ABSTRACT

The water balance in the West Bank shows a severe deficit. Scenarios and strategies are formulated in order to overcome the deficit problem. These include horizons for better management of the existing water resources and the enhancement of new ones. This research will focus on demand modeling as one of the key issues for effective water management. Although past literature about demand modeling is comparatively rich for various regions in the world, this research provides a unique study, due to the past political situation in the Middle East, for water demand modeling in the West Bank.

The main objective of this thesis is to assess the factors that influence domestic water use, and to determine the parameters that may help in demand management to develop, as a final stage, a statistical domestic water demand model for the study area. The service area of Nablus Municipality is used as a case study to illustrate the proposed framework of the analysis. The methodology followed to achieve this aim is: firstly, various factors that might affect water use for the study area are identified, secondly, questionnaire including these variables is designed according to the statistical principles, thirdly, a stratified random sampling is taken and field survey is conducted home by home for the selected population, finally, a statistical computer program called SPSS is introduced to develop four domestic water use models either as total consumption per month or liter per capita per day for Nablus city, for villages and camps related to Nablus, and for the whole service area of Nablus Municipality where multiple regression analysis technique was used.

The results of analysis indicate that housing area and area of the garden, if exits, are the independent variables that can predict 0.346 of the total water consumption for the first model (Nablus city). Family size is the independent variable that can predict 0.157 of per capita consumption and housing area with area of the garden are the variables that can predict 0.277 of per capita consumption for the same model. For the second model (villages related to Nablus), the result of multiple regression analysis shows that, quantity of purchased water as m^3 per month, number of times of washing the house with water per month, family size and area of the garden are the independent variables that can predict 0.723 of total water

consumption. For per capita consumption, family size and area of the garden are the predictor variables and together can predict 0.456 of the consumption.

For the third model (camps related to Nablus), family size is the most important variable in predicting total water consumption where it can predict 0.335 of it. Number of family members of age 18 and less is the variable that can predict 0.495 of per capita consumption for the same model.

For the fourth model (the whole service area of Nablus Municipality), the following variables are the predictors: housing area, area of the garden if exists, and family size. All of these independent variables can predict 0.38 of total consumption and 0.317 of per capita consumption. Family income and number of family members in high education are the two additional variables that can predict 0.083 of per capita consumption for the same model.

Finally, the results of analysis emphasize the importance of the following variables: housing area, area of garden, and family size. It is worth to say that, the developed water use models in this study have limitations and can be only applied to the study area in question. However, similar further studies for the rest of Palestinian cities are recommended.