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MECHANIZING AFRICA'S FARMS WON'T WORK UNLESS WE DO IT DIFFERENTLY



By Beth Bechdol

For decades, Africa's agricultural mechanization has been guided by a stubborn assumption: if tractors transformed farming elsewhere, surely, they would do the same here. So, we shipped in large, expensive machines built for flat fields and industrial supply chains – and declared progress.

The results are visible across the continent – idle equipment, spare parts out of reach, maintenance costs that exceed farm incomes, and machines abandoned after just a few seasons.

This is not a failure of African agriculture or African farmers. It is a failure of approach.

Africa holds more than half of the world's remaining uncultivated arable land, yet most food production still comes from small farmers cultivating less than two hectares of land. Too often, mechanization efforts have introduced oversized, capital-intensive equipment without financing, training, repair services or after-sales support. Without strong needs assessments and follow-up, these interventions proved ill-suited to local terrain and local growing conditions, disconnected from farmers' realities, and ultimately unsustainable.

These technical shortcomings were compounded by exclusion. Women, who carry much of Africa's agricultural workload, have routinely been left out of access to mechanization services, finance, leasing schemes, and training. Short-term,

fragmented projects have failed to build the durable ecosystems of skills, financing, manufacturing and after-sales service that mechanization actually requires.

The consequences are clear. Millions of farmers – mostly women – still rely on hand tools. Productivity remains stubbornly low. And young people are leaving rural areas, seeing agriculture as physically exhausting, economically uncertain, and disconnected from opportunity.

This outcome is not inevitable. It is the predictable result of repeating the same failed approaches. At the Food and Agriculture Organization of the United Nations (FAO), we are working with African governments and partners to shift mechanization away from one-off equipment delivery toward locally driven systems that build skills, financing, and service ecosystems.

Sustainable mechanization offers a different path. It is not about replacing labour – it is about transforming it. It spans tools, equipment and machinery that reduce drudgery, increase productivity, improve market access, and strengthen resilience, while fitting local economic, social, and environmental realities. Women and youth are central to this transformation.

Done right, mechanization can transform lives

When women gain access to affordable, labour-saving technologies, productivity rises, incomes grow, and time is freed for education, entrepreneurship, and community life. When young people are equipped with modern tools, training, and financing, agriculture becomes skilled, dignified work – from equipment operators and technicians to agribusiness entrepreneurs and farm managers. But this only happens when mechanization is locally adapted, properly financed, and designed to include those who have historically been excluded.

I have seen this transformation firsthand. Growing up on my family's grain farm in rural Indiana, I watched agriculture shift from long days of manual labour to data-enabled, precision farming. What once depended primarily on physical strength increasingly relies on GPS-guided equipment, soil sensors, field imagery, and real-time decision tools that improve efficiency, reduce input waste, and boost yields. Today, that farm is run by my sister – a woman farmer using modern technology to make smarter production decisions every season. Mechanization did not eliminate livelihoods, it reshaped them into more skilled, productive, and sustainable work across generations.

That experience shapes how I view Africa's agricultural future. Done right,

mechanization combined with digital tools can transform millions of lives here too – boosting yields, cutting back-breaking labour, and lifting rural communities.

This is why the Africa Conference on Sustainable Agricultural Mechanization (ACSAM, 3-6 February) in the United Republic of Tanzania matters. It is not just another gathering – it is a chance to move beyond scattered pilot projects toward a coherent, continent-wide system. One of the most important outcomes under discussion is the creation of a permanent, Africa-owned hub for mechanization – a platform to align national plans, accelerate local innovation, strengthen research partnerships, and scale technologies that are environmentally sound and farmer-centred.

Across Africa, early results show what is possible when this approach is applied. In Tanzania, locally designed compact tractors and precision tools are enabling smallholders to farm smarter, not harder. In Benin, women's cooperatives are using small-scale processors to turn soybeans and cassava into higher-value products. In Ghana, adapted machinery has reduced fonio processing from days of manual labour to just hours, boosting incomes while improving food safety and quality.

These aren't isolated successes. They are practical blueprints for what can be scaled.

Africa cannot afford another decade of fragmented mechanization that wastes resources and fails farmers. Governments, investors, and partners must act now – backing locally driven innovation, building service and manufacturing ecosystems, and expanding access to finance for farmers but especially for women and youth. From my own farm roots, I know agriculture thrives when people see a future worth investing in. The choice is clear: repeat outdated models, or commit to inclusive, African-led mechanization that delivers productivity, opportunity, and food security.

Beth Bechdol is the Deputy Director-General, Food and Agriculture Organization of the United Nations (FAO)

ENDS

The Africa Conference on Sustainable Agricultural Mechanization (ACSAM) is being held 3-6 February in Dar Es Salaam, United Republic of Tanzania.

#AgriculturalMechanization

NEC CONSTITUTED LOC FOR EMERITUS ENGR. PROF G. A. MAKANJUOLA LECTURE SERIES (GAMALS)

Constituted members of LOC are:

1. Engr. I. A. Olorunfemi, Chairman.

2. SW Regional Chairman, Member

3. Prof. Owolarafe, Member

4. Engr Prof. Z. Osunde, Member

5. Prof. C. C. Mbargiogu Member,

6. Dr. Bamidele Olatija, Member

7. Dr. Benjamin Atta, Member

8. Prof. Umaru Adamu Kamuyo, Member

9. Prof. Silas Nkakini, Member

10. Engr. Yahaya Kazaure, Member

11. Dr. Mrs. Nneka Ogbuagu, Member.

12. Engr. Prof. Christopher Akinbile, Member

TOR

The terms of reference for the committee are, to

1. Raise funds to execute the lecture

2. Suggest a date and venue for the event for NEC consideration and approval

3. Source for the chairman, resource person to deliver the lecture and other speakers at the event

4. Arrange for courtesy visits by NEC and elders to necessary people (VC, Dean of the Faculty, etc.).

5. Perform any other activities as may be directed by NEC.

6. Perform any other duties the committee finds necessary to achieve full objectives of the lecture

BRIEF ACHIEVEMENT OF EMERITUS ENGR. PROF G. A. MAKANJUOLA

Emeritus Engr. Prof G. A. Makanjuola is a distinguished Nigerian Agricultural engineer and academic, recognized for his significant contributions to agricultural mechanization in West Africa. As a key figure who helped resuscitate and lead the Nigerian Society of Agricultural Engineers (now Nigerian Institution of Agricultural Engineers, NIAE) when it was revived in 1975, following earlier attempts to establish the group in the mid-1960s. The society, established in

1975, focuses on professional development in agricultural engineering.

His major achievements are as follows:

i. **Pioneering Innovations (1975):** In 1975, he developed a machine for preparing **pounded yam**. This design, which featured a cylindrical aluminum cup with metallic beaters, was later modified for other agricultural processes, including cowpea dehulling.

ii. **Academic Contribution:** He is an academic researcher associated with Obafemi Awolowo University (OAU), Ile-Ife, where he has contributed to research on agricultural technologies, including impellers and viscoelasticity.

iii. **Expertise:** His work focuses on developing appropriate technologies for processing, planting, and harvesting crops.

iv. **Recognition:** He is recognized as an expert in the field and an "Elder" in the Nigerian Institute of Agricultural Engineers (NIAE).

Major Findings

Emeritus Engr. Prof G.A. Makanjuola's major findings primarily revolve around agricultural engineering, focusing on the processing of agricultural products and the dynamics of farm machinery. Key findings include:

a. **Melon Seed Processing**: Empirical equations were proposed to correlate the three principal dimensions of melon seeds, aiming to facilitate the development of machines for shelling and oil extraction Makanjuola, 1972. Additionally, research evaluated centrifugal impaction devices for shelling melon seeds, detailing the effects of impeller geometry and speed on the process Makanjuola, 1975.

b. **Gari Production**: Studies investigated the effects of processing factors like dice size, fermentation time, blanching time, and drying temperature on the quality (total cyanide content and swelling capacity) of gari produced via steam gelatinization (Ajibola *et al*., 1987). A new technique using steam for gelatinizing fermented cassava mash for gari production was also explored, where mash dewatered to about 50% moisture content was heated to 88-94°C by steaming (Ajibola *et al*., 1987).

c. **Oil Palm Fruit Processing**: Experiments showed that palm fruit

recovery is enhanced by processing spikelets in non-pressurized sterilizers or by processing fruit bunches at elevated steam temperatures (around 130°C at over 2.5 atmospheres of saturated steam pressure) (Babatunde *et al.*, 1988).

d. **Tractor-Mounted Implement Dynamics**: Research discussed the effect of hitch geometry on the lateral motion of tractor-mounted implements and derived design desiderata for optimal performance (Makanjuola and Cowell, 1970). This theory was then applied to a disc plough, investigating factors governing its lateral dynamic behavior (Makanjuola, 1974).

e. **Viscoelasticity of Cassava Root**: A recent study in 2022 explored the viscoelastic behavior of cassava root (Manihot Esculenta Crantz) in bending (Nwakuba *et al.*, 2022).

Today, the Nigerian Institution of Agricultural Engineers remember his contributions by introducing lecture series.

3,500 FARMERS TO QUIT RICE CULTIVATION OVER N93BN LOSSES

Punch Newspapers
https://punchng.com › 3500-farmers-to-quit-rice-cultivat...

FEBRUARY 1, 2026 12:00 AM



File photo: Farmers

By Stephen Angbulu

The National Agribusiness Policy Mechanism, a presidential policy committee, has revealed that about 3,500 rice farmers are set to abandon cultivation following losses estimated at N93bn across the sector during the 2025 wet season.

The findings emerged from a dry-season farmer intention survey obtained by Sunday PUNCH covering 33,507 farmers across 13 pilot states, which showed that 10.6 per cent of rice farmers intend to scale back production during the 2025/2026 dry season.

Applied to the survey sample, this translates to approximately 3,500 farmers planning to exit or reduce rice cultivation.

The results were contained in the 2025 Major Wet Season Impact Report released by the Presidential Food Systems Coordinating Unit.

The report, alongside a communiqué from the NAPM's Second Cycle Meeting held in Abuja between December 9 and 10, 2025, was made available to our correspondent on Friday.

According to the committee, rice farmers recorded losses of N20,220 per hectare during the 2025 wet season.

With the country's rice cultivation covering approximately 4.6m hectares, according to data from the Coalition for African Rice Development, the sector-wide loss amounts to approximately N93bn.

The development comes as farmers increasingly shift from rice and maize to export-oriented crops such as soybean and sesame, drawn by more profit margins and stronger global demand.

The country exported sesame products valued at N700bn in 2024, ranking second in Africa and fourth in the world.

According to findings from the NAPM, wet-season production declined by 2.8 per cent in maize, 7.9 per cent in rice, and 1 per cent in sorghum, while soybean production surged 38 per cent as farmers migrated toward export-oriented crops.

The committee noted that 23 per cent of rice farmers planned to switch to soybeans or sesame due to declining rice prices driven by import pressure.

It linked the profitability crisis to earlier policy decisions taken by President Bola Tinubu's administration in July 2024, when food inflation exceeded 40 per cent.

Before declaring a national emergency on food security in April 2025, Tinubu had approved, in July 2024, a massive duty-free importation of rice in response to acute inflationary pressures.

However, with about 2.4 million metric tonnes of rice imported into the country, the committee recommended that the Federal Government should "formally close current rice import windows, given that food inflation has fallen below 14 per cent."

Rice imports in 2025 led to a substantial foreign exchange outflow.

Using global benchmark prices published by S&P Global Platts, at Thailand's

assessed price of about $370 per tonne for five per cent broken white rice, importing 2.4 million metric tonnes would amount to an estimated $888m, equivalent to roughly N1.26tn at the Central Bank of Nigeria's NFEM exchange rate of N1,418.95 to the dollar.

Indian five per cent broken white rice was cheaper at about $347 per tonne.

On that basis, the same 2.4 million tonnes would be valued at an estimated $832.8m, equivalent to about N1.18tn.

Speaking with our correspondent in Abuja, Coordinator of the NAPM and Senior Special Adviser to the President on Food Systems, Marion Moon, warned that the profitability attracting farmers to export crops such as sesame might not be sustainable in the long term.

"Farmers are now going to sesame. Why sesame? Because sesame doesn't need much input, and there is an export market for it.

"But if everyone starts to go into sesame, the prices will crash, and profits will shrink again," Moon stated.

She noted that early movers in the sesame market would benefit most from the current price dynamics, cautioning that mass migration into the crop could erode the margins that initially made it attractive.

Nigeria's sesame exports have gained significant traction in global markets, with the country exporting $463.83m worth of sesame seed to the global market in 2024, the Executive Director of the National Exports Promotions Council, Nonye Ayeni, revealed at the STDF 845 project for Sesame and Cowpea in March 2025.

The largest markets for sesame seed exports from Nigeria were China, Japan, and India, accounting for 63 per cent of total exports.

The global sesame seed market was valued at $7.67bn in 2025 and is expected to grow at a Compound Annual Growth Rate of 2.3 per cent, presenting both opportunities and risks for Nigerian farmers rushing into the sector.

According to the indicative national food balance sheet presented at the meeting, the country produced 6.07 million metric tonnes of rice in 2025, while imports stood at 2.4 million metric tonnes.

With no reserves and no rice exports recorded, total availability reached 8.66 million metric tonnes, resulting in a surplus of approximately 1.1 million metric tonnes.

However, the committee observed that the rice surplus was largely sustained by historically high import levels rather than

improvements in domestic production capacity.

“Despite positive balances, domestic production remains insufficient to fully meet national demand, with estimated supply gaps of approximately three million MT in maize, 600,000 MT in soybean, 400,000 MT in sorghum, and one million MT in wheat. Rice shows a surplus of approximately 1.1 million MT, largely sustained by historically high import levels rather than domestic production capacity,” the communiqué read.

The wet-season survey revealed that rice farmers experienced a 25 per cent year-on-year drop in paddy prices alongside a significant rise in production costs, resulting in losses of N20,220 per hectare.

According to the report, Maize farmers fared worse, with profit margins falling to negative N40,560 per hectare, driven by a 40 per cent price crash and a 30 per cent rise in production costs.

In contrast, soybeans recorded high profitability, reaching a 51 per cent gross margin largely due to higher yields supported by favourable weather and better comparative prices.

Soybean farmers earned N419,675 per hectare during the season, the report said.

The committee noted that the import lever was activated without a concurrent stabilization mechanism.

“The absence of a triggered Guaranteed Minimum Price meant there was no effective price floor to protect farmers when market prices fell below cost-of-production thresholds.

“Production costs remained static or increased, while output prices declined sharply, resulting in negative gross margins, particularly for maize and rice,” the communiqué noted.

It said structural productivity constraints also disincentivised farmers from cultivating staple crops.

The current extension agent-to-farmer ratio is approximately 1:6,466, limiting the adoption of improved seeds and good agronomic practices.

Fertilizer use was 29.5 kilograms per hectare, far below the global average of 134.2 kilograms per hectare, while 30 per cent of smallholders reduced fertilizer use due to escalating production costs.

The dry-season survey also showed that 5.3 per cent of maize farmers intend to scale back production, while a greater share plan to focus on vegetables, wheat, and export-oriented crops.

The presidential panel warned that without targeted intervention, these changes could lead to supply gaps in major staples, posing risks to food security and price stability.

It also called for the activation of a Guaranteed Minimum Price protocol to protect farmer margins and the deployment of targeted profitability instruments, including energy subsidies and production-linked insurance, for 15,000 dry-season farmers.

It further resolved that any future activation of the import lever should be synchronized with price stabilization mechanisms to protect domestic producers.

The PUNCH earlier reported that the Tinubu administration was under pressure to dump the food import waiver that it announced in July 2024.

Multiple sources familiar with developments at the Presidency said the pressure was coming from the private sector, which claimed that opening the country to food imports would undermine its investments and worsen Nigeria's unemployment rate.

Data from the National Bureau of Statistics show that food inflation dropped from 26.08 per cent in January 2025 to 10.84 per cent in December 2025, representing a decline of 15.24 percentage points over the year.

Rice farmers had earlier raised the alarm over the collapse of Nigeria's rice industry, attributing the shutdown of local mills and mass job losses to cheap imports, insecurity, and lack of government support.

"Our mills have been shut down. We have retrenched workers. Is this the future for us in this country?" Chairman of the Competitive African Rice Forum Nigeria, Peter Dama, had lamented.

Dama recalled a time when Nigeria's rice production reached unprecedented levels, hitting eight million metric tonnes and meeting much of the national demand. He linked the industry's decline to escalating insecurity and unfair competition from imports.

"Imported rice is cheaper because importers evade taxes and receive subsidies. They bring rice into Nigeria at prices as low as $10 to $20 per ton," he said.

The NAPM recommended the activation of a Dry-Season Rescue Programme for maize and rice, providing subsidized or guaranteed inputs, targeted irrigation support, and structured financing to stabilize production and prevent further migration of farmers to export crops.



Stephen Angbulu

With three years of experience, Stephen, The PUNCH correspondent, has been covering Nigeria's presidency, politics, security, immigration and trafficking in persons

CONFERMENT OF TRADITIONAL TITLE TO SOME EMMINENT NIAE MEMBERS



ENGR. PROF. A. P. ONWUALU, FNIAE, FNSE, FAS, FAENG on the throne as UGOEZE III of Orba, Anambra State

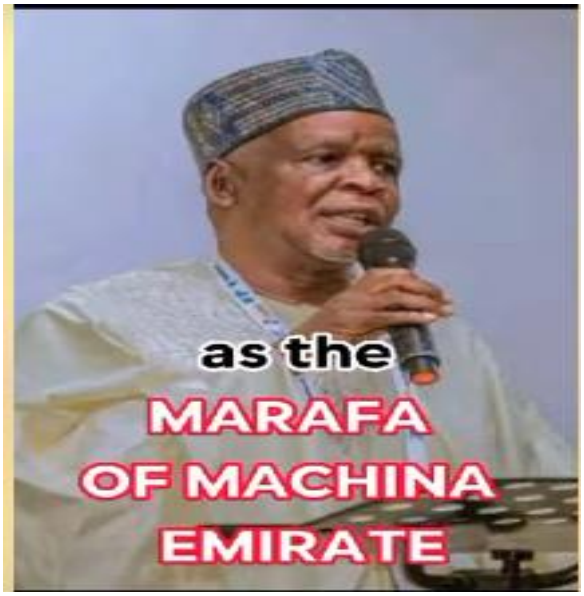
Igwe Chidubem Iweka III Crowns Engr. Prof A. P. Onwualu "Ugoeze III of Orba" in Awka. In a significant cultural gesture, His Majesty Eze Chidubem Iweka III, the Igwe of Obosi Ancient Kingdom and President of the Anambra State Traditional Rulers Council, conferred the chieftaincy title "Ugoeze III of Orba" to him.

Engr. Prof. A. P. Onwualu was born in Anambra State, eastern Nigeria, into the family of John Onwualu. He attended St. George's Primary School before he proceeded to Merchants of Light school in Anambra State, where he obtained the West Africa School Certificate (WASC) in 1977.He then attended the University of Nigeria, Nsukka where he obtained a bachelor's degree in Agricultural engineering in 1982. He later received a master's and Doctorate degrees in Agricultural engineering from the University of Nigeria, Nsukka and Dalhousie University respectively. He joined the services of the University of Nigeria, Nsukka as a lecturer I where he became a professor of Agricultural engineering in 1994. He has contributed significantly to Agricultural engineering in Nigeria with a special interest in

Agro-processing Technology and Agricultural power

Under his leadership, RMRDC won the National Productivity Order of Merit Award in 2009 and the Most Outstanding Public Institution in Service Delivery, 2012 by an Independent Monitoring Group. He has to his credit 200 scientific publications, including 20 books. He was Editor-in-Chief (2003-2014) of Nigeria Journal of Agricultural Engineering and Technology, published by the Nigerian Institution of Agricultural Engineers (NIAE). Onwualu received the Federal Merit Award (1978-1982), the Engr. (Prof.) E. U. Odigboh prize for the first student of Agricultural Engineering to get a First Class Honours and Canadian International Development Agency (CIDA) Ph.D. grant. Over 60 organizations have recognized him with awards including Presidential merit award, Nigerian Society of Engineers (NSE); Individual Honours Award, Nigeria Society of Engineers, Abuja branch; Award of Excellence by Nigeria Institute of Physics, Most Distinguished Agricultural Engineer of the Year by NIAE and Professional Service Award by Rotary Club of Gwarimpa. Under his leadership, RMRDC won the National Productivity Order of Merit Award in 2009 and the Most Outstanding Public Institution in Service Delivery, 2012 by an Independent Monitoring Group. He is a Fellow of 12 professional bodies, including Polymer Institute of Nigeria, Agricultural Society of Nigeria, Materials Science and Technology Society of Nigeria, Nigerian Society of Engineers, Nigeria Academy of Engineering, Nigerian Institute of Management, and Nigeria Academy of Science. He is married to Mrs. Blessing Onwualu, and they have four children, Zimuzor, Chimobi, Chimdalu, and Onyedika. Currently, he is the President African University of Science and Technology (AUST), Abuja Nigeria.

ENGR M. K. MACHINA AS MARAFAN MACHINA



On Saturday 31st January, 2026 the Ancient City of Machina in Yobe was agog with friends and families of four illustrious sons of the Emirate were turbaned including our humble respected elder of the Institution in person of Engr. Mohammed Kati Machina, MNIAE. As the Marafa of Machina Emirate. The Marafa advices the Emir on Land and Natural Resources. Engr. M. K.

Machina a retired Permanent Secretary Yobe State Government, Senior Liason Officer on Commerce and Industry to His Excellency the Executive Governor of Yobe State. Nigeria and now Chairman College of Administrative and Management Technology (CAMTECH) Potiskum.





CONDOLENCE VISIT BY THE NEC MEMBERS



Late Dr. Kamal Abdulgafar
Executive Director National Centre of Agricultural Mechanization (NCAM)

Immediately after the announcement of the demised of Dr. Kamal Abdulgafar the Executive Director National Centre of Agricultural Mechanization (NCAM) on the 7th January 2026. National Executive Council of the Nigerian Institution of Agricultural Engineers (NIAE) under a delegation were in the Late Dr. Kamal Abdulgafar's house to condole the family. The delegates headed by Engr. Prof Joseph C. Adama National Chairman. Engr. Prof Joshua O. Olaoye the IPC and Engr. Dr. Bala Gambo Jahun, the National Technical Secretary. They prayed for the departed soul of the late ED.

He was buried on Wednesday, 7th January, 2026 according to Islamic rites. The delegates escorted the corpse to the graveyard.

May his gentle soul rest in perfect Jannatul Firdausi, Amen.



NEC members at the house of Late Dr. Kamal Abdulgafar for condolences

APPOINTMENT



Engr. Dr. Yinka Segun Ademiluyi is now Acting Executive Director, National Centre for Agricultural Mechanization (NCAM).

Following the painful demise of late Executive Director/Chief Executive Officer, Engr. Dr. Kamal Abdulgafar Rasheed, the Agricultural Research Council of Nigeria (ARCN) has approved and appointed Engr. Dr. Yinka Segun Ademiluyi as the Acting Executive Director of the National Centre for Agricultural Mechanization (NCAM), with immediate effect.

Before his appointment, he was the Director Engineering/Head of Department of Processing, Storage and Engineering Department. He succeeded the Late Engr. Dr. A.R. Kamal who passed away on 7th January, 2026 after a brief illness. His appointment takes immediate effect.

On behalf NIAE teaming members, the Institution wishes to congratulates you on this noble responsibilities.