

## **Abstract**

This study aims to investigate the phenomenon of harvesting rain waters from roofs and public yards/places and to identify to what extent it is common in the study area. It also tries to search the feasibility of making use of water wells and the fields that it could be used in and to point out the obstacles and the challenges that face the process of harvesting rain waters and digging wells in this area. The area of this study represents both urban and rural places of Ramalla and Al-Biereh governorate. Residential communities were randomly selected based on taking a special sample through using the GPS facility. The methodology of this study used the field work through field observations, interviews and designing a questionnaire to collect data related to this phenomenon, then analyzing the collected data by using the SPSS by deciding the ratios and the frequency counts that help in understanding this phenomenon, in addition to using the Chi-square test and also using Cramers V test and the Cross Tab in order to clarify the relationship among the variables and how effectively affect the phenomenon of wells. Moreover, Cross-Cal Walls and the post tests were used so as to designate or show the difference among the factors affecting this phenomenon and to decide the factors having the strongest difference.

**Study Results:** The study revealed that there is no relationship between the spread of wells and the classifications of areas to both rural and urban areas in the area of the study. On the contrary, the geographical location has a clear effect on the spread of wells. The statistical parameters show that wells are common in the Eastern parts/areas of the region of the study. This is because these regions are mostly dry and lie in the areas of rain shadow, adding to the low average of pumping water in the water pipes in this area. The results of the analysis also showed that 72% of families studied in the area who own wells use the water of these wells to drink although the

hygienic and public safety conditions are not adequately considered when collecting rain waters. This is because a high percentage of these families do not clean these wells periodically (annually), and they do not take samples of wells' waters and test them at labs to ensure their suitability. Moreover, they do not add the chlorine necessary to sterilize these waters. Such behaviors form a threat when using such waters for drinking because this will lead to catch colon Bacteria and stool colon Bacteria. The study also revealed that the capacity of 80% of these wells doesn't exceed 80 cu3, and as a result, they stay as a complementary source to support the public water pipes supply and can't be considered as a source to depend on only. The study also showed that the wells in Ramallah and Al-Biereh governorate can only hold 2.5% of water demanded, and it can support only 10% of real deficit to cover the household needs in Ramallah governorate. The study also revealed that financial problems form the main obstacle in cutting wells by families who do not have these wells in the area of the study. The percentage among families reaches up to 60%.

Based on the results above, the researcher recommends the following: It's very important to pay attention to the hygienic and public safety conditions (such as cleaning the roofs of houses, wells, adding chlorine) when collecting rain waters especially when using it for drinking. The study also recommends cutting large wells so as to cover the needs of citizens for a suitable period of time, (Al-Hamaide, 1992) pointed out that when deciding the size of the well, it is important to take into consideration the monthly distribution of rain fall during the year. In case the rainfall is distributed during the whole year, a well must be cut with a capacity that can meet the needs for two months at least, and in case the rainfalls is only seasonal as it is in Palestine, the size of well should be of a capacity that meets the need for the whole year. The study showed that the amount of water needed by a family of 5 members is about 150 cu3 annually. This is based on statistics

derived from the Palestinian Central Bureau of Statistics for the year 2013. The study also recommend not giving licenses for buildings unless new wells are provided for these new buildings. It is possible to activate the Jordanian law regarding establishing buildings for the year 1950. The study strongly recommends governmental support for constructing wells through providing direct financial payments for the cost of cutting these wells or through providing long term loans to the citizens who want to construct these wells. The researcher also recommends using the GPS systems to serve the phenomenon of wells such as using simulations in an effort to estimate the amounts of water needed by the Palestinian Society. (This is in accordance with the increase in population and other economic activities) and also decide the role of these wells to face the deficit of water expected due to the increase in population and the development of different economic activities.