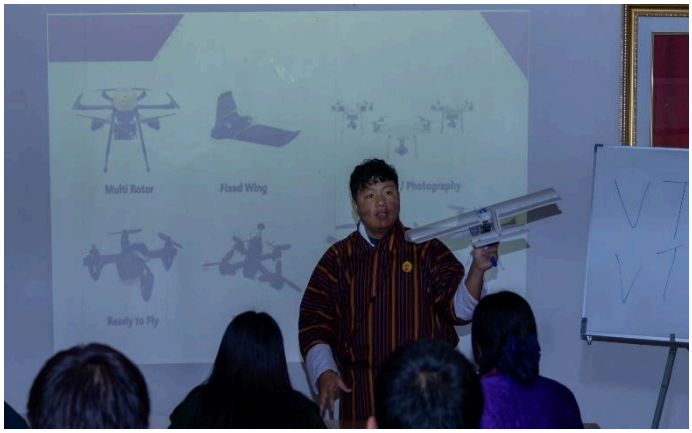
Drone Training for Agriculture in Bhutan



Participants engaging in theory class

Participants in the practical class

OVERVIEW	
Flying Labs	Bhutan Flying Labs
Location	Thimphu, Bhutan
Date	21st October 2024
Length (number of days)	21 Days
Format	In-Person Training
Co-organizer if applicable	GovTech Bhutan
SDGs	Pick one or multiple most fitting Sustainable Development Goals: GOAL 1: No Poverty GOAL 2: Zero Hunger GOAL 4: Quality Education GOAL 5: Gender Equality GOAL 7: Affordable and Clean Energy GOAL 8: Decent Work and Economic Growth GOAL 9: Industry, Innovation and Infrastructure GOAL 10: Reduced Inequality GOAL 11: Sustainable Cities and Communities GOAL 12: Responsible Consumption and Production GOAL 15: Life on Land GOAL 17: Partnerships to achieve the Goal

SCOPE & OUTCOMES	
Type of training	1. Introduction training to drones. 2. Training on operation of drones, especially agri-drones 3. Technical training of professionals on drone data analysis
Goal of the training	1. To raise awareness about the use of drones in agriculture. 2. To develop skills in agricultural drone data acquisition and analysis. 3. To enhance coordination between farmers and agriculturalists for effective use of agricultural drones.

Expected outcome for participants	1. Improved understanding of drone applications in agriculture. 2. Ability to operate agricultural drones effectively and safely. 3. Strengthened coordination between farmers and agriculturalists for drone-based farming solutions.

Confirmed outcome after training	• Participants can confidently operate agricultural drones for various farming activities. • Participants apply best practices and safety measures in agricultural drone operations. • Participants demonstrate the ability to collect and interpret drone-captured agricultural data.
Eventual next steps	• Support participants in applying drone technology on their own agricultural projects. • Encourage pilot projects or demonstrations to showcase successful drone applications in agriculture. • Promote ongoing training and upskilling opportunities to keep pace with evolving drone technologies.

PARTICIPANTS	
Profiles and number of participants	• 27 staff from government • 6 members of Bhutan Flying Labs
Name of participants' organizations	• The Ministry of Agriculture and Livestock • GovTech Bhutan
Gender ratio	10 Female : 23 Male
Who paid for the training?	GovTech Bhutan
Participant fee rate (if applicable)	Sponsored by GovTech Bhutan

Scholarships offered?	Free training for all participants as the consulting fees for BFL was covered by GovTech Bhutan.

CONTENT	
Training components	• Introduction to agriculture drone technology and its types. • Applications of drones in the agriculture sector. • Introduction to drone operation. • Introduction to different flight planning software and things to consider during flight planning. • Hands on session with drone data processing software. • Practical drone flight training in the field. • Operation of Agri-drone exercise in the field.
Training resources used	• Drones, tablets, android smartphones, high processing units, walkie-talkie, DJI GO 4, PIX4Dcapture, PIX4Dmapper, and PIX4Dreact.
Approaches and methods used	• Thematic experts were engaged to deliver sessions on topics such as agricultural drone operations, drone photogrammetry, and data analysis for crop health monitoring. • Bhutan Flying Labs team actively contributed to the training with technical expertise, training materials, and on-ground support. • The training included both theoretical and practical sessions. • Participants were grouped during field-based drone operations to encourage teamwork and peer learning. • Practical activities included live drone flights over agricultural fields, real-time data acquisition, and crop analysis exercises. • Software-based training allowed participants to practice data processing techniques relevant to agriculture.