



Mwamko Mpya

A NEW DAWN

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The journey of our seed began here

The decarbonization of the transport sector is a key challenge worldwide, as it contributes to about one quarter of all energy-related greenhouse gas emissions. Today, cars, trucks, as well as planes and ships, remain highly dependent on oil. However, as Eni, we are certain that a new path is possible to reduce emissions in the transports and we are already walking that path, leveraging innovative solutions like here in Kenya.

We have been present in Kenya for over 10 years. We chose to build here a distinctive business model for agri-feedstock initiatives to produce vegetable oil from oil crops as well as agriculture, forestry and agro-industrial residues such as castor or croton seeds - to be then transformed into biofuels.

Our model significant, positive impact on local communities. Agricultural production is fully entrusted to both small farmers and larger agribusinesses groups, while Eni builds and manages industrial processing plants for the vegetable oil extraction, thus promoting the market for the oil seeds crops.

To date, here in Kenya we are collaborating with about 90,000 farmers in 11 counties, in arid and degraded lands, identified by with local authorities, creating new business opportunities and supporting agricultural development. Moreover, we are contributing to employment through the processing facilities network; around 400 local professionals are already working in our plants in Makueni and Kwale, and these figures will increase.

The entire initiative is designed to be in line with the principles of circular economy. Indeed, the facilities do not only produce vegetable oil, but also give new value to the processing by-products

that, according to their characteristic, can be transformed into animal feed for livestock or fertilizers for the local markets.

From a social point of view, the overall agri-feedstock initiative that Eni is carrying out worldwide will have a positive impact on more than 700,000 families of farmers by 2027 and 1 million by 2030, contributing to food security with the production of 1 million tons of animal feed and fertilizers by 2027 and much more in the following years.

Starting from a seed, we have created a more sustainable model aiming at decarbonizing the transport sector, in a pioneering journey that would not have been possible without our partners: the Government of Kenya and the Counties' Governorate; the farmers and the local aggregators; the major institutions like Kenya Agricultural and Livestock Research Organization (KALRO) and the international organizations, such as the International Labour Organization (ILO) and the International Finance Corporation (IFC).

This photobook intends to celebrate this partnering adventure, focusing on the people behind it, telling their stories, highlighting their expertise, and entrepreneurial spirit. As the saying goes, Kenya is the cradle of humankind. The journey of our seed began here, and now is expanding, integrating other countries into the biofuels value chain.

I hope you will enjoy the reading as much as we enjoyed crafting it together with the Kenyan people.

Claudio Descalzi
CEO, Eni







From oilseeds to bio-refineries

Eni chose Kenya to develop its first agri-hub project, which has since become a blueprint for new developments in other African countries, from the Republic of Congo to Côte d'Ivoire, from Mozambique to Angola. With this project, Eni is creating new opportunities for farmers, sharing technical expertise and working hand in hand with cooperatives and aggregators in the countries involved.

The hum is as soft as the shuffle of red earth-dusted shoes. From above, the agri-hub resembles a Tetris puzzle of warehouses and sophisticated machinery. The rooftops look like tiny patches of green in a semi-arid landscape. This is Wote, Makueni County, where white sacks of castor, croton, bought from local farmers by the Italian energy company Eni, arrive. The seeds are destined to be processed into vegetable oil and sent by sea to a bio-refinery in Italy. We move on to Bonje, Kwale County. The second agri-hub is just as dynamic and gives farmers access to the market. It is a place that is creating many job opportunities. Makueni, Kitui, Kilifi, Kwale, Taita Taveta, Nakuru, Baringo, Embu, Meru, Machakos and Lamu: these eleven counties are the main characters of the book you



are about to read. As you do, the list continues to grow. Eni's agri-feedstock initiatives, in collaboration with the Government of Kenya, aims to combine new market opportunities with the rehabilitation of degraded land.

NEW CROPS, NEW ENERGY

Eni is a global energy company: it operates in 61 countries worldwide. It has been present in Africa since the 1950s and in Kenya for more than 10 years. The core aim of this agro-energy project is to promote the growth of biofuel crops – including castor, croton, in Arid and Semi-Arid Lands (ASALs), as such identified by local policies, where 35 per cent of Kenya's population live.

“With 80 per cent of the country's land classified as arid, this move will significantly increase the country's agricultural production”, says Kello Harsama, Principal Secretary, State Department for the ASALs and Regional Development at the Ministry of East African Community (EAC), the ASALs & Regional Development. Eni has built a seed collection and pressing plant in Makueni County, the company's first agri-hub in the country and in the entire African continent, with a production capacity of 15,000 tonnes per year. “To expand this programme, a second agri-hub at Bonje, near Mombasa, was launched in August 2023, with more planned in the years ahead, with the aim of producing 200,000 tonnes by 2026. We estimate that over 400,000 farmers will be involved in the project”, says Guido Brusco, Eni's Chief Operating Officer for Natural Resources. The oil pressed at the agri-hub is processed and then shipped to Eni's bio-refinery in Gela, Italy, which will transform it into biofuels, a key element to contribute to the progressive decarbonization. The first cargo of vegetable oil for bio-refining produced by Eni in Kenya left the port of Mombasa at the beginning of October 2022. That truly marked the start of a new era for farmers.

The expansion to more counties will have a significant impact on the lives of these communities, creating economic opportunities and improving overall agricultural productivity. “To achieve this goal, the initiative includes the provision of technical support and training to farmers on good agricultural practices, such as intercropping and soil conservation practices”, Harsama said. The agri-hubs will also work as training and technical support hubs. Feed and fertilisers, derived from the by-products of agri-feedstock processing, are also produced here, and can be utilized to increase livestock and food production. “The initiative will transform the livelihoods of these communities by providing a reliable



source of income and improving the economic conditions of the ASAL areas. With this project, the government seeks to create economic opportunities for the local communities in the ASAL regions while increasing the country's overall agricultural production", says Laban Kiplagat, Chief Engineer at the Ministry of Agriculture and Livestock Development.

During the hot season, these areas, which are considered marginal due to phenomena such as desertification, erosion, drought and pollution, are transformed into vast green expanses. "I received 8 kilos of castor seeds and started planting them on this farm. The harvest was good since the castor is highly resistant to drought; thanks to this cultivation we can now have revenues all along the year, covering the gap we previously had during the dry season and paying the school fees for our children ." says Gregory, a farmer from Naivasha. "I am grateful for being able to grow castor seeds," says Mary, "because it allows us to save water and at the same time it makes our farm look more beautiful. Participation in this project has unexpectedly provided Gregory, Mary and many others with an additional income in the long run and the opportunity of regenerating land.

TOWARDS THE JUST TRANSITION

Eni is taking concrete steps to support a just transition that creates long-term value and allows everyone to access a reliable and a more sustainable energy. "We have set the goal of achieving carbon neutrality by 2050. These targets match Kenya's target to reduce greenhouse gas (GHG) emissions by 32% by 2030 and to develop biofuel production in the country. In this context, we are developing innovative activities in the country to reach these goals", says Brusco. Currently, Eni Kenya's activities focus on integrated circular economy projects, based on the Memorandum of Understanding signed by Eni and the Government of Kenya in 2021 to promote the decarbonization process to tackle climate change through new industrial models of fully-integrated circular economy along the whole bio-fuel value chain.

ENERGY FROM THE EARTH

These circular economy projects are multifaceted. They include agricultural development, in particular agro-energy, and waste and residue collection. In the long term, the aim will be to produce biodiesel (i.e. Hydrotreated Vegetable Oil, HVO) biofuels for road transport.







“The first important aspect is that we create a market in the country and that we guarantee this market in the long term, so that we guarantee a long-term income to farmers”, says Luigi Ciarrocchi, CCUS, Forestry and Agri-Feedstock Director at Eni.

STAKEHOLDERS AT HEART

Eni, an integrated energy company today produces energy, meaning biofuels, also from the land, and it has chosen Kenya to build this model from scratch. “At Eni, we are investing a lot in Kenya with a portfolio of projects. It is among the most developed economies in the continent, with a positive business environment and a leadership with a clear vision. The country has set ambitious goals towards energy transition that match Eni’s goals”, says Brusco. Just consider that 85% of electricity in Kenya comes from renewable sources: photovoltaic, wind, biomass, geothermal, hydro, wind and solar. Kenya’s innovative ecosystem fits perfectly with Eni’s business approach. Two years ago there were nine people working in Eni Kenya’s offices. Today, 430 people are employed at the Nairobi head office and in the two plants”, 95% of whom are local workers. The numbers are growing.

TO MAKE OIL, YOU NEED SEEDS: THE THREE PILLARS

These agri-feedstock initiatives are concrete examples of the shift towards a more sustainable energy and a circular economy. Enrico Tavolini, Managing Director of Eni Kenya, explains: “Vegetable oil comes from industrial waste to agricultural products” Eni, with respect to the EU legislation and ISCC criteria, guarantees that crops do not come from cultivated areas obtained from the conversion of areas characterized by a high carbon content, such as wetlands and forests. They use crops such as castor beans, which can withstand drought, croton nuts, which grow naturally in Kenya and Tanzania which is processed industrially to extract oil. They also use peanut and macadamia nut waste, not suitable for human consumption or gone bad. Eni buys it and squeezes out every drop. Nothing is wasted. Even the by-products, such as the solid part of the waste, are used either as fertiliser or animal feed and sold on the local market.

“Our approach is to support all farmers,” says Ciarrocchi. “The 90,000 small farmers involved in these two years have joined our project through aggregators cooperatives that bring together tens of thousands of farmers.” And what is Eni doing? “We provide support for land preparation and seeds for planting. This makes the projects more sustainable”.

Here’s the second pillar: market access. These initiatives aim to contribute to land regeneration, providing farmers with access to market, additional incomes and training for the adoption of good agricultural practices. “The farmers own the land used for these projects, which have also been recognised by the Ministry of Agriculture and Livestock Development as a potential way to strengthen the food chain. With increased income, farmers can also consider investing in other projects,” adds Tavolini. Another initiative in the pipeline focuses on the use of improved seeds, which have a significantly higher yield than the local castor bean variety. “This allows the project to be more effective and gives farmers the opportunity to get more revenue, because this new variety of seeds have a better yield”, Ciarrocchi explains.

The third pillar is the sustainability certification, required by the European directives for biofuels. All agri-feedstock developed by Eni complies with the ISCC (International Sustainability and Carbon Certification) principles. The ISCC certification, a guarantee of sustainability, according to the criteria set out by the certification scheme itself, is renewed periodically to certify





that agricultural supply chains and products meet six sustainability principles: protection of biodiversity and carbon rich areas, good agricultural practices, safe working conditions, compliance with human rights and land rights, compliance with law and International treaties, good management practices and continuous improvement.

INSIDE THE AGRI-HUB

The agri-hub is a facility where the seeds are pressed. It has separate lines for different types of feedstocks which requires a different treatment - it needs to be cleaned and stripped of its outer layers. The production area is divided into three units: a pre-cleaning area, an oil extraction area and a filtration unit. Trucks loaded with seeds arrive at the reception area. Inside the plant, a set of machines that rotate and vibrate separate the seeds from impurities and prepare them for oil extraction. They are then sent for mechanical extraction, which produces the oil and a coarser residue called "seed cake". After filtration, the oil is stored in stainless steel tanks and then loaded onto tankers for transport to the port of Mombasa. At the port oil storage terminal, steel tanks stand next to warehouses with roofs as blue as the surrounding sea.

A CIRCULAR APPROACH

Eni Kenya is addressing the critical issue of used cooking oil (UCO) disposal in Kenya through a comprehensive and innovative program. The program is designed to contribute to a circular economy, with the aim to tackle environmental and health concerns, and align with the Sustainable Development Goals (SDGs). "The program has established a network of 400+ points of origin (POOs) across major cities in Kenya, including Nairobi, Eldoret, Nakuru, Kisumu, and Mombasa" Tavolini explains.

This network ensures a reliable supply of UCO and reduces the risk of environmental contamination. Eni Kenya's efforts extend beyond mere collection to encompass education and awareness campaigns. The company works with local businesses to provide them with the knowledge and tools they need to properly dispose of UCO. This approach fosters a culture of a more responsible waste management and contributes to safeguard public health. To transport the collected UCO to its biorefineries in Italy, Eni Kenya employs a multimodal logistics system that combines trucks, rail, and ships. This efficient and conscious approach reduces the program's carbon footprint. Eni Kenya's UCO collection program is a model for more sustainable waste management practices in developing countries. The program demonstrates the viability and effectiveness of such initiatives, and it is inspiring others to embrace an increased sustainability and leave a legacy of environmental stewardship.



TAKE OFF

Kenya's national carrier, Kenya Airways (KQ), became the first African airline to use SAF (Sustainable Aviation Fuel) provided by Eni for a long-haul flight during the second edition of the Sustainable Flight Challenge (TSFC), an initiative of SkyTeam.

The Boeing 787-800 (B787-8) Dreamliner, that took off on 25th May 2023 from Nairobi's Jomo Kenyatta International Airport to Amsterdam Schiphol, was the first Kenya Airways flight powered also by Eni's Sustainable Aviation Fuel. For that flight, JetA1 fuel was mixed with Eni Biojet, produced in the Eni's Livorno refinery by distilling the bio-components produced from the Gela biorefinery. This initiative is likely to inspire other African airlines to explore the incorporation of SAF into their operations, further accelerating the transition towards a more sustainable aviation industry on the continent. Indeed, it was the first time that this type of biofuel was used in East Africa, paving the way in the coming years for a contribution to the decarbonization of aviation also in this part of the world.

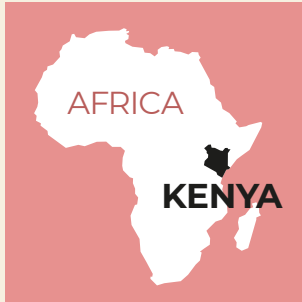
THE BUSINESS AND SOCIAL PROJECTS

Wherever Eni operates, it gives back to the community, adopting an approach that tends to create strong bonds with the local populations. Recently, Eni provided the community of Kwa Kathoka in Wote with a new water borehole.

The borehole has a production capacity of 5,000 litres per hour and provides clean water to approximately 3,000 people in Kambi Mawe sub-location.

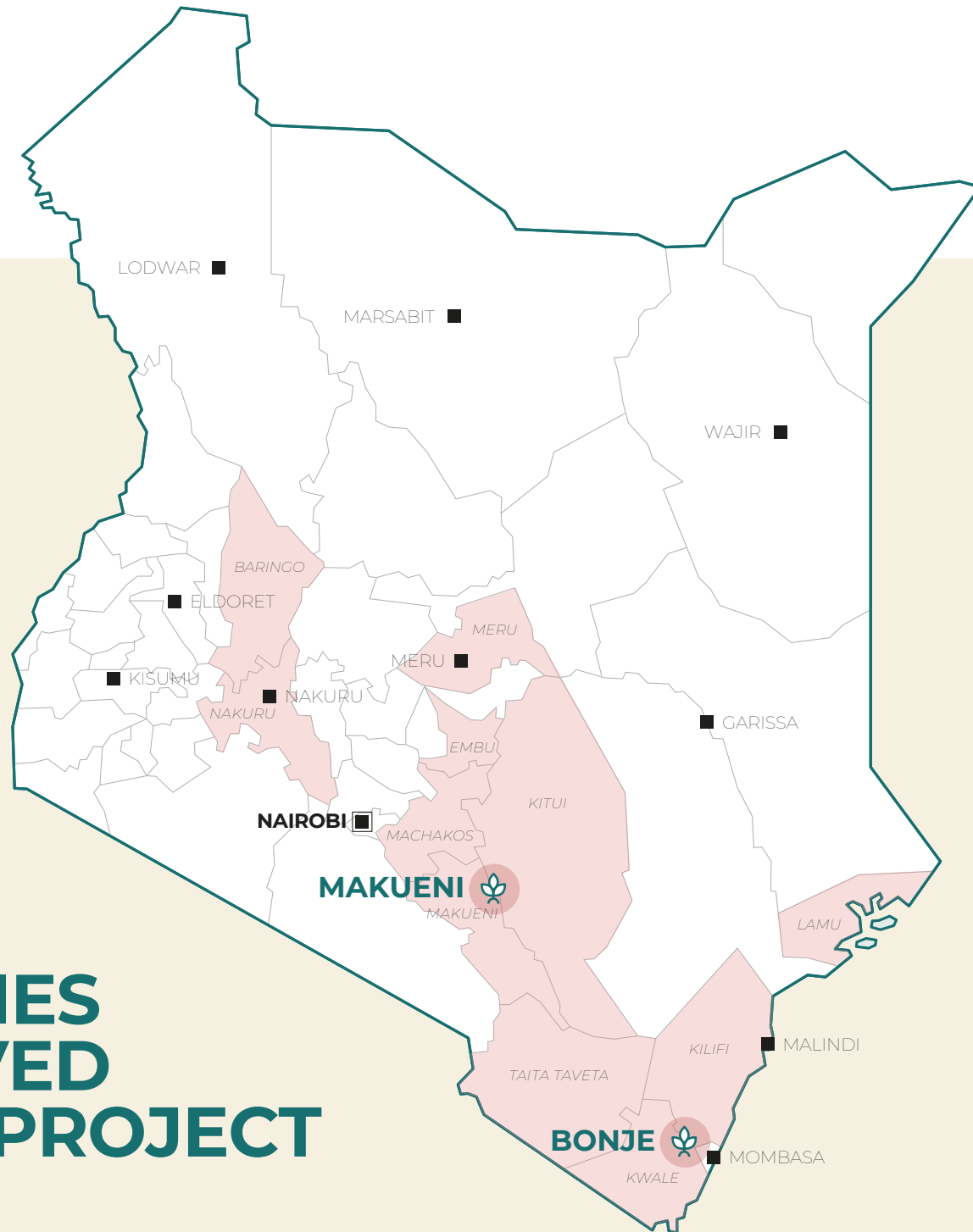
Moreover, the Government of Makueni County installed an inter-connecting pipeline to the Kambi Mawe Dispensary and the Kambi Mawe Primary School, adding to the list of beneficiaries.

There are also feasibility studies to develop new projects, such as one related to the production of gas, in whole or in part from biofeedstocks, from dumpsites. "We have established good relationships with local authorities and institutions and seize every opportunity to develop new business," Tavolini concludes. ■



Eni's agri-business project involves eleven Kenyan counties and the list continues to grow. The company's first agri-hub, located in Makueni County, is the first one in the entire African continent.

COUNTIES INVOLVED IN THE PROJECT



A SUSTAINABLE SUPPLY CHAIN

AGRICULTURAL PRODUCTION

 SMALL-SCALE FARMERS

 FARMING COOPERATIVES

 FARMING COMPANIES


 LARGE-SCALE FARMERS /AGRIBUSINESS

OIL EXTRACTION

HUBS FOR COLLECTING AND PROCESSING SEEDS

 OIL SEEDS
SUPPLY AGREEMENTS

MILLS/AGRI-HUBS

 VEGETABLE OILS

MARKET



BIO FEEDSTOCK

ENI BIOREFINERY EXPORTS



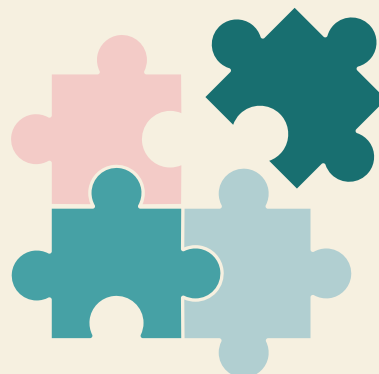
FOOD FOR ANIMALS AND BIOFERTILISERS

LOCAL MARKET AND EXPORTS

High **employment impact** and **creation of socio-economic development opportunities**

Promotion of **agricultural development** and market access for farmers, through a model known by farmers

Respect for **human rights**, food security and access to land



High **security and continuity** in the supply of more sustainable organic raw materials (low ILUC)

De-risking the price of biofeedstock in comparison to market purchase





The voice of the protagonists

The various phases of the project will be disclosed in the next pages. Every single step, from agricultural to industrial processes, from the importance of building relationships to the centrality of technology innovation, will be told through the stories of those who contributed to making it happen



Engaging people



The agri-hub



Agriculture



The aggregator



Castor grower



Farming in degraded land



Technology



Livestock Research





RACHEL NYAMBURA WANJOHI
SUSTAINABILITY AND EXTERNAL RELATIONS
OFFICER AT ENI KENYA B.V.

This is the future

The Makueni plant
catalysed farmers'
confidence. Here's why

Rachel has the serene, determined look of someone who knows where she wants to go and how to get there. She is at ease while talking to institutions, in her elegant silver dresses, and to farmers, in her Eni-branded yellow overalls. It comes with the job, they say. Her work is focused on external relations and increased sustainability, areas that combine her two academic fields of study: a bachelor's degree in Developmental Science and a master's degree in Psychology. "I do what I love," she declares without hesitation. "I work with communities, participate at institutional tables to figure out how best

to implement projects for our country, and make people happy through these initiatives. Nothing better than that, right?" The work conducted by her team is crucial because it helps engage farmers, the custodians and recipients of Eni's project. Engaging people is a challenge because it requires a relationship of trust to be established. Without this, you can't get anywhere. The farmers didn't trust us at first, they were skeptical but open to hearing about the initiative. Rachel explains pragmatically. "Other companies in the past had tried to develop agricultural projects without considering the key aspect: market access. Initially, when we went to talk to them, they would emphasize this element. They said they had tried to plant everything the companies proposed, but then failed to sell the products. This was our stakeholders' great dilemma, to which we responded with facts. Specifically, with the construction of the first agri-hub in Makueni. When you see a large-scale industrial plant in a depressed area, built in record time, you realise that the company in question is investing and has a long-term plan. It is tangible proof that that company is there to stay and operate in a robust, concrete manner. The Makueni plant succeeded in this respect: it catalysed







farmers' confidence." The agri-hub can even be seen from miles away. It emerges with a roof in shades of green, nestled in a semi-arid landscape, especially during the dry season. It plays a central role. It produces vegetable oil, giving market access to farmers. It is the intermediate point, the actual place of interchange where the agricultural product comes to be processed, i.e. the castor, croton purchased by Eni. Moreover, new jobs are created here. "Several businesses have sprung up around the facility," explains Rachel. "Satellite activities have sprung up, including firms that have participated in construction work, for example, as well as catering firms that provide the company cafeteria. This is in addition to the direct workers, who total about 140, in a place where these numbers make a difference."

Not only work, but also services. In July, Eni opened its first community water well near the agri-hub. Rachel was there on the day of the celebration, and her confident voice betrays emotion. "It was a valuable experience. The community was all gathered

around the well, along with colleagues and institutional partners from Makueni County. The excitement was palpable because water had finally arrived in the area. Previously, women had to walk many miles to collect water; this is no longer the case. Everyone was holding containers to fetch water. They talked about how the well would benefit schools, as well as hospitals. As a token of appreciation, locals also gave new names to some of the colleagues present, Eni Kenya Managing Director Enrico Tavolini and Project Manager Andrea Saccarello. For me, this was the culmination of the whole experience: we initially started out hesitant and ended up being baptised by the same community with local names, like people from there." "This is the future I envision for my nation," Rachel concludes. "To be one people, one person." To invest in agriculture, the leading sector of our economy, and in the energy sector, with a visionary outlook, with courage, and of course with a perfect mix of technologies and innovative ideas in order to cut CO₂ emissions." ■



eni

50kg
When Packed
BATCH NO
MFD



FARIN



EVANS ODHIAMBO

PLANT MANAGER, MAKUENI AGRI-HUB

Squeeze, harvest, store

How an agricultural
project becomes an
industrial project

He has the self-assured stride of someone who holds the keys to every single gear. The second of four siblings, Evans was born in Homa Bay County, Western Kenya, 29 years ago. Passionate about politics during high school, he gradually developed an interest in chemistry that led to a degree in Industrial Chemistry from the Jomo Kenyatta University of Agriculture and Technology (JKUAT). Following a master's degree in Business and Strategic Management from Jomo Kenyatta University (JKUAT), Evans started work at the Mill Company, a milling business where he soon became plant manager. In April 2022,

he was hired by Eni as deputy plant manager. “Today,” he says with glowing eyes, “I am plant manager of the first agri-hub in Africa. And I am very proud of it.” Evans imagines a future generation that can live in a zero-emission country: “I would like to thank Eni for being a pioneer in this decarbonisation project.” In the grand scheme of low carbon, Evans is assigned the task of overseeing daily operations in the plant. “I manage all the resources to ensure that we achieve our production objective, fully complying with safety requirements that are key for all of us and for the company.” As he speaks, behind him a line of trucks that have just arrived in Wote unload huge bags of jute. The plant receives the seeds, processes them and obtains the final product. “A simple process,” he quips. “When we receive seeds from our suppliers or aggregators in cooperation with the Eni’s Department of Agriculture,” he explains, “we first ascertain their exact weight and check their quality.” There are three parameters to check: impurity level, oil content and moisture content, “a key factor that affects most aspects of our business.” After the quality check, the production process begins, organised in various stages: pre-cleaning, mechanical extraction, filtering and storage of the oil.









“Pre-cleaning,” Evans explains, “basically serves to remove unwanted impurities. Next, the seeds undergo mechanical pressing in which they are pressed to obtain raw oil and a by-product we call cake.” The raw oil is then filtered and directed to internal storage before being sent to the port storage terminal in Mombasa. The cake is cooled and packaged: “we sell it as animal feed or organic fertiliser, depending on the type of seed processed at the time.” The plant has a total of 140 employees, including contractors employed on site. A third of the workforce is made up of women, “a fact we are really proud of, and we will strive to ensure that this number soon rises to half of the total.” The watchword is total safety: “an indispensable element for achieving our goals that overrides all the activities we carry out within the plant.” Evans does not regard safety as a set of rules to comply with, but as “a value that comes from within us”. From daily Toolbox Talks to daily inspections and a monthly training program: all these activities are designed to promote a culture of safety within the plant. Moreover, “we have also established an award that is given to the best safety ambassador of the month with a special ceremony. Each individual is the leader of their own safety in the workplace.” ■





EMMANUEL KITHEKA
AGRICULTURE DEVELOPMENT
ASSISTANT

Once upon a time

Ensuring that
the agri-hub is running
and having a positive
impact on farms

His shyness before the camera lends a gentle touch to his stubborn character. 30-year-old Emmanuel recently became a father for the second time and has just returned from a period of parental leave. The youngest of five siblings, as a child he dreamed of being a veterinarian. “As children, our dad often used to take us to see livestock,” he recounts, “and I used to fancy the idea of taking care of animals.” Emmanuel eventually decided to devote himself to agriculture: he obtained a bachelor’s degree in Agribusiness Management and a master’s degree in Agribusiness Development from Egerton

University, Kenya's oldest university. Since June 2022 he has been working at Eni as an Agriculture Development Assistant. "I'm still in the field of agriculture, not so far from what I wanted as a child. I never thought I'd get where I am now. It has been a journey for me and I'm really happy to have come this far." Before joining Eni, Emmanuel worked on a farm in Laikipia County. He developed a passion for *Croton Megalocarpus*, which is used to obtain oil for cosmetics, leather tanning, etc. "I used to work in oilseeds, but not oil pressing; it was a totally different thing," he recounts. "When I learned that the seeds can also be used for decarbonisation purposes, I was very impressed: especially since they are readily available seeds that can be easily adopted by farmers." Using readily available feedstock to implement a major change in terms of decarbonization was an idea that Emmanuel considered "an unthought-of breakthrough". Emmanuel's day consists of a series of meticulous exercises. "First, we have to make sure that the agri-hub is operational because our task is to ensure the availability of a sufficient quantity of seeds, from croton to castor". Emmanuel and his team must then ensure that scheduled deliveries are met.









“Since the hub is expanding,” he says, “we must always be responsive in terms of procurement, broadening our supplier base so that we always have feedstock available.” Involving all stakeholders is a necessary exercise to present the idea and share the project; assistance must be provided on an agronomic level. “I think my typical day can be summed up as follows: ensuring that the agri-hub is running and having a positive impact on farms.” Local communities receive practical help, an aspect that makes this young, experienced agronomist proud. “Thanks to this project,” he says, “farmers have an additional income with which they purchase food, pay school fees, and use their land, while contributing to the decarbonisation of mobility. Being part of this project therefore means having an opportunity to change the world, without any grand gestures, but simply by supporting our farmers. ■





BENJAMIN MWAKE MUENDO
MANAGER OF KITISE RURAL DEVELOPMENT
COOPERATIVE SOCIETY

Transforming lives

How to involve
thousands of farmers'
families in a virtuous
project

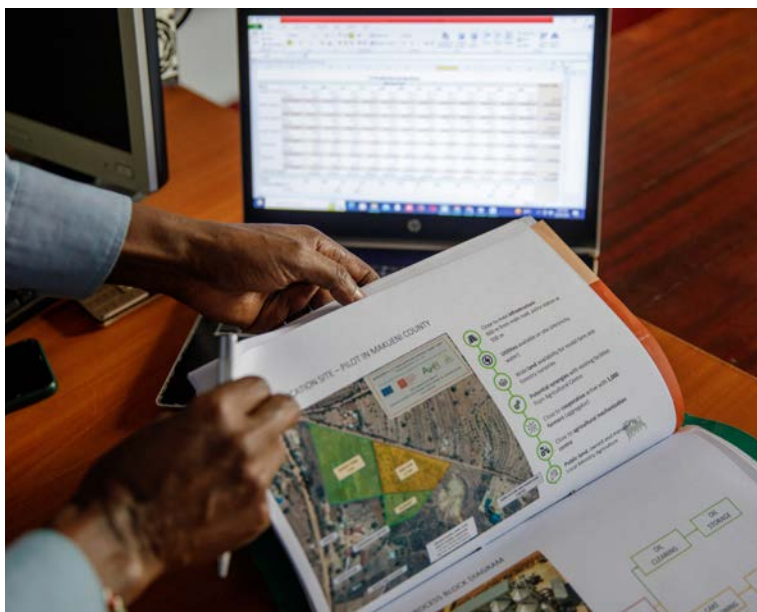
Benjamin's smile is what immediately sticks out. A genuine smile, with no pretence. Benjamin welcomes us to the outdoor courtyard of his cooperative, with a joke that immediately elicits a collective laugh. A turtleneck as red as his land, worn under a dark blazer, slims his figure as he leads the way inside a small brick building. We leave behind the dazzling light of a muggy afternoon, sucked into the half-light of a meeting room with the bare essentials. A co-worker arrives and offers each of us the yoghurt that is produced here: it is very sweet. Benjamin invites us to join in prayer.

Then he declares: “My name is Benjamin Muendo. I’m the manager of Kitise Rural Development, a cooperative founded in 2014: we work exclusively with farmers. We develop the milk and fodder value chain, as well as the Indian green bean and – more recently – castor beans. For Eni, we have acted as an aggregator for a year. We pioneered this project.” Benjamin has a background in finance and banking. He worked for a long time in microfinance institutions, including in the oil sector, before joining Kitise. “As a child I had a big dream,” he says. “I wanted to become a businessman. I enjoyed selling small items at school. My father worked in tourism and visitors would often leave behind curious objects, crayons and batteries, and I would sell them. Then I received a camera and started taking photos, but that’s another story.” His dream has partly come true: today Benjamin does business to enrich farmers. Three years ago, he started working as an aggregator: “I work with the community,” he says. “I transform lives.” This cooperative is owned by its members: “It gives me great joy,” he adds, standing up, “to help people seize opportunities to develop, earn, and grow, including on a personal level, so that they can bring food to the





table.” Initially, the cooperative operated as an NGO. Today, however, it has become a business: it aggregates farmers’ products and sells them. “Here we produce “Mala” i.e., fermented milk, and yoghurt, both vanilla and strawberry. This is the source of income with which we finance our activities. It all revolves around farmers’ needs. If we identify a project worth investing in, we put the farmers in touch with the project stakeholders. The farmers, with our support, examine all available options and choose the best.” What part of this project did the farmers like? “For the first time their fields were cultivated and healthy. They received support in preparing the fields. Payments are prompt: farmers are paid the day after they deliver the seeds to us.” There are also areas for improvement, which Benjamin discusses frankly: “When new crops are introduced, clearly we immediately look at the possibility of increasing seed sales prices and the need to introduce more effective means of defending crops against pests.” 3098 farmers are involved in the mother project, Kitise Rural Development. Of these, 546 are cooperative members. 1,000 farmers are involved in Eni’s project. Castor beans are an attractive option, since semi-arid



and arid land offers very few alternatives. “In cooperation with the Makueni County Ministry of Agriculture, we advise farmers to grow drought-resistant crops, such as castor beans. We have also changed our mentality: we have switched from growing food to fodder, moving away from maize, which requires irrigation. Castor beans are successful here, but it will be important to plant improved, more drought-resistant varieties. A central role is played by KALRO, which not only provides training, but also technology, expertise, research and development. And obviously consulting.”

The cooperative’s motto is to improve lives. “Here there were water problems, health problems, problems across the board. At the end of the day, there was a void: even after solving all these problems, how could these people support themselves? This is where the cooperative came in. Before us, brokers, i.e.

middlemen, resold castor at a much higher price, earning more than the farmers. The cooperative eliminated these intermediaries and obtained better prices for the products, improving farmers’ lives.” As part of the Kitise Rural Development Cooperative Society, we created Sacco Savings (Savings and Credit Cooperative Societies), a kind of savings bank that farmers can access when they need capital or an emergency loan. Now microcredit skills come back into play. “This morning, for example, a farmer came to me who had problems with his milk supply and did not have enough money to pay his son’s school fees. Community leaders know how important it is to maintain good relations, but if they cannot provide help with their own personal means, they can refer the person to a financial institution or give them an advance, subject to company policies.” This, Benjamin teaches us, is how dreams are built. ■

KITISE FARMERS COOPERATIVE SOCIETY LTD-DAIRY







THYAKA VULU AND SCHOLASTICA NDINDA
CASTOR GROWERS

Great expectations

If you have castor seeds,
you have hope.

“My full name is Thyaka Vulu, I’m a resident of the Makueni County. I moved here in 1987, the year I got married. It’s a good place, I like it.” This is the beginning of the story of a castor farmer who is deeply in love with his land and with his wife. “I met Scholastica in primary school. We grew up together, then we got married and had four children.”

As a child, he dreamt of becoming an army general like his father, who was a soldier. After nine years of service, he retired from the army to become a businessman in agriculture.

“I bought 50 hectares of land and have become an influential businessman and an important

farmer.” Mango trees used to grow here once. “I moved away from mango and maize farming because of the adverse weather conditions. The weather’s changed. I’ve changed too. Everything will have to change, except change itself. Now I grow castor and raise livestock. We’re getting good money from castor, it’s a good cash crop. Castor seeds are resistant.” Thyaka tells us how it all began. In October 2022 “This Italian man from SAFA (one of the aggregators contracted by Eni Kenya, ndr), came to Makueni County and sensitized farmers, myself included, on castor farming. Afterwards, we made an agreement and signed a contract. That’s how I became a member. Then by December the rain season came and I planted castor seeds. They need very little water to sprout. We did the first harvest in April and the second one in August.” Thyaka says castor seeds are “feather light” and resistant to weeds, so they require a minimal amount of manpower. Thyaka and Scholastica work on 25 hectares of land with the help of a single labourer. “If it’s about to dry, when the rain comes it shoots again. So it’s like dying, then coming up again. We have no problems with castor seed.” It is with these seeds that Thyaka became part of the first agri-hub project in Kenya.









“If you have castor seeds, you have hope. You have no castor seeds, you don’t have hope.” Thyaka is proud to be part of the “big Eni family” in a global project that binds Kenya to Italy. “To be successful, you need to be able to change your plans. I have decided to plant these seeds and I’m proud to be number one in Makueni. Although becoming number one is easier than remaining number one.” How do you remain number one? “By working harder than last time. Just like Julius Caesar. He went. He saw. He conquered. Life is like that. You learn through mistakes. You also learn through seeing what your friend is doing.” Thyaka buys and sells cereals every day. Travelling up and down Makueni County is his daily business. “On Saturday you can find me in my shop. I sell maize, beans, green gram, pigeon peas, finger millet.” For Thyaka, his work has a dual mission: “I help the community and I help myself.” He says his children live far away. “I want them to follow my way. I want to be a grandfather. It’s nice to be a farmer. When you are a farmer, you keep fit and stay active. I’ll live to be 120, I’m sure.” Thyaka is not only an optimist. He is also and above all stubborn and far-sighted. This is how he sees his future: “I imagine my future will be very bright. Kenya is a nice country. No country like Kenya. I tell you. Yeah.” ■





LUCY LAU BIGHAM
CEO AND FOUNDER
OF TOSHEKA TEXTILES LTD

For us

The value of land, the importance of farming (also) for industry on degraded land

She never stays in one place for too long, even during an interview. Will this be the universal trait that unites entrepreneurs? Looking at Lucy Bigham you would think so. With study and work experience behind her on no less than three continents, Lucy is the founder of the textile company Tosheka Textiles and the person who opened the doors of the partnership between Eni and thousands of farmers in Makueni County. Its history and that of the company are interwoven between the fibres of a castor leaf, a common weave to give life to new fabrics and new energies. “We started using castor leaf years ago to feed silkworms, with the aim of producing more sustainable fabrics with excellent thermal

properties in both summer and winter,” explains Lucy. “When Eni’s agronomist made contact with the Government of Makueni, the administration suggested that he contact us because we were the only ones in the area using castor leaf, so we met for the first time. For us,” she explains pragmatically, “it was a profitable collaboration from the outset because Eni only needed castor beans, which we did not use anyway. So the farmers can now cultivate the castor plant whilst generating two incomes: one from the leaves that feed the worms and one from the seeds that are bought by Eni to produce the vegetable oil which will be turned into biofuels.” With castor oil, Lucy also became a point of contact for developing the industrial chain linked to croton, a tree that grows wild in Kenya and whose nuts vegetable oil is always extracted from.

Before setting up her own company, Lucy studied in Kenya, the UK and the US, where she arrived along with a hundred or so excellent students selected from over 7,000 applicants for a very competitive programme. With her feet planted in the land of the American dream whilst her heart was always in Kenya, Lucy returned to her home country on several occasions: first to contribute









to a development cooperation project for economically and socially disadvantaged people, and then to move from this to the formation of a real business capable of sustaining the community's economy, leveraging women. "When a woman, a mother, tells me that thanks to her work she is able to send her children to university, I feel truly fulfilled. This was what I really wanted to do when I was young: work for society, giving something back to my country and the community," says Lucy. "I would like to tell young people," says Lucy seriously, "that it takes time to build anything. Today, many people know about



our company, and even google it, but it took years to get here. When I started the textile company in around 2005 on the back of the revitalisation of the sector that was then taking place in the country, we produced about 13 kilos of cotton in a year. A small amount compared to today. Then with the help of my husband who has always supported me, we started researching into Neem oil to increase the yield without using fertilisers. This was an insight that allowed us to revolutionise the way of doing business, changing people's culture. The result? Cotton production has increased to about 500 kilos per acre per year." Since 2005, it is now 2023,



it is a testament to the patience that Lucy mentions is necessary to build something lasting and valuable in the deepest sense. Lucy Bigham is certain: with the strength of her own hands and patience, Kenya has all the elements it takes to succeed. "It is a very versatile nation. There are mountains here and there is an ocean, so it is a great place for those who want to start a business. There are important resources for various sectors,

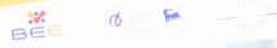
from agriculture to mining and energy. In addition, the population is educated, the technology is advanced for those who can seize opportunities, such as those in the biofuel industry, and the geographic location is strategic. You know, it is said that humanity originated in Kenya and this is a valuable legacy for our youth. That is why next time one of our girls will do the interview, so I will pass on the baton. Wanna bet?" ■





1st PLACE

SEEDS FOR
SUSTAINABLE ENERGY
May 2-5, 2023
Nairobi, Kenya





ESTHER KIMANI

FOUNDER AND CEO FARMER LIFELINE
TECHNOLOGY STARTUP

The golden girl

In digital technologies
the answer to crop
diseases that seemed
incurable

“When I was a child, all I saw in my future were farmed fields.” She saw well: today we have lush crops thanks to her inventions. She is Esther Kimani and a light brightens her passage. She founded the innovative start-up Farmer LifeLine Technologies, which she is the CEO of. The firstborn of four daughters, Esther grew up in a farming community. Then something happened: “At university I studied computer science and my life changed. Technology and my experience merged and I found myself in the world of agritech.” Growing up with the generational anxiety of pests threatening crops, she surprisingly

found an answer in technology to ills that seemed incurable. And that is how Farmer LifeLine was born. “They are always a bit amazed when I first introduce myself ‘Are you a programmer with those nails?’ Technology has broken down the barriers to gender equality.”

But let’s get back to the fields. “As each season progressed, farmers in my community lost almost half of their harvest due to delays in identifying pests and diseases. This was a fate shared by Kenyan farmers and millions of people in Africa. Drones are rather expensive for small farmers and are not available 24/7. I set out to find technology that would be active 24/7 and capable of detecting pests and diseases at an affordable price. And I believe that innovation was born just like that.”

Farmer LifeLine was launched in 2019 and uses cameras and scanners that capture images of crops within a 600-metre radius. “The device compares the acquired images with an online API database. If it detects a crop disease, it sends an SMS to the farmer’s mobile phone with a specification of the pests identified and the solution to be adopted in order to eradicate the disease,” she says. The expertise does not end there: “We try to





exploit renewable energy as much as possible: the device is powered by solar panels and so it works even in areas with no electricity.”

With the innovation put in place by Esther’s company, farmers are able to increase their harvests by more than 40% and reduce losses by 30%. They now know when the time is right to spray pesticides. So much more than a modern benefactor. “I think that giving something back to mankind,” says Esther, “is really rewarding and it becomes even more so when it comes to people you know or grew up with. Seeing them increase their harvest and have more money, seeing that children don’t have to give up any basic needs because of crop losses, I think it was really very encouraging. It’s a great thing.”

Like in all companies in the world, business comes first. Esther wants to expand beyond Kenya, beyond East Africa. FarmerLine is currently looking for funding programmes, which is how it came into contact with Joule and the “Seeds for Sustainable Energy” bootcamp (Eni’s project that aims to promote entrepreneurship in

the countryside and integrate innovative solutions along the agribusiness supply chain). “We use hardware devices that are the most costly. We want to develop a device capable of scanning up to 1500 metres. There is potential to expand our markets: I am thinking of areas with heavy fog, snow and rain. Research requires funding. We want to reach one million small farmers by 2030. We know we can do it. We will get there.” Partnerships play a significant role: “Often a start-up has a good idea but does not know who to turn to in order to make it happen; there are partnerships out there that can launch the product on the market.” Dreams do not build themselves: “I wouldn’t have gone anywhere without my team. We are a team full of different skills and we work in synergy together.” There are good days, there are bad days. “When you set up a company everyone expects you to have the answer for every problem. But things come to you suddenly. Like when the device launched the first text message. And it was like putting my feet on the moon for the first time.” ■







DR. JAMES NJOROGE

SENIOR RESEARCHER AT KENYA AGRICULTURAL & LIVESTOCK
RESEARCH ORGANIZATION (KALRO)

It feels good

The importance of
research and innovation
in agriculture

The first thing that strikes you about him are his large, gentle hands, which are equally at ease using delicate precision instruments in the laboratories of the Kenya Agricultural & Livestock Research Organization (KALRO) in Njoro, Nakuru as they are handling the thorny castor bean plants grown in the surrounding fields. This is because Dr. James Njoroge, now a senior researcher in the organization's vegetable oil production programme, grew up in the fields: "I have been working the land with my parents since childhood," he says with a smile. "I have always been familiar with agricultural activities, from sowing to

harvesting. Experience gained in the field was then complemented by knowledge gained in my studies [James has two bachelor's degrees and a master's degree in plant breeding] that helps me do what I do now. When he starts telling us what he does, the silent, shy man who welcomed us into his laboratory transforms: as he discusses his research, Dr. Njoroge James comes to life and his eyes light up.

The goal of the programme that KALRO is working on is to develop, through the use of biotechnology, plant varieties suitable for cultivation in soils with certain characteristics or which can be used for particular purposes, e.g. animal feed or feedstock for biodiesel. "When conducting research," James explains, "the goal is to solve a particular problem: in our case this could be a parasite, a disease or an insect. Developing new varieties that are better suited to a certain soil or more resistant to a specific pest will result in a high-yielding crop, benefiting the whole community." This is reflected throughout the value chain, which also has a positive impact on the industry. "Jobs will be created, imports will be reduced, and we will know that we have contributed to this... it feels good," he says proudly.







CASOIN
MATERIALS
DATE: 10/10/2019
GEL CONTENT: 100%

CASOIN
MATERIALS
DATE: 10/10/2019
GEL CONTENT: 100%

Dr. Njoroge's role in this complicated process is to develop varieties for commercial production. "After generating new varieties, you have to get the seeds from them," he explains. "I deal with maintenance selection, i.e. the process necessary to ensure that the plant retains the required traits. End buyers give us targeted requests and we must select products that meet their needs." "Here, castor bean has traditionally been used in different ways. It grows readily even in marginal areas, which in Kenya constitute almost 83% of the land," says James, emphasizing the importance, in the field of research, of the collaboration with the Italian energy company. "Our partners support us," he says, "in whatever we do and introduce us to fields of study that we have

not previously explored. They also help us to broaden our views, enhancing knowledge and innovation within the organization." On the other hand, research, in agriculture as in all other fields, always presents new challenges. "There's never a dull moment," jokes James. "It's impossible to claim that a problem has been definitively solved. Take diseases for example. We know that they evolve together with plants, just as the environment continually evolves. This is why we need to keep studying in order to obtain and market increasingly superior products," he explains. This is also why he hopes that the team he works with, supervises and trains with dedication and enthusiasm will be expanded with new scientists prepared to pursue an activity that is fundamental for the community and the entire country. ■





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Ricardo Franco and Helena Santiago, Anima Team;
Edward Musyoka Gedion, 4k MEDIA; Edithink; Archivio Eni

Cover

Edward Musyoka Gedion, 4k MEDIA

Sent to press on June 2024

Published by Eni

