Hydrogeological Contributions to the Regional Agricultural Development in Yugoslavia

[1]RASULA G., [1]Dr VUKOVIC M., [1]Jaroslav Cerni Institute for the Development of Water resources, Belgrade, Yugoslavia; Web page: www.geocities.com/CapeCanaveral/Hall/8183 e-mail: rasula@beotel.yu

The regional hydrogeological investigations performed as part of design studies for three large agricultural regions (Macva 1500 km^2, Srem 5500 km^2 and Kolubara 3650 km^2) were first accompanied by a complex analysis of the available records of all the previous research over the last 50 years. Starting with detailed studies of collected geological, hydrogeological, geotechnical and other documentation that contained results of 840 design reports and studies, publications and files, a detailed register was compiled of over 4,300 water structures. When the fundamental lithological columns of the Quaternary sediments were defined, three complete regional hydrogeological maps were prepared in the scale of 1:100 000. In plan and profile, down to an approximate depth of 300 m, general and representative aquifers were selected according to their significance for regional and local water supply, special attention being devoted to the "first aquifer". Consequently, detailed hydrodynamic analyses and mathematical modelling of the groundwater regime were performed for a case "with irrigation".

This paper presents basic hydrogeological characteristics of the "first aquifer" in Srem agricultural region, and an example of a hydrodynamic analysis and identification of representative hydrogeological and groundwater balance characteristics, as well as a prediction of groundwater regime changes in the circumstances of controlled irrigation. The objective of the paper is to demonstrate importance of learning about hydrogeological properties of any analyzed aquifer complex by quality and quantity, and carrying out hydrodynamic model tests in order to define an optimum and rational irrigation system. Representative elements are needed to determine possibilities for an active, systematic monitoring, channelling and predicting of effects of groundwater regime changes and their impact upon the actual agricultural production.