Geophysical Research Abstracts
Vol. 17, EGU2015-7816-1, 2015
EGU General Assembly 2015

Adapting to climate change or to stakeholders?

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The Tamassos dam protects the Pedieos watershed in Cyprus against floods. The waterbody behind the dam serves as a new biodiversity and recreational resource. Water from the dam is also used for domestic water supply for nearby rural communities. However, this peaceful picture is threatened by climate change. Regional Climate Models indicate a drier and warmer Pedieos watershed in the near future (2020-2050).

Interviews and meetings with a wide variety of stakeholders, for the development of a climate change adaptation plan for the Pedieos watershed, has created even more uncertainties than climate change.
Environmental-minded stakeholders suggested to demolish the dam and to return the watershed to its natural state and the water to downstream ecosystems. Agricultural producers would also like to see the return of stream flows, such that they can divert or impound the water for groundwater recharge and subsequent irrigation. Community leaders similarly prefer stream flows for the recharge of the alluvial river aquifers, to allow them to abstract more groundwater for community water supply. Downstream authorities have different concerns. Here the usually dry river bed serves as the drainage of the urban agglomeration of the capital of Nicosia; and has been identified as an area of potentially significant flood risk for the European Flood Directive (2007/60/EC).

The largest storm event in the upstream area in the recent past occurred in January 1989, before the construction of the dam. The runoff totalled 3.1 million m3 in one day and 4.4 million m3 in two days. Thus, part of the runoff would have flown straight through the spillway of the 2.8 million m3 dam reservoir. Average annual precipitation in the highly sloping, forested upstream area is 500 mm, while stream flows average 4.7 million m3/yr (1981-2001). This results in an average runoff coefficient of 19% for the 45-km2 upstream area. Past observations, climate change projections and hydrologic models facilitate the development of sustainable adaptation solutions. However, reconciling the diverging visions and water demands of the stakeholders will be a tougher problem to solve.

This research is supported by the European Union's FP7 BEWATER project (GA 612385).