Geophysical Research Abstracts
Vol. 12, EGU2010-14124, 2010
EGU General Assembly 2010

Agrogeology today

Barbara Kerek, Laszlo Kuti, and Jozsef Vatai
Geological Institute of Hungary, Environmental Geology, Budapest, Hungary (kerek@mafi.hu)

Agrogeology is one of the research sectors of applied geology. It addresses all geological characteristics of the superficial deposits and the related geological processes taking place therein which are of crucial importance regarding agricultural production and sylviculture, influence the plantation of crops and woods and provide information on a number of factors including the sequences constituting the soil, soil forming sediments and parent rocks, the position and quality of groundwater, the salt regime governed by groundwater movement as well as the natural and manmade changes in the regions below the soil horizon affecting the surface as well.
Accordingly, it investigates not only the sediment appearing on the surface and affected by soil development (=soil) but all near-surface sequences taken together as well as the relationship between soil–parent material–groundwater in lowlands and soil–soil forming sediment and parent rock in mountain and hilly areas. Furthermore, it examines also the changes of these systems as a result of human intervention and makes predictions concerning the advantageous or disadvantageous effects of these changes.
Consequently, the most important tasks of agrogeology can be defined as follows:
1. Detailed agrogeological description and specification of farmlands and land units aimed at optimal land use as well as supporting the rational selection of crops and the production system.
2. Investigation of the geological factors of different soil degradation processes (erosion, deflation, salinisation, acidification, desiccation, etc.), prediction of the occurrence of these processes together with the geological chances of their prevention and minimisation.
3. Examination of the agrogeological and water regime properties of the soil–(soil forming sediment)–parent rock–groundwater system characteristic for the given land unit.
4. Research, survey, simulation and prediction of the impacts of soil use as well as agri- and sylviculture on the soil–(soil forming sediment)–parent rock–groundwater or „soil–parent rock–bedrock" system aimed at the prevention and elimination of harmful effects.
5. Investigation of the geological aspects of water regulation and irrigation as well as their impact on the environment.
6. Definition, examination and characterisation of the real soil forming geological sequence.
In Hungary the actual agrogeological investigations were launched by the agricultural reambulation of geological mapping data. During the early 1980s the so-called BFK-method was elaborated to the agrogeological investigation of these areas still used today. The main aspect of this method is that apart from the common geological sampling of the boreholes samples are also taken from the top- and subsoil (horizon 1), the soil forming sediment or parent material (horizon 2), the fluctuation zone of the groundwater (horizon 3) as well as from the zone permanently below the groundwater level (horizon 4) and the groundwater itself (Figure 2). These samples undergo detailed laboratory analyses. The comparative evaluation of the derived results allows making different agrogeological conclusions.
During the period elapsed from the early 1980s the survey of the pilot areas allowed us investigating among others the agrogeological relationships of salinisation, acidification, excess water risk, erosion, and trace element regime as well as vine chlorosis.