



On the climate change implications to water supply in the city of Lima, Peru

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Water supply is one of the major problems that face the city of Lima in Peru. This problem is critical in periods of drought and extreme drought. Moreover, the hydrological cycle vulnerability to climate change, especially the impact on the availability of water resources requires the study and prediction of the consequences in water resources, among others. The project Liwa is a large-scale project that involves several disciplines addressing the problem of water supply in different perspectives in order to know the different parameters involved their interactions, their present and future implications, and at the end try to give an assessment and proposal for development and the optimal use of the water resource.

By using hydrological models, the first part of the project addresses the water supply problem in Lima by considering the use of three basins that feed the city. Secondly, through numerical simulations it is determined the future potential of the system by taking account the potential impact of climate change on the hydrological cycle. A statistical downscaling scheme (Bárdossy 2002) will be used to generate time series of local climate scenarios. These results will be input to the hydrological models. In order to simulate discharges and storage volume in glaciers, reservoirs and water balance groundwater the conceptual model HBV (Bergström, 1995) will be used. The most important variables considered in the system are the rivers, melting glaciers, precipitation, groundwater availability and other elements of the hydrological cycle. Results show that climate change implies, as well known, mean temperature will rise gradually in the coming years. As a consequence of this phenomenon precipitation pattern in this area will decline in rainy years and will increase slightly in the drought years.