



CSC Evaluation and Monitoring Programme

Transforming Nigerian Agriculture through Practice, Advocacy, and Education

Femi Adekoya



Nigeria, a nation of 220 million people, is the most populous country in Africa. It is the continent's largest economy, and one of the fastest growing economies in the world. Agriculture forms a large part of the Nigerian economy, with two-thirds of the labour force employed in the industry. However, pressure on Nigerian food systems is increasing.

Many Nigerian farmers are smallholders who are particularly vulnerable to economic and environmental shocks, and in 2022 extreme weather led to widespread flooding, which damaged large areas of farmland and diminished harvests. This has resulted in an increasing number of Nigerians facing food insecurity. Furthermore, the farming techniques currently used in Nigeria tend to be conventional in nature and labour-intensive. New and unfamiliar approaches to agriculture are not perceived positively, and there is a lack of willingness to engage with recent technological developments due to low levels of awareness about their benefits, regulatory and financial barriers, and limited knowledge on how to use new technologies. Combined, these factors mean that the agricultural sector is not attractive to young people looking to build a career. These challenges require innovative new approaches and the adoption of novel technologies in order to ensure food security for all Nigerians.

Commonwealth Alumnus Femi Adekoya is a leader in efforts to introduce drone technologies to the Nigerian agricultural sector. Femi is a farmer by practice, and he observed first-hand the issues that Nigerian farmers are currently facing, and how others in the industry are being held back by a reluctance to embrace change. He viewed this as an opportunity, and trained as an agritech (agricultural technology) specialist, studying first for an undergraduate degree in Agriculture and Horticulture before being awarded a Commonwealth Scholarship to complete a Master's degree in Integrated Pest Management. By acquiring and sharing this knowledge, Femi is working to transform Nigerian farming practices and help to secure the country's food systems for future generations.



Femi Adekoya graduated from Harper Adams University in 2019 with Master's degree in Integrated Pest Management. He is now the Founder and Managing Director of an agritech company, Integrated Aerial Precision (IAP). IAP uses drone technology to improve the efficiency, sustainability, and profitability of Nigerian farms, with the aim of achieving food security for Nigerians. IAP also has an education arm, the Precision Field Academy, which provides educational workshops and training sessions. As many as 5,000 young people have attended these workshops at universities across Nigeria. Alongside his startup, Femi is a passionate advocate for young people in Nigeria. His work has earned him international recognition, and he frequently represents Nigeria on the world stage. He sits on the Youth Advisory Committee for the Netherlands Consulate in Nigeria, and he represents Nigeria at the International Society of Precision Agriculture. He recently attended the Committee for Food Security Summit in Rome. In late 2022, the African Society for Precision Agriculture awarded Femi their Young Scientist of the Year award. This award recognises his work with drone technology, as well as the training, research, outreach, and education that he provides.

Aspiring for Hunger-free Communities through Sustainable Agriculture and Food Security

From a young age, Femi observed the dependence of his local community's wellbeing on agriculture. Not only was it the primary source of income for families, but any issues in the sector created food shortages, with local communities subsequently experiencing malnutrition. He also observed how significant crop damage caused by pests and diseases threatened both the livelihoods of local farmers, and the food security of Nigeria.

'I made it my life-time goal to see that my local community becomes food secure, and poverty is eradicated through sustainable agricultural practices. To make this dream a reality, I considered tertiary education necessary. Therefore, I moved on to study Horticulture in the university with an aim to acquire knowledge and required skills.'



Femi in his cabbage field.

As an undergraduate, Femi took part in a 'Work, Earn and Learn Programme' focused on building entrepreneurship in organic agriculture. As a result of this programme Femi cultivated and supplied high quality organic vegetables to over 50 registered consumers in and around his university's community, thus contributing to food security in his region.

'The challenge of pests and diseases in Nigeria is further worsened by climate change, poor farming practices, and pest resistance to current control techniques. This has consequently led farmers to hugely rely on environmentally harmful chemicals to safeguard their investments, while demeaning the importance of food safety and environmental sustainability.'



Femi in 2015, distributing his farm produce around the university community as an undergraduate.

In the penultimate year of his undergraduate studies, Femi established The Hortus Community NGO, promoting urban gardening, eco-conservation, biodiversity, climate action, and capacity building for sustainable agriculture. The NGO trained young people to develop sustainable farming practices and to be environmentally conscious by taking climate action.

'For Nigeria to achieve [the] Zero Hunger and No Poverty [goals] of the United Nations Sustainable Development Goals, the challenge of pest and disease management must be tackled head-on through developing its human capacity in crop protection.'

To advance his knowledge in crop protection and to be better equipped to promote sustainable agriculture in Nigeria, Femi applied for a Commonwealth Scholarship to undertake Master's degree studies in the UK in Integrated Pest Management.

Commonwealth Scholarship and Education

Harper Adams University is an internationally renowned centre for precision agriculture, and Femi knew that studying there would lend credibility to his position as an agritech specialist. However, financial barriers posed a major challenge for him; without external funding, he would not be able to afford flights to the UK, let alone international tuition fees. Securing the Commonwealth Scholarship was therefore a critical step in Femi's journey.



Femi after receiving his UKCAA Commercial Drone License standing in front of Harper Adams University's Main Building (Admin Block).

'I would say it this way: the Commonwealth Scholarship is the foundation for virtually 80% of what I do today.'

Studying at Harper Adams University opened a new world of opportunity for Femi. Over the course of his studies, he was able to connect and collaborate with like-minded colleagues who were also studying and working at the school. These international networks would prove crucial in the years to come.

For example, it was whilst studying that Femi first met his long-term business partner, a Nigerian who studied international agri-business and food chain management, skills complimentary to Femi's and vital in founding Integrated Aerial Precision start-up, which today has more than 10 employees and also hires additional contractors on project-by-project basis. Although Femi's partner has remained in the UK, he supported the start-up's business strategy, and they have maintained a close working relationship.

'I met my co-founder, this perfect fit I call a partner, because I was awarded CSC Scholarship to study in the UK. We have steered the agritech startup, Integrated Aerial Precision, into new heights with several awards such as the Eco-innovation in Technology Award, Orange Corner Innovation Fund Grand prize award by the Kingdom of Netherland (40,000 Euro Financial Aid), +1 Global Food Security Award (12,000 USD Grant) and many more.'

Harper Adams University continued to support Femi after his studies by publishing about his achievements on their news platform and social media channels, making his profile available for like-minded researchers and potential collaborators.

'In terms of professional network, until today my school still remains a very strong support - they are proud of what I do!'

Furthermore, at Harper Adams he gained vital knowledge about the use of novel technologies in pest management, crop protection, and plant health. As a centre for precision agriculture, the university was able to offer Femi access to an industrial sprayer drone. He spent his time in the UK acquiring essential skills that would help him to succeed in the agritech industry. Significantly, the Scholarship enabled Femi to take an additional short course alongside his Master's studies, which enabled him to acquire a UK drone license. This meant that he was certified to pilot industrial drones.

'Drones can help us to detect pests and diseases easily, give us information about crop health. So, these are ways we are leveraging technology to accentuate our expertise and provide solutions for farmers.'

Drone technology is already widely employed in the UK farming industry, and Femi knew that this technology could be transformative in his home country. Drones can be used to reduce the intensity of the labour required by farmers, whilst also increasing the speed and efficiency of farming practices.

According to OPEC Fund for International Development, 'When used in precision spraying of crops, drones provide operational efficiency equivalent to the work of 100 farmland workers.... [Drones] can improve the monitoring of livestock, fences, trees, and wildlife, and help farmers document their farms to improve their creditworthiness.' A PwC report on the Commercial Applications of Drone Technology shows that drone planting systems significantly increase productivity, resulting in higher yields per hectare, an uptake rate of 75 per cent and a drop in planting costs of up to 85 per cent.



Femi standing with a 40L capacity agricultural spray drone engaged for aerial applications of crop protection and agro-input solutions.

Furthermore, drones can increase the safety of farming by reducing the need for farmers to handle dangerous chemicals directly. They are energy efficient, and have a low carbon footprint, meaning that they can make farming more sustainable for the future. The novelty of this technology also acts to make farming a more attractive career prospect for young people.

However, in 2019, drone technology was relatively unknown in the Nigerian farming industry. Femi says that prior to his studies, he associated drones predominantly with military exercises, and had perhaps only seen one flying overhead once in his life. Upon his graduation, he returned to Nigeria with a determination to introduce precision agriculture to the farming industry.

Integrated Aerial Precision: Introducing Smart Farming to Nigeria

When Femi returned home in 2020, he established his start-up company, Integrated Aerial Precision (IAP). IAP is an agritech company specialising in the use of drones in farming. Through this start-up, Femi brings newly emerging technologies to Nigeria's farming sector, leveraging drone technology to enable farmers to work more efficiently and more sustainably. Most importantly, he aims to help farmers to increase their profits. The company's drones provide a wide variety of services.

'We provide drone-powered solutions such as precision drone-spraying services, targeted broadcasts operation with drone technology, crop monitoring and scouting services, farm mapping and surveying services, assets inspection and aerial filming with documentary, particularly in agriculture.'



Femi receiving the Eco-Innovation in Technology Award at Africa's Largest Sustainability Award 2023.

As the founder and CEO of IAP, Femi is responsible for strategic leadership, planning, and project management. He is also involved in the practical implementation of IAP's work, as he continues to pilot industrial drones. This work requires Femi to leverage his academic background and his practical farming experience to bridge the gap between traditional farming methods and novel technology.

Despite the great potential that this technology has to transform the Nigerian agriculture industry, Femi has had to overcome many barriers to establish and grow his startup. For example, the process of acquiring a drone license in Nigeria is complex since the structures that are required for training and accreditation are not yet well established. The complexity of navigating the certification system within Nigeria has meant that in a country of 220 million, only around 20 people are currently licensed to fly industrial drones for commercial purposes.

The Commonwealth Scholarship enabled Femi to overcome this barrier, since over the course of his studies he was able to acquire a drone license. However, the difficulty of acquiring a license from within Nigeria meant that in 2019, there were very few providers of specialist agricultural drone services. The number of individuals with specialist knowledge of agritech in Nigeria was similarly limited. Most significantly, many farmers resisted the introduction of new technology in part due to lack of awareness of its full benefits, financial and regulatory constraints, and not knowing how to use it. For Femi, who is a farmer himself, this reluctance was understandable.

'I wish that drone technology is far spread across Nigeria. I have to cultivate, raise awareness, educate, it's a challenge.'

Femi has faced an uphill struggle to promote the use of agritech. He has worked hard to raise awareness, offering demonstrations and workshops, both in person and online, in order to showcase the usefulness and effectiveness of his drones. As a result of this, the demand for drone technology has gradually increased. Femi's business has grown, and he now directly employs ten members of staff.

One of Femi's projects focused on herbicide application in largescale rice cultivation: Femi used agricultural spray drones to apply herbicide to control weeds and to prevent substantial drift issues which usually happen when using manned aircraft for this purpose.

'Herbicide drift negatively affects smaller neighbouring farms. Agricultural drones spray at a very low height compared to manned aircraft, and this helps avoid the issue of chemical drift. With drone spraying we achieved a 90% and 30% water and herbicide saving respectively, with more than satisfactory efficacy, as reported by the farmer client on their over 2,500 hectare of cropland.'

Additionally, Femi uses drones for farm mapping, which is one of the critical components helping to manage a farm effectively and a key requirement in acquiring farm certification for premium local or export markets.

'Using drones, we surveyed a 150 hectare organic farm to produce the accurate maps of the farm. This exercise and deliverables would be used in progressing the farm certification to open the farm world of export and premium market.'

His success has been such that he is now working on projects beyond Nigeria, in industries other than agriculture. For example, IAP was recently contracted to provide a thermographic inspection of a large solar farm in Togo which supplies energy for around 10,000 people in the country.



Femi using drone to carry out thermographic inspection of 50MW solar farm.

Precision Field Academy: Educating Young African Farmers

As the demand for drone technology gradually increased, Femi has taken on a new challenge; he wants to pass on the skills and knowledge he has acquired to the next generation of African farmers. He has identified several barriers that would prevent young people from engaging with new technologies including lack of awareness about drone technology and lack of access to educational resources. To overcome these barriers, Femi has established the Precision Field Academy, the education arm of Integrated Aerial Precision.



One of the training sessions on drone piloting with drone flight simulator at the Precision Field Academy Training Centre.

As the Vision Lead and Head of Training at the Precision Field Academy, Femi is responsible for designing and facilitating courses and mentorship programmes to train and develop the technical skills of young Nigerians. One element of Femi's educational work involves running workshops in collaboration with universities, such as

Federal University of Agriculture, Abeokuta. At these workshops, he introduces benefits and applications of drone technologies, providing vital information for both students and faculty members. As many as 5,000 young people have attended these workshops at universities across Nigeria.



Femi in a training session, sharing knowledge on precision agriculture and drones in agriculture application.

Beyond the universities he visits, Femi has also established an online following for the Precision Field Academy. He hosts monthly webinars via the Academy's YouTube page. To date, the platform has hosted talks from international specialists in precision agriculture, Geographic Information Systems (GIS), and data science. Femi's online following via social media reaches more than 5,000 people in total, including more than 1,000 in his own community.

Femi identified the education about drone technology benefits and its use as the most significant change he had on his community as a result of the Commonwealth Scholarship:

'With my work at Precision Field Academy I educate and build capacity in digital and precision agriculture and technologies. I have the passion to see that we raise the next generation of tech-inclined, and digitally savvy farmers and agricultural professionals, particularly in Africa.'

I design and facilitate resources to implement courses (e-learning & hands-on training) and mentorship programs to train and develop the technical skills of students in drone technology in agriculture, GIS and remote sensing, Artificial Intelligence and other smart technologies in agriculture.

Precision Field Academy introduced drone technology in agriculture and its benefits to more than 5,000 farmers in Nigeria through its engagements by now. I also trained close to 50 drone enthusiasts who currently use the acquired drone piloting skills in their industries with positive impact on their work environment.

We want to transform and revolutionise agriculture to be able to deliver on the promise of food security and a resilient food system. We are at the forefront of introducing drone technology to smallholder farmers, empowering them with tools to optimise crop health and yield.'

Femi has also published a book, 'Drone Professional 3', which introduces the key tenets of precision agriculture. Through these various platforms, the Precision Field Academy has expanded the scope of impact.



Femi (middle) with young professionals holding his co-authored book, Drone Professional 3.

'We've collaborated with many global leading professionals and experts to provide training to our African audience. We have a lady who is a community manager from Malawi. We have instructors from Kenya, from Uganda, from South Africa, from Zimbabwe. This network is quite large, and our impact is Africa-wide and even beyond. But our focus is on Africa.'

Recently, Femi has secured funding to establish a new training programme, which he launched this year. Femi is replicating the best practices that he believes have been key in enabling him to become who he is today; he is working towards establishing an incubation programme.

'Personally, I have benefited from various incubation programmes and accelerator programmes as a young entrepreneur that have helped me build basic business knowledge and skills.'

Recently, we've been able to get Orange Corners Nigeria incubation programme supported by the Kingdom of the Netherlands. We won the grand innovation prize totalling €45,000. Combined with funding we have received from other sources such as Global Fund, Federal Government Grant and DevGlobal, we won close to a total of \$80,000.'

The Precision Agriculture Incubation Programme recently completed hybrid training of its first cohort of 250 young professionals, majority of whom were from Africa. Within this Programme, the participants are learning about drone technology, GIS, remote sensing, Artificial Intelligence and other digital technologies for precision agriculture.

Furthermore, the programme also helps its students to acquire essential business skills. Femi hopes that this training will enable the next generation to follow in his footsteps and establish their own agritech startups, build skills for employability and advance their career in digital and precision agriculture.



Onsite drones in agriculture training as part of the Precision Agriculture Incubation Program of the Academy.

Advocating for Youth Participation to Transform Agriculture in Nigeria

Through Integrated Aerial Precision and the Precision Field Academy, Femi has firmly established himself as a leader in the Nigerian agritech industry. However, he has faced many struggles on the road to this position, and he is now intent upon using his experiences to advocate for other young people in Nigeria.

According to the UN Population Division, in 2022 over half of Nigerian population was aged between 15-64. Furthermore, 70% of the households in Nigeria are engaged in crop farming activities. In this backdrop, where half of the country consists of the workforce, and three-quarters of it is engaged in agricultural activities, promoting the role of youth in developing the agricultural sector of the country is the best course of action, Femi believes. He sees the challenges that this generation are facing, and therefore is determined to represent them, by using his leadership skills and expertise in agritech.

'If you want to achieve food security, we need to harness the youth, the power, the creativity, the energy of the youth. But in talking about this we need to put the youth right in where they're supposed to be.'

In order to achieve this, Femi has taken on the responsibility of representing his field and his country on national and international stages. In June 2023, he joined the Youth Advisory Committee for the Netherlands Consulate in Lagos. This committee provides a forum for continuous dialogue with the Netherlands Consulate, and it is focussed on developing crucial policies and initiatives that support young people in Nigeria, working on issues such as job development and inclusion.

Femi has also recently been appointed as an ambassador for the Next Generation Agricultural Impact Network (NGIN). This society brings together young people from across the world to spearhead transformative change in the agriculture industry. Through this collaboration, the society aims to empower youth in agriculture to work towards the UN's Sustainable Development Goals. NGIN aims to give young people a voice, a vote, and a role in ecosystems for impact.



Femi speaking at the CFS51 session at the FAO advocating for youths in agriculture.

As part of the NGIN Youth delegation, Femi attended the World Food Forum (WFF) flagship event in Rome in 2023 which brought together youth organisations, governments, the private sector, academia, indigenous communities, investors and many others to explore how science and innovation can accelerate climate action and how to leverage new production methods and technologies. Femi was engaged in advocating and amplifying the voice of the youths in agriculture at the WFF event and while attending the 51st Session of the Committee on World Food Security the following week.



From the left, Femi standing 7th with fellow global youth leaders in agriculture at the CFS51 session.

One of Femi's current goals is to establish a WFF National Chapter in Nigeria, for which he is currently mobilising partners. Launched in 2021, the WFF is an independent, youth-led global network of partners facilitated by the Food and Agriculture Organization of the United Nations (FAO). It aims to spark a global movement that empowers young people everywhere to actively shape agrifood systems to help achieve the Sustainable Development Goals (SDGs) and a better food future for all.



Femi at the United Nations' Food and Agriculture Organization Headquarters in Rome.

Femi has attended conferences across Africa and beyond, where he uses his skills and expertise to advocate for the role of young people in agricultural development. In January 2023 Femi attended the Africa Food Summit in Dakar where he addressed the heads of states advocating the importance of investing in youth in agriculture to enhance productivity and increase food security in Africa.

In April 2023, Femi was appointed as the Country Representative of the International Society for Precision Agriculture (ISPA) in Nigeria. The ISPA is an international network and umbrella body of precision agriculture scientists and practitioners. The ISPA's goals align closely with Femi's; the society works to promote the advancement and adoption of precision agriculture and technologies.

In addition to speaking at high level events Femi advocates for youth involvement in agriculture sector using his social media following, by publishing on various platforms and directly engages in face-to-face discussions with members of local community.

Research, Awards, and Plans for Future

Femi has contributed to a better understanding of farmers' reluctance to adopt modern technologies by undertaking research and publishing a paper on Perception and Willingness of Nigerian Farmers to Adopt Drone Technology in Agriculture. He presented his findings in December 2022 at the 2nd African Conference on Precision Agriculture (AfCPA) in Nairobi to raise awareness of the decision makers on the reasons for slow adoption of drone technologies. This research facilitates adoption of relevant policies to advance use of technology in Nigerian agriculture.



Femi receiving the APNI Young Scientist award at the AfCPA in Nairobi, Kenya.

At the same event the African Association of Precision Agriculture awarded Femi their Young Scientist of the Year award. This award recognises his work with drone technology, but also the training, research, outreach, and education that he provides.

Reflecting on the impact of the Commonwealth Scholarship, Femi identified the most significant change to himself:

‘Commonwealth Scholarship was hugely impactful on my life and career. I have noticed that the prestige attached to the Scholarship has opened doors for me, with many people being more willing to hear me out once they know I am a Commonwealth Alumnus. However, whilst the Scholarship provides the springboard, it is up to the individual Scholar to make the most of the opportunity that it offers. Whilst the Scholarship gave me the push from Nigeria to the UK, my mind was always set on the ways in which I would use [my] newfound skills and knowledge upon my return to my home country. The Scholarship was the catalyst that began my career in the Nigerian agritech sector, but it was by no means the end of the journey.

Perception of people knowing that I’m a Commonwealth Scholar opens the doors for me because people are interested to hear what I have to say. That’s huge. I am regularly invited to deliver webinars on drone technology and to mentor young agricultural professionals.

That platform, that opportunity, that world of opportunity I would say is what Commonwealth Scholarship gave to me.’

In the future, Femi looks to continue building on the work that he has started and is always searching for opportunities to broaden his horizons. In terms of his own personal development, he is planning to pursue a PhD in his field. This is vitally important given the groundbreaking and research-heavy nature of the field, and he feels that acquiring a doctorate would allow him to become an authority on the subject. Echoing the path of his Commonwealth Scholarship, he plans to use any future skills gained to expand and grow his outreach projects.

‘My future plan with the academy, we want to grow it big, to become an agritech hub where more people, innovators can be created. Not just observers with technology.’

‘Personally, yes, keep doing advocacy for the betterment. When one goal is solved, we move to the next.’

More about Femi Adekoya

Find out more about IAP start-up by visiting the website:

<https://www.iaprecision.com/>

<https://precisionfieldacademy.org/precision-agriculture-incubation-program/>

Farmers’ Perception and Willingness to Adopt Drone Technology in Agriculture in Nigeria:

<https://paafrica.org/>

[proceedings/?action=download&item=9537](https://paafrica.org/proceedings/?action=download&item=9537)

Access additional published work here:

[Influence of moisture regimes and organic manure on nutrient dynamics and growth of cashew](#)

[DRONE PROFESSIONAL3 by The Flying Farmer on Selar.co](#)

Additional resources:

[The Flying Farmer on YouTube](#)

[CSC Webinar on Drone Technology and Agricultural Development](#)

[TEDxOluyole talk: Stirring New Waters in Technology](#)

[TEDxLAUTECH talk: Agricultural Revolution](#)

[Harper Adams University: Alumnus receives second award of 2022 for work developing African precision agriculture](#)

[Dakar 2 Summit: Remarks - Femi Adekoya, “The Flying Farmer”](#)

[Integrated Aerial Precision Limited Wins 2023 Orange Corners Innovation Fund \(OCIF\)](#)

Works cited:

<https://opecfund.org/news/how-drones-are-revolutionizing-agriculture>

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