Drone-Based Traffic Monitoring in Bhutan

Participants engaging in group session (left) and practical session (right)

Participants pose for a group photo

OVERVIEW	
Flying Labs	Bhutan Flying Labs
Location	Thimphu, Bhutan
Date	August 2023
Length (number of days)	30 days
Sector program (optional)	-

Format	In-Person Training
Co-organizer if applicable	GovTECH Bhutan
SDGs	GOAL 9: Industry, Innovation and Infrastructure GOAL 11: Sustainable Cities and Communities GOAL 16: Peace and Justice Strong Institutions GOAL 17: Partnerships to achieve the Goal

SCOPE & OUTCOMES	
Type of training	1. Introduction training to drones. 2. Basic drone operations training. 3. Traffic surveillance and monitoring techniques. 4. Regulatory and legal compliance training. 5. Aerial photography and video analysis. 6. Incident response and emergency deployment training. 7. Data management and reporting. 8. Advanced tactical flying (optional/specialized). 9. Drone maintenance and troubleshooting.
Goal of the training	1. To enhance operational capability. 2. To strengthen law enforcement efficiency. 3. To promote road safety and reduce traffic incidents. 4. To ensure regulatory compliance and ethical use. 5. To build a data-driven policing culture. 6. To increase institutional readiness for future smart policing. 7. To enhance public trust in modern law enforcement.
Expected outcome for participants	1. Technical proficiency in drone operations. 2. Competence in traffic surveillance and monitoring. 3. Knowledge of legal and ethical compliance. 4. Incident response readiness. 5. Skill in evidence collection and reporting. 6. Capability in drone maintenance and troubleshooting. 7. Enhanced decision-making skills. 8. Contribution to public safety and trust.

Confirmed outcome after training	• 17 participants from the Royal Bhutan Police and relevant agencies, including the several agencies from Nepal, were sensitized and trained on drone applications for traffic monitoring, including operational coordination and drone technology integration into law enforcement practices. • The training was conducted in collaboration with agencies from both Bhutan and Nepal, including branches of the Nepal Police and Army, the Nepal Red Cross, and the Civil Aviation Authority (CAA) of Nepal. It fostered strong partnerships aimed at delivering accurate and meaningful instruction on integrating drones into traffic monitoring systems. • Based on the training, policy recommendations were developed to address gaps in current traffic monitoring practices and regulations, focusing on areas where drone technology can be more effectively utilized for improving traffic management and enforcement. • A drone task force was established, bringing together stakeholders from various ministries, countries and organizations to foster better coordination and collaboration on drone operations. This task force will ensure effective cross-departmental communication, facilitate streamlined drone operations, and ensure that all parties are well-versed in the technical and policy aspects of drone-based traffic monitoring. • By creating a shared platform for drone operations, different ministries, countries and organizations are now familiar with one another's roles, helping them to work together more efficiently on drone-based initiatives in traffic management and beyond.
Eventual next steps	• The CAA Nepal plans to digitize the existing drone registration system by introducing a new web portal, streamlining the registration process for drone operators and ensuring easier access to regulatory compliance. • CAA Nepal is set to implement a new set of regulations based on the Model Unmanned Aircraft System (UAS)

Regulations. These updated guidelines will provide a comprehensive framework for drone operations, including safety standards, operational limits, and licensing requirements for both recreational and commercial drone use.

PARTICIPANTS	
Profiles and number of participants	15 staff from Royal Bhutan Police and several Nepal agencies 2 staff from government
Name of participants' organizations	- Royal Bhutan Police - Ministry of Infrastructure and Transport - Ministry of Home Affairs - Ministry of Communication, Information and Technology - CAA Nepal - Department of Survey - Land Management Training Center - Nepal Police - Nepal Army - Nepal Armed Police Force - The International Centre for Integrated Mountain Development (ICIMOD) - Nepal Red Cross
Gender ratio	0 Females: 17 Males
Who paid for the training?	Royal Bhutan Police
Participant fee rate (if	Free training for all participants.
Scholarships offered?	Free training for all participants as the consulting fees for Bhutan Flying Labs was covered by Royal Bhutan Police.

CONTENT

Training components	- Introduction to drone technology. - Drone photogrammetry & mapping. - Flight planning & software. - Data processing hands-on. - Field training & simulation. - Disaster simulation exercise.
Training resources used	Drones, tablets, android smartphones, high processing units, walkie-talkie, DJI GO 4, PIX4Dcapture, PIX4Dmapper, and PIX4Dreact.
Approaches and methods used	- Expert-led thematic sessions. - Collaboration with Bhutan Flying Labs. - Blended theoretical and practical learning. - Hands-on drone operations and data processing. - Disaster simulation exercise. - Collaborative learning and group engagement.