



# IAEA

International Atomic Energy Agency

*Atoms for Peace*

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## ***Improving land use and soil conservation in Tajikistan***

### ***The challenge...***

With just 7% of Tajikistan's land suitable for agriculture, soil erosion and land degradation represent a major threat to the soil and water resources the country needs to ensure sustainable agricultural production. In order to provide a comprehensive assessment of the magnitude of these problems and to support the selection of effective soil conservation measures, quantitative data on the extent and rates of soil erosion under various agro-ecological conditions and land use systems was needed.

### ***The project...***

The IAEA provided expert advice in field sampling design, laboratory set-up and data interpretation, as well as through scientific visits and fellowship training. Fallout radionuclides (FRNs), such as  $^{137}\text{Cs}$  and  $^7\text{Be}$ , are being used as tracers to obtain quantitative estimates of long and short term soil erosion and deposition in agricultural landscapes. The use of FRNs together with conventional assessment tools based on geographical information system technology is an effective option for the assessment of soil erosion and the evaluation of soil and water conservation technologies and approaches.

The project's activities in Pamir are embedded into a United Nations-led undertaking in the High Pamir and Pamir-Alai Mountains (PALM) funded by the Global Environment Facility and more than ten co-financing organizations, including the IAEA. The PALM project is an integrated transboundary initiative of the Governments of Kyrgyzstan and Tajikistan. It addresses the interlinked problems of land degradation and poverty in this critical mountain region, and promotes sustainable land management practices which contribute to improving the livelihood and economic well-being of the inhabitants. In 2009, the first exploratory mission to Pamir Mountains in 20 years was arranged.



*Assessing soil erosion in the Pamir area of Tajikistan.*

### ***The impact...***

The project has provided a basis for sustainable land use planning and decision making and for the promotion of soil and water conservation techniques. By employing appropriate soil management practices with the use of FRN, annual soil erosion has been reduced from 150 tonnes per hectare to between 8 and 15 tonnes per hectare. As a result, a considerable amount of nutrients such as nitrogen, phosphorus, sulphur and potassium have been retained in farmland for crop production, rather than being carried away by the wind or in water runoff to streams and rivers. The data on soil erosion rates will be used to prepare the Soil Erosion Map of the Central Part of Tajikistan. Additionally, the counterpart institute, supported by the IAEA and the Lomonosov Moscow State University (Russian Federation), is facilitating the on-site evaluation of the FRN methodology for soil erosion mapping and evaluating soil conservation measures.

*Technical cooperation project TAD/5/002: Assessment of Soil Erosion and Sedimentation for Land Use, and TAD/5/005 Developing Soil Conservation Strategies for Improved Soil Health*