

Monitoring informal mining activities from space: SYMIN project successfully completed

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GAF AG, together with the Institute for Environmental Security (IES - Netherlands), the Bonn International Center for Conversion (BICC - Germany) and the German Aerospace Center (DLR - Germany), is pleased to announce the successful conclusion of the SYMIN ("System for monitoring law enforcement of informal mining") project. This follows completion of the project activities and presentation of the results at the final meeting with the European Space Agency (ESA), which financed the project as a component of the "Timely Situation Awareness for Law Enforcement and Intelligence Application" contract. It is part of ESA's Value Added Element (VAE) programme that supports industry in the application of Earth Observation (EO) data.

In the SYMIN project, the feasibility of using satellite-based remote sensing as an efficient tool for the area-wide mapping and monitoring of informal mining activities (primarily artisanal and small-scale mining - ASM) in remote, poorly accessible or security-sensitive areas was assessed. To this end, very high resolution (VHR) optical satellite images, stereo data and radar images were used, together with other geo-data such as mining cadastre information, in five pilot areas in Afghanistan which are rich in coal, gold, gemstones and also quarries. The aim was to detect artisanal and small-scale mining activities in order to help integrate such activities into the national mining supervision framework, with the objective of providing benefits for the miners themselves as well as for the government.

The information obtained from the analysis of such data was used to create up-to-date reconnaissance maps and dossiers with a description of current mining activities, which could be used to assist the work of authorities and on-site mine inspectors. The unique capabilities of the COSMO-SkyMed radar satellite constellation were also successfully demonstrated by mapping extraction activity using multitemporal coherence.

Through this use of such Earth Observation technologies, the project successfully identified and analysed areas and spots of digging. It was thus demonstrated that EO, in particular when combined with ground truthing, can be used as a tool for identifying active and inactive mining sites, as well as for the monitoring of environmental impact and of legal compliance, thereby helping in the resolution of conflicts and also with regard to resource governance. Potential end users of such a system include government ministries and departments, geological surveys and environmental protection agencies.

Vaughan Smith, Senior mining engineer and consultant to the Ministry of Mines and Petroleum, Kabul, comments, "the use of high-resolution satellite imaging, supported by appropriate training of personnel within the Ministry of Mines and Petroleum, will significantly enhance the capability of the Ministry with regard to monitoring artisanal and small-scale mining (...) This approach will substantially reduce the effects of constraints such as terrain and security. It will also help the Ministry to make optimum use of its resources in monitoring and controlling mining

activities and their environmental impact, and in ensuring that revenue accrues to the fiscal authority where it is due.”

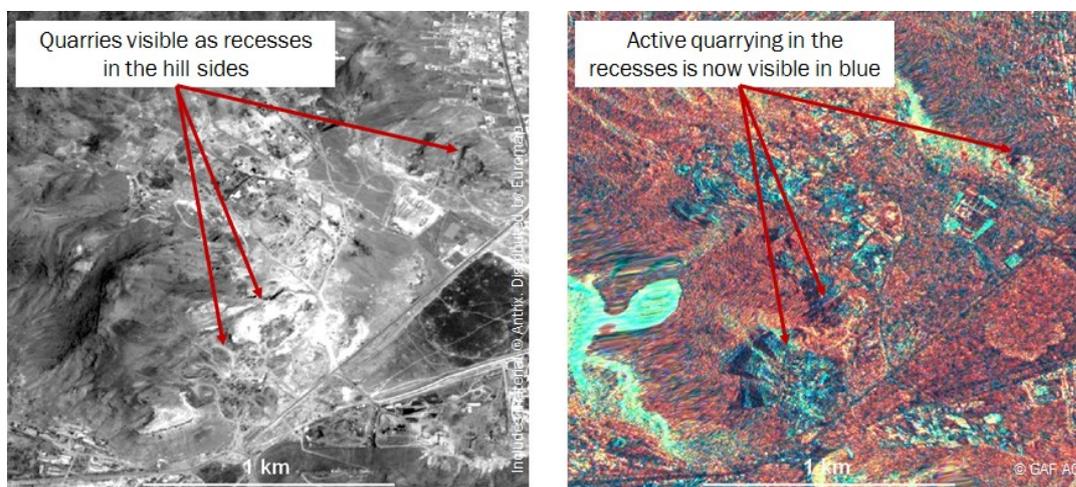
Dr. Stefan Saradeth, GAF Director International Consulting, comments, “we are very pleased with the project results, and the SYMIN activities in Afghanistan have provided a valuable source of technical and analytical information that can be used as the basis for the monitoring of ASM activities worldwide. In this context, our newly developed mobile mines-inspectors GIS solution will also be a very beneficial tool, featuring digital fieldbook functionality combined with navigation, positioning and geoinformation handling capabilities.”

About GAF AG – Germany (www.gaf.de)

GAF provides expert consultancy services in the mining governance sector, ranging from the implementation of computerised mining cadastre systems, title registries, and geological and mining information systems to the provision of capacity building and know-how. GAF AG, an e-GEOS, Telespazio company, is globally active and has an international reputation as an experienced provider of services in the fields of geoinformation, satellite remote sensing, spatial IT-consultancy and institutional strengthening for private and public clients. GAF offers solutions in the sectors of mining and geology, natural resources, water and environment, security, land and renewable resources. Over the past 28 years, GAF has been active in more than 100 countries throughout Europe, Africa, South America and Asia.

For more information, please contact:

GAF AG | Tel. +49 (0) 89 12 15 28 0 | www3.gaf.de/symin | info@gaf.de



Comparison of a satellite orthoimage (left) and multitemporal coherence analysis (right) highlighting activities in the quarries under observation. Scale: as indicated - area: outskirts of Kabul.