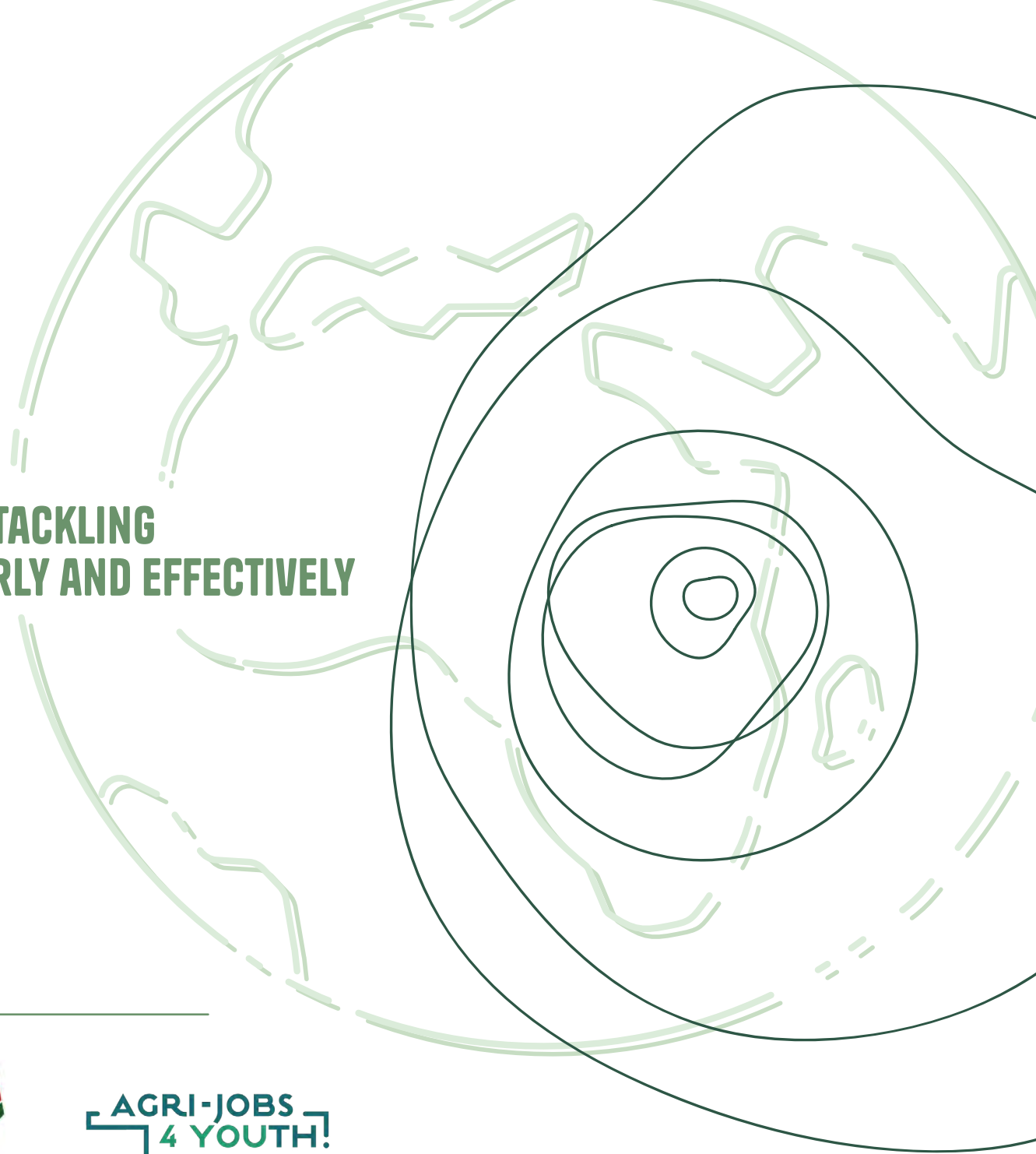


# GIGATONNE

## IMPACT & INSIGHTS:

HOW WESTERN KENYAN TEAMS ARE TACKLING  
THE CLIMATE CRISIS — RAPIDLY, FAIRLY AND EFFECTIVELY

2022 — 2023



 **GIGATONNE**



**AGRI-JOBS  
4 YOUTH!**

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# INTRODUCTION

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Gigatonne is a next-generation strategy to rapidly, fairly, and effectively tackle the climate crisis. Gigatonne provides training and financing to teams around the world wanting to take effective climate action. Gigatonne was launched by [10-in-10](#) in 2020.

In October 2021, Gigatonne was introduced to Agri-Jobs 4 Youth, a rural youth employment project by the German Development Cooperation and implemented by [Deutsche Gesellschaft für Internationale Zusammenarbeit \(GIZ\) GmbH](#) in partnership with the Kenyan Ministry of Agriculture, Livestock, Fisheries and Cooperatives (MoALFC).

The objective of Agri-Jobs 4 Youth is to create opportunities and to empower young people to build their livelihoods through gainful salaried employment or self-employment. The initiative focuses on rural youth employment in the context of agri-food sector development, creating opportunities for green business growth and climate-smart agriculture.

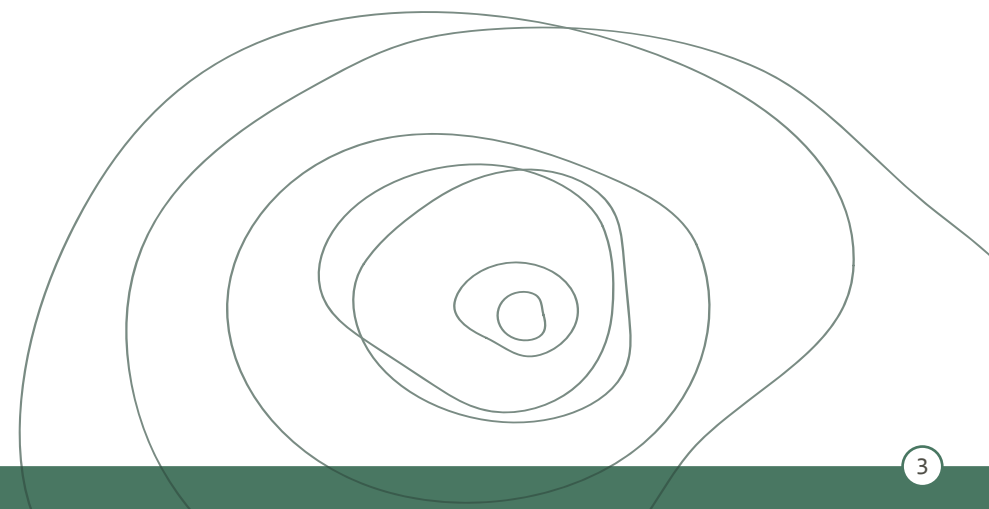
To support this objective, in January 2022, GIZ endorsed Gigatonne among youth organisations partnering with the Agri-Jobs 4 Youth initiative in Western Kenya.

Five teams signed up to participate in Gigatonne and were funded by GIZ for the initial Level 1 Gigatonne training. Following this, 10-in-10 sponsored the teams' advanced training (Levels 2 and 3) and provided direct funding to Level 3 teams, enabling them to reduce greenhouse gas emissions while directly benefitting vulnerable community members.

This evaluation report assesses the teams' experiences and impacts from April 2022 to January 2023.

10-in-10's mission is to tackle ten global challenges in ten years, starting with climate change.

GIZ has provided services in international development cooperation for over 50 years, promoting sustainable development worldwide. GIZ was commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) for the implementation of Agri-Jobs 4 Youth.







Members of the Kakamega Gigatonne team at their local landfill, where tonnes of mixed waste are deposited each day





# ABOUT GIGATONNE

*A next-generation strategy to rapidly, fairly, and effectively tackle the climate crisis.*

**MISSION:** Building the world's most effective response to the global climate crisis.

*"We can shift the direction of the crisis in 60 months, while benefitting one billion of the poorest families on the planet."*

–Zaid Hassan, Co-Founder of Gigatonne

Gigatonne provides training and financing to teams wanting to take effective climate action. Teams can range from informal groups, NGOs, governments or businesses.

Teams doing the work are referred to as "Gigatonne Teams." Multiple Gigatonne Teams in aggregate add up to a global response to the climate crisis.

The math here is simple. The more teams committed to a gigatonne-scale emissions target, the easier it gets and the greater the probability of collectively tackling the crisis.

Since its launch in 2020, Gigatonne's approach has been tested in 25 countries with 95 teams.

TRACTION	
TEAMS	
WHO	966 people trained in 95 teams
WHAT	146 sprints & 1,450 coaching hours
WHERE	25 countries & 71 cities
IMPACT	
	\$212,000 direct funding to teams
	2,107 tonnes CO2e abated by 8 teams alone
	1,385 families impacted by 1 team
	649 employed in abatement projects
	732 families/beneficiaries received food (3000+ kg)
	4 biogas units delivered

## THE GIGATONNE APPROACH

At the heart of the Gigatonne approach are three targets:

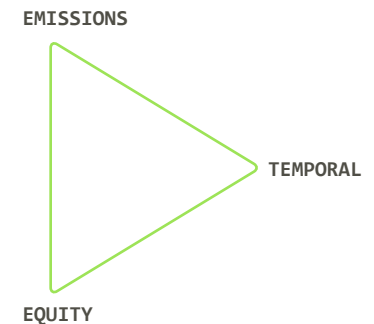
**Emissions.** Abatement: teams must meet an emissions reduction or removal target. Emissions are measured in CO2e.

**Temporal.** All action takes place in the context of a time-bound sprint, targets are set per sprint.

**Equity.** Teams must meet a target of support for families (in the bottom 20% socio-economic strata) per sprint where they provide jobs, food security and/or energy security.

The Open Gigatonne Protocol was developed to provide specifications for the approach towards tackling the climate crisis. [https://gigatonne.co/wp-content/uploads/2023/05/GT\\_Protocol.pdf](https://gigatonne.co/wp-content/uploads/2023/05/GT_Protocol.pdf)

CO2e is a measurement of the total greenhouse gases emitted, expressed in terms of the equivalent measurement of carbon dioxide.



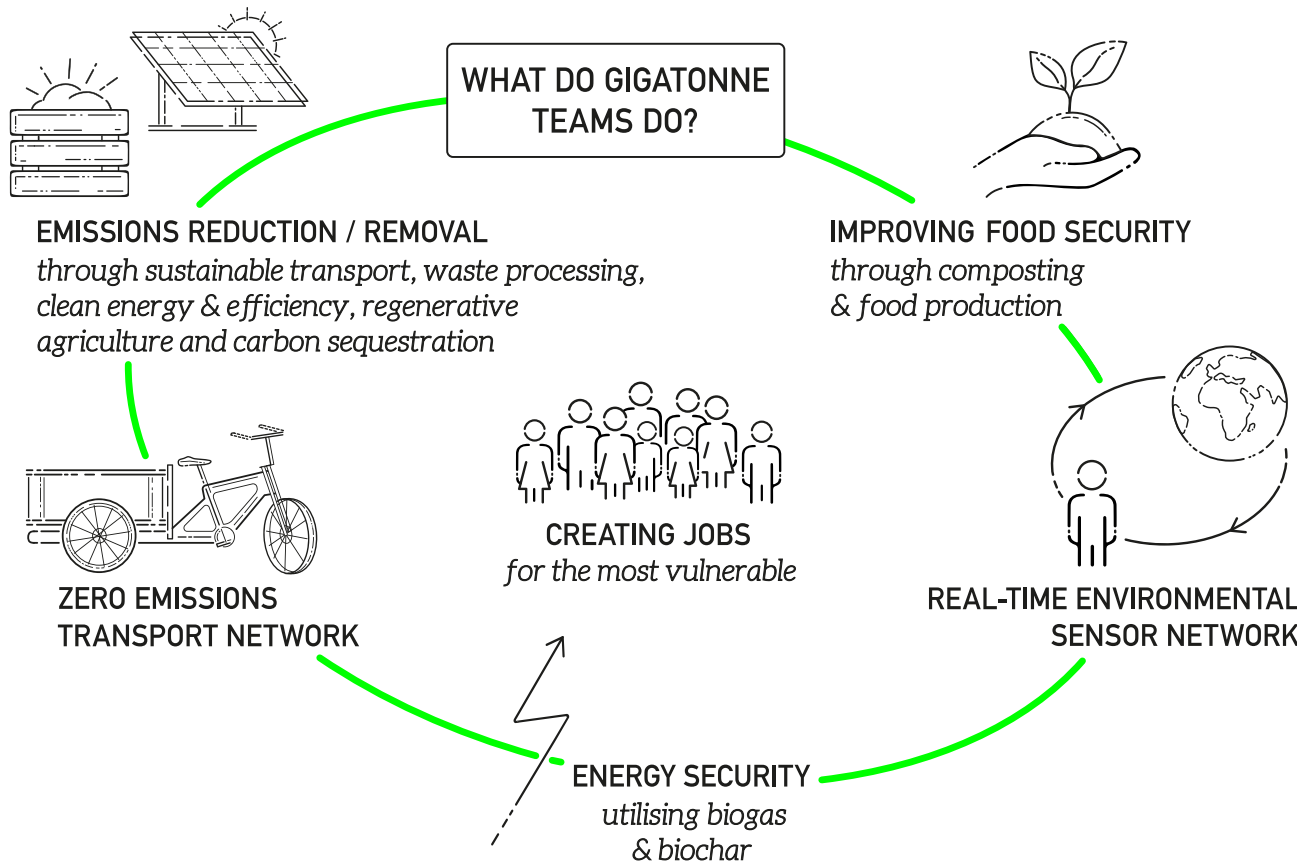
### PERFORMANCE LEVELS

LEVEL	ABATEMENT (tonnes of CO2e)	EQUITY (families)	SPRINT LENGTH
1	1	none	2 weeks
2	10	none	4 weeks
3	60	100	6 months
4	600	1000	6 months
5	6000	10,000	6 months
6	60,000	100,000	6 months
7	600,000	1 million	6 months

Gigatonne specifies seven levels of performance, from Level 1 to Level 7. Teams need to complete a level to graduate to the next. From Level 3 onwards, teams are funded by Gigatonne for their work. Targets increase x10 per level.

# WHAT DO GIGATONNE TEAMS DO?

Gigatonne Teams work on waste management, building zero emissions transport networks, regenerative agriculture, renewable energy, land use and carbon sequestration.



*"Gigatonne is precisely the type of disruptive initiative we need today."*  
– Manish Bapna, President and CEO, Natural Resources Defense Council

## PROTOTYPING

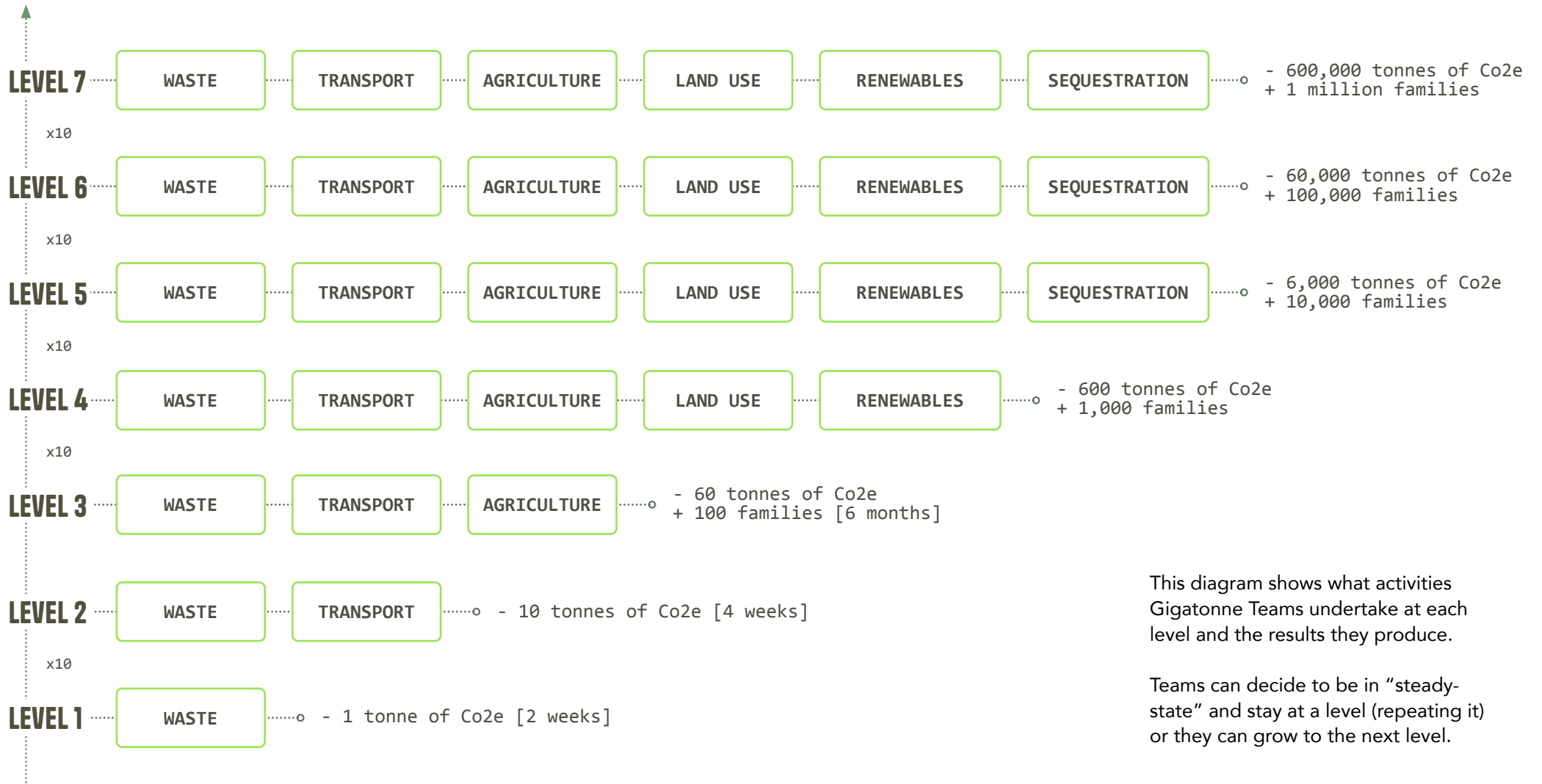
Drawing inspiration from Silicon Valley, Gigatonne has adopted tools such as scrum and rapid prototyping.

Gigatonne's performance levels are organised into defined periods called 'sprints'.

At each level, teams work on designing and testing prototypes to meet the set targets. These prototypes are chosen based on the specific context of each team. Teams collaborate with various local stakeholders, including the government, businesses, and community members to implement prototypes and scale their impact.

Prototyping helps teams move forward quickly as they learn through hands-on experience, which better equips them for the next iteration. Prototypes can then be repeated, adjusted, and scrapped, or new prototypes can be attempted until a design succeeds at abating the level of CO<sub>2</sub>e (and at higher levels, achieving equity targets) necessary to progress to more advanced levels.

# GIGATONNE TEAM LEVELS



This diagram shows what activities Gigatonne Teams undertake at each level and the results they produce.

Teams can decide to be in “steady-state” and stay at a level (repeating it) or they can grow to the next level.





Bungoma Gigatonne team inspecting  
compost created from food waste





# GIGATONNE TEAMS IN WESTERN KENYA

## FIVE TEAMS that participated + colour key

- Bungoma County Youth Visionary Network (BCYVN) - Bungoma county
- Kakamega County Youth Agripreneurs Association (KCYAA) - Kakamega county
- Siaya County Youth Network (SCYN) - Siaya county
- Vihiga Young Agripreneurs Network (VIYAN) - Vihiga county
- Kisumu Young Agripreneurs (KIYA) - Kisumu county

## YOUTH ORGANISATIONS

In Western Kenya, each Gigatonne team was established from youth-led organisations that focus on agribusiness within their respective counties. These organisations place a strong emphasis on self-organisation and peer-to-peer learning for young agripreneurs.

## FROM WASTE TO WEALTH: TRANSFORMING FOOD WASTE INTO SUSTAINABLE SOLUTIONS

During the Gigatonne training, teams learnt that diverting food waste from landfills for compost effectively reduces greenhouse gas emissions. All five teams initially focused on food and organic waste for their prototypes. Their challenges included sourcing food waste from local markets, implementing zero-emission waste transportation, and identifying suitable composting sites.

They also found that converting food waste into organic fertilisers offered a cost-effective, eco-conscious, yield-boosting alternative to inorganic options. As a result, the teams began using this organic compost

for food cultivation. This innovative approach reduced waste and created a sustainable cycle benefitting the environment and agriculture.

Their prototypes not only reduce emissions but also aim to create sustainable livelihood opportunities and boost economic activity in the local region.

### BCYVN BUNGOMA COUNTY

POPULATION 1,670,570  
YOUTH (0-29 years) ≈ 72%

### KCYAA KAKAMEGA COUNTY

POPULATION 1,867,579  
YOUTH (0-29 years) ≈ 69%

### SCYN SIAYA COUNTY

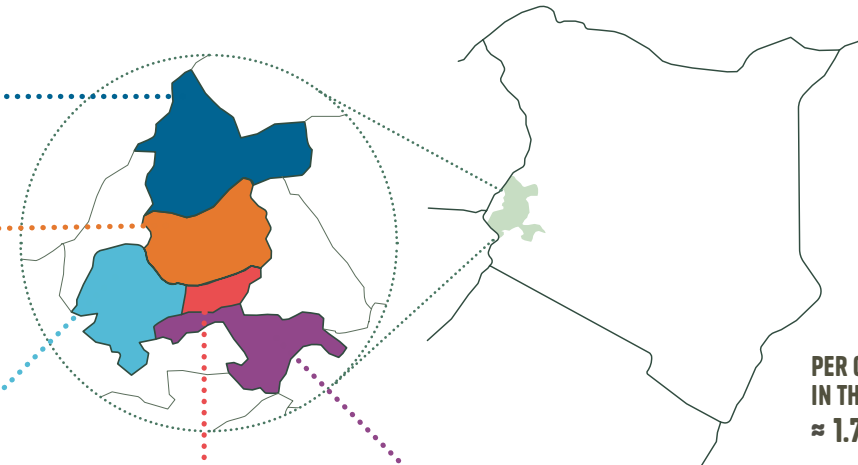
POPULATION 993,183  
YOUTH (0-29 years) ≈ 68%

### VIYAN VIHIGA COUNTY

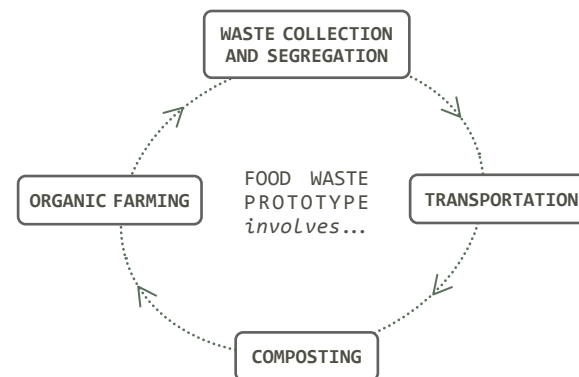
POPULATION 590,013  
YOUTH (0-29 years) ≈ 64%

### KIYA KISUMU COUNTY

POPULATION 1,155,574  
YOUTH (0-29 years) ≈ 69%



PER CAPITA EMISSIONS  
IN THE REGION (AS OF 2020)  
≈ 1.79 TONNES OF CO2E



Sources:  
Kenya National Bureau of Statistics  
<https://www.citypopulation.de/en/kenya/admin/>

World Bank - Data on CO2 emissions - Kenya  
<https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=KE>

# GIGATONNE IMPLEMENTATION IN WESTERN KENYA

Timeline	April 2022	May 2022	July 2022	Sept 2022	Oct 2022 - Jan 2023
<b>Sprint level</b>	Level 1	Level 2	Level 1	Level 2	Level 3
<b>Duration</b>	2 weeks	4 weeks	2 weeks	4 weeks	3 months
<b>Targets (per team/sprint)</b>					
<b>Emissions abatement</b>	1 tonne of CO2e	10 tonnes of CO2e	1 tonne of CO2e	10 tonnes of CO2e	30 tonnes of CO2e
<b>Equity</b>	–	–	–	–	benefit 100 families
<b>Teams participating at each sprint</b>	VIHIGA BUNGOMA KISUMU	VIHIGA BUNGOMA KISUMU	VIHIGA SIAYA KAKAMEGA	VIHIGA SIAYA KAKAMEGA	BUNGOMA KISUMU

At Level 3, the equity target is introduced. Teams develop prototypes that reduce emissions and directly benefit families in the bottom 20% socio-economic bracket through jobs, food, or energy security.

## TEAM PROGRESSION AND BASELINES

Teams started in staggered cohorts and underwent similar training at different times. Some teams repeated levels in order to reach their targets, build team capacity, or acquire the necessary resources to progress to the next level.

While Gigatonne offered virtual support to the teams, GIZ provided on-the-ground technical assistance.

At the beginning of each level, teams conduct baseline assessments. For food waste prototypes, this involves examining the landfill where the diverted waste would have been deposited to calculate emissions reductions. They consider factors like landfill location, type, size, waste segregation, average temperature, and humidity, as well as waste type, controlled placement, and anaerobic conditions. Furthermore, teams conduct assessments of

equipment, skills, and income levels. Level 3 teams did an equipment inventory and assessment of what they could use and what they need for the next sprint.

# GIGATONNE TRAINING & SUPPORT FRAMEWORK

At each Gigatonne performance level, a comprehensive training and support framework is in place to facilitate team achievement of their targets.

**LEVEL 1 & 2:** The primary focus is on training, initial practice, and team building. The team structure is kept simple in order to remove barriers to entry and allow teams to get started. Teams are introduced to foundations of operating within complexity and tackling climate change. They begin building multiple capitals (including team diversity) as they learn, gain experience, and progress to more advanced levels. ①

**LEVEL 3:** Teams deepen their understanding of effective strategy and are introduced to the principle of equity, which becomes integrated into the design of their prototype. They start formalising team roles, enhancing team diversity, and transitioning towards a scrum process. Financial aspects and budgeting are introduced as L3 teams receive funding to implement emissions-reducing prototypes that provide job, food and/or energy security to community members in the bottom 20% of the socio-economic bracket. ②

	LEVEL 1 & 2	LEVEL 3
Training & Capacity building	<p>Elements of Effective Strategy:</p> <ul style="list-style-type: none"> <li>• Strategy-as-Action (<i>prototyping</i>)</li> <li>• Strategy-as-Storytelling (<i>for engaging community &amp; forming partnerships</i>)</li> <li>• Strategy-as-Inner Game (<i>team dynamics, communication, resilience</i>)</li> <li>• Emissions abatement science</li> <li>• Composting</li> </ul>	<ul style="list-style-type: none"> <li>• Principles of equity</li> <li>• Unit economics and budgeting</li> <li>• Agile project management</li> <li>• Reporting on multiple capitals</li> <li>• Partnerships</li> </ul>
Supporting structures provided to all teams	<p><u>Coaches:</u> Team coaches provide structure and guidance to team members. They hold from daily to weekly meetings with the teams and play a crucial role in navigating the prototyping process, managing team dynamics, overcoming challenges and reporting on impact.</p> <p><u>The Gigatonne Community:</u> In addition to team coaches, members of the broader Gigatonne peer network offer guidance and support as required.</p>	

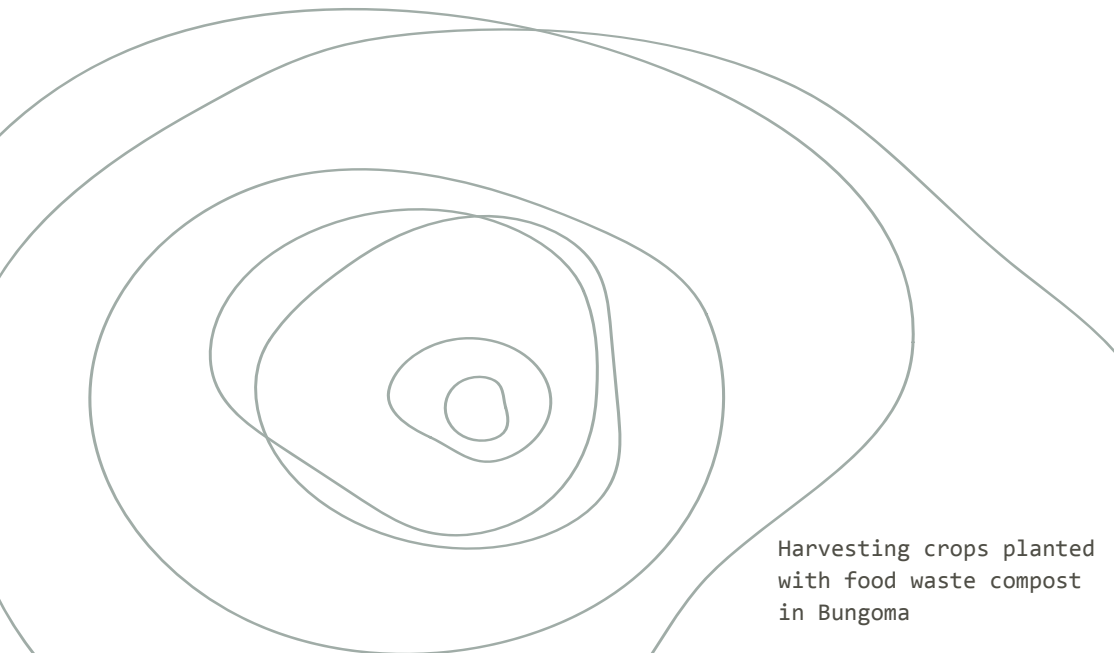
① The six capitals are: Human, Social, Natural, Intellectual, Physical, and Financial.

② Teams in L1 to L2 may receive financial support on a case-by-case basis.



# GIGATONNE JOURNEYS

## IMPACT, INSIGHTS & TESTIMONIALS OF EACH GIGATONNE TEAM FROM WESTERN KENYA



Harvesting crops planted  
with food waste compost  
in Bungoma





# BLUEPRINT FOR A GREENER FUTURE

## VIHIGA GIGATONNE TEAM

### MEET THE VIHIGA GIGATONNE TEAM

Despite being one of the smallest counties in all of Kenya, Vihiga County has a rapidly growing population of young people and a high population density (1,045 persons per square km). The Vihiga Youth Agripreneurs Network (VIYAN) engages young farmers in small-scale farming and smart agriculture to optimise yield. They also do agri journalism to promote the work of young farmers.

A group of members from VIYAN formed the Vihiga Gigatonne team to address climate issues that were affecting them every season and create livelihood opportunities for the youth of the county.



**Vihiga Young Agripreneurs Network**  
Phone number: 0113033097  
Contact email: [vihigayan2021@gmail.com](mailto:vihigayan2021@gmail.com)  
Facebook: [Vihiga Young Agripreneurs Network - VIYAN](#)

### THE CHALLENGE

The Vihiga Gigatonne team identified challenges and opportunities related to food and waste disposal in their county. Local markets accumulate substantial amounts of food waste, which is later transported by the county to the Ebuyangu landfill, 8 km away, using diesel trucks. These open landfills, along with waste burned by local residents in market centres, generate toxic greenhouse gases such as methane.

### THE TEAM'S PROTOTYPE

The Vihiga Gigatonne team developed a prototype to tackle the food waste issue. Operating mainly in the Luanda and Sabatia sub-counties, the team collected food waste from local hotels and the Luanda and Marikiti markets.

This waste was then transported to a nearby farm (owned by a team member) for composting, selected for its closeness to the market. The team put to work zero-carbon transportation for the waste, utilising hand-pulled carts, wheelbarrows, and a bicycle donated by World Bicycle Relief with support from GIZ.

**STARTED GIGATONNE** April 2022

**WASTE COLLECTED** 11,314 kg

**FUEL AVOIDED** 10 litres

**LEVELS COMPLETED** L1, L2

**EMISSIONS ABATED** 14.44 tonnes of CO<sub>2</sub>e



Team collecting at the market where waste is openly dumped in piles and bins



For composting, they designed a raised and covered structure from bamboo and wood, with a floor of thick soil that allows the team to collect solid compost as well as the liquid slurry that drains off.



The team experimented with different composting models. They tested with black soldier flies and vermiculture to enhance the nutrient value of compost. As part of the process, insects feed on the organic matter as it decomposes, thereby enriching the compost. The team discovered that the black soldier fly larvae also serve as organic animal feed which adds additional value to the farming business.



.....o The team used approximately 100 litres of slurry produced from their food waste to plant vegetable saplings, which subsequently grew into healthy organically produced crops

*“During the previous planting seasons, we were able to sell about 7 tonnes of compost from work done during Gigatonne sprints. Gigatonne has opened up opportunities for income, opened our minds and changed mindsets with the knowledge of composting and connecting to climate change.”*

- Brian, team member.

### LESSONS LEARNT

Team unity was crucial, a lesson they learnt early on in their Gigatonne journey. Sharing insights with other Gigatonne teams provided them with much-needed inspiration.

*“Unity is important for our success. Our coaches taught us that we might be individuals from different sub counties across Vihiga, but it is crucial we work as one team to succeed. Executing activities as a unified team has now become second nature.”*

- Brian, team member

*“Inspiration and insights from other participating Gigatonne teams proved to be a powerful motivator.”*

- Henry, team member

*“I gained insights on support systems and relationship-building. Our Gigatonne approach taught me to think like ubuntu, which means ‘I am because you are’. We depend on the community, just as they depend on us.”*

- Damaris, team member

### COMMUNITY ENGAGEMENT

The team engaged with farmers, vegetable vendors and youth from the streets and rehabilitation centres. One of the primary needs was to implement a reliable process for waste segregation at source through community engagement and demonstrating benefits.

*“The vegetable vendors who provided waste were initially sceptical of our activities. Now they are our partners in composting and also collect the food waste for us. Involving local youth in Gigatonne initiatives has sparked change. Some carry the knowledge back home to implement themselves”.*

- Damaris, team member

*“Many community members purchased our compost and expressed appreciation for its quality”.*

- Brian, team member

### FUTURE PROSPECTS

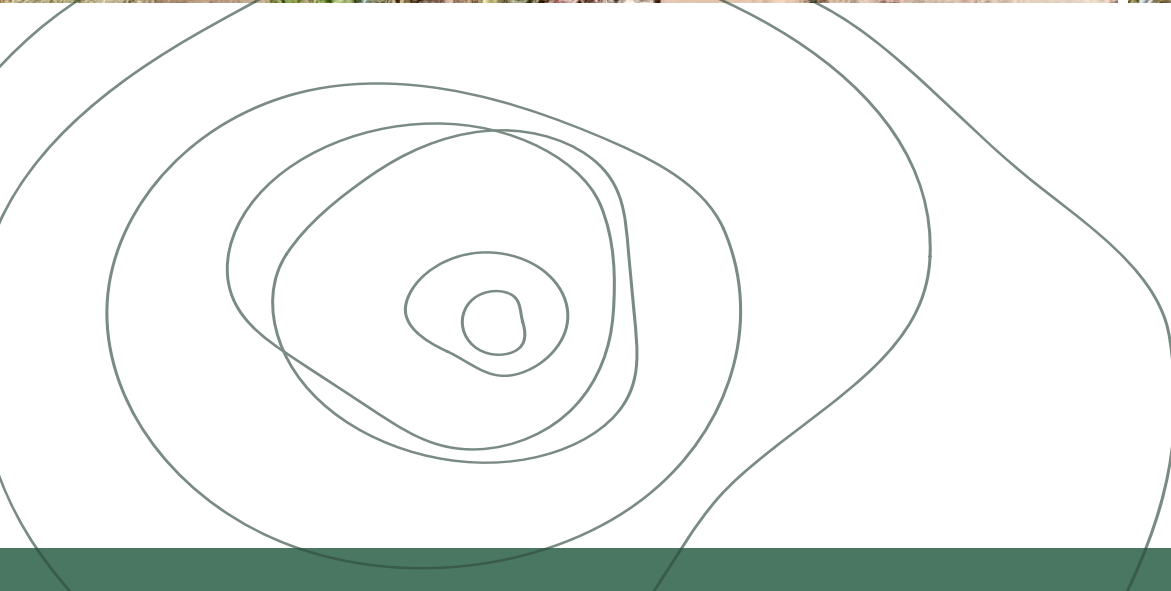
As the team moves to the next level, waste transportation will become a concern. They are exploring electric vehicle (EV) solutions. The teams will continue to refine their composting structures and strengthen their facilities. They aim to deliver hands-on training for students to support existing agricultural programs at school. Their objective is also to expand the team and provide employment opportunities for marginalised youth.

Future plans involve collaborating with municipal bodies to integrate waste segregation and collection facilities at the markets. The team is also embarking on new projects spearheaded by GIZ. One of these involves collaboration with a Crop Innovation Centre, established to promote peer-to-peer learning in Vihiga. The team is preparing to sell their latest batch of manure produced to the Crop Innovation Centre and are innovating with the use of compost in paper production.





Images of food waste and discarded vegetables at Kibuye market in Kisumu, captured by the Kisumu Gigatonne team





# ADVOCATES FOR POLICY CHANGE

## SIAYA GIGATONNE TEAM

### MEET THE SIAYA GIGATONNE TEAM

Siaya County is known for its fertile lands along the shores of Lake Victoria, playing a crucial role in the county's fishing and agriculture sectors. However, the region faces challenges from unpredictable weather patterns, posing difficulties to economic development and stability. This highlights the significance of supporting and uplifting local farming communities.

The Siaya County Youth Network (SCYN) empowers young to tackle agribusiness and environmental challenges through training and advocacy. The Gigatonne team comprises members from all corners of the county, uniting for the first time to merge agribusiness with climate action.



Siaya County Youth Network  
Phone number: 0723 033876  
Contact email: [scyf30@gmail.com](mailto:scyf30@gmail.com)  
Twitter: @YouthNetSiaya  
YouTube: [Siaya County Youth Network](#)  
Facebook: [Siaya County Youth Network](#)

### THE CHALLENGE

After assessing Siaya's primary markets, the team focused their efforts on the Ugunja market, accessible to most team members and generating significant waste volumes. Typically, the waste from this market is incinerated in a field 200 meters away, emitting toxic fumes and odour affecting the local population. Lack of awareness leads to haphazard waste disposal, ultimately impacting nearby water bodies.

### THE TEAM'S PROTOTYPE

The team collected waste from market vendors, supplying them with sacks for safe storage before it reached the burning site. The acquisition of protective gear, with support from GIZ, streamlined waste collection.



STARTED GIGATONNE July 2022

WASTE COLLECTED 1,141 kg

FUEL AVOIDED 0 litres\*

LEVELS COMPLETED L1, L2

EMISSIONS ABATED 36.82 tonnes of CO<sub>2</sub>e

\*as waste is not usually transported to landfill in fuel trucks, baseline fuel emissions are 0 for the Siaya team

Waste being openly burned near homes and public areas



Waste was transported using hand-pulled carts and wheelbarrows to a member's nearby farm for composting.

The team chose to try an anaerobic method for composting. They gathered the waste in a deep pit, sealing it with a polythene cover to maintain an airtight environment. Tithonia, a locally available plant known for fortifying organic compost and improving soil fertility, was incorporated.

The sealed pit is left undisturbed for up to 3 months to ensure complete decomposition, resulting in the production of organic compost. The team distributes their compost to market vendors and farmers at no



cost, demonstrating how food waste transforms into valuable organic compost and emphasising its potential to improve soil quality.

## LESSONS LEARNT

The team's journey increased awareness of emissions science and associated dangers, leading to a significant shift towards more sustainable practices.

Members ceased waste burning at home and began advocating for environmentally responsible alternatives within their community. They gained technical knowledge of compost production, exploring how food waste could effectively supplement their vegetable farms. Coaching support and peer learning provided valuable motivation and opportunities for tangible impact, driving them towards continuous improvement.

*"Participating in Gigatonne has opened additional opportunities in agri-entrepreneurship for my business, especially in environmental conservation. It brings credibility and proof of my involvement in this field, and has supported successful proposals to environmental organisations. It has also helped the development of environmental activities within SCYN "*  
- Samuel, team member

## COMMUNITY ENGAGEMENT

*"Most people were sceptical of what we were doing. There was a negative perception of waste collectors, and people wanted to know what was in it for them. It was demotivating because we were doing it for free to help the community. We built trust by connecting with market workers well known within the area. Working with these local men helped us integrate with the market community."*

- Janet, team member



.....○ Team transporting waste in a hand-pulled cart to the composting site



.....○ Team measuring waste collected from farms and markets before composting in their pit

Market workers volunteered to assist with waste collection. In return, the team cleaned up spoiled waste produce from their farms, which they included in their compost. They also showed the workers how to compost themselves for further emissions-reduction.

## FUTURE PROSPECTS

The team feels they have built a strong foundation and reputation to pursue lasting impact. They will use their advocacy platform to push for commercialising organic compost, and emissions-reducing methods like agroforestry. They'll work closely with market and county officials to expand to other markets and acquire sufficient equipment, and plan to involve the community, including children, for generational impact. They're also dedicated to advocating for county-wide regulations to prohibit open burning.

*"Through Gigatonne, we saw a chance to turn our food waste into valuable compost, completing the production cycle and benefitting the environment. By collecting and transforming food waste, we can demonstrate immediate benefits available within our locality. In the future, we'll expand to serve the community, youth network, and larger organic farming organisations, and generate income from this work."*  
- Solomon, team member



# COMPLETING THE CYCLE

## KAKAMEGA GIGATONNE TEAM

**STARTED GIGATONNE** July 2022

**LEVELS COMPLETED** L1, L2

**WASTE COLLECTED** 9,797 kg

**EMISSIONS ABATED** 11.09 tonnes of CO<sub>2</sub>e

**FUEL AVOIDED** NA

### MEET THE KAKAMEGA GIGATONNE TEAM

In Kakamega County, agriculture sustains most households through crop and livestock production. Despite county government efforts to implement climate adaptation strategies, adaptive capacity remains low, particularly for women and youth. This has led to declining agricultural yields, deepening poverty, and impeding regional economic growth.

To combat this, the Kakamega County Youth Agripreneurs Association (KCYAA), a local agribusiness youth collective, formed a Gigatonne Team. This team seeks to bolster government initiatives at the grassroots level, aiming for a safer, more productive community.



**Kakamega County Youth Agripreneurs Association**

Phone numbers: 0729275442 (Mercy Ochango); 0711342746 (Gabriel Litunya)  
Contact email: [kkyouth2018@gmail.com](mailto:kkyouth2018@gmail.com)  
Website: [kkagripreneurs.org](http://kkagripreneurs.org)  
Facebook: [Kakamega Youth Agripreneurs](https://www.facebook.com/KakamegaYouthAgripreneurs)

### THE CHALLENGE

Operating from the KCYAA innovation centre, located near the main landfill in Rosterman, the team identified waste management as a key intervention area. Residents have voiced worries and protested to have the landfill relocated due to health risks like water contamination, diseases, animal attacks, and broader environmental concerns. Despite these protests, waste disposal continues at the site. Moreover, in the nearby Kakamega market, large amounts of food waste are regularly discarded, leading to unhygienic conditions.

### THE TEAM'S PROTOTYPE

The team collected waste from the Kakamega market in the early mornings, occasionally retrieving it from the nearby landfill. The landfill's accessibility and proximity to their composting site at the KCYAA innovation centre add to the convenience of waste collection from this site. Through experiments, the team discovered that incorporating animal waste, readily available from local farmers, significantly improves the composting process. This approach simplifies the community's adoption of organic compost production. After



Team members assess the Rosterman landfill, which has created immediate challenges for the community

applying this compost to a quarter-acre maize plot, the team observed faster and healthier crop growth.

The team has explored prototypes involving black soldier flies and greenhouse planting methods. Their goal is to utilise slaughterhouse waste to rear black soldier flies for high-quality organic poultry feed. This initiative holds promise for elevating poultry farming standards while also improving conditions in the slaughterhouse.

Team composting waste behind the KCYAA building



Through collaboration with poultry farmers, they are uncovering new opportunities for efficient food waste management.

## LESSONS LEARNT

The team observed how their actions motivated market workers to take their cleaning jobs more seriously upon seeing this young team willingly and collaboratively engaging in the task. The team also learnt to manage team dynamics and stay resilient in the face of setbacks.

Vivian shared an incident, *“While we were in the market collecting food waste, one of our team members had their phone stolen by someone from the community. We ended up losing some of the photos we intended to share with our coach, which was quite frustrating for all of us. However, we didn’t let this discourage us. We encouraged each other to stay motivated and continue working towards our vision. We were able to communicate our challenges and move on with support from our coaches and KCYAA network.”*

As time passes, they notice shifts in mindsets that give them hope. *“Through action and demonstration, we’ve managed to encourage those who were previously idle and staying at home to join us. They are now directing their efforts towards something meaningful and utilising their energy to create value, both for themselves and the larger community.”*

- Joseph, team member



## COMMUNITY BENEFITS

*“The community, especially the women and youth we have talked to, are genuinely impressed with our efforts. Many of them express a strong desire to join us because they see clear opportunities for employment. We often receive inquiries from various levels, including the county government and the Ministry of Agriculture, about when we’ll welcome new members.”*

- Vivian, team member

*“During our waste collection trips to the landfill, we interacted with the women working there, who were unaware that the disposed waste could be repurposed into fertiliser. With this knowledge, they decided to join us. While we collected our waste, they also gathered theirs and took it to their homes for composting and planting. As a result, we’ve observed that many farmers in our community have shifted towards using organic compost instead of conventional methods and synthetic fertilisers.”*

- Mercy, team member

.....o Waste workers at the landfill. As work continues, the team hopes to engage them formally to improve waste management for the community and working conditions for these women

## FUTURE PROSPECTS

The team’s next steps involve conducting tests on their compost for potential commercialisation. They seek support from their youth organisation for marketing. Their plan includes conducting demonstrations and hands-on training to introduce organic compost production to the farming community, with a focus on creating jobs for unemployed youth.

The team has leveraged their Gigatonne activities to participate in national hackathons and innovation challenges related to climate justice responses. Their prototype has been short-listed for an incubation program focused on climate change and waste management responses in Kakamega.

*“As a team, we aim to educate our community on effective food waste management. We envision establishing more centres beyond Kakamega County, collaborating with nearby counties like Siaya, Vihiga, Kisumu, and Bungoma. We believe that by joining hands as youth, we can reduce the harmful emissions that affect weather patterns in our region.”*

- Joseph, team member





Bungoma Gigatonne team at their composting site





# A VISION FOR GENERATIONAL IMPACT

## BUNGOMA GIGATONNE TEAM

**STARTED GIGATONNE** April 2022

**LEVELS COMPLETED** L1, L2, L3

**WASTE COLLECTED** 77,618 kg

**EMISSIONS ABATED** 43.46 tonnes of CO<sub>2</sub>e

**FUEL AVOIDED** 129 litres

**EQUITY** 104 people benefitted  
(78 financially, 26 with food)

### MEET THE BUNGOMA GIGATONNE TEAM

Bungoma County features fertile farmland and receives ample rainfall, vital for irrigation and transport. However, deforestation poses a considerable challenge in the county, harming biodiversity and causing erosion.

The Bungoma County Youth Visionary Network (BCYVN) is an agribusiness group focused on creating jobs while preserving the environment. Operating in various agricultural value chains, they tackle challenges like expensive farm inputs and low productivity. Through Gigatonne, members from BCYVN have initiated the conversion of food waste into high-quality compost to boost crop yields and soil quality, benefitting local farmers.



Bungoma County Youth Visionary Network  
Phone number: 0700651264  
Contact email: [bungomayouth.v@yahoo.com](mailto:bungomayouth.v@yahoo.com)  
Facebook: [Bungoma County Youth Visionary Network](https://www.facebook.com/BungomaCountyYouthVisionaryNetwork)

### THE CHALLENGE

The team investigated waste disposal at two key agricultural hubs: Chwele and Mayanja markets. Chwele vendors generate 20+ tonnes of monthly food waste, while Mayanja produces about 15 tonnes. This surplus accumulates, emitting odour, and is then transported 40 km to Bungoma Town's primary landfill, resulting in high emissions and hazardous market conditions. The presence of similar centres across the county compounds these challenges. Additionally, high costs and low farm productivity are adversely affecting livelihoods and food security in the region.

Team weighing and recording waste before transferring into the compost unit



### THE TEAM'S PROTOTYPE

The team implemented a waste collection system, providing vendors with designated sacks for food waste. Initially, they relied on motorcycles and tuk-tuks for transportation, incurring high costs and emitting additional emissions. With Level 3 funds, they procured a hand-pulled cart and employed a driver.

At first, they collaborated with nearby farmers for composting sites, where farmers utilised the compost for their own crops. The team then partnered with community entities - Matibo Primary School and a local Catholic church - for compost units and community gardens. The compost units were reinforced to handle larger waste volumes and shielded from rainfall. Jobs were created for waste collection, packaging, compost unit construction, and processing.

The compost enriched the soil for vegetable growth and community members were employed for gardening and food production. Tests on demo plots showed this compost had superior effects over inorganic fertilisers, significantly boosting yield and quality of the vegetables.

Some vegetables went to vulnerable community members, while the rest were sold for income.



### FUNDING & EQUITY

The team received \$5,000 for Level 3, utilising \$3,028 to meet their targets and allocating the rest for extended activities and preparing for future goals. The team was responsible for allocating

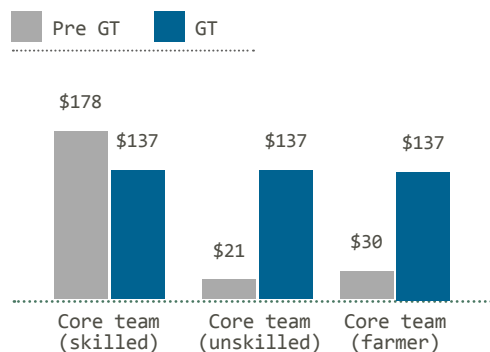
resources and determining payment amounts. These decisions were based on how they would achieve the targets set for the sprints and the types of community members engaged, aiming to promote equitable benefits. Part of the funding was distributed as stipends to both core team members and community members in the bottom 20% socio-economic bracket, providing them with an additional source of income.

The graphs below display a comparison of Full-Time Equivalent (FTE) monthly earnings before and during participation in Gigatonne.

**Graph 1:** The team decided that the Gigatonne team stipends would be distributed equally among all team members, regardless of their status as a student or skilled professional.

**Graph 2:** The graph for beneficiaries shows the positive impact of Gigatonne on the FTE monthly earnings of community members, showcasing an increase from their pre-participation income.

**GRAPH 1 - TEAM MEMBERS: INCOME IN USD PER MONTH AT 100% FTE**



## LESSONS LEARNT

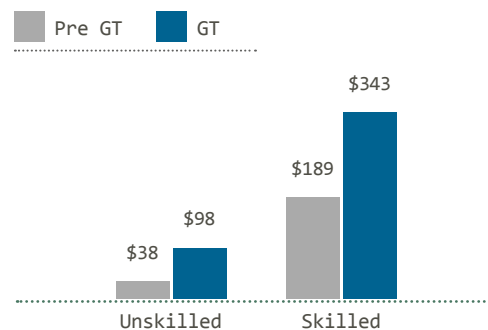
The team came to appreciate the significance of team diversity and unwavering commitment. Team member Julian expressed that the Gigatonne experience helped her build trust and become a strong, respected figure in the community.

As they prepare for the next phase of Gigatonne, they recognise the need to broaden their team's capabilities with additional skills and expertise. *"We need to identify committed team members, not everyone can be part of Gigatonne. We must assess well, so that you don't have team members dropping out".*

- Paul, team member

Faced with challenges such as heavy rains and uneven terrain, the team tested various transportation methods. Moving forward, they realise they will have to tailor their solutions to their unique context, ensuring effective waste management in challenging conditions.

**GRAPH 2 - BENEFICIARIES: INCOME IN USD PER MONTH AT 100% FTE**



Team member Julian conducting a tree-planting and awareness program with students at Matibo Primary School

## FUTURE PROSPECTS

The team is undertaking various initiatives to reinforce their work. They are constructing a secure storage and operation shed to enable the commercial development of compost, while educating local youth on composting and organic fertiliser usage. They are facilitating shifts in lifestyles by distributing spider plant seeds to community members to encourage independent food cultivation and composting.

Gigatonne has brought further opportunities for the team to share their expertise and insights. Paul, a team member and an active BCYVN coordinator, was invited as one of five panellists at an event in Nairobi exploring Green Livelihoods and the Future of Jobs in Kenya. He notes, *"We discussed emissions reduction as a viable space for creating green livelihoods. Among the teams present, ours was one of few that are working on the ground in this field, and from experience"*.

The team is using their Gigatonne training to build capacity in others, and has hired a team to oversee their ongoing sites. They envision building a coalition of at least 5 such teams county-wide to enable significant long-term impact.

## COMMUNITY ENGAGEMENT

The team conducted training and awareness sessions with farmers, youth, and children through their partnerships.

*"We have trained 10 farmers in food waste composting, who have had multiple sessions at our demo sites, and many more are coming to ask for our support. Demand for vegetables grown with our compost is high and we get feedback that it makes a difference that we don't use chemicals - the vegetable quality, taste, and texture are improved."*

- Paul, team member

*"The market vendors were initially not friendly with us. Now, I've noticed they value the cleaner environment we've created. Most have even learnt to separate plastics from food waste, and store the waste for us - a change in their usual practice. Even the county government has expressed appreciation, and if we're absent for a while, they inquire about our whereabouts."*

- Zipporah, team member



# SUSTAINABILITY THROUGH EDUCATION

## KISUMU GIGATONNE TEAM

### MEET THE KISUMU GIGATONNE TEAM

Kisumu Young Agripreneurs (KIYA) is a youth organisation dedicated to promoting agribusiness across all seven sub-counties of Kisumu County. They are based in Kisumu city, Kenya's third-largest city.

Located along Lake Victoria, the region holds untapped agricultural and aquaculture potential, yet faces significant challenges due to market uncertainty and inadequate infrastructure. High urban youth unemployment, inflation, and unpredictable climate patterns further deter youth from pursuing careers in agriculture.



Kisumu Young Agripreneurs

Phone number: 0110455182

Contact email:

[kisumuyoungagripreneurs@gmail.com](mailto:kisumuyoungagripreneurs@gmail.com)

Facebook: [Kisumu Young Agripreneurs](#)

### THE CHALLENGE

Kibuye market, one of East Africa's largest markets, generates approximately 20,000kg of waste weekly, with around 70% being organic or food waste. This waste is transported by municipal trucks to the county landfill near Chiga, 13 km away, resulting in odour, harmful gases, and environmental issues affecting the market's appeal and local commerce. It also leads to toxic runoff during rainfall, impacting water resources, fishing, and increasing waterborne diseases.

### THE TEAM'S PROTOTYPE

The team addressed these challenges by collecting and composting waste discarded at the market. Finding a composting site and using zero-

Team members on a waste collection run at Kibuye market



**STARTED GIGATONNE** April 2022

**WASTE COLLECTED** 96,138 kg

**FUEL AVOIDED** 54 litres

**LEVELS COMPLETED** L1, L2, L3

**EMISSIONS ABATED** 54.46 tonnes of CO<sub>2</sub>e

**EQUITY** 135 people benefitted (105 financially, 30 with food)



Team members collected organic waste from market skips and discard piles, and transported the waste to designated sites for composting

emissions transportation was challenging at first. With support from Gigatonne coaches and peers, they adapted their prototype several times. They started with composting waste at a private property, then established a decentralised model with multiple composting sites and waste collection points, including Ahero market. The team's prototype then involved a partnership with Highway Primary School near Kibuye market to facilitate more efficient waste transportation.

Testing with vermiculture and insect-enhanced composting, the team produced nutrient-rich frass fertiliser and organic poultry and fish feed.

This reduces the need for expensive chicken feed and genetically-modified mealworms. Enocka, a team member, observed, "Testing revealed that black soldier flies consume waste faster than red ones. Red soldier flies can take up to three months to decompose waste, while black soldier fly larvae can consume their body weight in food waste within a week, making the process more efficient".

### FUNDING & EQUITY

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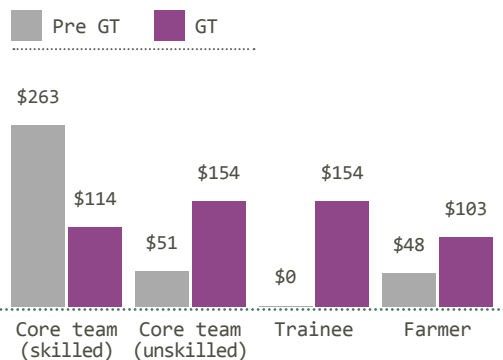
resources and determining payment amounts. These decisions were based on how they would achieve the targets set for the sprints and the types of community members engaged, aiming to promote equitable benefits. Part of the funding was distributed as stipends to both core team members and community members in the bottom 20% socio-economic bracket, providing them with an additional source of income.

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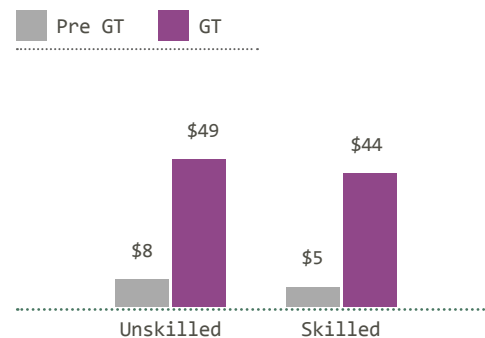
## LESSONS LEARNT

*"Gigatonne taught me patience and flexibility. It's not just about knowledge from books, but wisdom from our culture and other teams' experiences. We faced challenges, but working together, we found a way."*  
- Winnie, team member

*"When we work as a team, people bring different ideas and value in various capacities. This has helped me know the importance of teamwork and learning from each others' strengths."*  
- Roy, team member

*"I learnt to effectively communicate our activities to vegetable vendors, who provided us with waste and sold our compost-grown vegetables. I had to use language they could relate to, highlighting benefits. It was my first time interacting with diverse members of the community."*  
- Enocka, team member

**GRAPH 2 - BENEFICIARIES: INCOME IN USD PER MONTH AT 100% FTE**



Team members using their organic compost for farming

## COMMUNITY ENGAGEMENT

Nick Koyo, team lead of municipal waste collection at Kibuye market, explains the impact Gigatonne had in his life:

*"For years, waste disposal lacked proper planning, leading to haphazard dumping. When the Gigatonne team trained us last year, it sparked a shift in mindset throughout the market. Traders started segregating. Most importantly, Gigatonne was creating jobs for local youth involved in composting. This initiative has raised awareness and equipped us with practical composting skills. Our families have also learnt to separate waste and utilise compost for home farming. Gigatonne has significantly improved our lives, streamlining our tasks and maintaining cleanliness in the area. I hope this model is embraced in every market in Kisumu county."*

## FUTURE PROSPECTS

As they approach the next sprints, the team is leveraging their school partnership to explore future opportunities. Winnie states, "We plan to collaborate with more schools, especially those with agriculture and environmental programs, offering a unique learning perspective through Gigatonne to reduce CO2 emissions and educate young students about environmental issues and practical solutions."

The team envisions this hands-on learning aligning with Kenya's evolving education system, which incorporates agriculture into its competency-based curriculum.

On a policy level, the team members are actively involved in revitalising the 4-K Club, a government agricultural program in schools. Their goal is to emphasise the importance of integrating these skills into primary education in each ward.

Since joining Gigatonne, team members Roy and Enocka have been elected to the government's climate change committee, representing their respective wards. They are dedicated to communicating the impact of their waste transformation work to government officials, emphasising its potential for job creation and advancing climate justice.





Kisumu Gigatonne team aerating their compost



# OVERALL IMPACT & INSIGHTS

## REDUCED EMISSIONS FROM WASTE 160.26 tonnes of CO2e

TEAM	EMISSIONS ABATED (tonnes of CO2e)			TOTAL PER TEAM
	LEVEL 1	LEVEL 2	LEVEL 3	
VIHIGA	1	13.44	-	14.44
SIAYA	1.59	35.23	-	36.82
KAKAMEGA	2.4	8.69	-	11.09
BUNGOMA	2.4	10.23	30.82	43.46
KISUMU	1.17	10.92	42.37	54.46
total	8.56	78.51	73.20	160.26

## TOTAL FOSSIL FUEL AVOIDED 194.25 litres

TEAM	DIST. BETWEEN COLLECTION POINT & LANDFILL	NUMBER OF TRIPS AVOIDED	FUEL AVOIDED (litres) TOTAL PER TEAM
VIHIGA	8.2 km	1.61	10.59
SIAYA	0.25 km	0.49	0.00
KAKAMEGA	-	-	-
BUNGOMA	40 km	5.39	129.28
KISUMU	13.2 km	6.87	54.39
total	61.65 km	14.36	194.25

## TOTAL EQUITY IMPACT THROUGH GT 258 people

livelihoods created - 183  
 food benefits given - 56  
 team members paid - 19

## TOTAL COACHING & TRAINING HRS. (L1 - L3) 70 hours

total coaching hours - 38.5  
 total training hours - 31.5

## TOTAL NO. OF GT TEAM MEMBERS 56 team members

## AVERAGE AGE OF TEAMS 31 years

## COMMUNITY BENEFITS

At Gigatonne, we recognise the complexity of the climate crisis. While vital, emissions reduction is only part of the equation. Without a transition to a low-emissions lifestyle, our global climate strategy risks falling short. It's not just about the environment – it's about people, communities, and fairness. Hence, from Level 3 onwards, all Gigatonne prototypes factor in equity impacts in their design and implementation. These impacts span three areas: livelihood, food security, and energy security.

Over a 3-month period, Level 3 teams in Kisumu and Bungoma impacted 239 families: 183 benefitted from part-time employment, while 56 experienced enhanced food security.

"When my surplus produce started to spoil, I was forced to throw it away, facing losses in my business. Gigatonne has had a positive impact on me and fellow traders. We now earn extra income when the team purchases our excess vegetable waste, and this initiative generates employment within the community. I've gained a new understanding that waste can be transformed into compost, which greatly benefits our farms and the environment"

- Farmer and trader at Kibuye market, Kisumu county

"I am a farmer and I also have a kitchen garden where I grow African leafy vegetables. The Gigatonne team gave me 60 kg of compost to try on my farm, which I used to plant maize. My yield from this harvest increased to 6 bags of maize, where before I only got 3 bags from the same crop. Another benefit I have seen is the organic compost improves water retention and soil fertility in my kitchen garden. This is a huge benefit as water access is low in my ward. I would like to join the team going forward to mitigate climate change".

- Farmer from Ugunja, Siaya county

"I farm African leafy vegetables, which are high in demand and bring significant income. I used to plant spider plants on my farm, but the results were disappointing. The plants only grew to a height of one foot with very few leaves, and couldn't withstand even a brief drought. I was advised by one of the Gigatonne team members, Amos Nyongesa, to use compost made from food waste. The results were very encouraging. I planted 50 grams of spider plant seeds using compost prepared on my farm. From this small amount of seed, I managed to harvest 10 kg from a plot covering 200 square meters. The BCYVN organisation is promoting African leafy vegetables and I sold the seeds to members at KES 1,000 per kg. In just three months, the 200 square meter plot yielded crops worth KES 10,000."

- BCYVN farmer working with the Bungoma Gigatonne team



# FUTURE PROSPECTS

## TRANSFORMING CLIMATE ACTION IN WESTERN KENYA

As the teams continue to innovate and implement sustainable waste management and agricultural practices, they are set to diversify their initiatives. Teams will be exploring new avenues such as harnessing organic waste for clean energy sources like biogas for personal and commercial needs, integrating the use of biochar for soil enrichment and carbon sequestration, integrating electric vehicles (EVs) into their operations, and radically improving food and water security.

Additionally, they will install environmental sensor arrays to capture data, enhancing their monitoring and data-driven decision-making capabilities. This locally collected data will be integrated into a global dashboard.

To succeed, teams are looking to form strategic partnerships with local government, businesses, and community organisations. The county government has already shown interest in organic fertiliser production, and partnering with tree and flower nurseries can enhance the teams' compost product reach. Collaborating with Town Managers and the County

Environment Department facilitates knowledge transfer and infrastructure development, improving waste segregation. Additionally, as Gigatonne teams expand and diversify, they will create new job opportunities for the youth in their counties.

Gigatonne is eager to develop partnerships to establish a Hub in Western Kenya that can support up to 35 Gigatonne teams. New teams are seeded with grants, and further scale and diversify their impact via the sales of a premium carbon credit, known as a 'Super Credit'. These 'Super Credits' are generated through the Gigatonne Open Monitoring Platform, providing radical transparency at various levels, including financial transparency.

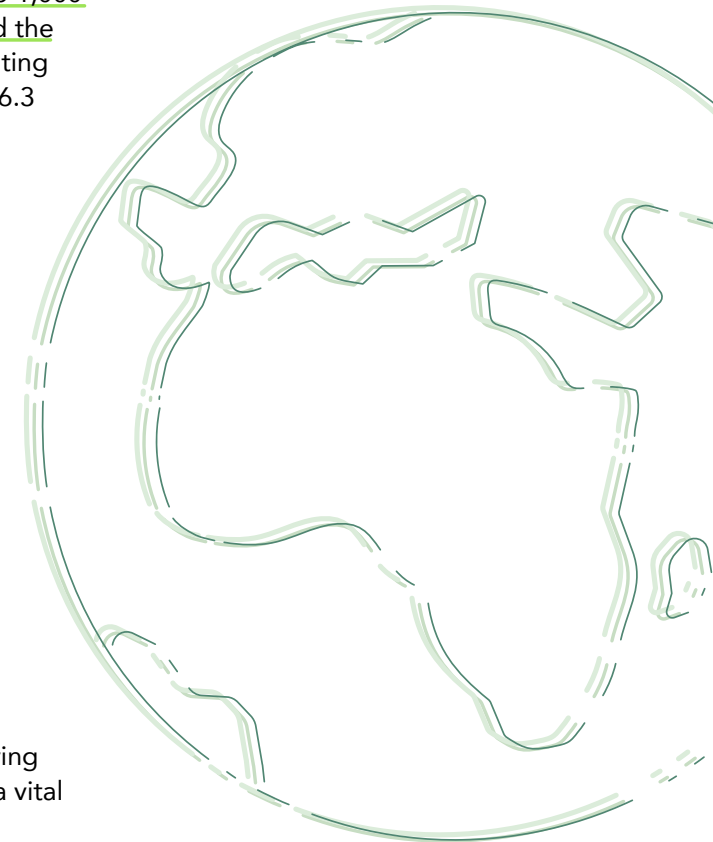
## GIGATONNE GLOBAL SCALE

Gigatonne is establishing a Global Coalition setting up Gigatonne Hubs in Africa, the Middle East, Asia and Latin America.

The 60-month goal is to stand-up 1,000 teams in climate hotspots around the world. These 1,000 teams, operating at a variety of levels, will abate 46.3 million tonne CO<sub>2</sub>e per year, while benefitting 38.6 million families in the bottom 20% of the socio-economic level, and employing 4.8 million people.

The ambition is to catalyse \$200B per year in climate finance for the Global South via the voluntary carbon markets.

Gigatonne-scale reductions are not possible without the extensive investment of human and social capital from multiple stakeholders. This means that the engagement and power-sharing arrangements of Gigatonne are a vital component for ensuring success.



# ANNEX MORE INFORMATION ON TEAMS

## VIYAN VIHIGA COUNTY

TEAM MEMBER	PROFESSION
Henry Avikoshe	farmer
Damaris Ayieta	farmer
Andrew Lodenyo	business person
Mary Waswa	accountant
Benjamin Adiga	farmer
Dianey Mugalizi	farmer
Henry Munala	teacher
Leah Shamala	statistician
Benard Juma	extension officer
Collins Otieno	farmer
Dianah Aleyo	farmer
Victor Osanya	technician
Charles Kadenge	farmer
Jacktone Ambole	GT team member

## SCYN SIAYA COUNTY

TEAM MEMBER	PROFESSION
Nichodemus Ondiki	organisation president
Nelson Owino	agri service provider
Beryl Omondi	agri service provider
Samuel Odhiambo	farmer
Janet Atieno	agri service provider
Trezzer Omoro	Gigatonne team member
Beatrice Oduor	community mobiliser
Jesse Otieno	agri service provider
Erick Okoth	agri service provider
Fredrick Apiyo	agri service provider
Rodgers Ochieng Oyola	agri service provider

## KCYAA KAKAMEGA COUNTY

TEAM MEMBER	PROFESSION
Vivian Nabwera	media & communications
Moilah Lidala	human resources
Leroy Shava	information technology
Joseph Mukofu Isohe	teaching
Gabriel Litunya	agriprenuer
Joyrose Mwati Ochango	secretary
Mercy Ochango	agribusiness manager
Simon Wasakania Orata	electrician
Phaustus Itemele	sales & marketing

## BCYVN BUNGOMA COUNTY

TEAM MEMBER	PROFESSION
Julian Simiyu	company secretary
Paul Mutambo	project coordinator
Lilian Nyongesa	value chain secretary
Hesbon Chongeywo	accountant
Cylus Kiprotich	M&E officer
Annastancia Machabe	aggregation manager
Zipporah Wamasebu	company treasurer
Vanice Simiyu	agribusiness
Simon Tindi	agribusiness
Amos Nyongesa	agribusiness
Lamech Walela	agribusiness

## KIYA KISUMU COUNTY

TEAM MEMBER	PROFESSION
Enocka Odongo	team leader
Winnie Owiti	chair person
Samuel Otieno	student
Fredrick Ayim	farmer
Don Odhiambo	secretary
Sonia Ndolo	treasurer
Roy Odawa	agriprenuer
Steven Otieno Onyango	general manager
Evans Osewe	extension officer
Evans Odhiambo	director
Mercy Ombogo	teacher and farmer



# CONTACT

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## CONTACT FOR GIZ

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## CONTACT FOR GIGATONNE

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