Geological problems facing dam constructions in Iran

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Iran is a developing country that is located in a semi-arid region and with mean annual precipitation of 300mm. Due to the unfavorable distribution of surface water, fluctuation of yearly seasonal rains and to fulfill water demands for supplying cities and other agricultural and industrial plants, a number of 35 large dams has created and about 15 more are under construction.

Dam construction usually causes changes of land-use and ultimately changes of environmental condition of an area. These make the role of geology very important to explain the importance of local geology to the land-use planner. Ignoring these factors may results in many types of dam's failure, including occurrence of any types of geological hazards, or the reduction of successfulness rate of the dam project.

The aim of this paper is to outline the geological features of the dam sites and to indicate the types of problems that the dams are facing. In this regard about 50 dam sites are studied and the following conclusions are taken.

The types of problem that the dams are facing can be grouped into three categories: structural failure, water leakage, and reservoir sedimentation. Only 6% of the dams faced structural failure that indirectly affects their performance. About 52% of the dams are facing water leakage problem, for example, Lar, Saveh, Jiroft, 15 Khordad, and Maroon. These are constructed on limestone units that are located in both karstic regions, and active tectonic zones. About 42% of the dam's reservoir have rate of sedimentation in excess of the normal. Latyian, Manjil, Ekbatan, Karon-1, and Tajan are example of such dams. Factors such as geological condition, land-use, morphology, control the rate of sedimentation in the reservoir.