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Dear reader,
THIS EDITION BRINGS together powerful stories that demonstrate how innovation is reshaping agriculture into a reliable source of livelihood for communities. We begin in Bungoma, where 3KM farmers have shown the strength of aggregation and value addition, transforming small harvests into reliable market supply. In Busia, a couple's venture into bokashi fertilizer making for sale shows how simple, locally made inputs can restore soils and reduce dependence on costly chemicals while creating a source of income. In Bomet, chilli farmers are proving that processing can turn a perishable crop into a high-value product, while in Nakuru, Nelly Mwaniki's homemade biofertilizer is reviving soils and creating new income streams. At Chuka University, students are reimagining banana residue into eco-friendly sanitary pads, linking agriculture to social impact. This edition also guides farmers on practical responses to climate and livestock challenges. Articles on El Niño preparedness and water harvesting offer strategies to turn heavy rains into opportunity, along with practical tips on integrated pest management in dairy farming for healthier herds without over-reliance on harsh chemicals. We also spotlight Laikipia County's newly launched Agroecology Policy, a framework that promises to align farming with climate resilience if successfully implemented.

Read on for these and much more.

WEATHER ADVISORY

El Niño Rains Are Coming: Can Farmers Turn Challenge into Opportunity?

By Vincent Sakwa

FOR MANY KENYAN farmers, the mention of El Niño brings back painful memories. The heavy rains of 2023 left a trail of destruction across much of the country. Farms were flooded, crops were washed away, roads became impassable, and some families lost their homes and livestock. For a small-scale farmer whose livelihood depends on a few acres of land, such losses can take years to recover from.

Kenya is expected to experience another period of unusually heavy rainfall during the October to December 2026 short rains, with some rains likely to continue into January 2027. While the rain may bring flooding and other challenges, it could also provide farmers with an opportunity to protect their farms and make good use of the extra water.

More rain than usual

El Niño is a weather pattern that influences rainfall and temperatures worldwide. In Kenya, it is often linked to above-normal rainfall. Too much rain can be destructive: floods can damage crops, wash away fertile soil, kill livestock, and destroy homes and roads. But rain is also a valuable resource. With good preparation, farmers can store and use excess water to support crop production even after the rainy season ends. The key is to manage the extra water effectively.

The benefits of enhanced El Nino rainfall

(i) More water for farming

During periods of heavy rainfall, rivers, dams, water pans and other water sources can fill up. Farmers who can harvest and store some of this water can use it later when the dry season returns. Simple water-harvesting methods such as water pans, farm ponds, tanks and properly managed runoff can help farmers save water for irrigation and livestock. Especially in dry areas, this stored water could make the difference between watching crops dry up and producing food during the dry season.



(ii) Better soil moisture

Good rainfall can restore soil moisture, making it easier for crops to grow. Farmers may also be able to grow crops that normally struggle when rainfall is too low. However, too much water can also cause problems. Crops standing in water for too long may rot or develop diseases. This is why proper drainage is important.

(iii) A chance to grow different crops

Heavy rain can give farmers an opportunity to diversify their farms. Instead of depending on one crop, farmers can grow different crops suited to their area and the expected weather. It is also important to plant fodder crops during this season for use in dry seasons. Di-

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Land preparation during El Niño

Water scarcity has significant impact on agricultural productivity, especially in arid regions. Erratic rainfall has awakened farmers to practice water harvesting to sustain their farms. PAGE 3

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versification is important because if one crop fails due to flooding or disease, another crop may still survive and provide food or income. Before planting, farmers should seek advice from agricultural extension officers on the crops and varieties best suited to their area.

For instance, bananas, Napier grass, Boma Rhodes, and sweet potato varieties grown for fodder, e.g. Wagabolige and Ex Mukurweini varieties in Kenya, desmodium, and dryland rice also known as Nerica, arrow roots and pigeon peas, can do well in the three-month-long rainfall. Growing different crops can reduce risk. If heavy rain destroys one crop, another may survive. Farmers can also combine crop farming with livestock, poultry, fish farming or other suitable activities depending on the resources available. Diversification gives a household more than one source of food and income.

(iv) Restoring water sources

Heavy rains can refill rivers, dams, water pans and other sources that may have dried up during previous dry periods. This benefits both crop farmers and livestock keepers.

How to prepare for the risks

Heavy rains can quickly turn from a blessing into a disaster if farmers are not prepared. Flooding can wash away crops and fertile soil. Waterlogged farms can destroy seedlings. Humid conditions can also encourage pests and diseases. The good news is that farmers can take practical steps before and during the rains.

Prepare drainage channels

Farmers should inspect their farms before the heavy rain begins. Clear blocked drainage channels and create safe pathways for excess water to flow away from crops. Avoid allowing water to collect in crop fields for long periods. However, manage drainage water carefully to avoid washing away valuable top soil.

Protect your soil

The most fertile part of the soil is the top layer. Heavy rains can easily wash it away, leaving farmers with poor land and lower yields. Farmers can protect their soil from heavy rains in several ways. Keeping the ground covered with mulch or cover crops, especially sweet potato vines, helps reduce the impact of raindrops and prevents soil erosion.

Farmers can also use water-conserving planting methods such as zai pits and half-moon planting holes, which help trap water and allow it to soak into the soil. On sloping land, terraces and contour farming can slow water movement and reduce runoff.

Avoiding unnecessary digging also helps keep the soil structure intact, while planting grass strips can further slow down flowing water. A farmer who protects the soil during heavy rains is also protecting future harvests.



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Follow weather forecasts

Weather information can help farmers make better decisions. Before planting, harvesting or applying fertiliser and other farm inputs, farmers should pay attention to weather forecasts and advisories from the Kenya Meteorological Department and agricultural extension officers. Knowing when heavy rains are expected can help a farmer decide when to plant, harvest or move livestock to safer areas.

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Land preparation and water harvesting techniques during El Niño rains

Water scarcity has significant impact on agricultural productivity, especially in arid regions. Erratic rainfall due to climate change has awakened farmers to practice water harvesting to sustain their farms

By Leah Munala

EL NIÑO RAINS can bring unusually heavy rainfall, flash floods and excess moisture, making farming difficult. Heavy downpours can wash away fertile topsoil, flood farms and waterlog crops, while livestock may lose pasture and drinking water sources may become contaminated.

In some areas, however, farmers may experience dry spells between periods of heavy rainfall. These sudden changes can affect crop growth and lead to poor harvests. Farmers can reduce damage from heavy rains by preparing their land early and using simple soil and water conservation practices.

These measures can also help them capture excess rainwater for use during subsequent dry periods.

Land preparation techniques

Conservation agriculture: Minimum or zero tillage helps maintain soil structure and reduces erosion. Leaving crop residues on the soil surface and applying mulch protects the soil from the direct impact of heavy raindrops, slows runoff and helps retain moisture.

Cover crops: Growing fast-growing legumes or other cover crops between or alongside the main crop protects the soil from being exposed to heavy rainfall. Cover crops reduce splash erosion, slow runoff and help conserve soil moisture.

Drainage channels and cut-off drains: On farms that are prone to flooding, farmers can construct diversion channels to direct excess runoff away from crop fields. Where appropriate, the runoff can be channelled into water pans or other storage structures. Grass or check dams along waterways can slow water flow and reduce erosion.

Raised beds and ridges: Crops can be planted on raised beds, ridges or mounds in areas prone to waterlogging. The planting areas raised allow excess water to drain through the furrows, reducing the risk of root damage and rotting.

Terraces and contour bunds: On sloping land, terraces and contour bunds slow runoff, reduce soil erosion, and allow more rainwater to infiltrate the soil. Farmers should maintain existing structures before the rain begins.



Contour farming: Planting and cultivating along the natural contours of the land helps slow water movement down slopes and reduces the loss of fertile topsoil.

Safe water harvesting techniques

(i) **On-farm water pans:** Water pans collect and store runoff during heavy rains for later use. Farmers should clean and repair existing water pans before the rainy season so that they can hold as much water as possible. Stored water can be used for irrigation and livestock, provided it is appropriately treated or managed for the intended use.

(ii) **Reinforcing soil and water conservation structures:** Existing terraces, bunds and vegetative barriers should be repaired before heavy rains arrive. Grasses such as Napier and vetiver can help stabilise soil and slow down runoff when planted appropriately along conservation structures.

(iii) **Integrating agroforestry:** Farmers can plant suitable agroforestry trees and fodder species along farm boundaries and soil conservation structures. Species such as calliandra, Leucaena, sesbania and gliricidia can help stabilise the soil and reduce runoff. Their roots improve soil structure, while their foliage intercepts some of the rainfall before it reaches the ground.

(iv) **Zai pits:** Zai pits are small planting basins commonly used in dryland farming. They collect rainwater around the root zone and can reduce runoff and erosion. The pits are filled with organic matter, manure or compost to improve soil fertility. Typical pits are about 20–40 cm wide and 10–20 cm deep, spaced at 60-80 cm apart. Spacing depends on the crop, soil and local conditions.

(v) **Roof catchment:** Farmers can install gutters on houses and other farm buildings to collect rainwater into storage tanks. Properly collected and stored roof water can provide water for domestic use, livestock and kitchen gardens. Cover storage tanks to keep the water clean and reduce mosquito breeding.

Heavy rains can quickly turn from a blessing into a disaster if farmers are not prepared. Flooding can wash away crops, fertile soil and destroy seedlings. The good news is that farmers can take practical steps before and during the rains

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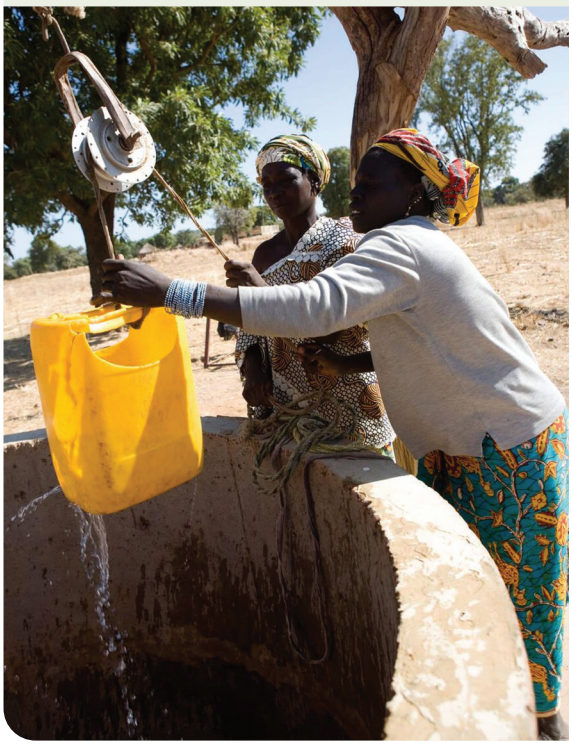
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Other management practices
Farmers can also take additional measures to protect their farms during periods of unpredictable rainfall:

i. **Protect fallow land:** Where land is left fallow, farmers should avoid leaving the soil bare. Crop residues, mulch or cover crops such as lablab, sweet potatoes can provide ground cover, reduce runoff and protect the soil from erosion.
ii. **Prune and manage trees:** Coppicing, pruning and pollarding can reduce the risk of weak branches and trees falling during strong winds and heavy rainfall. Farmers should pay particular attention to trees close to houses, livestock sheds, roads and power lines.
iii. **Avoid overstocking and overgrazing:** Too many livestock can strip land of vegetation, leaving the soil exposed to erosion. Keeping livestock numbers appropriate and avoiding overgrazing helps keep the soil covered and protected.
iv. **Plant early maturing varieties:** In areas where heavy rains are expected to be followed by dry spells, farmers can consider suitable early-maturing crop varieties. These may allow farmers to harvest before adverse weather conditions cause crop losses. Farmers should select varieties recommended for their area and planting season.

Conclusion
Good land preparation is not only about getting ready to plant. It is also about preparing the farm to receive, slow down, drain or safely store excess rainwater. This helps reduce losses and allows farmers to make better use of the rainfall they receive.

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INNOVATION

Turning Farm Residue into a Menstrual Hygiene Solution

What if the banana plant could offer more than its fruit?

By Pamela Apuko
AT CHUKA UNIVERSITY, students in the Department of Plant Sciences are exploring answers by turning banana fibre, an agricultural by-product, into sanitary pads. The innovation, Safe Sanitary Pads from Banana Fibre, was presented during the 5th Tharaka University Career, Innovation and Entrepreneurship Week (CIEW) 2026, held from March 4–6 under the theme *"Catalysing Economic Growth through Innovation and Entrepreneurship."* It emerged as the Best Innovation at the event.

The idea addresses three pressing concerns: menstrual hygiene, agricultural waste, and environmental sustainability. Rather than letting banana fibre remain an underutilised farm by-product, the students are exploring how to convert it into a useful menstrual hygiene product that is safe, affordable and biodegradable. According to the project report, the innovation also has potential to create economic opportunities for farmers, support agricultural value chains and generate rural employment.

Why banana fibre?
After a banana bunch is harvested, the pseudostem, the thick, layered structure commonly mistaken for the plant's trunk, is usually left behind. Yet this material contains significant amounts of cellulose, the structural component that gives plant fibres their strength.

Research shows that banana pseudostems can be mechanically processed to extract fibre. Depending on the variety and extraction method, the fibre can be obtained through processes such as decortication, in which the pseudostem is scraped or mechanically processed to separate the fibre from the softer plant material. Studies have found cellulose to be a major component of banana pseudostem fibre. This cellulose-rich material is what makes banana fibre interesting for absorbent products.

Researchers have been investigating banana and plantain pseudostem as alternatives to conventional absorbent materials in sanitary pads. The Chuka University innovation builds on this broader idea: turning an agricultural residue into a product with social and economic value.

The process of making the sanitary pads from the pseudostem
The journey begins with extracting fibre from the banana pseudostem. The extracted fibre is then cut into smaller pieces, then boiled and cleaned. It is washed and dried before further processing through pulping.

Once the fibre has been prepared and pulped, it is used to make the different layers of the pad. The students then bind the layers together to form the finished product of the right shape. After shaping the pad,



the finished product is sterilised and packaged, ready for the next stage towards the market. This approach is significant because the innovation is not simply about finding another use for banana waste. It is about taking something that is readily available in farming communities and processing it into a product designed to meet an everyday need.

More than a sanitary pad

The significance of the Chuka University innovation extends beyond the product itself. The project report describes the pads as eco-friendly because they are made from sustainable and biodegradable materials. It also positions the innovation as a response to the waste generated by conventional plastic-based sanitary pads.

The project also has a clear social dimension. The students are targeting girls aged 12–24 in semi-urban and rural areas, particularly those who struggle to access affordable sanitary pads. The project aims to respond to this need while tapping into growing interest in environmentally friendly menstrual products.

This innovation creates a circular economy opportunity for farmers: a farmer grows bananas for the fruit, and the pseudostem is processed and converted into a useful product.

This has several potential benefits, including creating additional economic opportunities for local farmers, supporting agricultural value chains, promoting rural employment and contributing to sustainable agriculture and environmental conservation.

This opens an intriguing possibility for banana-growing communities. Instead of viewing the pseudostem simply as farm residue, it can be considered a resource with potential applications in fibre, paper, textiles and absorbent products.

An innovation with room to grow

The students have already moved beyond the idea stage and begun production. However, the product is yet to reach the market as the team awaits approval from the Kenya Bureau of Standards (KEBS) and completion of other legal requirements. The project will require investment in equipment, raw materials, labour, utilities, marketing and advertising to support production, packaging and distribution. The students envision a facility capable of taking the product through these stages as they work towards serving the feminine hygiene market.

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The innovation therefore still has a journey ahead. Questions about production capacity, affordability, market acceptance and compliance will need to be addressed as the product moves towards commercialisation.

What it already demonstrates, however, is the potential of agricultural value addition to solve problems beyond food and income. By taking banana fibre from the farm and exploring its use in menstrual hygiene products, the students have connected agricultural waste management with environmental sustainability, innovation and enterprise.

The next step is to move from an award-winning innovation to a thoroughly tested, approved and commercially viable product. If that journey succeeds, a material once viewed as agricultural waste could become part of a solution to an everyday need, while creating another reason to see the value ofwhat farmers harvestand what they leave behind.

PEST MANAGEMENT

Integrated Pest Management in Dairy Cattle

By Francis Mwangi

PESTS ARE A common challenge for dairy farmers. Ticks, flies, lice and mites can make cattle uncomfortable, spread diseases and reduce milk production. Animals that are constantly bitten or irritated spend more time scratching and rubbing themselves and spend less time feeding or resting. Over time, this can affect their health, growth and productivity.

For smallholder dairy farmers, controlling pests is an important part of maintaining a healthy, productive herd. However, effective pest control does not always mean using more chemicals. Over-reliance on sprays and dips can cause pests to develop resistance, making treatment less effective over time. A better approach is to combine different prevention and control methods. This is known as Integrated Pest Management (IPM).

IPM combines good animal care, farm hygiene, pasture management, natural pest control and, where necessary, the careful use of approved chemicals. The aim is to keep pest populations at manageable levels while protecting animal health, reducing costs and minimising harm to the environment.

The first step is to know which pests are affecting the herd. Farmers should regularly observe their animals for signs such as scratching, rubbing against walls or posts, hair loss, wounds, restlessness or visible parasites. Early detection makes pest problems easier and cheaper to manage.

Ticks

Ticks are among the most important external parasites affecting dairy cattle. They cause irritation, blood loss and skin damage, and some species transmit serious livestock diseases.

Tick control should begin with good pasture and grazing management. Bushy and overgrown areas provide suitable places for ticks to survive and reproduce. Clearing bushes, controlling weeds and managing grazing areas can help reduce tick populations.

Rotational grazing can also interrupt the tick life cycle by moving cattle between grazing areas. Where possible, farmers should avoid allowing cattle to graze continuously in heavily infested areas.

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Choosing cattle that are well adapted to local conditions and more tolerant of ticks can also reduce the need for frequent treatment. Inspect new animals for ticks before introducing them to the herd.

Where dipping or spraying is necessary, farmers should use approved products at the recommended dosage and follow the correct treatment schedule. Unnecessary or improper chemical use can contribute to resistance.

House Flies

House flies are common on dairy farms, particularly where manure, wet bedding and spilt feed accumulate. Large fly populations can spread disease-causing organisms and contaminate milk, feed and equipment.

The best way to control flies is to prevent them from breeding. Remove manure and wet bedding regularly, and keep areas where feed, water, and organic waste collect clean and dry. Good drainage around cattle sheds is also important because wet, muddy areas mixed with manure provide ideal breeding conditions.

Keep the milk room as free from flies as possible. Well-fitting doors and window screens can help keep flies out, while sticky tapes, papers and ribbons can reduce fly numbers inside livestock buildings.

Farmers can also take advantage of natural enemies of flies. Some beetles, mites and parasitic insects feed on fly eggs, larvae or pupae. Protecting these beneficial organisms can reduce the need for insecticides.

Chemical control may be necessary when fly populations become difficult to manage, but it should not be the first option. Frequent, unnecessary insecticide use can lead to resistance.

Mosquitoes and Other Biting Flies

Mosquitoes and other biting flies cause irritation and stress and may contribute to disease spread.

Mosquitoes breed in standing water, including ponds, drainage ditches, waterlogged areas, containers and old tyres that collect rainwater. Farmers can reduce their numbers by improving drainage and removing unnecessary sources of standing water around cattle housing.

Keeping the farm surroundings clean and dry is a simple way of reducing mosquito breeding.

Cattle Lice

Lice are small parasites that live on the animal. Heavy infestations cause irritation, hair loss and poor feed conversion. Affected cattle may spend a lot of time rubbing themselves instead of feeding or resting. Severe infestations can cause poor growth, reduced milk production, and animals that are difficult to handle.

Prevention starts with checking new animals for lice before introducing them to the herd. Where possible, keep new animals separate and monitor them for parasites before mixing them with the rest of the herd.



Pastures should be well managed, with bushes and weeds controlled and, where possible, heavily waterlogged grazing areas avoided. Dung beetles can also help by breaking down manure and reducing breeding sites for some flies and parasites

Regularly inspecting the herd helps farmers detect lice early. Keeping calf housing clean and well managed can also reduce the risk of heavy infestations.

Where treatment is necessary, approved products can be applied as sprays, pour-ons or other recommended treatments. Farmers should follow the product instructions and seek advice from an animal health professional when necessary.

Mange Mites

Mange mites cause itchy skin, hair loss, scabs and inflammation. Affected cattle often rub themselves against walls, posts and other objects to relieve the itching. The problem may first appear around the legs, feet, thighs or tail area. As infestation worsens, patches of hair loss can develop into larger skin lesions with thick, crusty scabs. Heavy infestations affect the animal's comfort and can reduce productivity.

Carefully inspecting new animals is one of the best ways to prevent mange from entering the herd. Farmers should also regularly check cattle for unusual hair loss, persistent scratching or skin lesions and seek advice early if they notice these signs.

Good Farm Practices for Pest Control

Good day-to-day farm management can prevent many pest problems. Cattle should receive adequate feed, mineral supplementation and a reliable supply of clean drinking water. Healthy animals are better able to cope with disease and parasite challenges.

Cattle also need clean, dry and comfortable resting areas, particularly lactating cows and young calves. Regularly cleaning cattle sheds, pens, and feeding areas reduces places where pests can breed.

Pastures should be well managed, with bushes and weeds controlled and, where possible, heavily waterlogged grazing areas avoided. Dung beetles can also help by breaking down manure and reducing breeding sites for some flies and parasites. On some farms, poultry may help reduce insects around livestock areas.

Farmers should also maintain an appropriate vaccination and parasite-control programme with guidance from a qualified animal health professional. Regular observation of the herd makes it easier to identify problems and respond before they become severe.

Francis Mwangi is a livestock officer in KALRO, Kisii.

VALUE ADDITION

Chilli Farmers in Bomet County turn a challenge into a lucrative opportunity

By Caroline Mwendwa

RICHARD LANG'AT HAS always believed that farming is about more than producing food. It is about learning how to get the greatest possible value from what the farm produces. That belief was tested when his farmer group, Testai Farmers Group, embraced avocado production and learned to intercrop avocado with chilli. The combination promised good returns. But as the chilli harvests grew, the members were faced with a common challenge: where would they sell it?

Fresh chilli is highly perishable, and without a reliable market, much of the harvest went to waste. The losses discouraged farmers. Gradually, members began abandoning chilli production, and a group that had once had about 350 farmers producing chilli was left with only a fraction.

Richard, however, saw an opportunity in the problem. "If we could find a way of preserving the chilli and adding value to it, farmers would not have to depend on selling it fresh," he thought. Help came through Agribiz, an organisation supporting farmers to scale their enterprises through the KCIC project, sponsored by Danida and the World Bank. Richard enrolled in a year-long training programme that changed how he viewed chilli.

"We were taken to Kenya Industrial Research and Development Institute (KIRDI) in Kisumu, where we learnt through practical skills of chili processing," he recalls.

The training opened a new door; value addition could turn a highly perishable crop into a product with a longer shelf life, a wider market and a much higher value. After the training, Richard began taking about 50 kilograms of chilli at a time to KIRDI for drying and processing before selling it. He grows Red Demon and Long Cayenne varieties, with the latter particularly suitable for milling into powder and making chilli sauce.

"When I started selling the processed chilli, I discovered that the market is available, but very few farmers are producing it. Those in our group who left production are unwilling to come back, despite demand being higher than supply," he says.

Today, Richard sells some of his fresh chilli to local markets while taking processed chilli to supermarkets. The shift from simply selling what comes out of the farm to processing has given him access to a more lucrative market.



Processing doubles the profit

The financial gap between selling raw harvest and value-added powder highlights the clear benefit of agro-processing. Fresh chilli is highly perishable, vulnerable to spoilage, and fetches roughly Ksh 150 per kilogram at the farm gate. However, it takes approximately 5 kg of fresh harvest, worth about Ksh 750, to yield 1 kg of dried chilli. Even after accounting for this 5:1 weight loss and up to a year of storage, value addition pays off dramatically. Once milled and packaged into retail packs, retailing at around Ksh 70 per 50 grams, that same 1 kg of dry yield brings in roughly Ksh 1,400. That nearly doubles the raw-commodity value of Ksh 750, demonstrating the true margin gained by moving from raw harvest to finished retail product.

"The market, especially in supermarkets, is available," he says. "The problem is that very few farmers are producing chilli." With support from Agribiz, the group has acquired a drier and a milling machine. The equipment has already been installed, although the group is still awaiting inspection by the Kenya Bureau of Standards (KEBS) before fully operating the processing unit.

A commercial drier and milling machine can cost about Ksh 500,000. The group's drier can handle approximately 100 kilograms of chilli in three days, giving farmers a practical way to preserve their harvest instead of watching it rot.

Turning chilli into a marketable product

Processing chilli is straightforward, provided farmers have the right equipment and follow food safety requirements. The chilli is first



sorted to remove discoloured or damaged pods. It is then dried, milled, and packaged. The final product is branded for the market.

The packaging must provide important information, including the expiry date, type of chilli, company name and batch number. Richard also advises processors to retain a labelled sample of every batch. "After processing, one is advised to retain a labelled package, just in case reference is required after release to the market," he says.

Unmet market demand

The group's biggest challenge now is finding enough chilli to meet the huge demand. Of the approximately 350 farmers who once produced chilli in the group, only 55 currently do, and most do so on a small scale.

The shortage has forced Richard to buy chilli from other farmers at between Ksh 50 and Ksh 70 per kilogram and resell the processed product at a much higher price.

The group's major challenge is spoilage during transportation. Some fresh chilli is spoilt in transit because the group lacks cooling facilities to preserve the crop on its journey to processors and markets. Richard and his fellow farmers are therefore looking beyond their current operation.

They want more dryers to be established closer to farmers in Narok South and Transmara, reducing post-harvest losses and making processing more accessible. They also hope to expand their processing unit and establish adequate storage facilities. Their products already reach customers in Lamu, Mombasa, Baringo, Taita Taveta, Kwale, and Bomet counties.

Members now appreciate the benefits gained at every step. Drying gives the chilli a longer life without spoiling, milling gives it a new form that increases its value significantly, and branding gives it a place in supermarkets and an identity among customers.

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VALUE ADDITION

3KM Members Demonstrate Strength in Numbers Through Aggregation and Value Addition

By Caroline Mwendwa

FOR YEARS, FARMERS in Kimilili, Bungoma County, had a familiar problem. They were working hard on their farms, but finding a buyer for the harvest was often harder.

"I used to have bananas ready for sale, beans drying in the sun or green grams waiting to be harvested, yet the volumes were too small to attract reliable buyers. Sometimes the quality varied too. It is frustrating, especially when farming is the main source of income for the household," says Brigit, a farmer in Kimilili.

The farmers eventually decided they would have a better chance if they worked together.

That decision led to the formation of 3KM, a farmer organisation serving Kimilili, Kibingei and Kamukuywa wards in Bungoma County. Established in 2020, the organisation now has about 1,160 members. Women, youth and older farmers make up 65 per cent of the membership, while men account for 35 per cent.

As members attest, the change has been as much about mindset as it has been about markets. "When we started, most farmers simply produced food without considering the quality of seeds or the benefits they could get from their produce," says Ms Wafula, the group chairperson.

Many families farmed almost year-round but still earned little and struggled to put nutritious food on the table. That began to change when 3KM partnered with development organisations led by Biovision Africa Trust working in the area. Farmers received training in better production practices, sustainable farming and ways of producing enough food for both household consumption and sales.

"We wanted to ensure sustainable food production that caters for a balanced diet throughout the year and still affords the farmers a source of income," says Brigit.

The lessons helped farmers see their farms differently. What they grew could feed their families, but it could also become a steady source of income if they paid attention to quality, volume, and the market.

Bringing farmers' harvests together

At 3KM, aggregation begins long before farmers arrive at a collection centre with their harvest.

Farmers are encouraged to use quality seeds and follow good production practices so the produce coming together at the end of the season meets a standard buyers can rely on. Bananas have become one of the organisation's strongest value chains. The area produces plenty of bananas, and because the crop does not require heavy inputs, it fits well into the farming systems of many households. Farmers also intercrop bananas with beans, getting two harvests from the same piece of land.

> **3KM is also encouraging farmers to diversify their enterprises. Members who keep chickens are connected to markets, extension services and sources of chicks. Farmers have been trained to formulate feeds for poultry and other livestock, including alternatives such as azolla. They are also learning practices such as vermicomposting**

3KM has collection centres in each ward. When the bananas arrive, they check them for maturity, quality, and signs of disease. Farmers receive Ksh14 per kilogramme for green bananas and are paid immediately.

From there, the bananas move to a central storage facility the organisation rents. They are cleaned and placed into a ripening chamber, where large quantities can ripen naturally before being supplied to customers. It is a simple system, but it has made a significant difference. Farmers no longer have to find buyers one by one or worry whether a small harvest will attract a customer.

The market is available

Schools, institutions, individual customers and county markets have created a steady outlet for the produce. "There is sufficient market, but not enough supply," says Brigit. Kimilili, for example, has about 34 high schools, but 3KM currently supplies only two. Each has roughly 2,000 students. For a group that started by looking for markets, this is an unexpected problem.

Diversifying produce for the market

As the group discovered the power of aggregation, they diversified the produce to include beans and green grams. 3KM focuses on the Nyota bean variety, sourcing quality seeds through the improved seed company, HarvestPlus, and making it available to members at an affordable price.

The variety matures in about 75 days and is valued for its iron and zinc content. With good farming practices, a farmer can harvest between 6 and 12 bags per acre. A kilogram of Nyota costs Ksh160.

Having popularised the Nyota bean variety within its locality, 3KM has immensely influenced the nutritional intake of learners in schools and families. "The beans are now finding their way into schools, where they add nutritional value to meals served to learners. At home, farmers have beans, green grams and bananas to feed their families," says Brigit.

The group members are now aware of the need to balance household nutrition and income generation. "As women leverage the linkage to markets, they have more control over income from their farms," she says.

More than bananas and beans

3KM is also encouraging farmers to diversify their enterprises. Members who keep chickens are connected to markets, extension services and sources of chicks. Farmers have been trained to formulate feeds for poultry and other livestock, including alternatives such as azolla. They are also learning practices such as vermicomposting. "The idea is to make farming more resilient. If one crop performs poorly or prices fall, farmers have other enterprises to fall back on," Brigit explains. The organisation works through 136 groups and has a monitoring and evaluation officer and an accountant supporting its activities.

The market is no longer the problem

Aggregation has succeeded, but 3KM now



faces a dual challenge. On one hand, demand significantly outpaces local production, with seasonal collections of around 10 tonnes falling far short of market requirements. On the other hand, members struggle to capitalise on this unmet demand because cheaper bean imports from neighbouring Uganda undercut local prices, while cross-border suppliers also offer preferred banana varieties that local farmers currently do not supply.

3KM's priority is straightforward: expand the producer base and boost individual yields without compromising quality. Having already tackled the hard part of securing off takers, the organisation must now focus on building a reliable, continuous supply chain.

A different way of looking at farming

Brigit notes that the most rewarding change is the way farmers now think about their work.

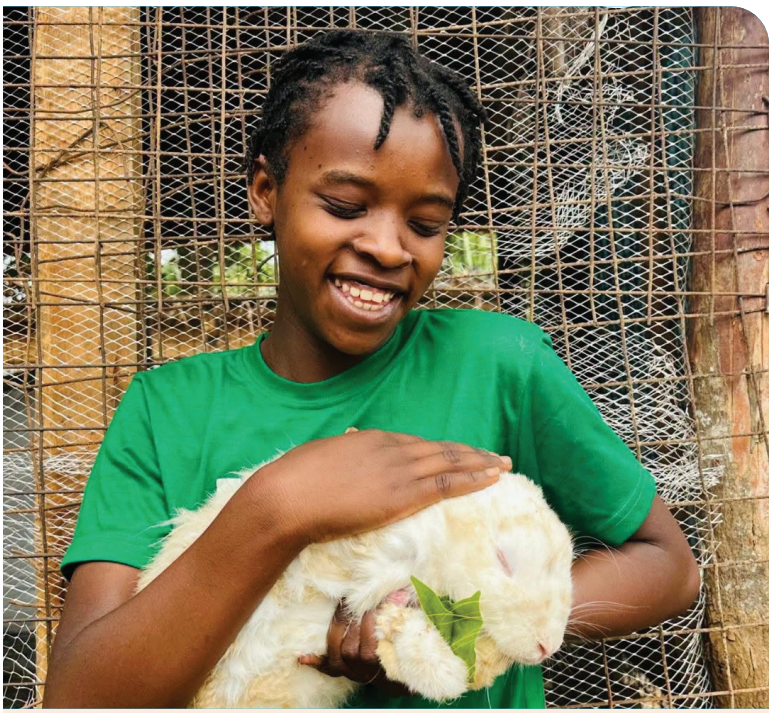
They are asking different questions. What should we plant? What quality does the buyer want? How much can we produce? Who will buy it? And what will we earn? That business mindset has made farming more purposeful.

The story of 3KM also shows that aggregation is about more than putting farmers' produce in one place. It brings farmers together around quality production, collection, storage, value addition and markets. The benefits ripple outward. A farmer has somewhere to sell. A school receives nutritious food. A family has more food choices. A woman earns an income from her farm. And together, farmers have enough volume to approach markets that would be difficult to reach on their own.

Brigit observes that farmer organisations need a clear reason to come together. They also need strong structures and leaders who listen to their members.

3KM began because farmers wanted to solve a market problem. Today, they have buyers waiting. Their challenge now is to grow enough to keep those buyers supplied.





CUNICULTURE

The value of rabbit keeping beyond its products

By Francis Mwangi

I RECENTLY LISTENED to a young man who said his secondary school experience made him the responsible man he is today. The greatest lessons he learnt came from the school farms, especially because, as students, they were assigned responsibilities beyond cleaning schedules; sometimes, they were put in charge of the pigs reared at school. If the Sow was pregnant, they would tend to her through pregnancy and delivery, then care for the piglets. "The awareness that the animal depends on you for survival makes you responsible," he said. Among many other rotational duties, the men who graduated from this school have gone out to be diligent and responsible enough to take up challenging projects to completion.

This prompts the question: how can other schools leverage such opportunities to nurture well-rounded learners? Young adults who see animals not merely as a source of amusement, but as livestock that, when well cared for, can provide good returns. Learners who understand the value of the animals kept at home and appreciate their potential as a source of food and income.

Rabbits as a lesson in responsibility

Rabbits are social animals, and rabbit keeping can involve people of different ages and genders. For children, the enterprise offers something difficult to teach through textbooks alone: responsibility through routine.

Someone must feed the rabbits. Someone must clean the hutches. Someone must collect weeds and suitable fodder. Someone must check on the young ones and ensure they are suckling properly. These may seem like small tasks, but they are not.

They teach children to show up, care for something and finish what they started. That is why school clubs such as 4K Clubs, Young Farmers Clubs and Science Clubs can be encouraged to take up rabbit production.

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A well-managed rabbit unit keeps students meaningfully occupied while giving them practical agricultural and entrepreneurial skills.

Additionally, students can construct rabbit hutches using locally available materials. Grass can be used for roofing and nesting, while suitable herbs and shrubs can provide construction materials and fodder. In the process, students learn basic building skills while keeping the school compound neat.

The work does not stop at the hutch. Students can help feed, clean, and care for young rabbits, and use the manure and urine to grow vegetables. They begin to see the connection between animals, crops, waste and food.

That is agroecology in practice, not just a lesson on a blackboard. Institutions that grow vegetables such as kale, spinach, cabbage, and carrots can use some crop residues and kitchen leftovers as feed. The rabbits, in turn, provide manure and urine that can support vegetable production and integrated pest management.

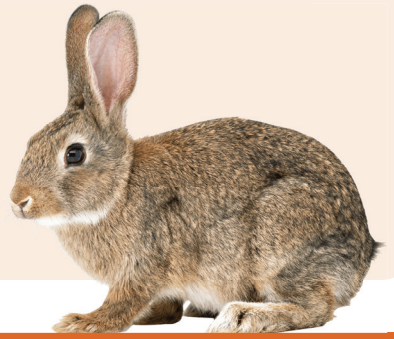
Social benefits

Schools can work with neighbouring institutions to exchange breeding bucks. This reduces the risk of inbreeding while improving productivity. Such exchanges create opportunities for students and institutions to interact, share knowledge and build friendships. A rabbit project can quietly become a bridge between neighbouring schools and communities.

Children also pick up new technologies and ideas quickly. What they learn at school can travel home, reaching parents and siblings and potentially increasing adoption of better farming practices.

The rabbit, in other words, becomes a teaching tool, a way of recycling farm waste while providing a source of food. Most importantly, it becomes a reason for children to take responsibility for something that depends on them every day.

Francis Mwangi is a Livestock Officer at KALRO, Kisii



BOKASHI FERTILIZER

Busia couple taps into the growing market for bokashi fertiliser

By Caroline Mwendwa

IN SIBELE VILLAGE, Busia County, Benjamin Akwata and Lilian Ombandu, have turned a simple soil-health practice into a thriving enterprise. They produce and sell bokashi fertiliser to farmers in the community, helping them improve crop yields while reducing reliance on costly synthetic inputs.

The couple's journey into bokashi production began after reading about the technology in The Organic Farmer magazine. Their interest was further strengthened through training and mentorship provided by an extension officer from Biovision Africa Trust, a Kenya-based organisation that promotes agroecology and sustainable farming practices.

What started as a learning experience soon evolved into a profitable venture. Today, the couple is among the pioneers of bokashi fertiliser production in their area and has earned a reputation as reliable suppliers.

Farmers often place orders long before the fertiliser is ready. "The biggest advantage of bokashi is that it matures very quickly," says Benjamin. "Within just 14 days, it is ready for use, unlike many other organic fertilisers that take much longer."

How Bokashi Fertiliser Is Made

One reason bokashi has gained popularity among farmers is that the raw materials are readily available on most farms.

Bokashi is made using locally available and environmentally friendly materials as an alternative to synthetic fertilisers. Farmers can prepare it using livestock manure, poultry droppings, charcoal dust, bran, rock dust or wood ash, rice husks, molasses, and yeast. Farmers can also incorporate additional organic materials such as kitchen waste.

Each ingredient plays a specific role in the fermentation process and soil improvement. Livestock and poultry manure provide essential nutrients for plant growth. Charcoal dust contributes carbon, which improves soil aeration and porosity, helps regulate soil temperature, and absorbs harmful pathogens. Rock dust supplies important minerals needed by crops, while wood ash can be used as an alternative to reduce soil acidity.

Rice husks increase silicon levels in the soil, strengthening plant tissues and enhancing crop resilience. Where rice husks are unavailable, farmers can substitute them with chopped stalks from maize, sorghum, millet, wheat, or other locally available crop residues.

Molasses serve as an energy source for beneficial microorganisms that break down organic matter during fermentation. Yeast acts as a catalyst that accelerates the fermentation process.

If yeast is unavailable, virgin soil collected from a naturally forested area can be used because it contains beneficial microorganisms.

Preparing bokashi begins by layering farmyard manure, charcoal dust, and bran. Separately, water is mixed with molasses and yeast to create a liquid solution. This mixture is then sprinkled over the heap while thoroughly turning the materials to ensure uniform distribution.

The mixture's moisture content is critical. A simple test can determine the correct consistency. When a handful of the material is squeezed, it should form a ball without crumbling or releasing excess liquid. If the material falls apart, it is too dry and requires additional moisture. If water drips out, it is too wet and should be aerated or mixed with dry materials.

As fermentation progresses, the heap temperature rises, indicating active microbial activity. Bokashi fertiliser should be turned twice daily, preferably in the morning and evening.

Regular turning ensures proper aeration and uniform fermentation throughout the heap. After fourteen days, the fermentation process is complete, and the bokashi is ready for use.

Although the process is straightforward, Benjamin notes that success depends on consistency and commitment.

"Many people admire what we do and would like to earn income from bokashi," he says. "But it requires dedication. You have to turn it at least twice every day for it to mature properly, and not everyone is willing to put in that effort."

Meeting Farmers' Demand

The couple sells a 90-kilogramme bag of bokashi fertiliser for KSh 600 while reserving some for use on their own farm. Demand continues to grow as more farmers witness the benefits of the fertiliser.

> **It requires dedication. You have to turn it at least twice every day for it to mature properly, and not everyone is willing to put in that effort**

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For many smallholder farmers, the rising cost of synthetic fertilisers has made crop production increasingly expensive. At the same time, prolonged use of chemical inputs has contributed to declining soil health. Bokashi offers an affordable alternative that improves soil fertility while reducing production costs.

Benjamin and Lilian have experienced these benefits firsthand.

"In the past, our maize harvest would run out long before the next season," Benjamin recalls. "Now, we harvest enough food to sustain our family until the following harvest."

Diversifying for Resilience

Beyond bokashi production, the family has built a diversified livelihood through several complementary enterprises. At the centre of their daily trade is a family-run posho mill, which Benjamin and Lilian have leveraged into a hub for other sales. Outside the milling shop, Lilian sells indigenous vegetables such as cowpeas (kunde) and slenderleaf (mitoo).

"As customers come to mill their maize into flour, they often pick up fresh vegetables on their way out," Lilian explains. "It creates a convenient one-stop shop and guarantees us a steady market."

The couple also keeps poultry and has ventured into aquaculture. Along a nearby riverbank, Benjamin manages two fish ponds that provide a dependable income stream. "Very few people rear fish around here, so demand is strong," says Benjamin. "Most buyers come directly to the farm".

These diverse enterprises have enabled the family to comfortably support their two children, including their eldest daughter who attends a national high school.

The Value of Knowledge

Training and access to information have played a key role in the family's success. Benjamin credits Biovision Africa Trust extension officers with helping improve their poultry enterprise through training on homemade feeds and the use of plant-based remedies for disease management.

"Before receiving training, we relied on trial and error," he says. "Now we understand how to feed our birds properly and manage diseases using proven methods." The couple has also adopted environmentally friendly crop protection practices. For example, they prepare biopesticides using tithonia leaves mixed with water and stirred daily for 14 days before application. These innovations have reduced production costs while improving farm productivity.

Benjamin and Lilian can now see the value of farm enterprises beyond subsistence. Their advice to fellow farmers is "do not rely on one product, diversify to have streams of income, however little, when consistently done it amounts to something substantial."





FOLIAR FERTILIZER

Training that changed everything for Ol Kalou farmer Mary Mwaniki

The process of making the foliar fertiliser uses locally available materials, including cow dung and urine slurry, water, bean flour, and nutrient-rich green leaves such as tithonia and stinging nettle

By Caroline Mwendwa

MARY MWANIKI, a member of the Good Pastures Organic Farmers Group, did not know that the training she acquired on homemade biofertilizer would open a door to a successful enterprise. Together with other farmers in her community, Mary faced the challenge of low yields, despite intensive use of synthetic fertilisers and pesticides on their farms. They had reached a point of desperation and needed an alternative method of food production that did not involve heavy use of chemicals. That is how they learned about Biovision Africa Trust's field officer in their area in Ngorika Ward, Nakuru County, who was working with other farmer groups and training them in organic farming.

"When we formed this group, the idea was to start practising organic farming and learn the technologies used to sustain soil fertility and improve yields without the application of harsh chemicals," she says. "Having been relying on synthetic fertilisers for a long period, our soils could no longer yield much. We were in dire need of training on alternative farming methods." The training was tailored to equip the members with skills in making biofertilizers from locally available materials. They also learnt how to prepare bio-inputs for managing frost damage on crops.

The process of making the foliar fertiliser uses locally available materials, including cow dung and urine slurry, water, bean flour, and nutrient-rich green leaves such as tithonia and stinging nettle. These are mixed and left to ferment for several days. The fermented product is then strained and packaged for use.

The final product contains nitrogen, phosphorus and potassium, which helps revive the soil and improve both the quality and quantity of harvests. "I have been applying this foliar fertiliser on my crops, especially the avocado trees, and I can attest that the quantity has been doubling every season, and the quality of the avocado fruit is distinct," she says. Mary has also noticed that her avocado trees produce more flowers, resulting in more fruit. She says the fruits are heavier and have a longer shelf life than those she produced before she started using the product.

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TOF Radio

Through weekly Kiswahili and local languages radio programmes, TOF Radio helps to improve awareness and knowledge of sound agroecological practices, strengthen the link between researchers and farmers to enhance food security, reduce poverty and increase household incomes among farmers in Kenya.

TOF Radio Stations

Emuria FM	Monday and Friday -10-11AM
Getembe FM	Monday 8PM
Milele FM	Tuesday 11-12AM
Mutongoi FM	Wednesday 10-11AM
Coro FM	Thursday 8.20-9PM
Ingo FM	Friday 8-9PM





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"After learning how to make the fertiliser and using it on my farm, I was relieved to find out its efficacy in restoring the life of the soil and crop vitality." It was exciting to finally stop relying on commercially bought synthetic inputs," she says.

Turning skill into business

When she perfected the skill of making her own foliar fertiliser, and the results could be seen on her farm, neighbouring farmers started asking for the product, and that is how her business in making and selling foliar fertiliser was born.

She submitted the product to KALRO for testing to establish its micro and macro elements. After confirming the product's efficacy, she began packaging and selling it in her local area and nearby markets.

She sells a litre of the fertiliser for KSh400. At the recommended application rate, 250 millilitres is mixed with 20 litres of water, giving a farmer about four to five knapsack applications from one litre of the product. Mary makes about 200 litres per batch, which earns her approximately KSh 50,000.

However, the business is about more than income. It demonstrates how knowledge acquired through farmer training can become a practical solution to declining soil health while opening another livelihood opportunity.

"I have been making and packaging the product for three years now, and the market is stable as the product is reliable," she says.

Taking the message to other farmers

Mary acknowledges that convincing farmers to change their practices has not always been easy. Some farmers remain skeptical about bio-inputs and, even after purchasing them, continue combining them with conventional products.

"Explaining to fellow farmers that the product works well is not easy," she says. The farmers' group has also faced adoption challenges. Some members did not embrace the practices introduced during the training and eventually left the group, fragmenting it.



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Despite these challenges, Mary believes farmers have a growing opportunity to restore degraded soils while creating new income streams. "Our soils are degraded by the overreliance on synthetic inputs. Biofertilisers have the potential to restore our soils, and this will increase our dwindling yields," she says.

Mary sees bio-input production as both a farming solution and a business opportunity. "Making and packaging bio-inputs helps one to diversify their income, while improving one's own yields. Organically grown produce has a market as people eventually realise the distinct benefits of organically grown food," she closes.

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