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Assessing the ecological state and managing Armenia's farmlands

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The territory of the Republic of Armenia (RA) occupies an area 29.8 sq. km, the major part of which - 2077 hectares - falls on farmlands located at a height 400-3200m a.s.l. Such a variation in altitude complicates development of territories especially in the case they have an extensive character stemmed from the Soviet era: land plough-up on sites lying at a very steep angle of decline - >20 grade, unregulated grazing and so on. A long-term, unplanned and unregulated use of farmlands entailed intense washout of upper soil horizon, which subsequently provoked intense development of erosion and degradation of lands. A practicable solution to this problem is a scientifically and methodically grounded assessment of ecological state of farmlands and economically 'competent' planning and management of agricultural resources.
With the view of developing animal husbandry and managing pastures/hayfields, in 2011-2012 the Government of the Republic of Armenia under support of the World Bank implemented a Farm Resources Management and Competitiveness Program. The goal of the Program is ceasing a trend to overgrazing and degradation of close-to-village sites, using remote pastures/hayfields in the best effective manner, improving feed production and animal feeding networks, and promoting a growth in animal feed production volumes.
To achieve that, the following works were planned and implemented successfully in 23 rural communities of 6 marzes of the RA, which was done by 3 stages.
In preparatory stage
• Accessible web resources – programs and sites (Google Earth, www.landcocer.org) with a view of identifying information to support implementation of the planned activities, were explored and evaluated.
• Cartographic material (topographic maps sc.1:10000, landscape maps, panchromatic and multi-spectral high- and medium – resolution satellite images /LANDSAT ETM, QuickBird/ and other thematic cartographic and archival material) required for subsequent treatment of information which underlay development of field maps of the noted communities of the six marzes, was selected. Schematic maps required for implementation of field works, which helped indicate optimal routes and evaluate accessibility of separate sites, were produced.
• Through collation between maps and satellite images visual signatures of interpretation of satellite images of separate objects (cliffs, rocky river slopes, etc.) were developed, which in chamber conditions would help calculate and exclude idle, vegetation- barren and impassable areas from pastures.
Based on field observations and tests the overall state of natural pastures and the level of degradation was assessed.
In final stage for the 23 communities series of cartographic layers was produced that included relief, river-ravine and road networks, infrastructure (roads, aqueducts, electricity cables, gas pipelines, irrigation points, structures erected on grazing sites); data on land use and soil types in the noted communities were processed, a relevant database was compiled and mapped. Finally, with a view of assessing the usable area of vegetation cover on the grazing sites, the area occupied by objects found on separate pastures (stone contents, stone fields, rocks, rocky-side ravines etc.) was calculated. The latter underpinned the assessment of ecological status of all the grazing sites.