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Editorial

A new year always feels like fresh soil - ready to be worked and full of promise. Our theme this month is **Smart Farming**. Technology is no longer a distant dream; it is already reshaping the way we farm. Drones are giving us eyes in the sky, sensors are unlocking the secrets of our soils, and big data is turning information into smarter decisions. These tools don't replace the farmer's instinct - they sharpen it, helping us farm with precision, efficiency, and resilience.

But farming is never just about innovation. It is also about facing the realities on the ground. The **Foot-and-Mouth Disease epidemic** has reminded us how vulnerable our livestock sector can be. In this edition, we unpack the crisis, its impact, and the ambitious 10-year plan to strengthen biosecurity and restore confidence. It is a sobering reminder that resilience requires both vigilance and vision.

We have also broadened our scope to cover topics that are shaping agriculture in different ways. Our deep dive into **Tilapia farming** explores its origins, nutritional value, and growing role in aquaculture. Tilapia is more than just a fish — it is a symbol of diversification and sustainability in food systems.

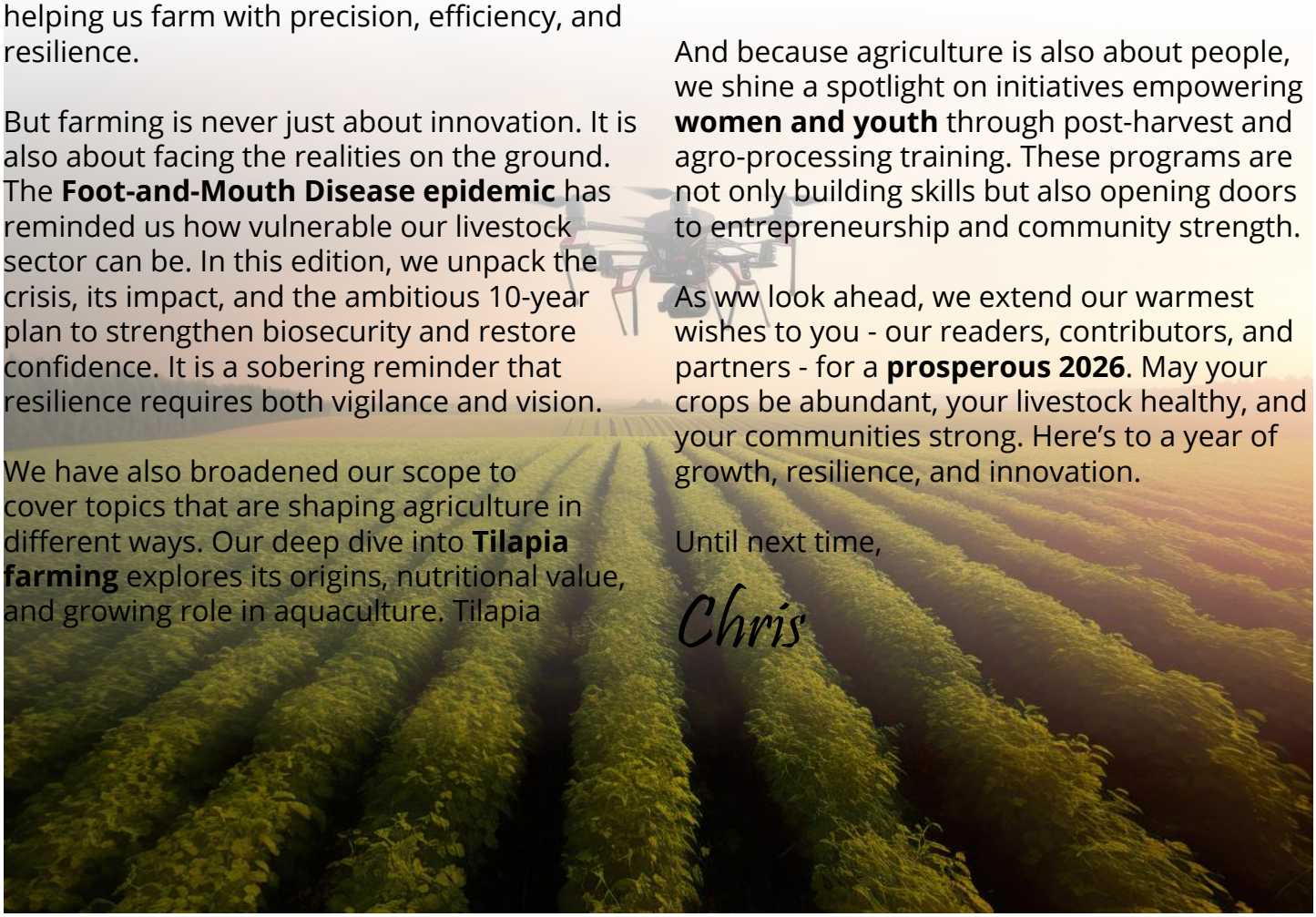
Land reform remains another pressing issue. The challenges are persistent, but so is the need for solutions. We share perspectives on how reform can be accelerated, ensuring that access to land drives both equity and productivity.

And because agriculture is also about people, we shine a spotlight on initiatives empowering **women and youth** through post-harvest and agro-processing training. These programs are not only building skills but also opening doors to entrepreneurship and community strength.

As ww look ahead, we extend our warmest wishes to you - our readers, contributors, and partners - for a **prosperous 2026**. May your crops be abundant, your livestock healthy, and your communities strong. Here's to a year of growth, resilience, and innovation.

Until next time,

Chris



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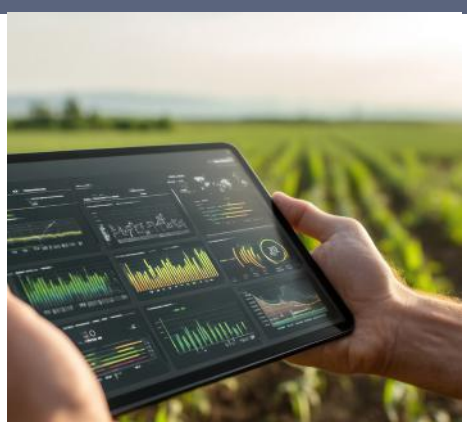

Smart Farming and Data-Driven Decisions: How Technology is Changing South African Agriculture

Walk onto almost any farm in South Africa today and you'll notice something different. It's not just tractors and irrigation pipes anymore—there are sensors buried in the soil, drones buzzing overhead, and farmers checking data dashboards on their phones. This is the new face of agriculture: **smart farming**, where decisions are guided by real-time information rather than guesswork.

Why Smart Farming Matters
Farming has always been about working with nature, but nature is becoming harder to predict. Rainfall patterns are shifting, input costs are rising, and farmers are under pressure to produce more with less. That's where precision agriculture steps in. By using tools like sensors, drones, and analytics, farmers can
see exactly what's happening in their fields and act before problems spiral out of control.

Think of it this way: instead of watering an entire field because "it looks dry," a farmer can water only the patches that need it. Instead of spraying pesticides everywhere, drones can spot where pests are gathering and target those areas. It's farming with a microscope rather than a magnifying glass.

The Tools of the Trade
Sensors
Small devices placed in the soil or attached to plants can measure moisture, nutrients, and even temperature. They give farmers a clear picture of what's happening underground—something that used to be pure guesswork.

Drones
No longer just for hobbyists, drones are becoming essential farm tools. They fly over fields, capturing images that reveal crop health, pest infestations, or irrigation problems. Some can even spray fertilizer or pesticides with pinpoint accuracy.

Analytics
All that data from sensors and drones needs to be interpreted. That's where analytics platforms come in. They crunch the numbers, highlight trends, and even predict what might happen next. For example, analytics can warn a farmer about a likely pest outbreak before it happens.

Real-Life Applications in South Africa
- **Maize farmers in the Free State** are using soil sensors to fine-tune irrigation, saving water while boosting yields.
- **Citrus growers in Limpopo** rely on drones to spot early signs of disease, protecting orchards before damage spreads.
- **Wine producers in the Western Cape** use analytics to manage irrigation and canopy growth, improving grape quality for export.
- **Livestock farmers** are experimenting with wearable sensors that track animal health and grazing patterns, cutting down on veterinary costs.

What's in It for Farmers?
The benefits are clear:

- **Better productivity**: Crops and animals get exactly what they need when they need it.
- **Lower costs**: Less wasted water, fertilizer, and pesticides.
- **Sustainability**: Smarter resource use means less strain on the environment.
- **Competitiveness**: Farmers who adopt these tools are better positioned to meet export standards and market demands.

The Roadblocks
Of course, it's not all smooth sailing. Many smallholders worry about the **cost of technology**, and rural areas often struggle with **poor internet connectivity**. There's also a **skills gap**—farmers need training to make sense of the data. And while government and private initiatives are starting to help, more support is needed to make smart farming accessible to everyone.

Looking Ahead
The future of farming in South Africa is likely to be even more data-driven. Artificial intelligence is already being tested to predict crop needs weeks in advance. Imagine a system that tells you: "Next Tuesday, your maize will need extra nitrogen." That's where we're heading. And with more startups entering the agri-tech space, opportunities are opening for young entrepreneurs and farmers eager to embrace innovation.

Final Thoughts
Smart farming isn't about replacing traditional knowledge—it's about enhancing it. Farmers have always relied on experience, intuition, and observation. Now, they have tools that make those instincts sharper and more dependable. Whether you're a new farmer just starting out, a smallholder looking to stretch resources, or a commercial producer aiming for global markets, precision agriculture offers a way forward.

Would you like me to now **adapt this conversational flagship piece into shorter companion articles**—one for beginners, one for smallholders, and one for commercial farmers—so each group gets a tailored perspective?

Drones in the Field:
How Flying Technology is Transforming South African Farms

Not too long ago, drones were seen as toys for hobbyists or tools for photographers. Today, they're becoming indispensable on farms across South Africa. From citrus orchards in Limpopo to vineyards in the Western Cape, drones are giving farmers a bird's-eye view of their land—and that perspective is proving to be a game-changer.

Why Drones Matter

Farming has always been about observation. Farmers walk their fields, check their crops, and look for signs of stress or disease. But walking every hectare is time-consuming, and problems often go unnoticed until it's too late. Drones change that. With a quick flight, they can scan vast areas, capture high-resolution images, and highlight issues invisible to the naked eye.

Imagine spotting a patch of maize that's under stress before it spreads or identifying pest infestations early enough to stop them in their tracks. That's the kind of insight drones deliver.

What Drones Can Do on the Farm

- **Crop monitoring**: Drones capture images that reveal plant health, often using multispectral cameras to detect stress before it's visible.
- **Mapping and surveying**: Farmers can create detailed maps of their fields, helping them plan irrigation, planting, and fertilization more precisely.
- **Targeted spraying**: Some drones are equipped to spray pesticides or fertilizers, reducing waste and ensuring chemicals are applied only where needed.
- **Livestock monitoring**: In open grazing systems, drones can help track herds and check for strays or injured animals.

South African Examples

- **Citrus growers in Limpopo** are using drones to detect greening disease early, saving orchards from devastating losses.
- **Sugarcane farmers in KwaZulu-Natal** rely on drones to monitor crop growth and identify pest hotspots, cutting losses by double-digit percentages.

- **Wine producers in Stellenbosch** use drones to manage canopy growth and irrigation, improving grape quality for export markets.

Benefits for Farmers

- **Time savings**: Covering hundreds of hectares in minutes.
- **Cost efficiency**: Less wasted water, fertilizer, and pesticides.
- **Precision**: Problems are identified and treated exactly where they occur.
- **Sustainability**: Reduced chemical use means less environmental impact.

Challenges to Adoption

Of course, drones aren't without hurdles.

- **Cost**: High-end agricultural drones can be expensive, though service providers are making them more accessible.
- **Regulations**: South African aviation laws require licensing for certain drone operations.
- **Skills**: Farmers need training to interpret drone data and integrate it into decision-making.

Looking Ahead

The future of drones in agriculture is promising. Advances in automation mean drones can soon fly themselves, collect data, and even upload it directly to farm management systems. Combined with artificial intelligence, drones could predict crop needs and recommend interventions automatically. For South African farmers, this technology offers a way to stay competitive in global markets while managing local challenges like water scarcity and climate variability.

Final Thoughts

Drones are more than flying cameras—they're becoming trusted farm assistants. Whether you're a smallholder looking to monitor a few hectares or a commercial producer managing vast fields,

Sensors and Soil Intelligence: Digging Deeper into Smart Farming

When you think about farming, the soil is where it all begins. Healthy soil means healthy crops, but understanding what's happening beneath the surface has always been tricky. Farmers have relied on experience, visual cues, and sometimes trial and error. Now, thanks to sensors, we can actually measure what's going on underground—and the results are transforming agriculture across South Africa.

Why Soil Sensors Matter

Water scarcity, rising fertilizer costs, and unpredictable weather patterns make it more

important than ever to use resources wisely. Soil sensors give farmers real-time data on moisture, nutrients, and temperature. Instead of guessing when to irrigate or fertilize, farmers can make decisions based on hard evidence.

Think of it as putting a stethoscope to the soil—you're listening to what the land needs.

What Sensors Can Measure

- **Moisture levels**: Helping farmers irrigate only when necessary, saving water.
- **Nutrient content**: Guiding precise fertilizer application, reducing waste and runoff.
- **Temperature**: Monitoring soil warmth to optimize planting times.
- **Salinity**: Detecting salt buildup that can harm crops, especially in arid regions.

South African Applications

- **Maize farmers in the Free State** use soil moisture sensors to fine-tune irrigation, boosting yields while conserving water.
- **Fruit growers in Mpumalanga** rely on nutrient sensors to apply fertilizer exactly where it's needed, cutting costs and improving orchard health.
- **Vegetable producers in the Western Cape** combine sensors with weather stations to plan irrigation schedules more accurately.

Benefits for Farmers

- **Efficiency**: No more blanket irrigation or fertilization—resources go exactly where they're needed.
- **Cost savings**: Lower input costs mean better margins.
- **Sustainability**: Reduced water use and chemical runoff protect the environment.
- **Consistency**: Crops grow more evenly, improving quality for local and export markets.

Challenges to Adoption

- **Cost**: High-tech sensors can be expensive, though entry-level options are becoming more affordable.
- **Connectivity**: Some systems rely on internet access, which can be patchy in rural areas.
- **Training**: Farmers need to learn how to interpret sensor data and act on it.

Looking Ahead

The future of soil intelligence lies in integration. Sensors are increasingly linked to mobile apps, dashboards, and even automated irrigation systems. Imagine a system that detects dry soil and automatically turns on the drip irrigation—no human intervention required. As costs come down and training expands, these tools will become accessible to more farmers, from smallholders to large commercial operations.

Final Thoughts

Soil sensors are giving farmers a new kind of vision—one that looks beneath the surface. By listening to the land, farmers can grow more with less, protect the environment, and build resilience against climate challenges. For South Africa, where water and soil health are critical, this technology is more than a luxury—it's becoming a necessity.

Analytics and Big Data: Turning Farm Information into Smart Decisions

If sensors and drones are the eyes and ears of smart farming, then analytics is the brain. All the data collected from fields, livestock, and weather stations needs to be processed, interpreted, and turned into action. That's where big data and analytics step in—helping farmers make smarter, faster, and more profitable decisions.

Why Analytics Matters

Farmers have always worked with information—rainfall records, planting dates, yield histories. But today, the sheer volume of data is overwhelming. A single drone flight can generate thousands of images, and soil sensors can stream data every few minutes. Without analytics, this information is just noise. With analytics, it becomes insight.

Imagine being able to predict a pest outbreak before it happens or knowing exactly how much water your crops will need next week. That's the power of big data in agriculture.

What Analytics Can Do

- **Yield prediction**: Using historical data, weather forecasts, and crop health indicators to estimate harvests.
- **Pest and disease forecasting**: Spotting early warning signs and recommending targeted interventions.
- **Irrigation planning**: Combining soil moisture data with weather models to optimize water use.
- **Market insights**: Linking farm production data to market demand, helping farmers plan for profitability.

South African Applications

- **Maize producers in the Free State** are using satellite imagery and analytics platforms to forecast yields more accurately, improving planning and reducing risk.

- **Fruit growers in Mpumalanga** combine sensor data with predictive models to fine-tune fertilizer use, cutting costs while boosting orchard health.
- **Wine estates in Stellenbosch** rely on analytics to manage irrigation and canopy growth, ensuring consistent grape quality for export markets.

Benefits for Farmers

- **Precision**: Decisions are based on evidence, not guesswork.
- **Efficiency**: Resources like water and fertilizer are used exactly where needed.
- **Profitability**: Better planning reduces waste and increases margins.
- **Resilience**: Farmers can adapt more quickly to climate variability and market shifts.

Challenges to Adoption

- **Connectivity**: Many analytics platforms rely on internet access, which can be limited in rural areas.
- **Cost**: Advanced platforms can be expensive, though mobile apps are making analytics more accessible.
- **Skills gap**: Farmers need training to interpret data and act on insights.
- **Integration**: Linking different data sources—sensors, drones, weather stations—can be complex.

Looking Ahead

The future of analytics in farming is about automation and prediction. Artificial intelligence is already being tested to recommend interventions automatically—like suggesting when to irrigate or apply fertilizer. As costs fall and platforms become more user-friendly, analytics will move from being a "nice-to-have" to a necessity for farmers across South Africa.

Final Thoughts

Big data is changing the way farmers think about their land. Instead of reacting to problems after they appear, analytics allows proactive management. Whether you're a smallholder looking to stretch resources or a commercial producer aiming for global competitiveness, analytics offers a way to farm smarter, not harder.

The Quality Features of Tilapia Fish for Human Consumption

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Tilapia has been nourishing human beings for thousands of years. Tilapia's most appealing attributes are that it is easy to farm, and its very mild flavour that makes it wonderful to eat. It is no wonder that Tilapia is prized far and wide, and it has made its mark on history.

Tilapia is the Latin form of the African word "tlhapi" which means "fish" in Tswana (also known as Setswana). Tilapia was given its name by Andrew Smith, a Scottish zoologist in 1840. Nicknamed "St. Peter's Fish" thought to be derived as the fish harvested from the Sea of Galilee, tilapia is believed to be the fish that was used in the biblical allegory to feed the multitudes.

Today tilapia (/tɪˈlɑːpiə/ tih-LAH-pee-ə) is the common name for nearly a hundred and ten different species of cichlid fish from the coelotilapine, coptodonine, heterotilapine, oreochromine, pelmatolapiine, and tilapiine tribes (formerly all were "Tilapiini"), with the economically most important species placed in the Coptodonini and Oreochromini. Tilapias are mainly freshwater fish native to Africa and the Middle East, inhabiting shallow streams, ponds, rivers, and lakes, and less commonly found living in brackish water. Historically, they have been of major importance in artisanal fishing in Africa, and they are of increasing importance in aquaculture and aquaponics. Traditionally a popular and affordable food in the Philippines with a mild taste, tilapia has been the fourth-most consumed fish in the United States since 2002, favoured for its low cost and easy preparation. After carp, tilapia is the second-most-farmed fish in the world. Consumers often regard this nutrient-rich food as an affordable option compared to other animal protein. It is commonly fried or broiled as part of a dish.

Tilapia typically has laterally compressed, deep bodies. Like other cichlids, their lower pharyngeal bones are fused into a single tooth-bearing structure. A complex set of muscles allows the upper and lower pharyngeal bones to be used as a second set of jaws for processing food, allowing a division of labour between the "true jaws" (mandibles) and the "pharyngeal jaws". This means they are efficient feeders that can capture and process a wide variety of food items. Their mouths are protrusible, usually bordered with wide and often swollen lips. The jaws have conical teeth. Typically, tilapia have a long dorsal fin, and a lateral line that often breaks towards the end of the dorsal fin and starts again two or three rows of scales below. Some Nile tilapia can grow as long as 60 centimetres.

Other than their temperature sensitivity, tilapia exists in or can adapt to a very wide range of conditions. An extreme example is the Salton Sea, where tilapia was introduced when the

water was merely brackish now live in salt concentrations so high that other marine fish cannot survive.

Tilapias are also known to be mouth-brooding species, which means they carry the fertilized eggs and young fish in their mouths for several days after the yolk sac is absorbed.

Nutritious qualities of tilapia:
The quality of fish is a very complex concept. Quality is frequently described using terms related to nutritional, microbiological, biochemical and physiochemical characteristics alone, but none of these terms serve as adequate indices of quality-sensory perception and consumer acceptability must be included.

Whole tilapia fish can be processed into skinless, boneless fillets. In some of the commercial strains, the yield has been reported up to 47% at harvest weight.

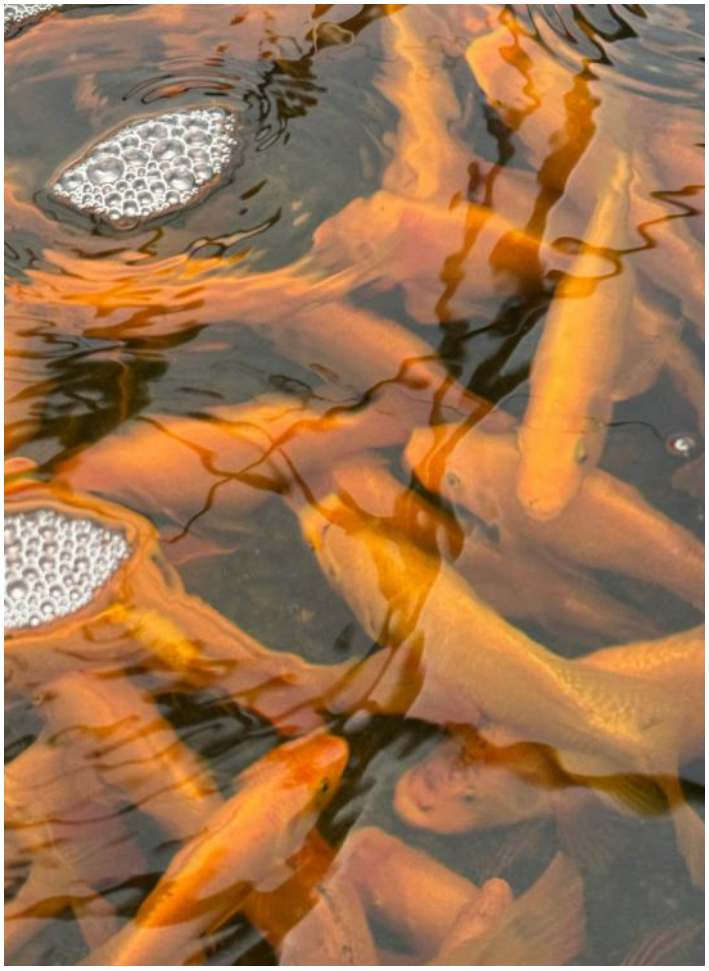
Tilapias are among the commercially important aquaculture species that are susceptible to off flavours (others include trout, barramundi, and channel catfish). These 'muddy' or 'musty' flavours are normally caused by geosmin and 2-methylisoborneol, organic products of ubiquitous cyanobacteria that are often present or bloom sporadically in water bodies and soil. These flavours are no indication of the freshness or safety of the fish, but they make the product unattractive to consumers. Simple quality-control procedures are known to be effective in ensuring the quality of fish entering the market.

Tilapias have very low levels of mercury. Tilapias are low in saturated fat, calories, carbohydrates, and sodium, and are a good protein source. They also contain the micronutrients phosphorus, niacin, selenium, vitamin B12, and potassium.

Tilapia may be a less nutritious fish than generally believed. The fish's omega-3 fatty acid content is often far lower than that of other commonly eaten fish species. Their omega-6 fatty acid levels are unusually high. Multiple studies have evaluated the effects of adding flaxseed derivatives (a vegetable source of omega-3 fatty acids) to the feed of farmed tilapia. These studies have found that both the more common omega-3 fatty acid found in flax, ALA and the two types almost unique to animal sources (DHA and EPA), increased in the fish fed this diet. Guided by these findings, tilapia farming techniques could be adjusted to address the nutritional criticisms directed at the fish, while retaining its advantage as an omnivore capable of feeding on economically and environmentally inexpensive vegetable protein. Adequate diets for salmon and other carnivorous fish can alternatively be formulated from protein sources such as soybean, although soy-based diets with soy oil may also change the balance between omega-6 and omega-3 fatty acids.

Appearance and Freshness Indicators (Raw Fish):
When purchasing raw tilapia, consumers look for visible signs of freshness:

- **Eyes**: Should be clear, bright, and not cloudy or sunken.



- **Gills**: Should be bright red and clean, free of dirt or slime.
- **Colour**: Fillets should have a bright, uniform white appearance or a slight pink tinge. Yellow discoloration can indicate lipid oxidation.
- **Lustre and Texture**: The surface should be intact, moist, and shiny, with clear white muscle texture.
- **Smell**: Fresh tilapia should have a mild, slightly sweet smell, not a strong “fishy” or “musty” odour, which can indicate off-flavours caused by environmental factors during farming.

Eating Quality (Cooked Fish):
The main characteristics that drive consumer preference for cooked tilapia are:

- **Flavour**: A primary reason for its popularity is its bland, mild, slightly sweet taste that easily absorbs other seasonings and flavours. The absence of a strong “fishy” or “muddy” flavour is a key quality indicator.
- **Texture**: Consumers prefer a firm, yet tender and flaky texture. Texture is a crucial sensory attribute influencing acceptance.
- **Bones**: A significant portion of consumers prefer boneless fillets for ease of preparation and consumption.
- **Cooked Appearance**: Products like fried tilapia nuggets are popular for their golden colour and crispy shell.

Health and Production Perceptions:
Consumer choices are also influenced by the following factors:

- **Nutritional Value**: Tilapia is valued as a low-fat, high-protein source of essential vitamins and minerals.
- **Perceived Safety**: It is widely recognized as one of the “greenest” aquaculture products due to its hardiness and low requirement for antibiotics, minimizing contaminant risks.
- **Affordability and Availability**: Tilapia’s low price and year-round availability make it a widely accessible and popular protein source in many regions.

Sensory and Physical Features:
These are the primary features a consumer can use to evaluate quality:

- **Appearance:** Fresh, high-quality fillets should have a clear, bright, and uniform white or slightly pink colour with a natural lustre. The presence of a “muddy” or “musty” smell is

a significant quality issue, typically caused by organic compounds in the water during farming, and indicates poor quality.
- **Texture:** The flesh should be firm, elastic, and moist, not slimy or mushy. The muscle fibres should be intact and bind well, providing a pleasant chewiness.
- **Smell:** A fresh tilapia product should have a very mild, slightly sweet smell. A strong, «fishy» odour indicates spoilage.
- **Form:** For whole fish, clear, bright eyes (not cloudy or sunken), and clean, bright red gills are key freshness indicators.

Chemical and Safety Features:
These features are typically monitored through processing and certification standards to ensure safety and consistency:
- **Low Off-lavour Compounds:** A primary quality issue in tilapia is the presence of off-flavour compounds like geosmin and 2-methylisoborneol (MIB). Responsible aquaculture practices, such as holding fish in clean, flowing water (depuration) before processing, help eliminate these tastes.
- **pH Level:** The pH value of fresh tilapia muscle is typically between 6.0 and 6.8 shortly after slaughter. An increasing pH during storage is a key indicator of protein degradation and spoilage.
- **Low Total Volatile Basic Nitrogen (TVB-N):** TVB-N measures the amount of ammonia and amines produced by microbial and enzymatic activity. Low TVB-N values indicate freshness; a value above the standard limit (e.g., 30 mg N/100g in some regions) indicates the fish is not fit for consumption.
- **Minimal Contaminants:** High-quality tilapia from responsible sources (often certified by organizations like the Aquaculture Stewardship Council or Best Aquaculture Practices) should be free from harmful levels of antibiotics, heavy metals like mercury, and other contaminants.

Ultimately, the best products come from systems where water quality, feed type (high-quality, vegetable-based diets are preferred), and processing conditions are meticulously managed to yield a consistent, mild-flavoured, and firm-textured fish.

Unfortunately, the post-harvest activities are directly related to the poor quality of the product. In Africa, the cold chain is often not properly in place and hygiene standards are often lacking in the pre-processing proses.

How to keep the quality in place when harvesting your fish:
To harvest tilapia correctly and preserve fish quality, you must minimize fish stress and maintain a rapid, continuous cold chain from harvest to processing.

Pre-Harvest Preparation:

- Stop feeding the fish for 2 to 3 days before harvesting to empty their stomachs. This prevents off-flavours, improves overall hygiene, and ensures better quality during processing.
- Harvest during cool weather, preferably in the early morning, to avoid temperature stress.
- Prepare equipment in advance, including nets, handling bins, and ample amounts of crushed ice or an ice slurry (preferable 30% ice for the volume of fish you are planning to harvest).
- Wet hands and equipment that will contact the fish to avoid damaging their protective slime layer and scales.
- Reduce crowding time as much as possible, ideally to less than 2 hours, to minimize stress and prevent injury.

Harvesting and Humane Killing:

- Harvest gently using methods like seining or partial/total pond drainage, ensuring fish are handled with care to avoid bruising or tearing of the skin.
- Kill fish humanely and quickly immediately after removal from the water to prevent the buildup of stress hormones (which can affect meat quality).
  - Acceptable methods include the use of Aqua-S, clove-oil, percussive stunning (a forceful blow to the head just above the eyes) or effective electrical stunning, followed by immediate bleeding (exsanguination) or gutting to ensure death.
  - Unacceptable methods that cause prolonged suffering and should be avoided include asphyxiation in the air or in an ice slurry alone (without prior stunning).

Post-Harvest Handling and Storage:

- Wash the fish immediately after killing with clean, cold water to remove mud, slime, and bacteria.
- Chill rapidly to a temperature near 0° (32°F). The best method is to submerge the fish in a mixture of crushed ice and water (an ice slurry) in a 1:1 ratio of ice to fish. This rapid cooling slows bacterial and enzymatic spoilage and helps keep the flesh firm.
- Gently gut the fish to remove the internal organs, then wash the cavity thoroughly with clean water to remove any blood or debris.
- Pack in layers of ice for transport. Ensure a layer of ice is at the bottom of the container, between layers of fish, and on top, to maintain a consistent low temperature. Use insulated containers for longer transport distances.
- Process or store promptly. Fresh tilapia should be used within two days if refrigerated or can be stored in an airtight container in the freezer for six to nine months.

Conclusion:

To prepare tilapia, you can bake, pan-sear, or grill it; the key steps involve patting fillets dry, seasoning generously (salt, pepper, garlic, paprika are staples), and cooking until the white flesh flakes easily with a fork, typically 3-4 minutes per side when pan-searing or 10-15 minutes at 200°C when baking. Popular flavour additions include lemon, butter, garlic, chilli, herbs (dill, rosemary, parsley), and breadcrumbs. Be careful not to overcook the fish. If done properly you will be incredibly surprised by the quality of the product.

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Looming Water Crises in South Africa: Implications for Agriculture

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Joseph Kau : Agricultural Economist

South Africa is naturally a water-scarce country, receiving less than half the world's average rainfall while facing high evaporation rates and growing demand from all. Climate change deepens these challenges, leading to more intense droughts and floods, less predictable rainfall, and shifting temperatures. Beyond the environmental factors, long-standing historical inequities, aging irrigation systems, and concerns about water quality further complicate the situation. The agricultural sector, which uses over 60% of South Africa's water, is particularly vulnerable. Droughts have led to significant drops in crop yields, which in turn contribute to rising food prices and food insecurity. With about 14% of the population relying on agriculture directly or indirectly, water scarcity has a profound effect on rural livelihoods and efforts to reduce poverty.

The roots of today's water challenges can be traced to apartheid-era policies that created severe racial disparities in water access. During this time, white commercial farmers were given preference, while Black communities were often systematically excluded from water rights and infrastructure. While policies like the National Water Act of 1998 were designed to redress these imbalances, progress has been gradual. There is a perception that commercial interests still often take precedence, and that underlying biases can influence policy, risking a continued inequality in water provision. In a recent effort to promote a more inclusive and equitable system, the South African government introduced "The Water Use Licence Applications Amendment and Appeal Regulation No. 3434 of 2022." This regulation encourages a significant shift by asking new commercial agriculture applicants to allocate up to 75% of their water use to Black farmers.

Water infrastructure shortage

South Africa is currently facing a severe water infrastructure shortage, characterized by outdated and poorly maintained systems, insufficient investment, and inadequate water conservation measures. This has led to significant challenges, including widespread water losses, service delivery failures, and unequal access to water resources. Many

municipalities are failing to strategically manage their water infrastructure assets, neglecting proper record keeping of asset locations, age, and condition. The long-term consequences of this underinvestment include deteriorating reliability and quality of water services, a shift towards more expensive crisis maintenance over planned maintenance, increased future maintenance and refurbishment costs, and a shortened useful life of assets. The problem is further exacerbated by weak governance, which contributes to delays in new infrastructure projects, such as the Lesotho Highlands Water Project Phase II and the Giyani water project, both of which have experienced substantial delays and cost overruns due to poor governance and tender irregularities. The nation's water scarcity is evident in the fact that demand is projected to surpass supply by 17% by 2030, with non-revenue water accounting for more than a third of water loss nationally, and specific regions like Gauteng losing between 40% and 49% of its agricultural supply and up to 44% of drinking water through leakages. The Blue Drop 2022-23 report highlighted that nearly half (46%) of drinking water systems were not microbiologically safe at times, and the Green Drop report indicated that 64% of municipal wastewater treatment works are at critical risk, underscoring the dire state of water infrastructure and management.

Urban Water Shortages

Major South African cities such as Johannesburg and Cape Town are increasingly vulnerable to severe water shortages, driven by a combination of climate change, rapid urbanization, population growth, and persistent governance challenges. Cape Town's 2015–2018 drought, culminating in the near-catastrophic "Day Zero," highlighted the fragility of urban water systems and the urgent need for adaptive management. The crisis is worsened by declining rainfall, over-reliance on surface water, and delayed infrastructure diversification, with dam levels reaching unprecedented lows and residents restricted to minimal daily water use. Johannesburg, South Africa's economic hub, faces similar risks, with experts warning it is just one drought away from disaster due to its growing population and interconnected water and power infrastructures. Both cities' negative experiences underscore the role of social and economic inequalities in exacerbating water crises, as wealthier groups often overconsume water while marginalized communities withstand the worst of shortages. Efforts to address these challenges have let to policy considerations, which included among others, tariff restructuring, and the exploration of alternative sources such as groundwater and desalination. Still, implementation is hampered by institutional fragmentation, limited capacity, and public mistrust. The lessons from Cape Town's crisis are actively debated and increasingly inform water policy in Johannesburg and other metropolitans, emphasizing the need for integrated, equitable, and resilient urban water governance in the face of ongoing climate and demographic pressures.

Urbanization and population increase raise demand and reduce groundwater recharge, exerting pressure on supplies. Urban water demand in 2050 will rise exponentially. Climate change is causing diminishing rainfall, higher temperatures, and worsening droughts, exacerbating scarcity. Water bodies are already under pressure of pollution and over-abstraction, with old, leaking infrastructure leading to humongous losses. Water scarcity is predicted to reduce agricultural productivity by 15-50% for crops and animals. The impact is not even; smallholder farmers are disproportionately affected because they lack irrigation, capital, and technology as commercial farms (Aguilar et al., 2021). This leads to the rise in prices of food, improved food insecurity, and severe socio-economic effects, including massive agricultural employment losses.

The Current Administration and Governing System

The Department of Water and Sanitation regulates water, but the licensing process is complex and disenfranchises smallholder farmers. Arguments exist for increased and hybrid water rights systems. Underlying these issues is inefficient and fragmented governance, including poor maintenance, lack of coordination, political interference, and minimal inclusion of farmers, that jeopardizes water security. Investment in water infrastructure is dominated by the public sector (over 90%), and private contribution is

under 10%. This has led to prolonged under-investment and a backlog of over R600 billion, with investment remaining at a low level of 0.35–0.74% of GDP. Under-pricing of water and poor revenue management threaten financial sustainability. Affordability for the poor versus cost-recovery for infrastructure remains a key policy dilemma. In South Africa, municipalities lack capacity to manage storage of water and domestic allocation and supply.

Proposed policy interventions: A Multi-Pronged Approach

A transition towards private sector engagement through Public-Private Partnerships (PPPs) and blended finance is on the rise to fill the financing gap, though political risk and regulatory complexity are deterrents. Intelligent farming practices like precision irrigation and drought-resistant varieties must be practiced in agriculture for building resilience. Outside the farm, reuse of greywater and rainwater harvesting are favourable, decentralized practices that can greatly reduce the need for drinking water .International forums like the G20 recognize the importance of water security and set forth general recommendations for Sub-Saharan Africa and not those specific to South Africa (Gabriel, 2020). The same applies to the BRICS-plus club, where political commitment towards green technology and sustainable development exists but no concrete and meaningful investment in South Africa's water infrastructure from such forums, more motivational than actual. In the context of African Continent Free Trade Agreement, the River Congo in the DRC, as a strategic source to provide South Africa, with fresh water needs to be considered as an on-going research investment. Furthermore, considering that South Africa is surrounded by oceans, the investments into water desalination can serve as a solution, especially for irrigation.

Conclusion

Ultimately, addressing water scarcity requires concerted action at all levels. Households can contribute significantly through water-saving practices, especially when supported by awareness campaigns and financial incentives. Effective water conservation and sustainable agriculture require strong governance and integrated policies. Reforms such as strategic water pricing, targeted subsidies and incentive-based payment schemes have proven effective in promoting water-saving behaviours and ensuring equitable allocation. Participatory approaches and decentralized governance improve the adoption and long-term sustainability of water solutions, fostering social cohesion and resilience to local challenges. Finally, public engagement and advocacy are essential for holding leaders accountable and driving the systemic change needed for a water-secure future. On the R&D front, it must be researched as to how water can be sourced from the Congo River basin in Africa, and desalination remains an important research intervention.

Three women farmers turned a failed cooperative into a thriving agribusiness

Dr Charity Mapumulo: ARC Institute for Soil, Climate and Water.Cedara
Dr Siphe Zantsi: ARC Economic Analysis Unit

When 15 members of a community cooperative gave up on farming, three women from the group decided to stay behind. They had no capital, little equipment, and only a few hectares of land to work with. But five years later, their enterprise – *Zolwande Trade In* – has become one of the most successful small farming cooperatives in their community outside Durban, South Africa.

Their story offers lessons on what it takes for women farmers to succeed in an environment where access to land, finance and markets is still deeply unequal.

From charity to self-reliance
Zolwande operates on Inanda Farm in the Ekukhanyeni area. The land belongs to a commercial farmer, Mr Gillespie, who for years was known for helping residents with small donations – often to cover funeral costs. Realising that such help was not sustainable, he looked for a way to support the community to build something lasting.

In 2019 he leased 50 hectares of irrigated land to a new cooperative, *Ndlumnyama*, for ten years rent-free. Fifteen people joined, most of them women. Each contributed R500 to buy seed and fertiliser. They started with one hectare of cabbage and potatoes, and the first harvest was good.

But the success didn't last. Disagreements over how to share the proceeds, combined with a lack of reinvestment capital, tore the group apart. By the next planting season, the cooperative had collapsed – a story all too familiar in South Africa's small-scale farming sector.

Studies by agricultural economists at the University of KwaZulu-Natal and the Human Sciences Research Council have shown that many cooperatives fail because of poor governance, unrealistic expectations, and weak financial planning. When members expect immediate payouts rather than building reserves, production cannot continue.

Three women refuse to give up
Among the few who refused to quit were Sithembile Hlongwa, Zona and Peggy Maphumulo. They had worked the soil themselves, knew the potential of the land, and were not ready to abandon their dream. The three approached Mr Gillespie again and proposed forming a new, smaller cooperative – *Zolwande Trade In*.

They negotiated a simple but effective financing arrangement: Gillespie would lend them money for seed and fertiliser, and they would repay him after the harvest through their bank account. It was an informal contract built on trust, but it gave them a start when no formal bank or government fund would.

Access to credit is one of the biggest barriers for smallholder farmers in South Africa, particularly women. A 2021 report by the

African Development Bank found that fewer than one in ten women farmers can secure production loans from commercial banks, forcing many to rely on informal arrangements like this one.

Finding the right crop mix
Zolwande began modestly, planting 20 000 cabbage seedlings on one hectare – fewer than the recommended density but within their labour capacity. They sold each cabbage for R10 and tried a hectare of potatoes. Potatoes brought good money – about R50 per 10 kg bag – but labour costs were high.

After repaying half their loan in the first season, they decided to experiment. They replaced potatoes with **amadumbe** (taro), a traditional root crop that requires less labour and fertiliser but has a strong local market. "Amadumbe was our breakthrough," says Makhawula. "It costs less to grow, gives a good yield and people love it." Amadumbe has recently gained attention among nutritionists and agricultural scientists as a climate-resilient crop. It tolerates erratic rainfall and poor soils, making it ideal for smallholders facing rising input prices and unpredictable weather.

Over time, Zolwande increased cabbage production to four hectares and amadumbe to six. They later added three hectares of calabash; a hardy vegetable used in traditional dishes. Today, the cooperative manages around 16 hectares in total. A head of cabbage still sells for R10, amadumbe for up to R14 a kilogram, and calabash for R10 a kilogram.

Building markets from the ground up
Zolwande has earned a vegetable production compliance certificate, which allows it to sell to formal retail outlets. But the women still depend on intermediaries because they lack transport to reach urban fresh-produce markets.

Market access remains one of the most persistent challenges for small farmers in South Africa. The country's major fresh-produce markets are in cities, and without vehicles or cold-chain facilities, rural cooperatives lose out on higher-value sales. According to the National Agricultural Marketing Council, intermediaries often capture most of the profit margin.

Despite this, Zolwande provides employment to four permanent and up to 16 seasonal workers during planting and harvesting. Most of them are local women and youth. The cooperative pays R400 per hectare for land preparation – ploughing, discing, and ridging – which is why owning a tractor is now their biggest goal. Having their own equipment would cut costs and increase independence.

Waiting for state support
So far, Zolwande has received no direct funding from government programmes. The Agricultural Development Agency has promised support, but the paperwork has been slow. For now, the women rely on their own profits and informal credit.

Their experience reflects a wider reality. While South Africa's agricultural policies speak of empowering smallholders, bureaucratic delays and fragmented support systems often leave farmers waiting for years. Women farmers remain under-represented in state funding despite evidence that investing in them yields high social returns.

A model of resilience and vision
Zolwande Trade In has survived where others failed because its members share a clear vision, work transparently and make cautious business decisions. They show that even without large subsidies or expensive machinery, women can build profitable and job-creating agricultural enterprises when given secure land and trust-based support.

Their story is also a reminder that land reform and community farming projects do not fail because people are incapable – but often because systems of support are too rigid or poorly coordinated.

If policymakers are serious about inclusive rural growth, they could learn from Zolwande's example: start with trust, invest in practical infrastructure like transport and tractors, and recognise the leadership capacity that already exists among rural women.

As Maphumulo puts it, "We just needed a chance – not charity, but a chance to prove that we can farm and build something for ourselves and our community."

A path of accelerating Land Reform in South Africa

Wandile Sihlobo

Delivering the African National Congress's January 8th statement recently, President Cyril Ramaphosa noted, amongst other things, that:

"Land reform remains one of the most urgent tasks of the National Democratic Revolution. While progress has been made, much more is required to give effect to the constitutional requirement for redress and equitable access to land."

The President further stated that: "Key tasks include strengthening support for land reform beneficiaries, accelerating the processing of outstanding restitution claims and resolving disputes more efficiently."

To give effect to these matters, the President highlighted that the starting point should be a sharper focus on ensuring that the Department of Land Reform and Rural

Development is working effectively. Any close observer of the land matters in South Africa will agree that the Department has, quite frankly, been dismal in 2025. The optimism that some progress would occur, which had persisted in the years before, dwindled.

It also didn't help that we didn't see any meaningful progress on land reform beyond a few high-level policy statements that sought to spark more conversation than implementation. I am focusing on implementation because, while we can all agree that there is much more work to be done on various land reform programmes in the years to come, the government has a starting point.

We can take a moment and focus on releasing the land that has been acquired by the government over time and not constantly channeling our attention only on acquiring new land while applying minimal effort in thinking about how we distribute what has been acquired and ensure that the new farmers succeed in their efforts of being notable commercial farmers.

Under the Pro-Active Land Acquisition Strategy, the South African government has roughly 2.5 million hectares of land. This is the land acquired on the market under the willing buyer-willing seller approach over the years. And we must continue onA the path of a market-based approach to land reform and protect property rights. This is key to ensuring that the country's land reform programme delivers economic benefits for beneficiaries in the future.

Now that the South African government has this land, it must release it to deserving beneficiaries with title deeds. Such an approach would align with the President's view that land reform must be accelerated in a fair and sustainable manner. There would ordinarily be a need for support for the new beneficiaries through training and finance, amongst other key supportive interventions. Thus, the land reform program should not be the sole responsibility of the government.

There must be collaboration with organised agricultural groups and commodity associations to provide the necessary support to the new beneficiaries. In selecting the new beneficiaries, we must also be comfortable with the possibility that we may not support a large group of farmers.

The concept we must seriously consider is of "**Better Few, but Better**". We must support a new cohort of a few black commercial farmers, which could then encourage new ones over the years. Attempting to create numerous smallholdings from previously commercial farmland is not an ideal policy path.

The then Minister of Agriculture, Land Reform and Rural Development, Ms. Thoko Didiza, had an elegant approach to releasing this land through a Land Reform Agency, which was supported by organised agriculture and the Land Bank, amongst others. The Department of Land Reform and Rural Development must refocus on this approach as an effective means of releasing the land.

The failure to release this land adds to the continuous frustration of the minimal contribution of black farmers to commercial agricultural output. At the time, then-Minister Ms. Thoko Didiza was looking to establish the Agency, and we had so much goodwill from various large commercial farmers that we were eager to partner with and support the program.

The Department of Land Reform and Rural Development must revive such conversations and reconnect with farmers. The approach, though, must not be the never-ending meetings, but more action-oriented. It is through such action that the Department of Land Reform and Rural Development would provide a supportive path to the words President Ramaphosa voiced out during the ANC's January 8th statement of 2026.

Acknowledgement:
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Strengthening Women and Youth Through Postharvest and Agro-Processing Training

Dr Sipho Sibanda and Manoshi Mothapo
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The village of Jenoi in the Gambia's Lower River Region hosted an intensive capacity-building programme from 11–14 November 2025, aimed at empowering women and youth in vegetable and fruit postharvest management and agro-processing. Conducted under Work Package 2 of the *Enhanced Vegetable Production and Processing for Rural Women and Youth* project, the training emphasized the crucial role of postharvest technologies in reducing losses, improving food quality, and creating income-generating opportunities. In a region where horticulture is a key livelihood activity, strengthening skills in postharvest handling, processing, and value addition is essential for enhancing food security, reducing waste, and fostering long-term economic development.

Postharvest losses in the Gambia remain high due to poor handling, limited processing capacity, and inadequate storage. Women and youth form the backbone of local vegetable production and marketing; and are particularly affected by these challenges. This training responded to these gaps by equipping participants with skills needed to reduce losses and increase the value of their produce through improved handling and processing techniques.

Outcomes of the training

A major outcome of the training was improved knowledge and practical understanding of postharvest handling techniques among participants. The training also emphasized food safety, hygiene, and product quality standards, which are increasingly crucial for accessing both rural and urban markets. Farmers were introduced to Good Handling Practices (GHP), Good Manufacturing Practices (GMP), and basic cleaning and sanitation requirements. Farmers gained a clearer understanding of proper maturity indices, cold-chain management, hygiene practices, sorting, grading, drying, fermenting, and packaging of vegetables and fruits. Participants also developed skills in producing value-added products such as tomato sauce, chili paste, dried onions, and cabbage pickles, which can be sold in local markets for higher returns.

Another important outcome was the enhanced collaboration between farmers, extension officers, and development partners. By bringing these actors together, the training strengthened agricultural support networks in the Lower River Region. Extension officers gained deeper insights into the challenges faced by local producers and acquired new teaching materials including posters, manuals, and processing guides to use in future community outreach. This interaction promoted long-term sustainability, as trained officers will continue mentoring farmers after the project's completion, ensuring continuity of skills and reinforcement of good practices.

Benefits to Women and Youth

The training provided women and youth with practical tools to transform perishable produce into stable, marketable products, offering important income buffers against fluctuating fresh-produce prices. Through the introduction of value addition, participants gained the ability to diversify their livelihood activities and reduce vulnerability to market gluts and seasonal shortages.

Participants also benefited from training in food safety, hygiene, and product quality standards. This knowledge strengthened their ability to produce goods suitable for informal and emerging formal markets. Many youth participants reported feeling newly empowered to establish micro-enterprises in dried vegetable snacks, bottled sauces, and powdered spices. In addition to technical skills, the training also built confidence, leadership, and problem-solving abilities, helping women and youth overcome barriers such as limited access to tools, restricted mobility, and lack of prior training opportunities.

Sustainability

The programme highlighted the importance of supporting farmer groups to establish village-level processing units that can serve as hubs for continued production. Such units will allow farmers to collectively access processing equipment, adhere to consistent quality standards, and scale production beyond household levels.

Another priority area for sustainability is improving access to basic equipment and packaging materials. Starter kits including knives, trays, jars, and drying racks will enable trained participants to immediately apply the skills learned. Furthermore, access to targeted financial support, such as grants or micro-loans, will be critical for establishing micro-enterprises and procuring necessary equipment.

Strengthening market linkages with cooperatives, aggregators, and local retailers will help sustain demand for processed products. Refresher trainings every six months are recommended to reinforce good practices, troubleshoot challenges, introduce new technologies, and maintain momentum among women and youth groups eager to apply their new skills.

The capacity-building activities conducted in Jenoi represent a significant investment in rural livelihoods and the transformation of local agrifood systems. By equipping women and youth with critical postharvest and processing skills, the programme directly contributes to reduced food loss, increased household income, improved nutrition, and strengthened rural entrepreneurship. As participants begin applying these techniques within their communities, the long-term impact is expected to extend beyond individual households—supporting the growth of small processing enterprises and enhancing the resilience of the horticulture sector across the Lower River Region and The Gambia as a whole.

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South Africa's Struggle Against Foot-and-Mouth Disease

The outbreak of foot-and-mouth disease (FMD) has become one of the most pressing challenges for South Africa's livestock sector. Despite a strong recovery in field crops and horticulture in 2025, cattle farmers were left behind. Auctions — the lifeblood of rural economies — were cancelled across provinces, cutting off farmers' primary sales channels and leaving communities vulnerable to economic decline.

The disease's impact has been particularly severe in KwaZulu-Natal and the Eastern Cape, South Africa's dairy heartlands. Farmers have reported widespread losses, with milk production falling sharply as infected cattle are culled or quarantined. This threatens not only local livelihoods but also national food security.

Government's Response: A Decade-Long Vaccination Strategy

In January 2026, South Africa announced its first-ever ten-year FMD elimination strategy. The plan involves immediate mass vaccination in hotspot provinces, with ambitious targets: 90% of commercial cattle, 80% of communal cattle, and 100% of feedlot and dairy cattle within 12 months. The long-term goal is to restore South Africa's FMD-free status without reliance on vaccination.

Already, millions of cattle have been vaccinated since 2025, using vaccines imported from Botswana. Yet this covers only a fraction of the national herd of over 12 million cattle, leaving millions still vulnerable. Farmers argue that time is not on their side, as losses mount daily.

The Bottleneck: Vaccine Supply and Distribution

The government's reliance on Botswana as the primary supplier has raised concerns. Industry experts and farmers alike stress the need to diversify imports, with Turkey identified as a potential supplier. The limited capacity of state-owned laboratories has also slowed vaccine rollout, prompting calls for greater collaboration with private laboratories to expand storage and manufacturing.

Wandile Sihlobo, agricultural economist and author from South Africa, has emphasized that this is not merely a technical issue but a matter of urgency. Without swift action, auctions will remain closed, rural economies will suffer, and the sustainability of the beef and dairy industries will be at risk.

Comparative Economic Impact

Sector	Key Challenges	Short-Term Impact	Long-Term Risks
Beef Farmers	Cancelled auctions; restricted cattle movement; rising feed costs after drought	Loss of daily income; inability to sell cattle; mounting debt	Shrinking herd sizes; reduced competitiveness in export markets; collapse of rural auction economies
Dairy Farmers	Severe outbreaks in KwaZulu-Natal & Eastern Cape; infected cows culled; milk production disrupted	Falling milk output; shortages in consumer markets; rising costs for replacement stock	Long-term contraction of dairy industry; food security risks; erosion of South Africa's dairy export potential

Projected Recovery Scenarios

Scenario	Description	Expected Outcomes	Timeline
Best Case: Vaccination Success by Mid-2026	Rapid vaccine import diversification and efficient rollout achieve targets	Auctions reopen; herd sizes stabilize; milk production recovers; rural economies rebound	Mid to late 2026
Worst Case: Rollout Stalls	Continued vaccine shortages and logistical delays	Prolonged auction closures; herd depletion; dairy industry contraction; food security worsens	Late 2026 and beyond

Conclusion

South Africa's fight against FMD is both a scientific and economic battle. The government's decade-long plan is a step forward, but time is not on farmers' side. Without rapid vaccine imports, broader supplier engagement, and private-sector collaboration, the cattle industry risks collapse. The stakes are clear: protecting rural livelihoods, securing food supply, and restoring South Africa's place in global beef and dairy markets.

Making Farm-Style Tomato Leathers at Home

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Fruit leathers are dried sheets of fruit pulp with a soft rubbery texture and sweet taste, characteristic of the fruit used. Most types of fruit can be used to produce fruit leather, either alone or in fruit mixtures. The most used fruits are apples, various berries, tomatoes, apricots, peaches, plums, mangoes, guavas, pineapples, and passion fruit. Layers of different coloured leathers can be pressed together to form a sandwich, or the single layers can be cut into various shapes or strips.

Small-scale tomato leathers:
Harvesting:
The tomatoes are harvested at the mellow-ripe stage when full colour and flavour development has taken place. The fruit must still be firm enough to withstand handling without excessive bruising.

Separation and sorting:
Selective hand picking has the advantage of sorting the produce in the field. Any infested, sunburnt, misshaped and otherwise defective fruit are removed. Stem-ends and leaves are also separated from the fruit. The tomatoes are sorted again on arrival at the storage/ processing site.

Washing:
Not all fruits require washing, especially since they are peeled prior to pulping. Soiled or latex producing fruits require washing to remove unwanted debris and seeping latex. Soft and sensitive fruits are usually placed in water flumes to reduce bruising and to gently remove the debris from the surface.

Peeling:
The method of peeling depends on the type of fruit used. Most types of fruit are peeled by hand using sharp, stainless-steel knives.

Cutting, trimming and coring:
The fruit is reduced in size by cutting in half or quarters to expose the tomato seeds, which needs to be removed. Minor blemishes and bruises may be trimmed away using a sharp stainless-steel knife.

Possible pre-treatments:
Various pre-treatments may be given to the fruit pieces prior to pulping. Such treatments

are intended to preserve the natural colour and microbiological quality of the tomatoes and prevent enzymatic browning during drying.

- Brining: Salt has a very effective preservative effect on the tomatoes and contributes to accelerating drying. The fruit pieces are dipped for 3 minutes in a 1 – 1.5%salt solution.
- Acidification: Acids are also known for their preservative effect. A 2.5% solution of lemon juice or citric acid may be used as a dip for 5-10 minutes. The treated tomato pieces are then rinsed with fresh, potable water prior to further processing to remove excess acid on the surface of the fruit that could otherwise affect the taste of the final product.
- Blanching: blanching is also an effective method in preventing enzymatic browning of fruit. The tomato pieces generally require 1 minute in hot water (80°C) for effective blanching.

Osmotic dehydration:
The tomato pieces are boiled in a 60-70% sugar solution for 10-15 minutes and then left to soak for up to 18 hours. In this way, as much as 50% of the moisture in the fruit can be removed through osmosis. This not only reduces the subsequent drying time but also produces a sweeter product with better colour retention. Some of the fruit flavour is lost through this treatment. The fruits are removed from the syrup, strained and rinsed prior to further processing.

Pulping:
The tomato pieces are pulped in paddle pulpers to obtain a uniform consistency.

Additional ingredients (optional step):
Depending on the type of fruit used to produce fruit leathers, additional ingredients may be included to enhance or complement the specific fruit flavour or create an interesting new product. Garlic powder, celery salt and dried basil could be interesting additions to the tomato puree.

If the osmotic dehydration step was not performed, the product may be sweetened with sugar, corn syrup, or honey. Take note that granular sugar can cause crystallisation on long term storage. Saccharin-based sweeteners can be used for low kilojoule or diabetic products.

If the preservation step was not performed, browning can be reduced by the addition of lemon juice (10ml per 500ml fruit puree), or ascorbic acid (375ml per 500ml fruit puree). Purees of different types of fruit may also be mixed at this stage to create fruit blends.

Drying:
The fruit pulp is poured into a shallow tray. The tray is tilted to ensure that all corners are filled and to obtain an even spread of approximately 2mm. Avoid using spatulas to even-out the pulp.

The trays should be lined with plastic wrap or cooking spray to prevent the tomato leather from sticking to the tray. Drying can be sone in direct sun or in an oven.

- Sun-drying: Sun-drying is an economical option in areas with hot, dry climates. The trays are placed outside in direct sunlight, under shade cloth or in hothouses. It is important that the surrounding area be well covered to minimize dust blowing onto the pulp. The time required to reach the final moisture content varies according to the prevailing weather conditions, but usually 2-3 days under fair conditions. Sun drying can reduce the moisture content to between 15-20%. Take care not to over-dry the tomato leather: the product is dry enough when it stops feeling sticky to the touch and peels off the tray and maintains its shape. To ease the removal of the leather from the tray, a spatula may now be used, after 1 hour of drying, to lift the outer edges of the product.
- Oven drying: The trays are placed in an air-convection drier. It is important that the spacing between the trays and the design of the dried is such that uniform airflow over all the trays is ensured. A constant drying temperature of 60°C along with an air velocity of 4m/s is recommended to dry the fruit pulp within 3-4 hours.

Rolling of the tomato fruit leather (optional step): The fruit leather should be rolled up as soon as it is removed from the sun/drier, while it is still warm and pliable. Various fillings may be applied to the tomato leather prior to rolling. Experiment with jam, cheese spread etc for interesting varieties, but keep in mind that any kind of filing will have a definite influence on the keeping quality of the product as well as on its storage requirements.

Cutting and storage: The cooled sheets or rolls of tomato leathers are cut into the desired size and shape with a knife or a roller cutter.

The finished product can be stored for a few months at room temperature, depending on the type of preservative or filling used. The storage life can be greatly extended by placing the fruit leathers in refrigerated or frozen storage.

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Pepper Steak Stir Fry

Ina Paarman

A quick and easy recipe that takes the guess work out of creating bold, punchy flavours.

Serves: 2

You Will Need:

4 T (60 ml) olive oil

1 medium red bell pepper, cut into strips

1 medium green bell pepper, cut into strips

1 medium onion, cut into half rings

400-500 g beef steak, thinly sliced into strips (flank / ribeye / sirloin / rump)

2 t (10 ml) garlic, minced

1 t (5 ml) ginger, minced

2 - 3 spring onions, thinly sliced as a garnish

For the Pepper Steak Sauce

¼ cup (60 ml) soy sauce

1 T (15 ml) sugar

1 T (15 ml) cornstarch

4 x sachets Ina Paarman's Steakhouse Pepper Flavour Bomb

cooked rice, for serving

Method:

In a large heavy based frying pan over medium-high heat, add 2 T oil, when warmed add peppers and onion.

Sauté until lightly charred.

Remove from the pan and set aside.

Meanwhile, in a medium bowl, mix the soy sauce, sugar and cornstarch together.

Add the Flavour Bomb sachet, mix well, then add the steak strips and stir to coat.

Bring the same pan to a medium-high heat, add 2 T (30 ml) oil and marinated steak strips (reserve the sauce).

Fry until the steak strips start browning but aren't fully cooked.

Add the garlic and ginger and fry for another minute, then add the veggies back in followed by the soy sauce mixture.

Cook for another 2-4 minutes or until the sauce has thickened.

Serve on a bed of fluffy rice and garnish with freshly sliced spring onion.

Zesty Lemon Skewered Paneer with Lemon Raita

Ina Paarman

A fantastic vegetarian meal, bold on flavour! Easily made in the air fryer for a low effort supper.

Serves:2

You Will Need:

± 300 g paneer (one block)

3 x sachets Ina Paarman's Zesty Lemon Flavour Bomb

2 T (30 ml) olive oil

½ t (2,5 ml) chilli flakes (optional)

½ red onion, cut into slivers for skewering

½ red onion, finely chopped

½ cucumber, diced

200 g cherry tomatoes, halved / quartered

a squeeze of lemon juice

2 x naan bread

1 cup (250 ml) plain yoghurt, double cream

1 t (5 ml) ground cumin

a handful fresh mint leaves, chopped

a handful fresh coriander leaves, chopped

Method:

Paneer Skewers

Cut the paneer into cubes and set aside.

In a large mixing bowl, add 2 x Zesty Lemon Flavour Bombs sachets, oil, and chilli flakes.

Mix well.

Add the cubed paneer and onion slivers and toss to coat.

Skewer the paneer and onion on two long skewers.

Cook in the air fryer at 180 °C for 10-12 minutes until golden.

Salad
In a medium bowl, add the chopped red onion, cucumber, and cherry tomatoes with a squeeze of lemon to make a salad.

Raita
In a small mixing bowl, add the yoghurt with the remaining Flavour Bomb sachet, cumin, mint, and coriander. Mix well to make a raita.

Toast the naan in a hot pan, then serve the naan with the cooked paneer skewers, salad, and raita.

SERVICE EXCELLENCE

At BKB we value the importance of trust. Trusting that the rains will return and that the land will produce for those who nurture it. Knowing that trust cannot be bought, but rather earned over time through our actions and our commitment to you, through the good times and bad. We take pride in the relationships we have built with generations of clients, each underpinned by integrity and bound through a look in the eye and the shake of a hand.

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The Trusted Home of Agriculture
Die Betroubare Tuiste van Landbou

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