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" Using the impact model in order to predict the Danube river flow in the last quarter of the XXI century"

M. Adamovic

University of Belgrade, Faculty of Mining and Geology, Department of Hydrogeology, Belgrade, Serbia (damdamrgf@yahoo.com)

The paper has intercompared and verified Regional Climate Model (RCM) EBU-POM in its representation of the hydrological balance over the Danube river basin along Iron Gate gorge, for the time frame 1961-1990 and 2071-2100 according to the IPCC SRES scenario A1B.

The Danube has been chosen as a case study because of its multiple relevance for socioeconomical, as well as environmental and climatic level. This part of the Danube river basin has a direct relevance to the Mediterranean region, since it provides a relevant input of freshwater to the sea, as well as being fuelled mostly by precipitations due to the water of Mediterranean origin. On the other, the Dinaric-Balkan mountain chains in the west and the Carpathian mountain bow in the north and east, present distinctive morphological and climatic regions and barriers.

Having been aware of the climatic-hydrologic and hydrographic homogeneity of regions, the whole territory of Serbia is divided into 20 units basins. The part of Danube basin in its eastern part present one of them, and was subject of the research. For this balance unit, the main components of the balance equation of the water that included into the calculation are: precipitation P (mm), flow Q (m3/s), runoff depth h (mm), evaporation E (mm) and annual air temperature T (0C).

The hydrological balance has been computed in two different, but in principle equivalent ways. The first approach, which has a more hydrological nuance, relies on establishing relationships between annual averages of the hydrological balance parameters (E, P, T) in order to get relevant coefficients. The second approach, which is more typically meteorological, relies on the calculation of the E for the time frame 2071-2100 by using the previous coefficients. On the basis of the assessment of climate parameters in the XXI century and with help of the established relationships, the water flow of Danube river and runoff depth were defined for this century.

The outcomes are very troublesome since according to these simulation the discharge in this part of the Danube basin will decrease over 50% with a great consequences to the Iron Gate I and II dams, and their accumulations. As a result of all that, this part of Europe will face with worse conditions (high temperatures, droughts) in a region already vulnerable to climate variability, than those of 2003 when Europe was hit by an incredible heat wave. Reductions of water availability, hydropower potential, summer tourism and general crop productivity are certainly appearances which are to be expected in this area.

So on, when talking about climate change, a question always arises: Should we adapt to the climate change, or should we mitigate it? Maybe the answer is in mitigation while doing adaptation. According to the Danube River and the dam Iron Gate I, the works for fighting reservoir related bank erosion in order to preserve the dam and accumulation have already been started. Also protection of the natural resources and the ecosystem, which urged the performance actions of restoration of nature and reintegration of temporarily occupied lands and landscape improvement (like maintenance of verdure spots), started to happen. Pushing and raising the problem of climate change to the surface, what should be reality and the global prime issue, is a way to get community involved in order to preserve its existence.