

Georgia:

Building an integrated monitoring and early warning forest fires detection system in the Borjomi - Kharagauli National Park using innovative remote sensing tools

Baku - September 09, 2026

BACKGROUND

- ▶ Location: Borjomi-Kharagauli National Park, Georgia
- ▶ Duration was 17 month, but extent 4 month due to seasonal conditions.
- ▶ Technology Solution: Development of Integrated monitoring and early warning forest fires detection system.
- ▶ Project was funding under Technical assistance granted by UNEP through CTCN. Beneficiary is Agency for Protected Areas of Georgia; IBEDC - service provider selected by tender.
- ▶ UNEP CTCN grant: USD 248,440
- ▶ The project supports a total of 174 135 beneficiaries, including 1020 direct beneficiaries and 173115 indirect beneficiaries; Among the total beneficiaries, 52.16% are women and 15% are youth.

BACKGROUND

- ▶ The objective of this project (Integrated Monitoring and Early Warning Forest Fire Detection System Implementation Project) is to implement a monitoring and early detection system for forest and landscape fires. The system enhances early detection capabilities, provides real-time monitoring, and facilitates quick response to potential fire incidents. The system is installed on the Customer's local server and will provide secure access to authorized users through a web interface.
- ▶ The primary objective is to reduce the risk of uncontrolled forest fires in Borjomi-Kharagauli National Park by implementing an advanced monitoring and early warning system. This system will allow for early detection of the hazards, enabling swift action.

BACKGROUND

- ▶ **Project Key Objectives are:**
- ▶ Develop an integrated monitoring and early warning system for forest fires.
- ▶ Utilize innovative remote sensing tools to enhance fire detection capabilities.
- ▶ Establish a standard operating procedure for the system's use.
- ▶ Train personnel on the new system for effective implementation.

ACTIVITIES

Output 1 - Contextualize, map stakeholders, analyze current practices to monitor forest fires and **assess** risk, organize stakeholder working group

Output 2 - Benchmark, select and design the integrated monitoring and early warning forest fires detection system, cost analysis and stakeholder meeting

Output 3 - Develop and Test the system
in one specific area of the National Park, train users

Output 4 - Define a standard operation procedure for an efficient use of the designed integrated monitoring and early warning forest fires detection system, organize workshop

Output 5 - Dissemination modules to demonstrate advantages of system, organize workshop with Ministry of Environmental Protection and Agriculture and the Agency of Protected Area of Georgia, organize stakeholder engagement workshop with finance agencies, redact Concept note

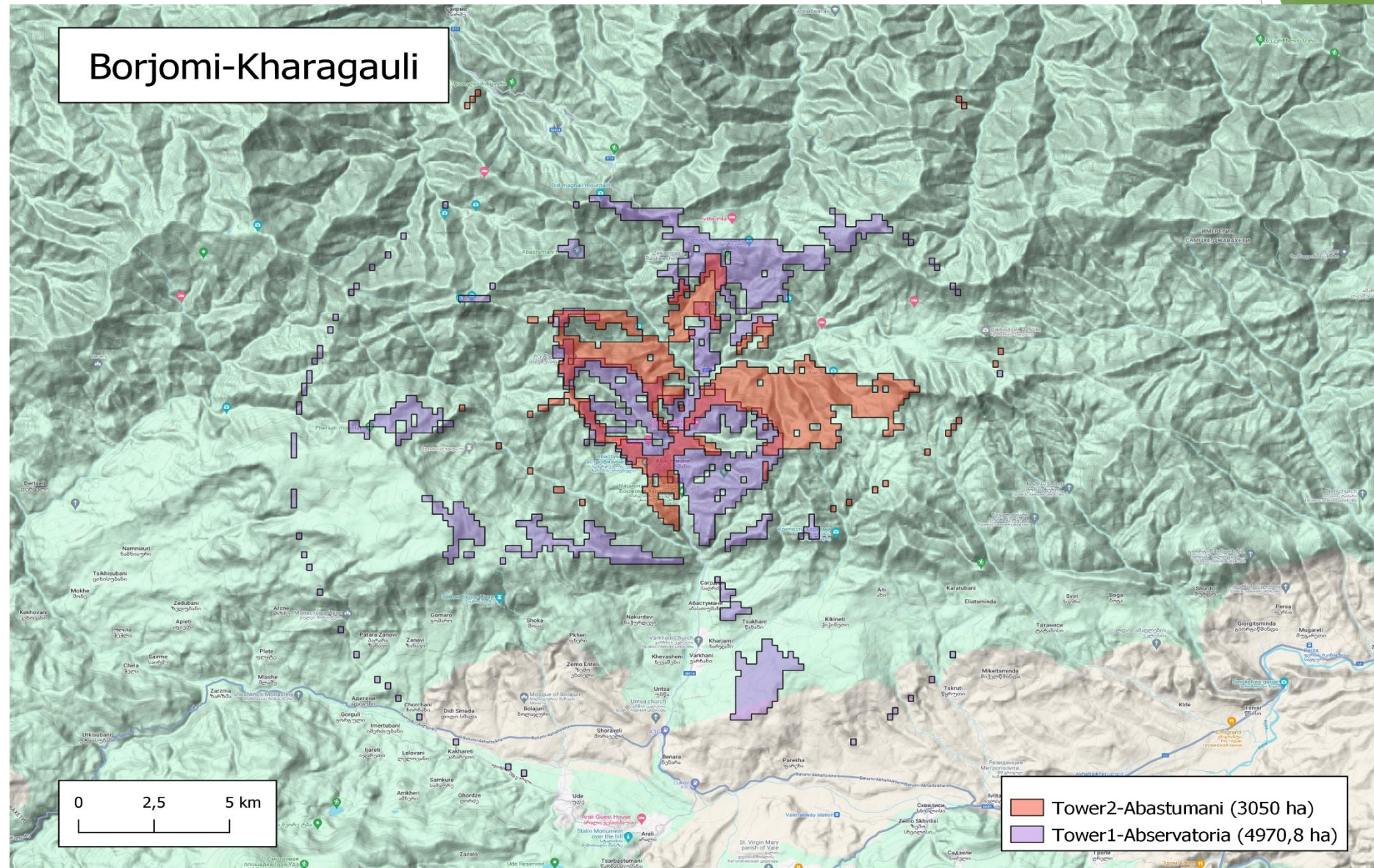
Summary

- ▶ On the base of selection of Stakeholders working group, we build an early warning forest fire detection system with video cameras and control management system;

Advantages over other systems:

- ✓ Less dependent on climatic conditions;
- ✓ Detection and management is carried out in real time;
- ✓ It is possible to produce video/photo history of the surveyed forest area; Technology is well known, the hardware is commonly available;
- ✓ It is possible to use devices of different manufacturers;
- ✓ It's easy to service the system;
- ✓ The system is easily expandable;
- ✓ It's easy to get staff, system operators, administrators

Selected Locations



System components

Core Components:

1. Central Management System
2. Video surveillance camera for monitoring forest areas;
3. Network equipment and internet connection provision;

Supporting Technologies:

1. Video surveillance camera mast;
2. Lighting protector;
3. Equipment shelter;
4. Solar power panels and equipment;
5. Security cameras - outdoor surveillance camera and internal Video Camera for the equipment shelter

Centralized Management System - Firepost

- Web portal built on the GIS system;
- Full management of video cameras;
- Automatic detection of smoke and fire using AI;
- Determine the distance and mark the point on the map;
- Incident fixation, confirmation;
- Users rights management
- Sharing video cameras;
- Internal messaging;
- Archive;
- Support to various organizations
- Obtaining information from third party systems

Hardware infrastructure:
Communication mast, solar panels,
shelter with network equipment, lighting
protector and video cameras set



Equipment Shelter

- Built on-site using sandwich panels
- Equipped with a solar panel control system and batteries
- Network equipment is installed

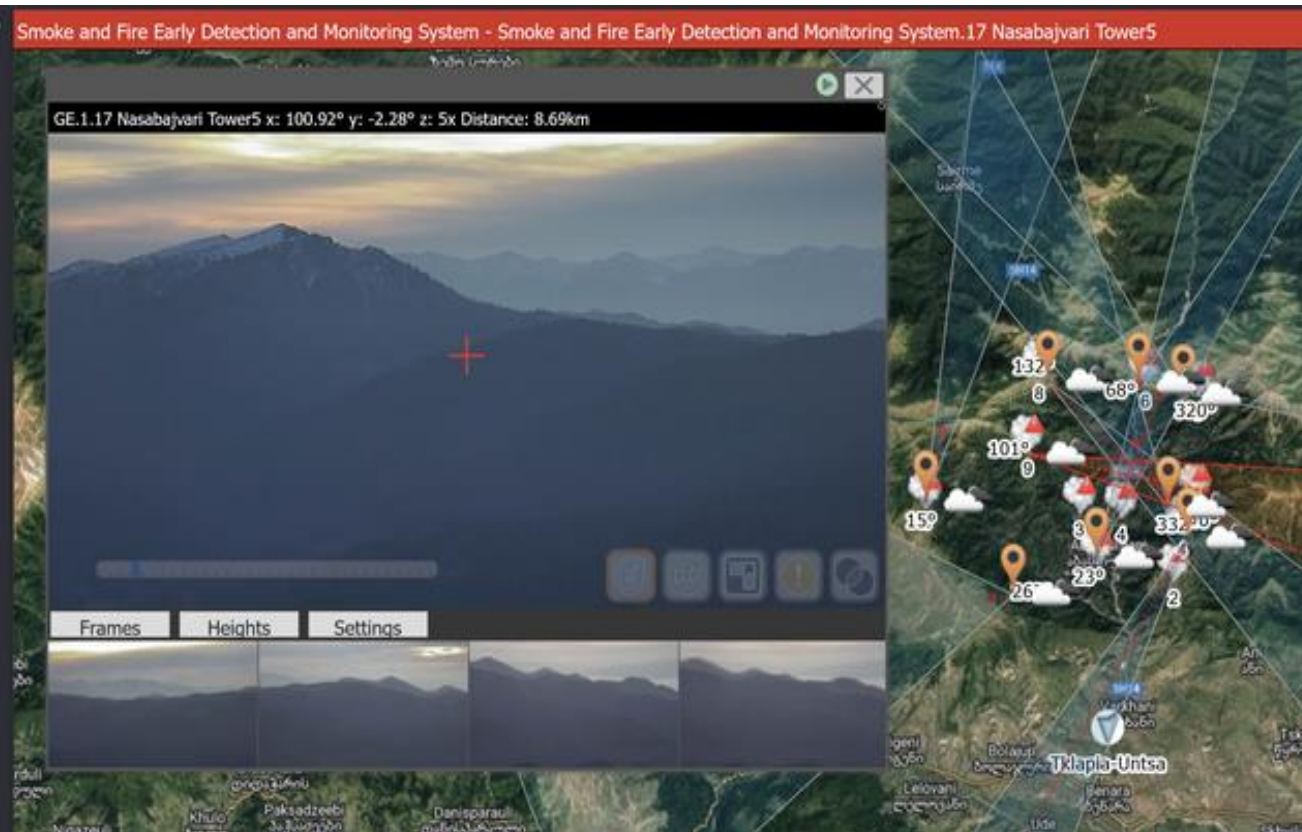


Firepost Software - Centralized Management System

The System is based on the Geographic Information System, integrated with Video Surveillance Cameras.

It utilizes Artificial Intelligence video stream processing for smoke and fire detection - <https://www.youtube.com/watch?v=vR56b6pDsLU>

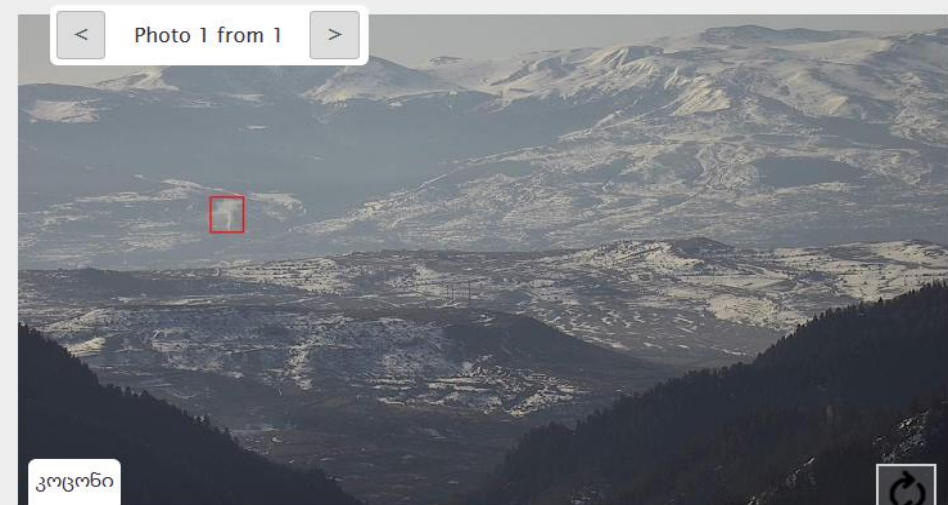
An incident involving automatic smoke detection using a video camera.
The smoke area is visible in the red square (bonfire).



Fire information #1 from 15.03.2025 17:48

POO Forces and means

< Photo 1 from 1 >

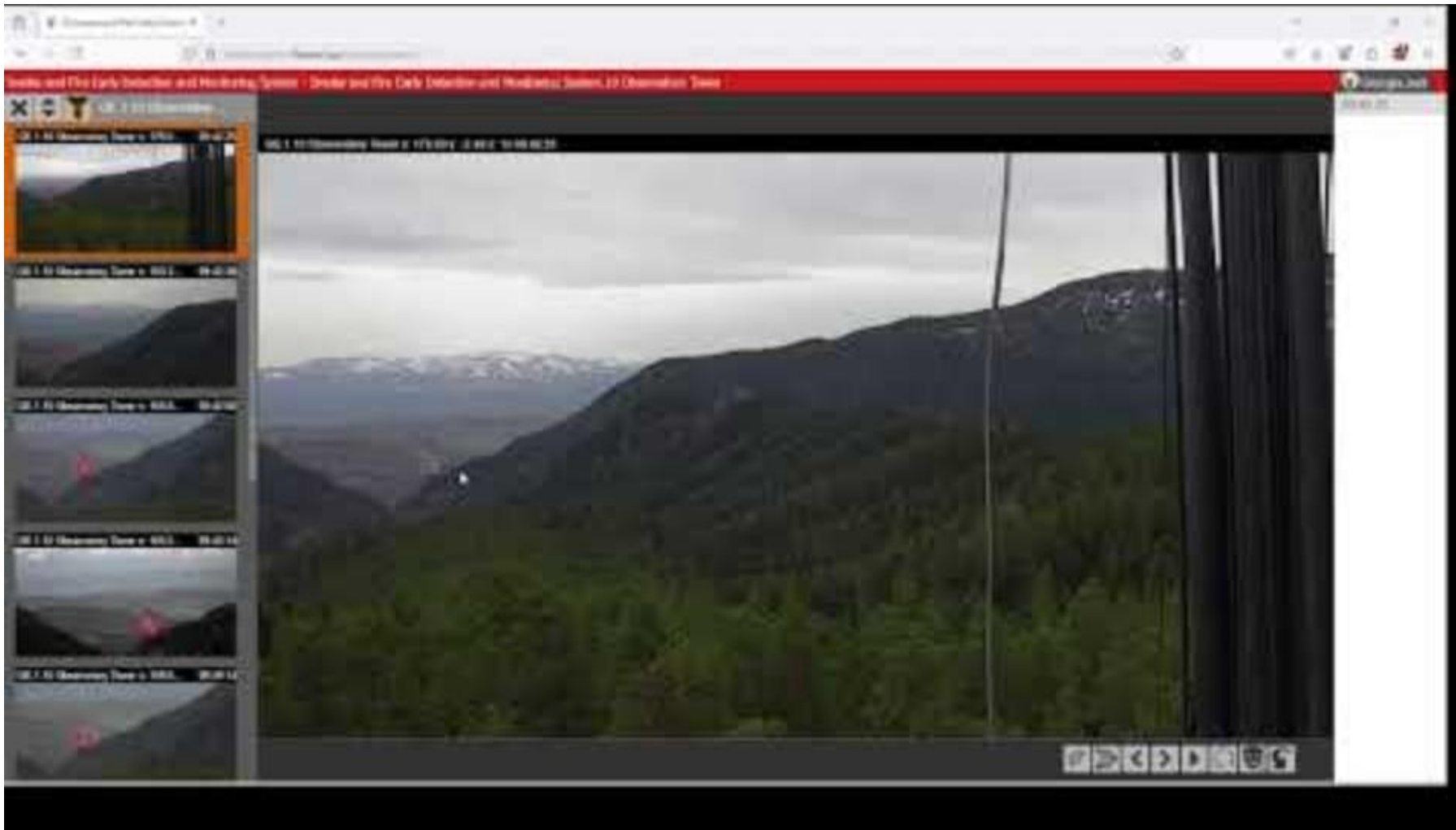


კოცონი

Source:	Camera Observatory Tower
District	
Detection time	2025-03-15 09:39:38
Confirmation time	2025-03-15 17:48:49
Longitude	42.932769760264
Latitude	41.605293105496
The nearest cameras	Observatory Tower
Information	
Nearest city and locality:	not defined, not defined
Distance, azimuth:	not defined km., not defined°

Firepost- Centralized Management System, Video

Link - <https://www.youtube.com/watch?v=vR56b6pDsLU>

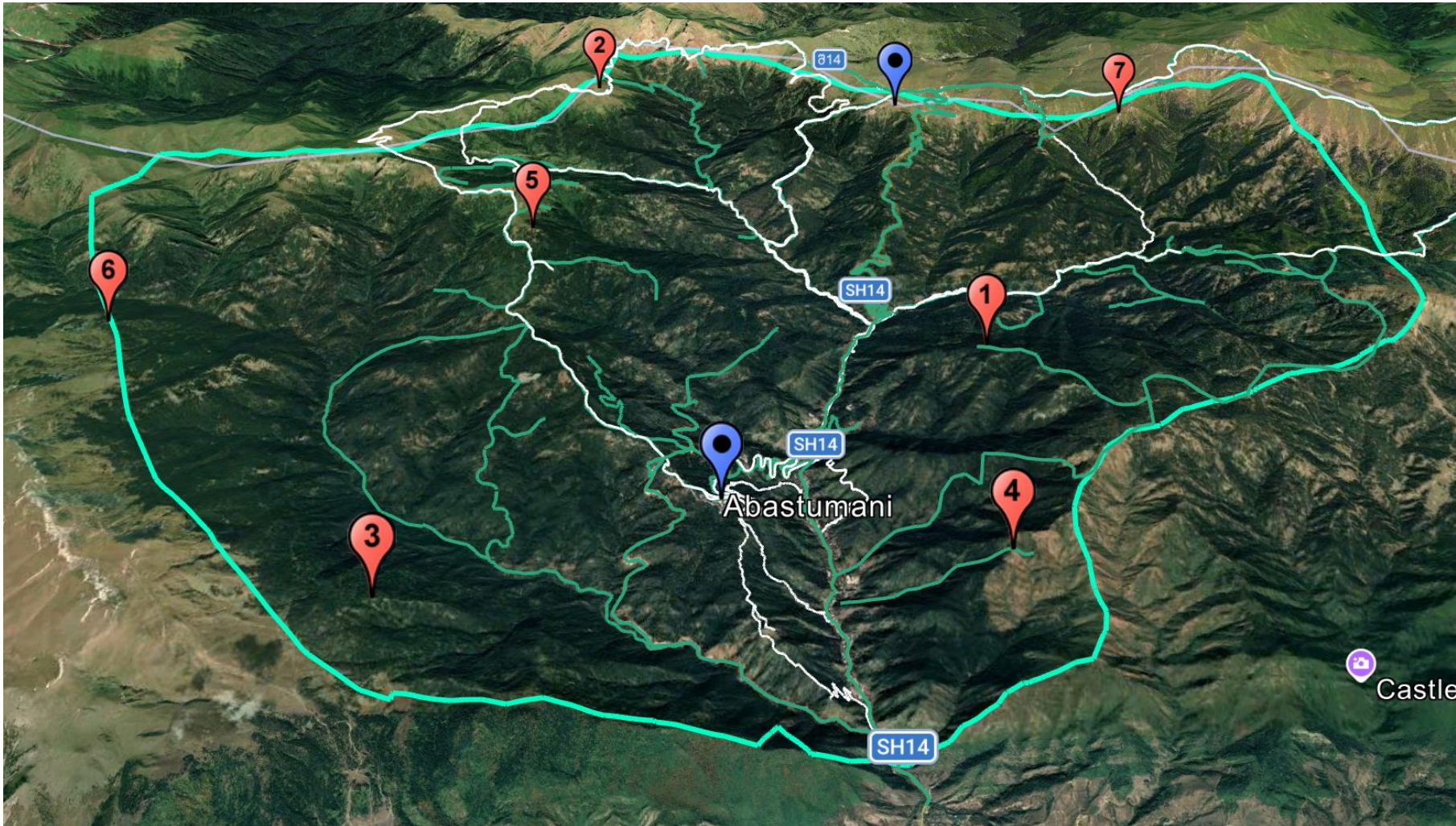


Further development of the project

- ▶ The Municipal Development Fund of Georgia financed the development of the project;
- ▶ Seven new locations were selected;
- ▶ The total target area covers 15,500 hectares;
- ▶ 85% of the vulnerable territory is covered by the monitoring system;
- ▶ Specific areas are covered by multiple cameras, which ensures high accuracy in smoke detection and localization;

Selected locations

- ✓ New seven locations in Abastumani





Completed projects

Zekari



Tklapia



Fersati



Output 4 Define a standard operation procedure for an efficient use of the designed integrated monitoring and early warning forest fires detection system,

Proposed operation procedure is based on best international experience, which consists from following components:

- ▶ Forest fire prevention
- ▶ Preparedness
- ▶ Response
- ▶ Restoration

To ensure effective implementation of these principles project did recommend introduction of Annual Operational Plan as part of forest fire management plan and provided relevant draft template.

MAIN HIGHLIGHTS

- ▶ The project is based on a consultation processes with stakeholders and use of feedback in the deliverables
- ▶ Gender balance and an adequate representation of vulnerable groups are important for all project activities
- ▶ The scope identifies the best solution for early fire detection & warning and also identifies financial resources for scaling up the pilot project across protected area



Thank you!

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