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Transboundary cooperation in international basins: Clarification and experiences from the Orontes River Basin agreement: Part 2

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ABSTRACT

This article analyzes the water security risks in the Orontes basin shared between Syria, Lebanon and Turkey. A complete description of the watershed's hydrography and hydrology is presented, and then, using a geographic database, an optimization method is used based on the nine factors of the UN Convention to allocate water equitably between the co-riparians. The optimization results show that Turkey and Lebanon could benefit from additional water if new negotiations are initiated. We conclude that the role of Geographic Information System (GIS) in transboundary basins is essential once a multilateral agreement occurs, whereby GIS will assist in data sharing and standardization to evaluate future policy alternatives.

1. Introduction

The Orontes is a 487 km long river shared between Syria, Lebanon and Turkey, it has a drainage area of 24,745 km^2. These values as well as the catchment areas for each riparian country were determined using Geographic Information System (GIS) and a newly available 30 m × 30 m Digital Elevation Model (DEM), released in October 2011 under the Advanced Spaceborn Thermal Emission and Reflection Radiometer (ASTER) program (NASA, 2011).

This paper complements the analysis done in part 1, its goal is to assess the water security risks associated with the negotiations and asymmetrical power relations between Turkey, Syria and Lebanon especially under the current political events in Syria. We present the main findings of the UN-Watercourse Convention workshop at the University of Dundee in Scotland, in June 2012. Risk analysis was

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evaluated by optimizing the water allocations in the basin using the nine factors related to the UN 1997 convention. This risk assessment comprises of the following: (1) optimizing water allocation in percentage using factors relevant to equitable and reasonable utilization mentioned in article 6 of the UN convention (2) A complete description of the basin hydrography including all the tributaries and streamflow measurements since, to this date, there is no complete hydrologic information of the basin in the literature (Caponera, 1993; Kibaroglu et al., 2011; ESCWA, 1996).

A Geographic Information System (GIS) database is described that contains hydrographic data and was used in the calculation of water allocations. We conclude that the GIS database presented in this paper may enhance cooperation by standardizing data handling procedures and assisting the evaluation of policy alternatives.

By consolidating information about the Hydrology and water uses of the Orontes River we aim to analyze the broad implications of the impact of the current water use to the future water security of the co-riparians. This detailed study related to water resources needs and stresses on hydrological systems will benefit riparian countries toward cooperation and help them manage the changing hydro-political context in the Middle East.

2. Background: summary of the Orontes River system characteristics

2.1. *Hydrology*

The Orontes River originates in Lebanon and flows North to the province of Hatay, Turkey, discharging into the Mediterranean.

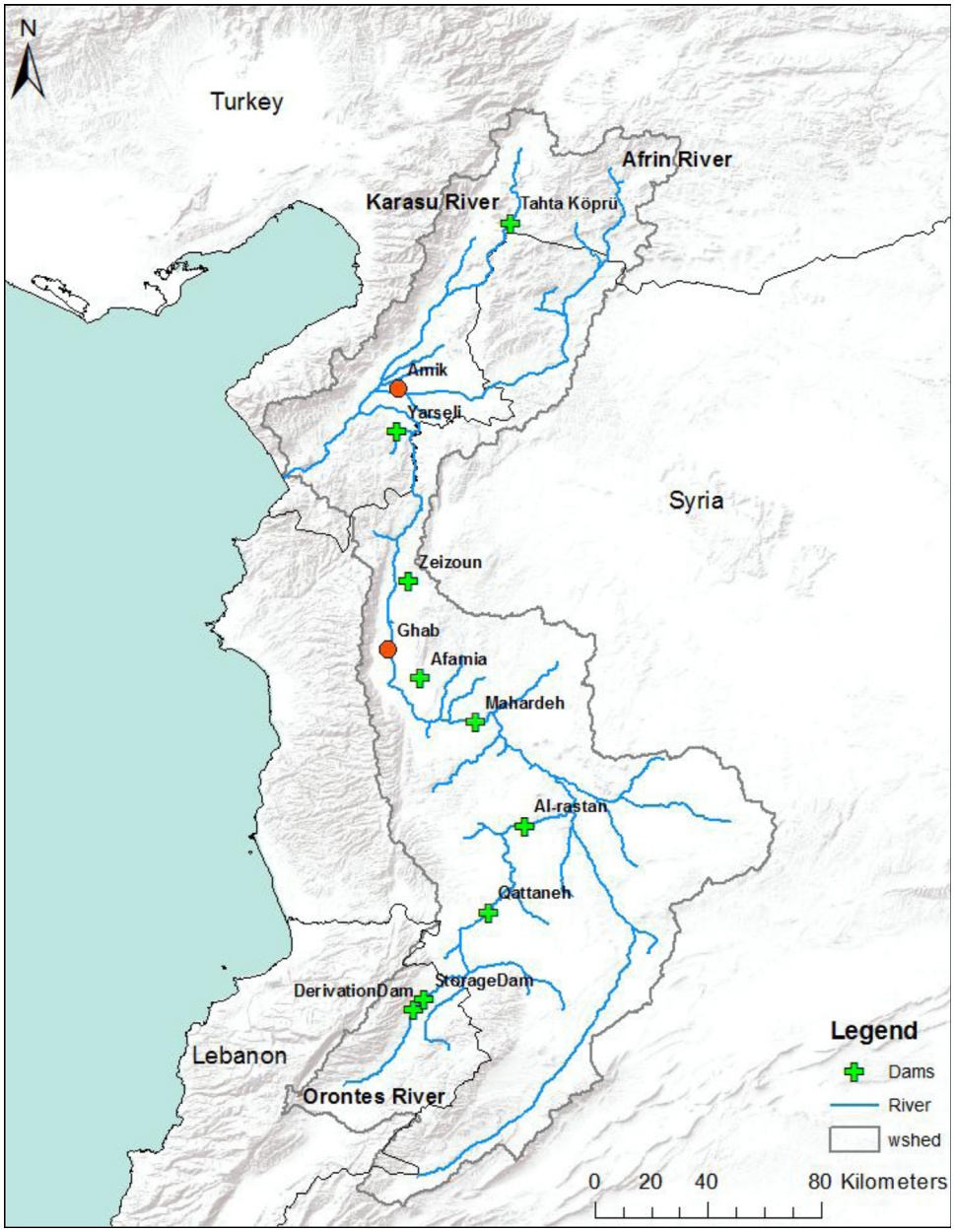

Fig. 1 – The Orontes basin boundaries, drainage system and dams.