



**PRECISION AGRICULTURE
INCUBATION PROGRAM
COHORT 1.0 REPORT**



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PROGRAM OVERVIEW

03

EXECUTIVE SUMMARY

The Precision Agriculture Incubation Program, initiated by Precision Field Academy (PFA), aimed to equip youths, agricultural graduates and undergraduates with digital skills to revolutionize farming practices through precision agriculture technologies. The program spanned from February 15th to April 8th, 2024, blending both virtual and on-site practical training methodologies.

Program Highlights

Participants Trained: The program successfully trained more than 350 participants, who fell into the demography of youths which are agricultural graduates and undergraduates, young farmers and agripreneurs, with key targets on building the capacity of young agricultural professionals in precision agriculture technology.

Key Topics: Participants were trained in notable digital & precision agriculture technologies such as drone technology, GIS, data science, robotics, IoT, AI, machine learning, personal branding, business development, and entrepreneurship management.

Achievements: Through this incubation program, Precision Field Academy (PFA) has been able to close the knowledge gap by raising awareness and positively impacting all participants with skills to engage and apply 21st century smart agricultural technologies to empower them to practice precision agriculture while preparing them for relevance in the future of work in agriculture.

Impact Summary

Graduates from this program have started leveraging Earth Observation Technologies in the form of Geographic Information Systems (GIS) Software, Mobile, and Web Applications to help farmers acquire data from their fields in the form of satellite imagery data.

The program has been able to give participants firsthand experience in flying drones, giving them an exhilarating experience about how drones work and also dissecting practical applications of drones to solve problems and challenges for farming practitioners. Some of these graduates are now been engaged in practice by our partner, Integrated Aerial Precision to provide drone technology services.

Participants were able to build a model fixed-winged aircraft from scratch, the workshop further enhanced their knowledge on the parts and components of a drone and the aerodynamics behind the aircraft operations.

The program was well-expository for the participants which contributed to them providing their feedback highlighting high satisfaction levels with the training content, delivery methods, and overall learning experience. The evaluation results showcased the program's effectiveness in enhancing participant's skills and knowledge acquisition.

Acknowledgments

We express sincere gratitude to program sponsors, partners, and stakeholders for their invaluable support and contributions to the success of the Precision Agriculture Incubation Program Cohort 1.





INTRODUCTION

Precision agriculture represents a transformative approach to farming that integrates cutting-edge technologies and data-driven practices to optimize agricultural processes and outcomes. In recent years, the agricultural sector has witnessed a significant shift towards precision agriculture due to its potential to revolutionize traditional farming practices and enhance productivity.

Background

The advent of precision agriculture has been fueled by advancements in technologies such as Global Positioning System (GPS), Geographic Information Systems (GIS), remote sensing, drones, sensors, and data analytics.

These technologies enable farmers and agricultural professionals to collect and analyze data with unprecedented accuracy and precision, leading to informed decision-making and optimized resource utilization.

As global challenges like population growth, climate change, and resource constraints continue to impact the agricultural sector, the adoption of precision agriculture has become imperative in ensuring food security, mitigating climate factors and economic viability.

Need for Training Program

Recognizing the transformative potential of precision agriculture, there is an urgent need to equip young emerging farmers, agricultural professionals, and aspiring agripreneurs who fall into the demography of youths with the need for requisite knowledge and skills to harness these technologies effectively for global opportunity and exploits.

The Precision Agriculture Incubation Program (PAIP) addresses this need by providing comprehensive training in key areas such as drone technology, GIS, data science, robotics, Internet of Things (IoT), Artificial intelligence (AI), Machine learning(ML), personal branding, drone business, and entrepreneurship.

Through this program, participants are empowered to embrace innovation, optimize farm management practices, and contribute to the overall advancement of the agricultural sector by creating local content digital solutions.

The Seven Objectives

The primary objectives of the Precision Agriculture Incubation Program are:

- 1.To close the knowledge and skills gap of participants about precision agriculture technologies and practices.
- 2.To raise Next-gen Agricultural Remote Pilots.
- 3.To Groom Young Precision Agriculture Leaders and Stakeholders for Global exploits.
- 4.To build the capacity of youths in the aspect of technology application in Agriculture.
- 5.To promote the adoption of innovative and sustainable farming technologies that improve agricultural productivity and resource management.
- 6.To foster entrepreneurship and encourage participants to develop technology-driven solutions for agricultural challenges.
- 7.To create a network of digitally empowered young agricultural professionals who can drive positive change through digital transformation in the agricultural industry.

Target Audience

The target audience for the Precision Agriculture Incubation Program includes youths, women, agricultural graduates and undergraduates, farmers and agripreneurs, with key targets on equipping and building the capacity of young agricultural professionals, passionate about leveraging technology and putting precision agriculture into practice



PROGRAM DESIGN AND IMPLEMENTATION

The program followed a structured curriculum covering essential domains in precision agriculture & technologies. Topics include Drone Technology, GIS, Data Science, Robotics, Internet of Things, Artificial Intelligence, Machine Learning, Enterprise Development, and more. The program structure is detailed in the provided timetable, showcasing the sequence of courses, dates, times, facilitators, and topics covered.

Training Delivery Methods:

Training methods covered virtual facilitations, workshops, hands-on activities, field trips, online resources, and guest speaker sessions. This multi-faceted approach ensures a comprehensive learning experience for participants, combining theoretical knowledge with practical application.

Training Materials and Resources:

During the training, participants were given various resources to complement their learning such as books, electronic manuals, software tools, and equipment required for hands-on training and learning activities. The program also utilized online platforms and digital courses to enhance the learning process.

Instructor/Facilitator Information:

The program was facilitated by experienced professionals and experts in the field of precision agriculture, with diverse backgrounds such as drone technology, GIS, data science, robotics, and entrepreneurship. Detailed information about key instructors and facilitators, including their expertise and backgrounds, is provided in the facilitator section.

Independent Learning and Assessment:

Participants were encouraged to engage in independent learning through self-study courses and additional learning platforms provided during the program. Regular assessments, feedback sessions, and evaluations were conducted to track participant progress, measure learning outcomes, and ensure program effectiveness.



TRAINING CONTENT OVERVIEW

Through a comprehensive curriculum and diverse training methods utilized, participants gained expertise in key areas essential for modern farming practices and agricultural innovation.

Key Topics and Curriculum:

The training program covered a range of essential topics, including:

- 1.Introduction to GIS and Data Processing in Agriculture.
- 2.IoT and Embedded Systems Applications in Agriculture.
- 3.Satellite and Remote Sensing Technology in Agriculture.
- 4.Sustainable and Data-Driven Farming to Mobile Apps.(Data Science)
- 5.Introduction to Drone Technology. (General and Technical)
- 6.Drones in Agriculture Application. (Spraying and Data Collection)
- 7.Geospatial Analysis and Technologies for Agriculture.
- 8.Robotics, Automation, and AI Applications in Agriculture.
- 9.Introduction to Drone Business and Entrepreneurship.
- 10.Satellite Application in Precision Agriculture.
- 11.Personal and Corporate Branding Leveraging LinkedIn.
- 12.Next-Gen for Digital Agriculture and Global Development.
- 13.Becoming a Certified Drone Professional.
- 14.Geospatial Data Survey and Mapping Operation.
- 15.Diary of Successful Agric-Tech Entrepreneurship.
- 16.Drone Codes, Operational Safety, and Crew Management.
- 17.Precision Crop Spraying with Drones.
- 18.Risk Assessment, Human Factor and Drone Safety.
- 19.Precision Agriculture Technology in the Hands of African Youths for Transforming the Food Systems.
- 20.Drone Data Collection and Processing.



Training Methods:

The training content is delivered through a mix of methods, including:

1. Interactive lectures and presentations by industry experts and career professionals.
2. Hands-on practical sessions for drone piloting, data collection with drones, and data processing and analysis.
3. Online resources, training materials, and digital platforms for independent learning.
4. Certification courses for drone piloting and aerial data collection (FAA TRUST, UK CAA Flyer ID, RPAT Certificate Course, and Drone Deploy Certificate Course)
5. Participants were given the opportunity to join the African Association of Precision Agriculture (AAPA) as a registered member

Training Materials and Resources:

Participants have access to a range of training materials and resources, including:

1. A copy of **Drone Flying for Beginners** ebook for all participants and **Drone Professional 3** book for those who were physically present.
2. Manuals, and guides covering key concepts and practical applications.
3. Drone technology equipment for hands-on training and simulation exercises.
4. Software tools and platforms for GIS, data processing, and drone operations.
5. Assembling and flying a radio-controlled fixed-wing Aircraft for aerial surveillance.
6. Online courses, webinars, and video tutorials for continuous learning and skill development.



PARTICIPANT FEEDBACK AND EVALUATION

Precision Agriculture Incubation Program received overwhelmingly positive feedback from participants, who praised its relevance, practical approach, knowledgeable instructors, and collaborative environment. The program effectively equipped participants with the necessary skills and knowledge to drive the adoption of precision agriculture technologies, paving the way for a more sustainable and productive agricultural future.

Assessment and Evaluation:

Participant learning and progress were assessed through:

- 1.Regular quizzes, exams, and practical assessments to evaluate understanding and application of concepts.
- 2.Project-based assignments and case studies to demonstrate practical skills and innovative solutions.
- 3.Feedback sessions, mentorship opportunities, and peer evaluations for continuous improvement.

Learning Outcomes:

Upon completion of the program, participants :

- 1.Acquired advanced knowledge and skills in precision agriculture technologies and practices.
- 2.Demonstrated proficiency in drone technology, GIS, data analysis, and advanced farming techniques.
- 3.Built a strong professional network and contributed to the digital transformation of agriculture



Instructor/Facilitator Information:

The program is led by a team of experienced instructors and facilitators, including:

1. Dr. Wole Fatunbi, Ag. Director of FARA
2. Violet Ochieng, UAV Research Officer at CABI
3. Kenneth Obayuwana, Managing Director of Agricelerate Global Consulting & Chief Editor, Agritech Digest.
4. Matthews Ajibola, Founder of Maotronics
5. David Bolaji, Founder of Flite Zoom Aeromodelling Hub
6. Tawanda Chiambakwe, CEO of Precision Drone Training and Director of Precision Aerial Group
7. Jagongo Obara, Aviation Consultant at Jagongo Obara Aviation Consultants
8. Victor Tariah, Registered Surveyor and GIS Analyst
9. Kat James, Drone and Data Consultant
10. Saheed Saliu, Geospatial Practice Leader at Dev-Afrique Development Advisors
11. Adewale Adegoke, Executive Director, Nigerian FlyingLab
12. Eno Umoh, Drone Business Coach and Mentor
13. Ervin Csoke, Business Development Manager DynaCrop Space
14. Matt Manning, Founder of DevGlobal
15. Ridwan Sorunke, Principal Advisor Dev-Afrique
16. Prof. David Bervingson, BeSustainable.io & DevGlobal
17. Eddy Dias, COO Business Smart Drone Solutions
18. David Opatayibo, Drone Professional (Dronerios)
19. Kory Koir, GeoSpatial Data Scientist at Amini (Kenya)
20. Joseph Adeyemi, Program Officer, Precision Field Academy
21. Femi Adekoya, Organizer Precision Agriculture Incubation Program





IMPACT ASSESSMENT

With the data obtained from the participants, they expressed a better awareness and wide exposition about various digital technologies to advance agriculture. The participants also have acquired knowledge and insights on how to use precision agriculture technologies to solve pestering problems and challenges for themselves and other practicing farmers.

Social Empowerment:

Capacity Building: The program empowered participants with advanced knowledge and skills in precision agriculture, enhancing their professional capabilities and career prospects.

Gender Inclusivity: Efforts to promote gender diversity resulted in increased participation and empowerment of women in agriculture, fostering inclusivity and gender equality within the sector.

Research Work Engagement: The clarity that comes as a result of attending the Precision Agriculture Incubation Program, has birthed the obsession for educational research work and projects among university graduates who are looking into designing deployable digital solutions for agriculture growth in Africa.

Positive Perception: The program has also contributed greatly to changing the perception the youths have towards agriculture, such as a default standpoint that agriculture is dirty, labor intensive, and it is for people in the rural. Using digital technology tools on both virtual and hand-held modern tools for hands-on practices has re-engineered participant's mindset, that agriculture is now going digital, or driven by smart equipment and data.

Promoting innovation Adoption: Participants who are youths practicing or intending to go into agriculture from their physical use of technologies to collect data and make informed decisions, through Satellite Imaging, Drone technology, and Robotics have seen the great need to embrace digital technologies as a platform to farm smart, eco-friendly and also save resources and funds.

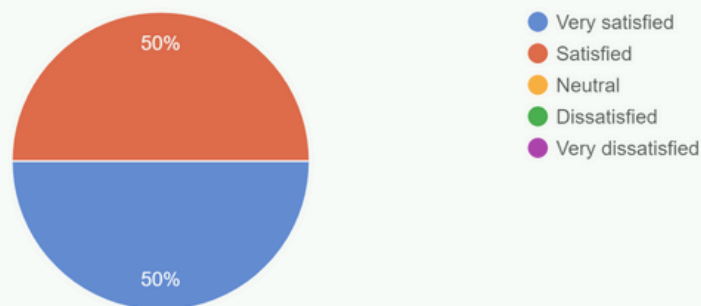


Participants Feedback and Evaluation:

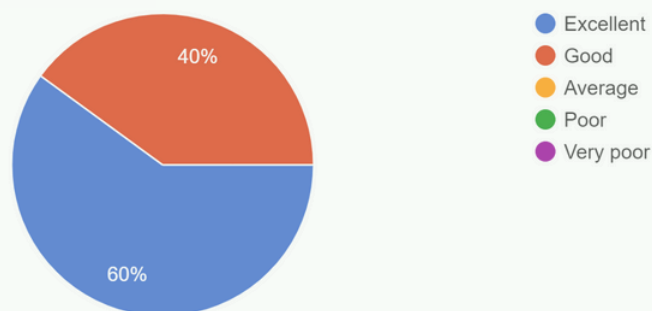
Below are the responses harvested from participants to measure their assimilation and how the program has positively impacted them.

Satisfaction Levels: The majority of participants expressed high levels of satisfaction with the program.

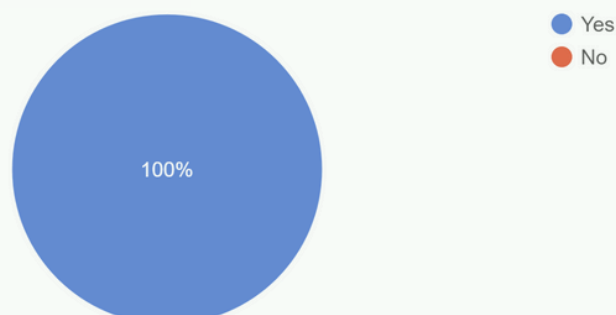
How satisfied were you with the Precision Agriculture Incubation Program



How would you rate the relevance and quality of the training content?



Were the training materials (presentations, handouts, e.t.c.) helpful and informative?



Some Suggestions from participants for improving training program:

1. "If participants could get to know each other during the initial days, it would likely spark better conversations, especially since we come from various locations. Additionally, allowing individuals who have studied virtually to train in person in the future, perhaps under a 50-50 sponsorship, would ensure they can benefit from the physical class experience. Otherwise, we might forget what we've learned in a few weeks and be unable to apply our knowledge later".
2. "I would suggest that the Drone Data processing class should be done physically instead of virtually and in some cases hybrid can be done fine. Practicals and field trips should be given a week-long stretch so as to enable participants from far distance to prepare themselves for full participation".
3. "I would recommend having interactive sessions, discussions, or forums after the online sessions to improve participation and assimilation rate".
4. "The organizers should look into getting booked accommodation for international participants who will be coming to Nigeria to participate physically."
5. "I propose a sort of weekly review or forum where participants can answer questions on things they've learned so far as well as interact with other participants. I believe this will enhance networking and greater information retention among participants."
6. "More online simulation courses are needed to enable virtual students to practice effectively. Additionally, partnerships with countries that have expertise in drones and similar technologies could establish training programs. Such collaborations could provide significant value to the entirety of Africa in cost-effective ways."
7. "I aspire to be your ambassador in Rwanda, and potentially for Eastern Africa, to create a centralized program addressing the real-life challenges of farmers. I am developing an AI solution to assist farmers throughout the agricultural season."



CHALLENGES & LESSON LEARNED

The lessons learned emphasize the need for curriculum enhancement, resource adequacy, facilitator preparedness, identifying suitable delivery modes, entrepreneurship focus, incubation with mentorship, and empowering participants, while challenges included internet connectivity issues, logistical constraints for practical training, geographical limitations, resource scarcity, space constraints, and time zone differences.

Challenges:

- Some participants faced difficulties joining the online classes during live facilitation due to unstable network connections or poor internet connectivity. Additionally, some participants were unavailable because of other important commitments.
- We encountered slight logistical issues in transporting participants to the field for practical, hands-on training sessions.
- Due to the geographical distance between our applicants from around the world, some participants who wished to attend the on-site practical training found it challenging.
- We faced a lack of adequate training materials and gadgets for the training sessions.
- Another challenge we encountered was the limited space in our training classroom, which resulted in an uncomfortably warm and uncondusive environment for the participants.

Lesson learned:

- Some courses in our curriculum lacked adequate equipment to facilitate effective instruction.
- Facilitators should be adequately followed up and supported to ensure excellent session delivery.
- We noticed that some classes would have been better taught in person rather than virtually.
- While technical training was provided, the overall objective is to promote agricultural entrepreneurship among youth and young women. To achieve this, we need to develop a more robust curriculum tailored specifically to entrepreneurship.
- The Incubation Program needs to be transformed into a proper incubator program, where participants can receive direct mentorship and seed funding to develop their innovative ideas
- Beyond the knowledge and capacity being built, participants desire to be empowered with the equipment and tools to practice, increase their competence, and develop business skills.



KEY METRICS AND TESTIMONIALS

The Precision Agriculture Incubation Program's key metrics demonstrate its effectiveness in equipping participants with the necessary knowledge, skills, and motivation to embrace precision agriculture technologies. The high enrollment, completion, and satisfaction rates, coupled with substantial improvements in knowledge acquisition and technological proficiency, underscore the program's success in achieving its objectives.

Participant Registration and Representation:

The Precision Agriculture Incubation Program (PAIP) attracted a total of over 354 registered participants, with majority of this participants participating virtually and 85 attending onsite as part of the hybrid model. The program received , with 88 female registrants and 266 male registrants.

Global Outreach:

The PAIP's reach extended across four continents – Africa, Asia, Europe, and Australia, highlighting its global appeal and relevance. Participants hailed from a diverse pool of 22 countries, showcasing the program's ability to resonate with agricultural communities worldwide.

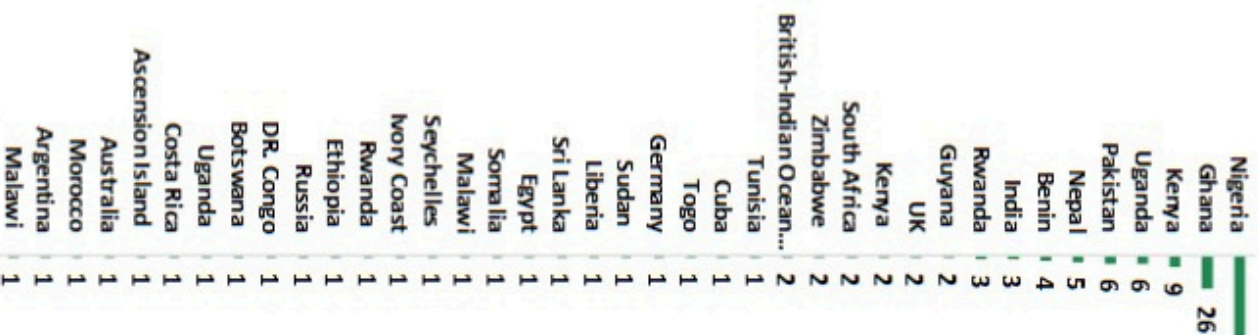
Country Representation:

Nigeria emerged as the country with the highest representation, contributing 254 participants to the program. Other well-represented nations included Ghana (26 Participants) Kenya (9), Ghana (6), Pakistan (6), Benin Republic (4), Nepal (4), Uganda (6), and the United Kingdom (2). Notably, the program attracted participants from a wide range of countries, such as Costa Rica, Democratic Republic of the Congo (Kinshasa), Germany, Ivory Coast, Liberia, Malawi, Morocco, Rwanda, Somalia, South Africa, Togo, and Tunisia.



PAIP 1.0 DASHBOARD

Countries



Participants

354

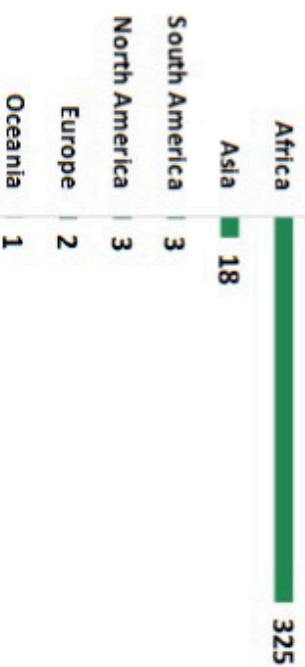
Continents

5

Countries

47

Continents



Training Mode



Gender



Map Distribution



Testimonials:

The Precision Agriculture Incubation Program (PAIP) received overwhelmingly positive feedback from participants, who praised the program's impact on their knowledge, skills, and outlook on modern farming practices. Here are some testimonials that highlight the program's success:

Paul James Eteudo



"Words can't express how I feel. Participating in this program has given me value beyond measure, providing a platform for innovation, networking with industry professionals, especially learning from their wealth of experience from various agriculture related fields."

Selina Musa



"Though Distance for me was a barrier in participating in the onsite practical training, I still found the online courses and virtual masterclasses for various industry experts very valuable, because it helps me understand more about agriculture and it can also go digital. I will advise this to be brought to Kenya for youths to benefit from it. Glad to join this program from Kenya."

Idris Adepoju Moronkola



"...As someone who managed over 200 hectares of crops, I experienced the challenges of exhaustive farm walks to monitor crop performance, pests, and weeds. Seeing a white man using drones on a larger farm in Niger sparked my interest in this technology. I'm now proudly certified as a drone operator and data analyst through the PAIP training."



Ademoye Mahmood



We had theoretical classes on Drone Technology, Satellite mapping, Artificial Intelligence in Agriculture, Robotics in Agriculture, Corporate Branding and Entrepreneurship for Agric Business owners. I also took courses and got 5 globally recognised certificates and most importantly I connected with like-minded youths... I look forward to seeing the impact PFA will make in the Agriculture industry in Africa.



Boluwatife Bamidele



"I appreciate the fact that I was selected to participate in this training, a lot of things we taught on precision agriculture which has helped me see Agriculture differently. Because with precision agriculture you can minimize input and still increase your yield through the help of data. It was a worthwhile time for me."



Thierry Kamugisha



"P.A.I.P was an incredible journey that equipped me with the knowledge and skills to navigate the ever-evolving world of precision agriculture technologies. I'm confident that these skills will allow me to make a significant impact on the agricultural industry in Rwanda by promoting sustainable practices and maximizing crop productivity."



Emike Enakhena



"I sincerely want to appreciate Precision Field Academy for organizing the Precision Agriculture Incubation Program. This program for me has been an eye-opener into digital technologies and opportunities that exist in the world of Precision Agriculture. It gives encouragement for youths in adopting Precision Agriculture technologies to change agriculture."



Stephen Popoola



"The program exceeded my expectations, equipping me with practical skills and knowledge that I can immediately apply on my farm. The networking opportunities were invaluable, allowing me to connect with industry leaders and explore potential collaborations for future projects."





RECOMMENDATIONS AND FUTURE ROADMAP:

The Recommendations and Future Roadmap outline continuous program improvements, alumni engagement, partnership expansion, robust monitoring and evaluation, policy advocacy, research and innovation initiatives, and capacity building opportunities to position the program as a global leader in digital agriculture education and innovation.

Recommendations and Future Roadmap:

- **Continuous Improvement:** Regularly review and update program content, modules, and delivery methods to align with industry trends, technology advancements, and participant learning progress.
- **Alumni Network:** Establish an alumni platform for networking, knowledge sharing, and collaboration among graduates, industry partners, and experts.
- **Partnership Expansion:** Strengthen partnerships with industry stakeholders, research institutions, government agencies, and international organizations to broaden reach, access funding, and enhance impact. Engage program graduates and students as ambassadors for expansion in various regions in Africa.
- **Monitoring and Evaluation:** Implement robust mechanisms to track outcomes, assess feedback, measure impact, and identify areas for improvement.
- **Policy Advocacy:** Engage in advocacy efforts to influence agricultural policies, higher education curricula, regulations, and incentives that support digital agriculture adoption and innovation ecosystems.
- **Research and Innovation Hub:** Establish a dedicated hub to foster collaborative research projects, technology prototyping, and agritech solution development.
- **Capacity Building:** Offer continuing professional development programs, advanced certifications, and entrepreneurship programs for alumni, promoting lifelong learning, career growth, and agricultural innovation.





**DRONE
PILOT**

CONCLUSION

The Precision Agriculture Incubation Program has made significant strides in advancing knowledge, skills, and innovation in the agricultural sector. Through its comprehensive training modules, expert facilitators, and hands-on learning experiences, the program has equipped participants with the tools and capabilities to drive positive change in agriculture.

It is evident that the impact extends beyond individual participants to encompass broader industry transformation and technological innovation. The insights gained, and lessons learned during the program's implementation have laid a strong foundation for future growth and sustainability.

ACKNOWLEDGEMENT

We would like to express our sincere appreciation to our esteemed program partners for their invaluable support and commitment to the Precision Agriculture Incubation Program.

Our heartfelt thanks go to Integrated Aerial Precision, International Society for Precision Agriculture (ISPA), DevGlobal, HortiNigeria, Soilless Farm Lab, and Dev-Afrique for their collaborative efforts and expertise in driving technological advancements in agriculture.

Your partnership has been instrumental in empowering participants, fostering innovation, and promoting sustainable practices in the agricultural sector.

PARTNERS & SPONSORS

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Main Partners and Sponsors:



IntegratedAerial
Precision

RODDENBERRY
+1 GLOBAL FUND



IFDC
Developing Agriculture from the Ground Up

DevGlobal



ISPA

Dev-Afrique



Supporting Partners:



DYNA
CROP
SPACE

AirSmat



PRECISION AERIAL



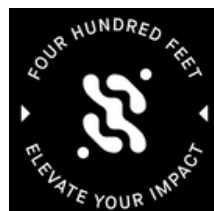
MAOTRONICS



GLOBAL AIR
UNIVERSITY



Nigeria
Flying Labs



Soilless
Farm Lab
TECHNOLOGY | BUSINESS | OPPORTUNITY

THANK YOU



JOIN US IN TRANSFORMING AGRICULTURE IN AFRICA

The success of our inaugural Precision Agriculture Incubation Program (PAIP 1.0) is just the beginning. At Precision Field Academy, we are passionately committed to advancing precision & digital agriculture across Nigeria and the entire African continent. We invite visionary partners and sponsors to join us in this transformative journey.

By investing in the capacity building of youth and young professionals, we aim to bridge the technology gap and harness the power of innovation to revolutionize the African agri-food systems and beyond. Our mission is to expand the reach and impact of this vital training and educational program, making precision agriculture a cornerstone of sustainable development across diverse sectors.

Together, we can cultivate a future where technology empowers farmers, enhances productivity, and fosters economic growth. Your partnership will play a crucial role in driving this change and ensuring that the benefits of precision agriculture are felt far and wide.

If you are inspired to be part of this groundbreaking effort, please contact us at precisionfieldacademy@gmail.com. Let's work together to create a brighter, more prosperous future for Africa.

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