Title:	**Optimization Of Water Supply Network For Nablus Municipality**

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Abstract

Water supply of a city is very vital for inhabitants living in it. Effective management of water supply resources is of great importance due to shortage of these resources and the increasing pressures resulting from demographic and/or economic growth and ecological deterioration. Water distribution and storage allocation need to be carefully examined in order to satisfy water demands while minimizing the various types of associated costs. Technical and financial constraints compel the motivation to optimally manage the water supply network (WSN). Nablus city has many limited water resources that have to be optimally managed within a well-controlled system that collects, analyzes, and optimizes data for each demand node through the entire WSN. In this study, we model the drinking water distribution and allocation/usage problem over the entire WSN of Nablus city using Linear Programming (LP). We then optimize the model seeking for optimal water distribution and allocation/usage policies which maximize water availability and minimize the total incurred costs in the supply network. Such optimal policies will aid decision-makers at Nablus municipality in their short-, medium- and long-term planning to secure sufficient quantities with proper qualities of drinking water and to bridge the current and forecasted water supply-demand gap while keeping their technical (capacity) and financial constraints within their feasible limits. Initial solutions of the model resulted in better distribution and allocation policies compared to the current policies adopted by the Nablus municipality. Specifically, the new optimal policies resulted in 35% savings in water pumping costs in the WSN.

Keywords: urban water supply network, linear programming, drinking water, water allocation and usage policy.