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Assessing the Amount of Domestic Water Consumption in Mehtarlam City

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ABSTRACT

An access to pure and fresh water is an issue in developing countries and almost in the entire world. Mehtarlam City has 70000 residents and almost all of them are facing with lacking pure and fresh water. The demands of access to fresh water is the right of every individual and it is concerned a highest priority of basic needs. No research work has been done to specify the resources that, how much water is used? Water supply department and welfare organization bring distinct digits for designing their projects where the issue (An access to pure and fresh water) is still remained. To identify the percentage of used water within Mehtarlam city, one survey shows that residents of Mehtarlam fulfil the required access of water from different sources such as (public water supply, Wells, surface wells, public water pump station and neighbor's house). Different factors such as income source, members of family and water source types have been considered to identify and assess the amount of used water in houses. The findings of this research work identified the exact digits in the five phases of Mehtarlam city, the study has found that the estimated usage of water per capita is *(65.55 litter/49.52Litre /37.57 litter /29.69 litter and 24.55 litter). In addition, the study has found that the average usage of water in 24 hours per capita in Mehtarlam city is (41.58 litter).*

Keywords: *Water, humans, atmosphere, consumption, environment, domestic, households*

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1. Introduction

Water is a one of the fundamental resources of living on earth. There are five basic needs of humans to live their lives, life would be impossible if one of them is lost. Water is a natural element that is widely circulated on Earth and changes periodically in three states (liquid, gas, and solid). Water is carried out at a certain temperature and conditions. Water is essential to keep the organs of all living things active, alive and it is involved in various stages of metabolism. Water plays an important role in the countless elements of nature due to its unique physical and chemical properties, therefor water is called the miracle of nature and the blood of the earth.

The word "water" is mentioned sixty-three times in the Quran because this vigorous element has found in the earth's shell to meet the needs of living things. In addition, Water was the holy and immaculate thing for the ancient Greeks, Romans, Chinese, Indians, Arabs and others. They believe that water is a purifying and cleaning element. Water goes hands-in-hands with all living beings. Water is also called a life in dry deserts and sparrows and it is a crucial source of living being.

Water plays a major role in the human body. A thirst is the symptoms of dehydration on the first hand, on the second hand, if the dehydration level goes down more, it put an end to the normal state of metabolism that causes death. In addition, when there is water exist in the area, the plants remain green and trees/ shrubs grow up that creates a beautiful and green atmosphere. In a result, this green atmosphere subsidizes the protection of the environment.

There are many sources of water; for instance, rainwater, springs, streams, rivers, and groundwater. WHO & UNICEF (2008) revealed that access to sufficient health care and safe drinking water is not only essential for the health but also important for economic growth.

Afghanistan is a country where there are many mountains and these mountains act as natural water resources, however, due to their physiographic diversity, but it forecasts a risk of the nation to be under water because of water pressure (S.A Koiler and S. Helwig, 2009). In addition, the systems of water supply in Afghanistan have not been enhanced due to long-lasting political instability, a total of 48% of population in Afghanistan has access to safe drinking water (WHO and UNICEF, 2011).

Similar to the other provinces, the water supply of Mehtarlam city is handled by the Central Water Supply and Sewerage Department. Currently, only a small area of Mehtarlam city is covered by this department, still many people do not have access to water supply system, they fulfill the need of water from the other sources.

No research has been carried out to show the consumption of domestic water's amount and source in Mehtarlam city. Charities, donors and water supply department are showing diverse statistics and data for their projects design, therefor this problem need an investigation in order to clarify this issue. Thus, the investigator decided to find a solution to this problem and selected the title "Measurement of Domestic Water Consumption in Mehterlam City" for his research. The findings of this research will be a great benefit to all the stockholder in Laghman province

2. Scope of the Research

Mehtarlam is the center of Laghman province, located 155 km east of Kabul- Afghanistan, and 47 km to Jalalabad province and is 779 meters above the sea level. Laghman province has been significantly improved in terms of urban development and is still under development in parallel with several provinces through the establishing of the current government.

3. Research Methodology

A research method is a broad term. It involves the procedure by which the research starts from initial invention of problem to its conclusion. The purpose of the present research is to assess the amount of domestic water consumption in mehtarlam city. The study is descriptive in nature so survey method is used to conduct this study.

4. Data Collection

Proper data gathering is the essential process of carrying out research. In this research, a survey questionnaire has been employed as the data collection tool, and data collection lasted for two months, started in Qaws 1397 and ended in Jaddi 1397. The data gathering process is conducted in two separate stages, which are below:

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4.1. Primary Data Collection

In this research, the data has been gathered from 50 households in the center of Laghman province, and such a sample has been calculated on the Solin formula placed below. The survey questionnaire entailed questions related to water consumption and has been interrogated from each participant in which the amount of water consumption has been determined from each household.

$$n = \frac{N}{1 + Ne^2} \cdots\cdots\cdots 1$$

In the formula above, the letter "N" stands for a sample of the research and "e" for the sample error in which total population is 70000 and sampling error is estimated at ten alpha value. Besides, the data has also been gathered from the water management and canalization authorities in Laghman province.

4.2. Secondary Data Collection

In this research, the secondary data has been collected from different governmental and non-governmental organizations in Laghman province, mainly water management and canalization authorities, Mehtarlam municipality, rivers controls, national information and statistics office, metrology, rural, urban, and agriculture departments. Indeed, such departments have played an indispensable role in the completion of this research. It is also worth mentioning that different online research papers and resources have also been utilized as secondary data of this research.

5. Using survey questionnaire as the Primary data Collection tool

In order to collect primary data, the researcher has used a survey questionnaire in this research. The questionnaire was distributed to 50 households across the center of Mehtarlam under and beyond water distributing territories. The survey questionnaire

has been distributed to 5 regions of Mehtarlam municipality, and 10 participants have been interviewed from each region to collected primary in-depth data for this research.

Table: 1

Region/area	Region 1	Region 2	Region 3	Region 4
Number of families surveyed	10	10	10	10
Total number of families surveyed	50			

Questionnaire

The questionnaires were prepared in Pashto Language. They included questions on water consumption, water resources, and social and economic aspects. There were two types of questions. First type selective (multiple choice), second type explanatory questions which required short answer. There were a total of fourteen questions in the questionnaire. In addition to the fourteen questions, there is a short table where different part of household water needs to be written and the last part of the table indicates the amount of familial and individual water consumption.

6. Analysis and Results

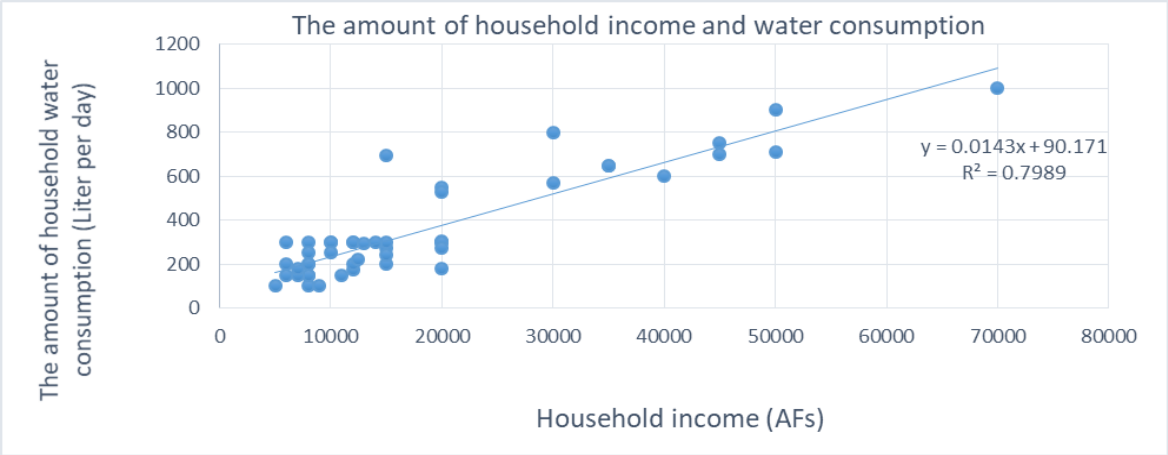
The average amount of water consumed per person depends on the following factors;

✓ Household income and domestic water consumption

The amount of household water consumption is directly related to the number of household members. The findings of this survey indicates that the amount of household water consumption increases with the increase of their income. Our findings are in line with Shikolomo and colleagues (2012) who found that people wouldn't be poor in terms of water consumption because of not having access to water, but they will be poor in water consumption because of their household income. The following figure demonstrates the change in the amount of household water consumption of the residents of Mehtarlam city in terms of their income level. For further understanding refer to figure 1.

Figure 1.

Number of members and amount of household water consumption



Some of the related resources mention the relationship between the number of family members and the amount of household water consumption. Based on this, it can be said that as the number of family member's increases, the amount of household water consumption also increases. On the contrary, as the number of family member's increases, the amount of water required per person decreases. The average number of family members in Mehtarlam city is six (report from Laghman Department of Statistics and Information, 2018). Our survey findings also indicated that there is an increase in household water consumption as well as decrease in the amount of water consumed per household, which is not very significant in this research because it is very little. For further understanding refer to figure 2 and 3.

Figure 2.

Number of household members and the amount of household water consumption

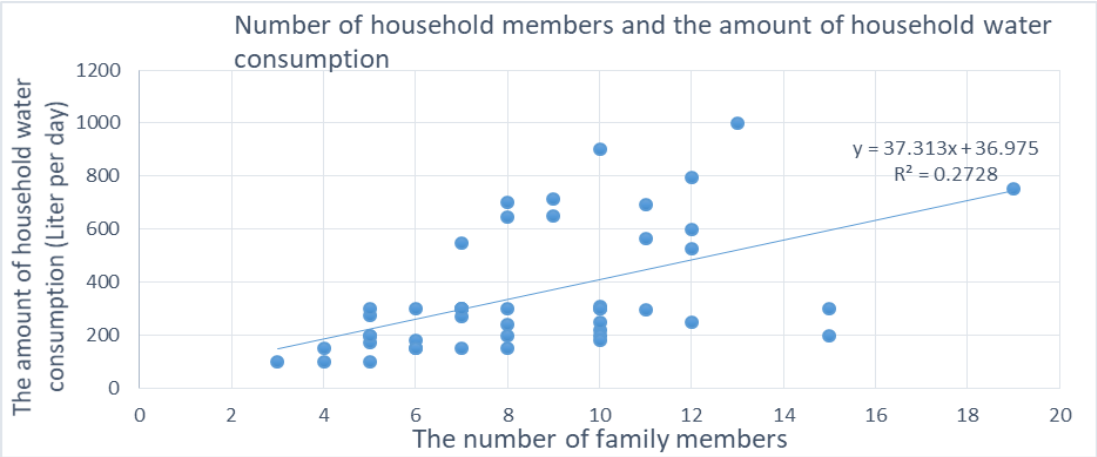
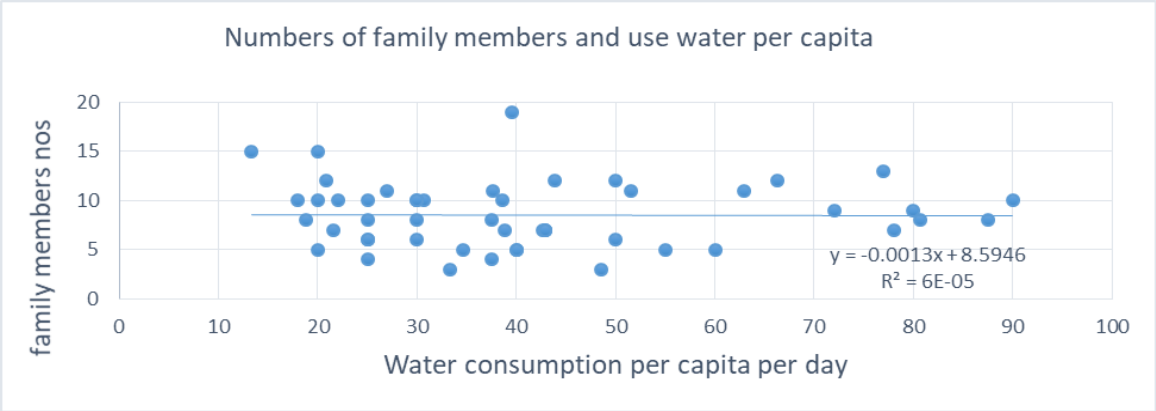


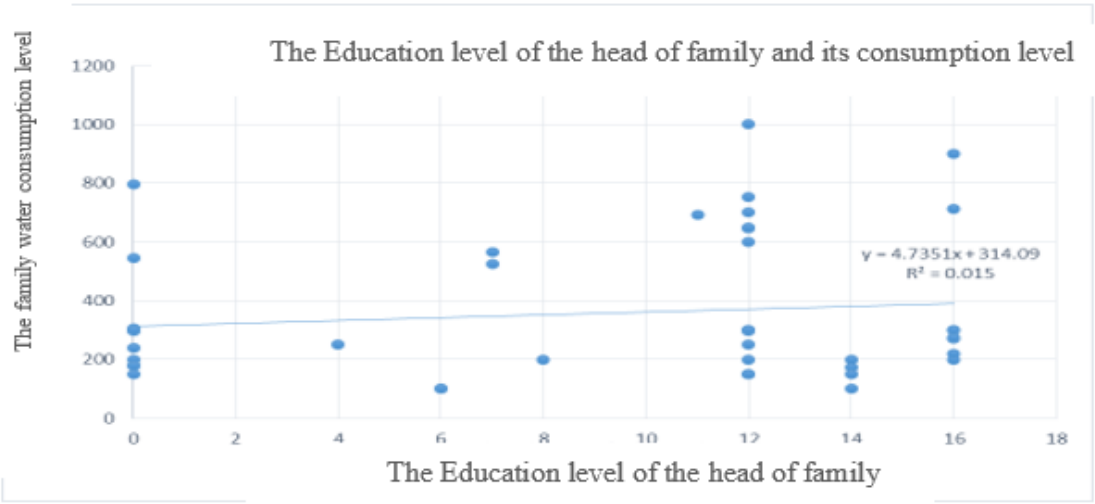
Figure 3.



✓ The impact of education on a family's head in water consumption

The education of a family members has a direct impact on the amount of water consumption, because increasing the level of education of a family can be more able to care about the hygiene and their selves' health, the number of family members and their head is a positive factor on the amount of water consumption for a family (reference), The results of our research field survey questionnaires also expose that increasing the level of family head education increases the amount of water consumption for a family. For further understanding, refer to figure 4.

Figure 4.



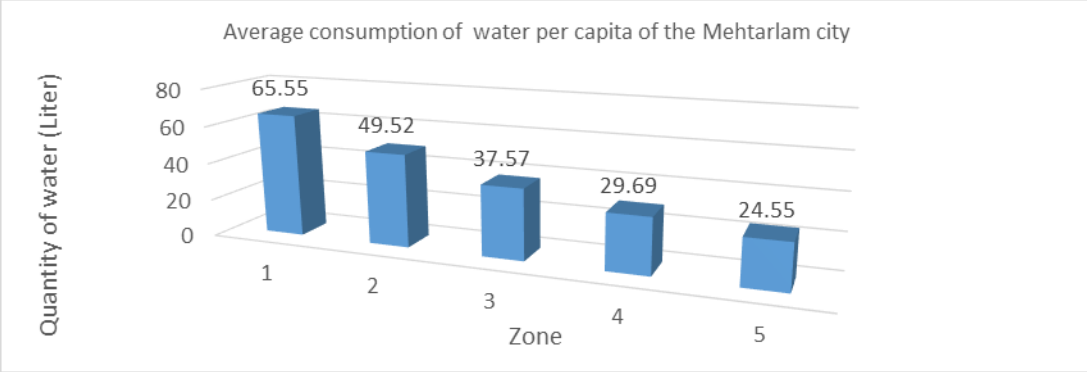
Domestic water consumption assessment is the main objective of this research which is based on field survey data and information. According to the research, the average water consumption for a family are 65.55 liters for the first district, 49.52 liters for the second district, 37.75 liters for the third district, 29.69 liters for the fourth district and in the 5th District, the domestic consumption of one person was 41.58 liters are calculated. Therefor the average domestic water consumption of any individual in Mehtarlam city calculated as 41.58 liters. As per above finding we can say the amount of domestic water consumption depends on the source of water, the level of income, the amount of family members, and the level of a family's head. By considering these factors, a comparative research of domestic water consumption is as follows: for further information, refer to table 2 and figure 5.

Table 2.

Average consumption of water per capita of the Mehtarlam city

No	Sector	Water consumption per capita	Consideration
1	First Sector	65.55	
2	Second Sector	49.52	
3	Third Sector	37.57	
4	Fourth Sector	29.69	
5	Fifth Sector	24.55	

Figure 5.



7. Conclusion

The result of the research showed that the main water supply system of Mehtarlam city is supplying water only to limited numbers of the families which included 5.43 percent of the whole population of the city, and the remaining families taking their water from other sources. According to the research, the overall percentage of the remaining families taking water from other sources included 52 percent from private surface wells, 16 percent from tube wells, 12 percent from public hand pumps, 10 percent from public taps, and 12 percent from their neighbors. According to the quantity of water consumption of the Mehtarlam city, the findings of the research revealed 41.58 liters per day per capita which is significantly varied from zone to zone of the research. The research also revealed that the water consumption in the city is directly proportional to the income, number, and education level of the head of the families.

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