for the network to grow from the bottom without necessarily having a heavy secretariat. Although, the PELUM Kenya zonation process is still at early stages and some of the member organizations are still grappling with its understanding, results and impacts are visible. Two main building blocks were key to the solution.

BUILDING BLOCKS

A. Clustering member organizations into geographical zones

Member organizations from one geographical region are clustered together into one zone to facilitate decentralized zonal networking. Thereby, member organizations that are experiencing similar challenges due to similar geographical locations have been brought together. They can meet in a more cost-effective manner because less time and resources are required to engage a fellow member organization in the same zone. The members of a certain zone participate in joint advocacy initiatives in their zones, and they engage in decision making processes. This enhances horizontal networking within a zone. At national level, various initiatives started based on the decisions made at zonal level.

B. Upscaling agroecological practices through joint horizontal networking and learning from each other

The various zones engage in joint learning and sharing forums, farmer exchange visits, joint exhibitions, joint project proposal writing and implementation. This enhances learning and sharing amongst the network members and provides an opportunity to interact. For example, member organizations could visit each other to learn various methods of agricultural practices that enhance agrobiodiversity and ecosystem services. Through the zonal initiative, members can apply for consortium funds, which enhances their level of winning the funds. In such a way, five members from Nairobi and Central Zone have been implementing a joint project by the name Food Security and Livelihoods (FOSELI). This is a way of creating synergy and doing things that one member organization cannot do alone.

How do the building blocks interact?

Joint zonal activities are important in improving horizontal networking among members and are also increasing PELUM Kenya visibility in different Counties. Clustering between four and ten member organizations within one zone creates room for members in the zone to implement joint zonal activities among themselves. It promotes cross learning, makes the network relevant and reaches out

to the needs of the members in a fair manner. Through the PELUM members organizations, farmers within and outside the zones enhance cross learning, which in turn, enhances the results in the fields of agroecology and food security.

Enabling factors

The PELUM Kenya national secretariat supports zonal initiatives in its programs and promotes a suitable ground for members to engage with each other. zonal networking coordinators support networking among the members in a zone. Zonal members hold periodic meetings to discuss various issues regarding their zones as a way of reflecting and improving. National initiatives are based on participatory processes and decision-making at the zonal level.

IMPACTS

The zonal networking has promoted horizontal networking and joint learning amongst:

- Member organization to member organization.
- Farmer to farmer.
- Extension officer to extension officer.
- Board to board.

The member organizations have become more visible in the zones and lastly, they have been recognized by local development partners including government and have been influencing the local agenda on ecological land use management for sustainable development. One example of recognition by the local development partners has been in Upper Eastern zone where the County Director of Agriculture have recognized Caritas Meru (a zonal member organization) and engaged the zonal member organization in agricultural matters in the county. Various agrobiodiversity strategies such as organic farming, permaculture, biodynamic agriculture etc. have been upscaled. PELUM Kenya network has become more member driven. The inclusion of the views of the member organizations from the zones has enhanced as most of the decisions are participatory and include the views of the zonal networks. As a grassroots network, the members of PELUM Kenya and their beneficiaries feel the relevance of PELUM Kenya network more than before.



Fig. 21: Farmer to Farmer Exchange Visits in Nyanza Zone.
© PELUM Kenya



Fig. 22: Water harvesting pans at Christian Impact Mission-Yatta.
© PELUM Kenya

PELUM Kenya secretariat does more without becoming “big”. This has enabled PELUM Kenya to maintain a lean secretariat, while at the same time performing more grass root work, hence it enhanced efficiency.

Examples include:

- In 2017, PELUM Kenya took member organizations for an exchange visit to Christian Impact Mission (CIM), a member organization in its Lower Eastern and Coast Zone. The visitors learned methods of water harvesting and adaptive methodologies in drylands, such as aquaponics, kitchen gardening, beekeeping etc. Christian Impact Mission presented an exemplary solution of how simple water harvesting technologies have transformed a community in the drylands of Yatta, Machakos. Farmers from Marsabit County replicated the lessons learned from the visit in CIM. They are now able to cultivate vegetables and other food crops during dry seasons.
- Grow Bio-intensive Kenya is another exemplary member organization in Central Kenya which has enabled farmers to learn methodologies of urban agriculture. The center has been visited by PELUM Kenya member organizations and PELUM organizations from other countries to learn how to grow bio-intensive practices that can support urban farming in small land sizes.

LESSONS LEARNED

Encouraging zonal network members in decision making is increasing their ownership and the sustainability of the organizations and their initiatives. It is important to plan early, especially for activities that engage various members, so that there is time to integrate activities and joint events in the organizational plans of the member organizations and for effectiveness. At the same time, it is important that members are engaged from the planning stage to the implementation stage to enhance common understanding and minimize conflicts and increase impacts and sustainability.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 6: Potential for indigenous vegetables in central Kenya⁸

Themes

Biodiversity mainstreaming.

Ecosystems

Agro-ecosystem, cropland.

Beneficiaries

Farming families.

Governance type

By indigenous peoples and local communities

Location

Lari, Central Province, Kenya

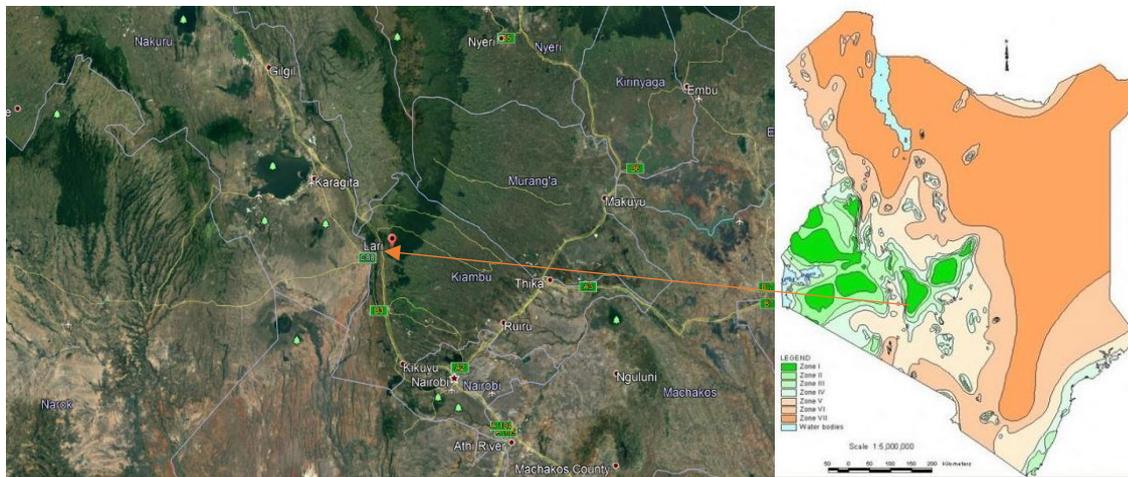


Fig. 23: Lari in Aberdares mountains east of Central Kenya Province

The Challenge

In Kirenga, Lari, Central Kenya the low and erratic rainfall and lack of irrigation facilities limits the production of vegetables. Exotic vegetables are grown in kitchen gardens, whereas nutrient-rich indigenous vegetables are rarely produced nor consumed in the rural areas. The consumption of vegetables is limited despite the occurrence of malnutrition among children and women.

THE SOLUTION

Indigenous vegetables have high nutrient values and do have a ready market in Nairobi and its peri-urban population, which is between 20 and 50 km away to the south east. Consequently, the production of indigenous vegetables would enhance livelihoods of these farmers through income generation, while consumption of the same would enhance their nutritional status.

To achieve this, the Kenya Agriculture and Livestock Research Organization (KALRO) trained farmers in techniques of farming these indigenous species. In addition, training on how to prepare and consume

⁸ Solution provided at <https://panorama.solutions/en/solution/potential-indigenous-vegetables-central-kenya>, by JANE MBUGUA, Kenya Agriculture and Livestock Research Organization (KALRO)

the vegetables was offered. The activities also included the raising of awareness on the nutritional value of these vegetables to further encourage consumption by the local farmers and their families. Two main building blocks were key to the solution.



Fig. 24: The head of Amaranth leafy vegetable crop. © Anthony Njogu



Fig. 25: Black nightshade leafy vegetable plant. © Anthony Njogu



Fig. 26: African nightshade crop. © Jane Mbugua

BUILDING BLOCKS

A. Participatory characterization of genetic resources

Participatory characterization of indigenous vegetable species with high nutrient contents and marketing potential together with farmers led to the best selection of a given crop genotype. The researcher and the potential beneficiaries (mostly farmers) plant and manage the crops together and then characterize them according to some mutually agreed criteria. It is best when the crop is grown on the farmers' field and managed using farmer practices.

B. Need to communicate the potential benefits

It is important to explicitly explain the benefits of the indigenous vegetable species. This is because the stakeholders (mostly farmers) are busy and will only listen to an external researcher or advisor if they see monetary or other social benefits from the suggested intervention and change.

How do the building blocks interact?

Participatory processes will only lead to the expected impact if farmers see clear benefits for their families. Therefore, apart from awareness creation on the nutrient content and the nutrition status of many children and women, as well training on the production and management of the crops, income generation is a key benefit, that will encourage farmers to change.

Enabling factors

Trust between researchers and farmers, the involvement and support of local community leaders and the interest of the farmers in what the researchers are doing is the basis for a good cooperation. Therefore, it is important that researchers speak the local language that is easily understood by the local community.

IMPACTS

The National Gene Bank of Kenya, which is part of KALRO, in her activities to promote on-farm conservation of under-utilized crop genetic resources has been promoting the production, consumption and marketing of African Leafy Vegetables (ALVs) in Central Kenya region in collaboration with other stakeholders. The project started by raising awareness on the nutritional value of these vegetables among the farming families, after which people were trained on how to grow, consume and market these vegetables. Therefore, some farmers started to grow nightshades, cats' whisker



Fig. 27: Farming women planting ALVs. @ Jane Mbugua

(*Cleome gynandra*) and amaranths and started selling in the open-air markets. This business was taken up by women initially as they sold these vegetables alongside the exotic kales and spinach.

This led to increased family incomes. The women also started preparing and consuming these indigenous vegetables and giving to their children after they were explained their health benefits. This improved the health status, because first indigenous vegetables are safe foods since they do not require pesticides and secondly most families in this area are resource poor but can now access nutritious leafy vegetables. Yet, small children and women in childbearing age are worst hit by protein, calcium, and iron, vitamins A and C malnutrition. These nutrients are richly found in indigenous leafy vegetables. The women also took advantage of their merry go rounds (saving groups) to grow and market these indigenous vegetables collectively. This way, they were able to sell to hotels which needed large quantities and regular supply; the hotels offered a market and better prices.

LESSONS LEARNED

Before initiating the project, it is important do conduct a baseline survey so that one can get an idea of what the local community needs; the needs should be expressed by the community. This guarantees the uptake and sustainability of new ideas and interventions. Participatory processes starting from the planning stage will lead to the buy-in of farmers. It is important to respect the stakeholders, their time, customs and culture.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 7: Promoting principles of ecosystem-based adaptation in conservation agriculture⁹

Themes

Adaptation, agriculture, biodiversity mainstreaming, ecosystem services, erosion prevention, gender mainstreaming, restoration

Ecosystems

Agro-ecosystem, agroforestry, cropland.

Beneficiaries

Farming families.

Governance type

By indigenous peoples and local communities

Location

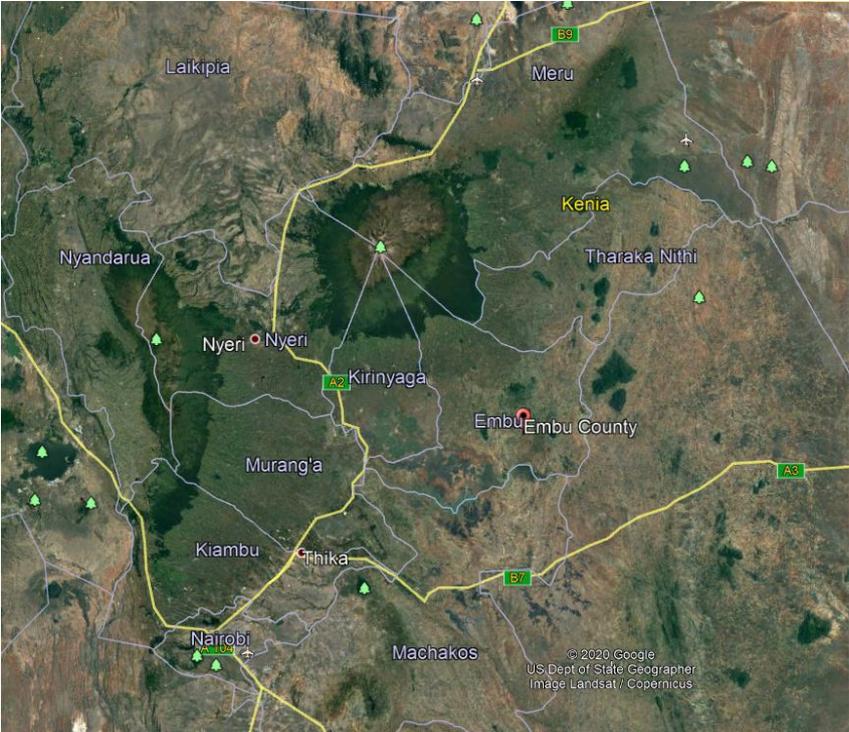


Fig. 28: Embu, Meru, Tharaka Counties in Eastern Kenya

The Challenge

Climate change effects in eastern Kenya has resulted in erratic rainfalls, droughts and floods, extreme heat and desertification. These effects lead to land and forest degradation and lack of food security. Lack of technical capacity, conflicting uses, poor governance and participation as well as inefficient management of financial resources are additional challenges.

⁹ Solution provided at <https://panorama.solutions/en/solution/promoting-principles-ecosystem-based-adaptation-conservation-agriculture> by HAUSNER WENDO, Pan African Climate Justice Alliance

THE SOLUTION

Trocaire works with local organizations to promote food and resource rights across Africa. In Kenya, the organization works with Pan African Climate Justice Alliance in a project aimed at building community resilience and climate change adaptation in semi-arid lands. Ecosystem-based adaptation (EBA) is the central approach applied in three counties where land and ecosystem management techniques are integrated with conservation agriculture. At the same time, the principles of EBA are promoted to achieve food and income security for small holder farmers vulnerable to climate risks.

In Embu County, farmers have been trained on the principles and practices of ecosystem-based adaptation and how to integrate conservation agriculture in their farming techniques, alongside soil water and moisture conservation and agro-forestry. Target farmers are now minimizing tillage, using more manure, mulching, planting of soil cover crops as part of an inter-cropping strategy, thus diversifying their crops.



Fig. 29: Smallholder farmer in Embu inspecting his farm.
© Hausner Wendo



Fig. 30: local trees left to grow freely in farmland, Embu.
© Hausner Wendo



Fig. 31: Agroforestry tree seedling in farmland. © Hausner Wendo

IMPACTS

Environmental impacts encompass shade provision provided by increased fruit and fodder tree cover on farmland. The shade helps to conserve soil moisture while the shedding foliage serves as mulch and manure. Some tree species, like gravellier, are good for fuelwood and timber.

Conservation agriculture techniques like minimal tillage, soil cover and soil moisture conservation techniques are great for soil management and enhance biodiversity while maintaining productivity. This also reduces the risk of topsoil loss to flash floods and minimizes desertification by reducing exposure to direct sunshine and heat.

Socio-economic impacts relate to food and nutrition security, among others. Fodder and fruit trees within farms are an important source of food for families and livestock. Fruits provide a cheap source of vitamin for households, while fodder from the trees serves to improve livestock nutrition and production. Some of the trees integrated in farms, such as mangoes and pawpaw are produced in larger sale and have market potential, thus boosting the income of small-scale farmers.

Multiple cropping and intercropping build the resilience of agricultural farms through genetic diversity and the ability to withstand climate-related risks. Similarly, the nutritional value for the family and children will be diversified.

This approach has potential to increase yields and enable families to sell surplus harvest and meet other household needs.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 8: Holistic grazing land management and restoration¹⁰

Themes

Adaptation, connectivity/transboundary conservation, Ecosystem services, genetic diversity, land management, restoration, traditional knowledge.

Ecosystems

Grassland ecosystems, tropical grassland, savanna, shrubland.

Beneficiaries

Local communities, women and children, rangeland resource managers.

Governance type

By indigenous people and local communities, shared governance.

Location

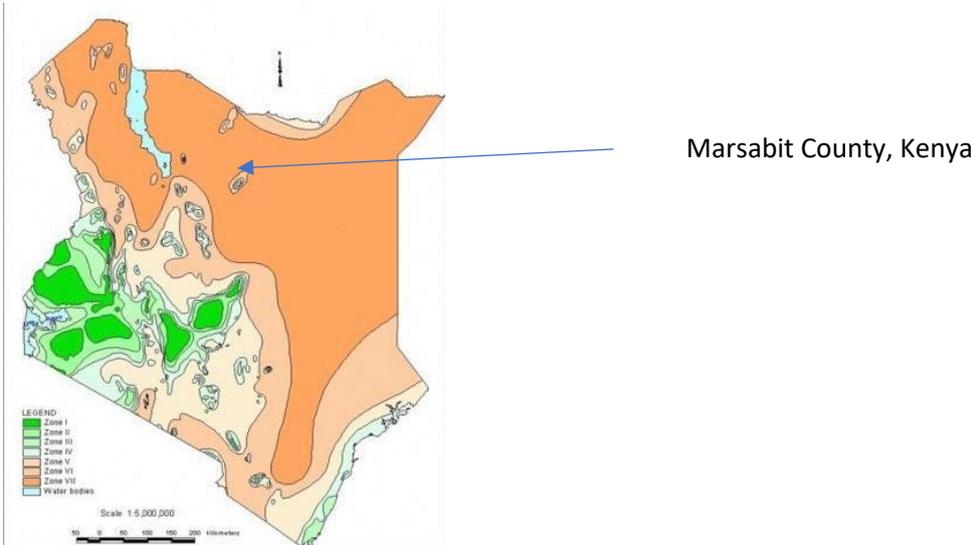


Fig. 32: Marsabit, Eastern Province, Kenya

The Challenge

Overgrazing due to increased livestock populations threatens biodiversity and diminishes ecosystem services. Local rangelands exceed their carrying capacity due to climate change impacts, such as cycles of severe droughts and flash floods. This leads to a decline in biodiversity and ecosystem services in the local agro-ecological system. Resilient and nutritious grass species diminish.

Climate change related unpredictable rainfall trends disorganize community-managed grazing patterns. Weak local resource governance structures hamper enforcement of community resource management. Furthermore, low resource allocation to county departments impede the ability of technical resource officers to support their communities. A decline of grazing and natural management

¹⁰ Solution provided at <https://panorama.solutions/en/solution/holistic-grazing-land-management-and-restoration> by HAUSNER WENDO, Pan African Climate Justice Alliance

systems has resulted in inter-communal competition for pasture and water leading to rangeland over-exploitation and resource-based conflicts.

Pastoralism is a livelihood system that currently faces pressure from various factors. The main resulting problem from multiple challenges is degradation of grazing lands beyond the ability to support livestock. This trend needs to be stopped and reversed to avoid total collapse of pastoralism as a source of livelihood.

THE SOLUTION

Working in the area, *Vétérinaires sans Frontières* (Veterinarians Without Borders) Germany, utilizing an approach called *Holistic Natural Resource Management*. Seeing nature functions as a holistic system with interactions between people, animals and the managed land the holistic management approach integrates indigenous knowledge, cultural issues and natural processes to create sustainable pastures and healthy livelihoods. A community-based grazing land management and restoration, focusing on local pasture species and traditional land management practices was implemented.



Fig. 33: Degraded rangeland © Hausner Wendo



Fig. 34: Community forum discussions in Gotab village, Mount Kulal © SVF Germany

BUILDING BLOCKS

A. Rangeland ecosystem (grazing land) restoration

This project applied community-based ecosystem restoration techniques and approaches to help revive grazing fields. This is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed through a combination of different techniques. In this project the following techniques were used:

- Pasture enclosures to enable portions of grazing land recover without disturbance and for local grass species to mature and deposit their seeds for natural regeneration.
- Reseeding of heavily degraded pasture lands with local grass species to aid recovery after rains.
- Community-managed wet season dry season grazing patterns for seasonal pasture recovery.

B. Rangeland ecosystem management

In order to have an integrated approach that places communities at the center of governance and management of community resources a rangeland ecosystem management was established. Along

with restoration, rangeland ecosystem management techniques were integrated with local knowledge and approaches to enhance sustainable management of shared grazing lands. The ecosystem management process aimed to conserve major ecological rangeland services and restore natural resources while meeting the socio-economic and cultural needs of local communities. Some of the approaches employed included:

- Creation of community environmental management committees.
- Integrating local knowledge in local rangeland management by-laws and codes of conducts.
- Integrating sustainable resource use of natural resources.
- Linking local environmental management committees with county technical resource pattern from relevant departments for sustainable support and strong resource governance.

C. Inter-community peace committee and peace meetings

The Mount Kulal landscape consists of eight different villages spread out around the biosphere and depending on shared ecosystems and rich biodiversity within the landscape. This leads to competition for shared resources and conflicts. The project worked with local administration and leadership to revive peace committees within the communities and link them together across the landscape to create an inter-community peace committee that can meet periodically to plan sustainable management of shared pastureland and water resources, resolve disputes and provide leadership in resource governance to reduce and prevent degradation of local ecosystems and biodiversity. Through this structure peace meetings were organized where communities openly discussed their grievances, challenges and how to address issues around sustainable pasture management.

Although inter-community peace committees and arrangements for management of shared resources are challenged by traditional community rivalry, the peace committee and peace meetings structures can be developed for viable sustainable ecosystem management.

D. Holistic grazing land management and restoration

Many pastoralist communities show an increased interest to diversify their livelihoods as a resilience strategy. The project utilized two main strategies for livelihood diversification to improve household incomes and nutrition:

- Promoting women group-based *Village Community Banking (VICOBA)* in an approach that encourages micro-savings and borrowing to enhance financial security and promote business.
- Identifying villages with sufficient water resources and introducing shared community vegetable and fruit gardens to enhance nutrition in an area with acute shortage of fruits and vegetables. Production of fruits and vegetables can also lead to higher household income.

How do the building blocks interact?

The building blocks are integrated to form an approach known as *Holistic Natural Resource Management*. The understanding is that sustainable management of ecosystems like rangelands providing important pasture, fodder, and water resources to sustain a socio-ecological system. The approach combines ecological approaches like management and restoration of ecosystems with socioeconomic and cultural aspects like governance, inter-communal relationships and livelihoods.

Enabling factors

A readiness of local stakeholders, like county government and participating communities to change pasture management and implement necessary actions. This applies especially to inter-community peace committees. There must be an open-mindedness to overcome traditional rivalries.

Impacts

Environmental impacts

- Pasture enclosures and reseeded of degraded grazing lands allows natural rangeland regeneration as trees, shrubs and local grass species are allowed to thrive.
- Management of invasive species through clearing enables useful local species to thrive.
- Controlled grazing under community-managed rangeland governance enhances ecosystem health and biodiversity by improving grass and fodder productivity.

Socio-economic impacts

- Improved ecosystem health enhances pastureland productivity with higher income.
- Introduction of fodder trees enhances productivity of small stock and is an effective disaster risk reduction strategy as the fodder prevents loss of animals during droughts.
- Introduction of fruit trees improves nutritional diversification by providing vitamins particularly for children while supporting food security and improved household incomes.

Long term socio-ecological impact

- Strengthened socio-ecological resilience for pastoralist communities and supportive ecosystems in Mount Kulal area.
- Protection and enhancement of biodiversity and ecosystem services.

Lessons learned

- There exists deep knowledge and skills on pastureland management that needs to be tapped into sustainable management and packaged with modern techniques.
- Rangeland management is only sustainable when integrated approaches place local communities at the center of governance and management of their own resources. Inter-community peace committees form the structures for a strong basis for landscape management processes for viable sustainable ecosystem management.
- Many pastoralist communities and households are increasingly ready, willing and able to diversify their livelihoods as a resilience strategy.

Contribution to sustainable development goals



Contribution to Aichi targets



SOLUTION 9: Home gardens empower communities¹¹

Themes

Adaptation, agriculture, ecosystem services, food security, gender mainstreaming, health and human wellbeing, sustainable livelihoods.

Ecosystems

Agro-ecosystem, agroforestry.

Beneficiaries

Pastoralists, small scale farmers, local communities.

Governance type

By indigenous people and local communities.

Location

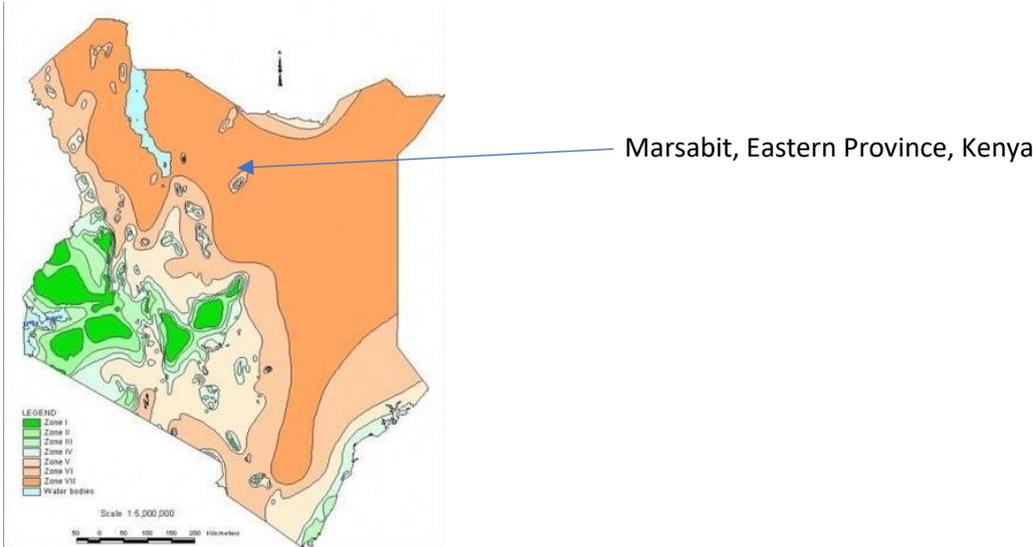


Fig. 35: Marsabit, Eastern Province, Kenya

The Challenge

To finance livelihood with pasture animal husbandry often comes up against the limits. Especially in the face of climate change and increasingly extreme weather conditions, the income generated by grazing livestock is often insufficient and involves risks. In order to improve resilience, new sources of income must therefore be generated.

THE SOLUTION

The project is working on providing alternative livelihoods for former Borana pastoralists, who have settled down to try agro-pastoralist production for food security. In a first step, households joined hands to harvest rainwater by creating a small pan near their homesteads and use this for small home gardens. Although creating a pan takes a bit of time, when people joined hands, they were able to

¹¹ Solution provided at <https://panorama.solutions/en/solution/home-gardens-empower-communities> by DIIDA KARAYU, Food for the Hungry

work on a single pan for relatively shorter time. In home gardens vegetables like kale, onions, pepper, cassava, tomatoes, spinach, watermelon are grown. Some farmers are also piloting a small agroforestry in one corner of their garden. The food produced is used for home consumption and surplus is sold to the neighboring villages.

The pans and gardens are done for one household at a time with the long-term goal to reach every household in the community. Thus, this marks a departure from overreliance on pure pastoralism, which is negatively affected by climate change.



Fig. 36: Livelihood technical advisor in front of a pan.
© Diida Karayu

Impacts

There are several impacts on different levels. These include:

- As a result of consuming a more balanced diet with locally produced food, nutrition of the members has improved.
- Minimized soil erosion as planted crops can stop soil erosion.
- Economic benefits and livelihood diversification through sales of produced vegetables.
- Building up savings is possible for participating farmers.
- People work together and therefore learn to support each other. The members conduct regular meetings to discuss their progress and plan their work for the week ahead.
- The practice has attracted many members to the group. Initially, 20 members started but the membership has grown to over 40 households in a span of five months. Replication of the practice is seen by neighboring villages.

Contribution to sustainable development goals



SOLUTION 10: Using biointensive agriculture to improve nutrition, income and food security¹²

Themes

Drought, land and forest degradation, pollution (incl. eutrophication and litter), erosion, lack of alternative income opportunities, lack of technical capacity, lack of food security, unemployment/poverty.

Ecosystems

Agro-ecosystem, cropland.

Beneficiaries

Small scale farmers.

Governance type

By governance.

Location

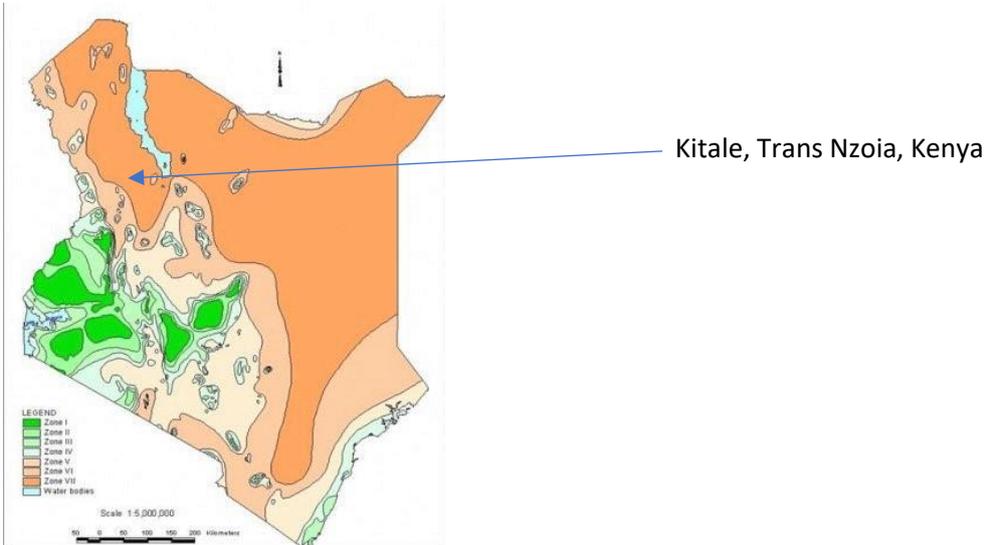


Fig. 37: Kitale, Trans Nzoia, Kenya

The Challenge

Over 70% of farmers in Kenya are small-scale farmers practicing conventional farming with the use of fertilizers. This is unsustainable and produces most greenhouse gases causing high temperatures and low soil pH, which have adversely reduced yields and thus threatening food security. Due to recent droughts, farmers are cultivating riparian land for food resulting in pollution of rivers.

Use of conventional farming methods by small scale farmers is uneconomical and produces greenhouse gas emissions. Furthermore, it is unsustainable and the need to purchase fertilizers does not fit the requirements of small-scale farmers, who are often lacking resources.

¹² Solution provided at <https://panorama.solutions/en/solution/using-biointensive-agriculture-improve-nutrition-income-and-food-security> by DAVID MWANGI, Manor House Agricultural Centre

THE SOLUTION



Fig. 38: BIA fields. © Manor House Agricultural Centre

This project establishes a train the trainer program on bio-intensive agriculture (BIA). It involves introductory lessons on BIA and other sustainable ideas. The trainings are carried out indoors. After this familiarization with the concepts, the trainees are subjected to demonstrations to aid in acquiring of relevant practical skills and finally participatory action based on-farm training. Discussions and sharing of ideas and experiences is highly

encouraged at this stage and upholding is equally emphasized. Thematic approaches based on soil conversation, long term soil fertility building, ecological farm management practices and energy saving are stressed.

The farmers are then encouraged to assist in adoption of the ideas and their implementation. These include continuous and regular visits by the field based staff in order to guide, advice, direct and motivate them. Planning for real at this stage motivates community members to come up with various strategic livelihood improvement projects.

BUILDING BLOCKS

A. Training of farmers

The method used in training involves introductory lessons on BIA and other sustainable ideas carried out indoors. After this familiarization with the concepts, the farmers are subjected to demonstrations to aid in acquiring of relevant practical skills and finally participatory training in the field and on farms. Discussions and sharing of ideas and experiences is highly encouraged at this stage and upholding is equally emphasized. Thematic approaches based on soil conversation, long term soil fertility building, ecological farm management practices and energy saving are stressed.

Initially, potential trainers are selected from famer groups. They are then trained at *Manor House Agricultural Centre*. They are then sent to establish mini-training centers in the community where they train other farmers.

B. Follow ups and extension

The extension staff usually discusses farmer priorities in a participatory manner and then develops appropriate farming interventions. Trained farmers are offered post training services geared towards smooth transition towards sustainable practices. These include continuous and regular visits by the field-based staff in order to guide, advice directly and motivate them. Participants can come up with various strategic projects for livelihood improvements and are motivated to realize them.

How do the building blocks interact?

This project aims at training of trainers about BIA. It involves introductory lessons on BIA and other sustainable ideas. After this familiarization with the concepts, the trainees are subjected to demonstrations. These enables relevant practical skills and participatory action based in the field. Discussions and sharing of ideas and experiences is highly encouraged and upholding is equally emphasized. Thematic approaches based on soil conversation, long term soil fertility building, ecological farm management practices and energy saving are stressed.

The farmers are then followed up to assist in adoption of the ideas and their implementation. These include continuous and regular visits by the field-based staff in order to guide, advice direct and motivate them.

Enabling factors

Committed and open-minded participants towards alternative agricultural approaches are needed. Furthermore, weather conditions and social-economic conditions need to be taken in account during planning for the follow-up sessions.

Impacts

The methods described under the eight key components of BIA are employed and farmers adopting them. The positive impact of adopting this model is seen regarding soil regeneration, food, nutrition, health, income. The whole gardening system suits the farmers well.

Other long-lasting effects are better living standards and reduced poverty levels among the community members. Adversities in climatic change such as desertification and effects of global warming will be mitigated.

Lessons learned

- Sensitized and trained community members might be able to hold together onto their convenient groupings making it easy for follow ups and sharing of ideas.
- The group members have come up with various strategic livelihood improvement projects.
- Farmers are adopting the technologies learned during the training.

Contribution to sustainable development goals



Contribution to Aichi targets





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