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Impact of Water Stress on the Quality of Life of Residents in Miramar and Paramonga Housing Programs

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Abstract – In this research, it is argued that drinking water services directly influence the economy, health and social conflicts, generating social or family water stress. During primary education in 2000, the author focused his attention on classes, sports, and childhood issues. In retrospect, he remembers that the water supplied at school was not potable, creating an unhealthy environment, especially for classmates from remote areas without access to potable water in their homes. This problem persists at the national level, affecting children and young people who go through their education without access to drinking water at home or at school.

Keywords—Impact of stress, Quality of life, housing programs, water stress.

I. Introduction

For several years we have been hearing that water is running out, especially water for human consumption and as we all know well, water has a primary value for the development of the nuclei of society, which are families. The United Nations Organization (UN), in order to resolve the great inequalities that different countries on the planet experience, prepared, approved and made known to all the countries of the world that "On July 28, 2010, through In Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation, reaffirming that clean drinking water and sanitation are essential for the realization of all human rights" [1].

By virtue of this, all countries or nations are recommended to provide these services for the social, economic and health development of their entire population. Water is essential for socioeconomic development, energy, food production, healthy ecosystems and for the very survival of human beings. Water is also a crucial part of adaptation to climate change, and is a decisive link between society and the environment [2].

Clean water and adequate sanitation are as important for education as pencils, books and teachers are for all-round development. These services are very important for boys and girls to carry out their academic and sports activities without prejudice to contracting an illness. In some cases, the lack of these basic services produces a high dropout rate among students (boys and girls). Currently, there are still schools that unfortunately do not have adequate hygienic conditions, with unsafe water supply, damaged, dirty and unsafe facilities, with laundry rooms and latrines that are not suitable for children, particularly girls. Some schools have no water or sanitation facilities at all, and too often schools pose a health risk to children (UNICEF). However, in Peru, the problem of basic drinking water and sewage services has been unresolved for many years in various districts, provinces and departments throughout deep Peru; Whether due to lack of investment, apathy of the authorities, deficit in government management, etc.

This work addresses the situation that many families are going through and analyzes the impact of the lack of access to drinking water on the economic, social and academic development of people. The difference between the access to basic services that the urban population has and the rural population is large and discriminatory. Consequently, there is a gigantic challenge on the part of the central government to expand coverage to provide the service and access to drinking water to all Peruvians, since it is a human right, established in the constitution.

Population growth, increased meat consumption and the intensification of economic activity are putting increasing pressure on the world's water resources. Likewise, inhabitants of almost 400 regions of the planet are already living in conditions of "water stress", according to a new report from the World Resources Institute (WRI). a Washington-based think tank.

One of the points to be discussed in this Work is Water Stress in the people or inhabitants of an area and how it affects their daily lives, since water stress is defined as the proportion of water that all sectors extract in relation to the available water resources. The world average for this proportion is 13%. Stress affects all continents, compromises sustainability and limits economic and social development. More than 2 billion people live in countries suffering from significant water shortages. Although the global average for water stress is only 13%, 32 countries suffer water stress between 25% (the minimum value at which scarcity comes into play) and 70%, and 22 countries exceed this percentage and are considered under severe stress.

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The urbanization processes that have developed in the world in the last century have had repercussions on the consumption of water resources. It is estimated that, in the coming decades, there will be the fastest increase in urban areas in the history of humanity, with 2.6 billion additional people in urban areas by the year 2050. This dizzying urban growth consequently generates an increase in the demand for water for consumption, therefore, to satisfy this growth in demand, it is a global trend for urban areas to exploit new sources of water such as surface waters, aquifers and/or through seawater desalination processes [3].

For many years now, many people in Peru have been migrating from rural areas to cities. Likewise, taking state information as a reference, we know that, in 2017, the National Housing Population Census was carried out in Peru, and as a result of this it was evident that the urban population amounts to a total of 23,311,893 Peruvians and the rural population totals 6,069,991 Peruvians. That is, 79.30% of the inhabitants belong to the city, while 20.70% of the inhabitants belong to the rural area [4].

It should be noted that according to data collected by the Census developed by the INEI, it is estimated that the coverage of the drinking water system reaches 94.4% in the Urban area. On the other hand, it is estimated that the coverage of the drinking water system reaches 72.2% in the Rural area. Likewise, looking globally, it is estimated that 89.4% of the national population has access to drinking water [4].

Due to the above and given that the reality of the inhabitants of the Miramar and Paramonga housing programs is the lack of access to drinking water which makes them a vulnerable population, additionally their homes are located in a desert area, on the slopes of the hill, far from the center and as a consequence they do not have access to drinking water and are most likely subjected to Water Stress.

During the years 2012 to 2015, pre-feasibility, feasibility, pre-investment studies and different feasibility studies were carried out, which were favorable for the execution of a sanitation work that would meet the objective of providing basic drinking water services. and sewage. However, this proposal analyzed demographic growth with a minimum minimum ratio, which is not reflected in reality, since over the years the area under analysis has a demographic growth higher than the local average, which is why some programs housing projects such as Miramar and Paramonga were left out of the aforementioned project.

Likewise, as a result of the migration of the population, it is observed that over the years the residents have decided to build their homes in high areas (slopes of the hills), some of these invasions being the lack of a roof to live and as a consequence, their homes do not have access and installation to the public drinking water network for human consumption. In addition to that, dust particles, solar heat, water scarcity and poor sanitation result in infectious foci, gastrointestinal diseases, and many more negative conditions summarized as population and/or social water stress.

Most of the water obtained is not for human consumption, as it does not meet the quality standards to be called drinkable. And the cost of obtaining minimally treated water has a monetary value higher than the monthly payment of inhabitants with access to the public drinking water and sewage network.

Unhealthiness due to lack of access to drinking water and sewage services affects the population's personal, family, professional and educational development, which is summarized in population WATER STRESS as a consequence of a permanent forgetfulness or apathy of the authorities to provide drinking water to the Miramar and Paramonga housing programs.

According to [5], a person must consume an average of 100 liters of water to satisfy both consumption and hygiene needs; however, in the aforementioned population, this recommendation is not being met, so the inhabitants run the risk of contracting some illness, having inadequate nutrition, not performing optimally in their chores, etc.

Water stress is a latent factor in the population, since every day they have to transport the water they can obtain by tanker in containers. The transfer, loading or hauling of water to homes that are in high altitude areas without access to vehicular traffic affects women, pregnant women, children and adults, which over time can affect correct muscle and bone development since the weight of the containers is excessive for the entire population.

In general, the poor access to water by the population produces a general discomfort called Population or social water stress which, in this work, is proposed to be related to the quality of life of people in the economic, social, educational and health.

All civilizations have required, to a greater or lesser degree, water management. Throughout history, the different elements that have allowed its management have been built based on the ease of access or evacuation and/or the size of the population to be served. This is something that we know perfectly well today, but it is also evident when we analyze the remains that ancient civilizations have left us.

One of the main jobs or works of every population is to have access to Water and Since very ancient times dating back to the years 10,000 BC, the first techniques began to channel the flow of water, coming from heights, ravines, springs, streams, etc. In cultures preceding or contemporary to the Inca Empire, ancient cities supplied the liquid element through gravity; the engineers of that time designed collection, supply and distribution networks.

With a primitive supply system, water was not distributed to individual homes, but on the contrary, everything focused on the channeling of water to a central well from which all the inhabitants came to collect water from said Well. Initially the systems were not adequate and barely distributed minimum water flows; Over the years, aqueducts are built to transport water from higher and more distant places.

With the fall of the Roman Empire, a period of decline in water technology began, which caused sanitation and public health to suffer a decline in Europe. The sanitary conditions were such that the water supplied was contaminated, there was animal and human waste in the streets, and sewage was thrown out of the windows onto the streets, onto passers-by. As a result,

terrible epidemics are born that wreak havoc in Europe. The ancient constructions used in water supply networks were pipes made of wood, clay or lead, which were barely able to withstand low pressures, however, current networks have a higher degree of resistance to pressure.

As the years went by, the era of iron arrived, which was used in construction, at that time the drinking water distribution networks were installed with pipes made of this material, in addition, due to its low cost and the advancement in new technologies. water lifting technologies, it became possible for the vital element to reach every home, not only for the rich but for the poorest.

Despite new technologies in drinking water supply systems, and the exponential growth of cities, the waste produced by them began to contaminate the supply sources of several other cities. Then, concern began about health care and water treatment methods for mass consumption. By the 20th century, studies and practices of water treatment began with the use of filters in cities. These filters decreased the high rate of diseases due to ingestion of drinking water. Later, disinfection with chlorine began, which greatly increased the effectiveness. of treatments in drinking water.

Access to drinking water and the sewage system are important factors that contribute to improving the quality of people's living conditions. Unfortunately, not the entire population has access to it within their home. The most affected are the populations with lower economic income, in places where the state does not reach to provide basic services, since it is a right of the entire population, regardless of where they reside.

The partial or total limitation of access to drinking water has negative consequences such as unhealthy environments, affecting the economic, educational and health development of all people without access to the liquid element and especially the most vulnerable people such as the boys and girls; This impact is greater in them because they are more prone to contracting an infection. Therefore, this work seeks to know the level of Water Stress that people are enduring, if Water Stress directly or indirectly influences the development activities and quality of life of each person.

Likewise, know what the amount of water they receive is and if it is sufficient to satisfy their needs since, as stipulated by law, every person must have the minimum conditions of development or at least know how much they need. affects to be able to compensate for the forgetfulness of the state.

On the one hand, access to the area under study is by road (trail), with difficult access to each home, since the homes are above the slopes of the hill with steep slopes and limited pedestrian traffic. Additionally, it is an area affected by crime.

The population residing in the study area does not have a property title, which indicates that the subdivision has not been formally regulated and affects the data collection because there is an established order in their homes.

In many cases, some residents are not participatory or collaborative in the collection of information regarding the economic impact generated in their families by water stress.

It should be noted that the factors that influence water quality mainly include hydrogen potential (pH), dissolved oxygen level (DO) and water temperature (TA); Therefore, it is crucial to carry out constant monitoring of these variables so that those in charge of aquaculture farms can anticipate the necessary controls or prevent disasters that could cause economic losses. In this sense, systems based on information and communication technologies (ICT) have been developing, such as wireless networks belonging to the field of personal area networks (PAN), such as ZigBee. These networks or systems have the function of sending information on pH, DO and temperature values to long-range transmission devices (WAN), such as CDMA and GPRS, as well as to computing tools such as VPN, neural networks and/or web servers, in order to monitor water quality in real time [6].

Some studies have attempted to illustrate the application value of blockchain in water-related fields. Initially, blockchain technology was mainly applied to water trading systems to avoid delays and reduce transaction costs [7].

It has been shown that the adoption of blockchain technology to collect water data could increase public awareness of water quality and achieve water quality traceability [8].

II. Theoretical Framework

According to the following research work, water provision values were analyzed, evaluated and found for families with socioeconomic level C, which resulted in 71.61 liters/inhabitant/day, as shown in the following graph. Additionally, the daily and hourly variation coefficients of water consumption were found, as well as the critical consumption during the day, month and year, in the town of Salcedo in order to find more realistic values than what is recommended in the RNE. Therefore, the research showed that the values found are higher than those of the RNE [9].

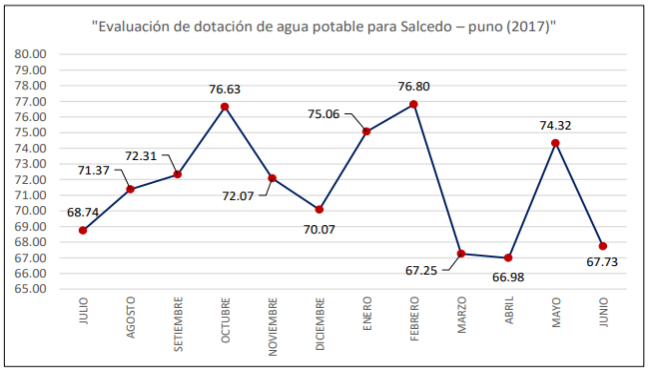


Fig. 1 Average variations of the month of Salcedo - Puno

According to the following research work, the per capita endowment of the aforementioned district was evaluated. They estimated the water consumption of the different homes in said district, taking into account the factors that affect water consumption such as: socioeconomic level, climatic conditions, number of inhabitants, type of community, losses and waste in the drinking water supply. Achieving this through direct

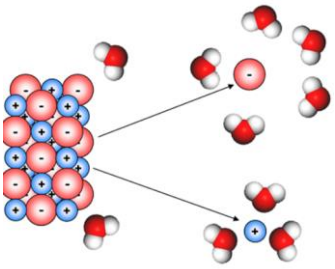
surveys and measurement of water consumed per day for 05 days of each month for a year using containers. They found that the per capita provision for the town of Vilavila is 70 liters/inhabitant/day, which is less than 120 liters/inhabitant/day for cold weather established by the RNE – OS.100 and water consumption during the cold season. summer is 52.77 liters/inhabitant/day and for the winter season it is 47.45 liters/inhabitant/day; and the average consumption for both seasons is 50.11 liters/inhabitant/day. The maximum water consumption in the summer season was 56.07 liters/inhabitant/day in the month of March and a minimum of 50.41 liters/inhabitant/day in the month of December. And for the winter season, the maximum water consumption was 49.86 in the month of May and a minimum of 44.72 liters/inhabitant/day in the month of July [10].

In the following research work the author determines the average amount of water that a Colombian family needs to cover the basic needs of the home. The author's objective is to model consumer behavior, using two appropriate methodologies to perform econometric analysis with panel data, from which two demand functions are constructed and thus the variation in water consumption is evaluated when they occur. changes in variables such as the price and average temperature of the city. In this way, the author finds that the level of basic water consumption that currently applies to the Colombian population, which corresponds to 20 m3, is high; since today an average household consumes a smaller amount in basic activities [11].

In the following research work the following is concluded: A total of 17 regions would be affected by water deficiency. Of them, 7 regions would already be affected by the prolonged period of water deficit and the other 10 regions present imminent danger according to the forecasts prepared by SENAMHI. It is estimated that a total of 10,824,140 inhabitants are being affected and/or will be affected directly and indirectly by the effects of this danger. According to the IV National Agricultural Census, the cultivated area in the identified regions is 4,693,744 hectares, the same ones that would be at risk of a lack of rainfall during the coming months. Through the analysis of the information provided by SENAMHI and ANA, effects of water deficit are expected in some regions of the country, mainly in the northern and central regions. If current conditions continue or worsen, a severe impact is expected on agricultural and livestock activities identified in the region. In addition to increasing the probability of developing forest fires. It is estimated that the most affected provinces in these regions are those that have the highest concentration of urban and rural population due to the deficit of water for human consumption and for native crops [12].

Water is a fundamental, necessary and indispensable natural resource for all living beings and variable ecosystems, however, threats that constantly minimize its quality and availability are always latent in every context. The quality and available quantity of drinking water are determining factors to ensure the well-being of human beings. One of the main threats to water resources is the increase in demand for water for human consumption as a consequence of accelerated population growth, the contamination of rivers, lakes and natural water sources due to the discharge of domestic and industrial wastewater, and the undermining of biodiversity, among others [13].

The physical and chemical properties of water are essential for life; it also has great value and usefulness for the development of economic activities. Water is the universal solvent par excellence, which is its main characteristic. Other important properties are the tendency to form hydrogen bonds and its ability to form bonds with metal ions. Due to these properties, water constitutes the means of transport of nutrients and waste products that, in turn, facilitate biological processes in aqueous media [14].



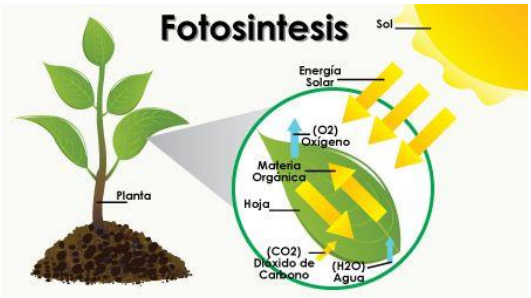
Water is an element of nature, a member of natural ecosystems, fundamental for the maintenance and reproduction of life on the planet since it constitutes an indispensable factor for the development of the biological processes that make it possible. Water is the most abundant component in organic media; living beings contain on average 70% water.

Not all have the same amount, vegetables have more water than animals and certain tissues (for example: fatty tissue) contain less water - it has between 10% to 20% water - than others such as, for example: nervous system, with 90% water. It also varies with age, thus, young individuals have more water than adults.

Water is the foundation of life: a crucial resource for humanity and the rest of living beings. We all need it, and not just to drink. Our rivers and lakes, our coastal, maritime and groundwater, constitute valuable resources that must be protected. Likewise, water contributes to the stability of the

functioning of the environment and the beings and organisms that inhabit it; it is, therefore, an essential element for the subsistence of animal and plant life on the planet. That is to say, "water is a basic necessity for living beings and an essential natural element in the configuration of environmental systems."

In this aspect, this vital fluid constitutes a large part of the body of most organisms and is involved in most of the metabolic processes carried out in living beings; It also plays a fundamental role in the photosynthesis process of plants and is the habitat of a wide variety of living beings [11].



In 2006, 54% of the world's population had a piped connection to their home, land or garden, and 33% used other improved sources of drinking water. The remaining 13% (884 million people) depended on unimproved sources. Access to safe water and adequate sanitation services has been shown to be one of the most efficient mechanisms for improving human health. The World Health Organization has calculated the economic costs saved and the returns generated by different levels of investment in water supply and sanitation services: for every dollar invested in sanitation and improved water supply, four to twelve are obtained, in depending on the type of intervention. Furthermore, access to safe drinking water and adequate sanitation services is basic for human health, but it also presents other important benefits that range from the most identifiable and quantifiable (cost and time savings) to the most intangible (comfort, well-being). , dignity, privacy and security) [15].

III. Method

A. Type of Research

1) Pure or Basic Work: Which will generate new knowledge based on the collection of data in relation to water stress in the study area.

2) Quantitative Work: Collection of economic data of the population.

3) Qualitative work: Interpret the impact of water stress on the development and search for opportunities of residents.

4) Observational Work: We measure and analyze the data obtained in the field in relation to the surveys carried out on the population.

5) Cross-sectional work: Because the collection of population information is obtained at a given moment in time

6) Descriptive Work: Describe the characteristics of water stress and its origin to expand knowledge about the national reality of the percentage of inhabitants who lack a drinking water supply and sewage system.

B. Population and Sample

1) Homogeneity: All inhabitants of the study area have the same deficiencies in obtaining water and also in the disposal of wastewater.

2) Time: The research will be carried out in the same period for the entire population, taking data from inhabitants of different ages.

3) Space: Data collection is limited to the jurisdiction of the Miramar and Paramonga housing programs.

4) Quantity: The number of people surveyed exceeds 200 surveys or, failing that, 40 families.

5) Stratified: The data obtained in the field are subdivided into groups taking as reference the location range of each inhabitant belonging to the Miramar and Paramonga neighborhood programs, in the district of San Martin de Porres – Lima.

C. Operationalization of variables

TABLE I
VARIABLE OPERATIONALIZATION MATRIX

VARIABLE	DIMENSIONES	INDICADORES	UNIDAD DE MEDIDA	
ESTRÉS HIDRICO	Dotación de Agua	Cantidad de agua que se obtiene	Litros/mes	
		Cantidad de días para solicitar agua	Días	
		Cantidad de agua que se compra por cada vez que se solicita	Litros	
		Cantidad de personas que viven en su casa	Cantidad de personas	
		Cantidad de agua que consume cada persona por dia	Litros	
	Tiempo	Precio de compra de agua	soles	
		Tiempo de espera de recolección	min	
		Precio de agua por cada vez que se solicita	soles	
		Tiempo en el que se utiliza	min	
	Salud	Salud familiar	SI	Intensidad
			NO	
		Sensación de Malestar	SI	Intensidad
			NO	
		Estaciones del año	Estaciones del año	
		Alimentación	Intensidad	
		Cantidad de años viviendo en la zona	Años	
CALIDAD DE VIDA	Economía	Ingreso Económico Mensual	Soles	
		Trabajo	Formal o informal	
		Cubrir gastos en salud	SI	
			NO	
		Actividades personales	SI	Intensidad
			NO	
		Calidad de vida familiar	SI	Intensidad
		Estabilidad laboral	SI	Intensidad
			NO	
		Conflicto social	SI	Intensidad
			NO	
		Cambio de residencia	SI	Número de años
	Salud	Gasto en salud	soles	
			Intensidad	
		Reutilizar agua	SI	
			NO	

D. Instruments and procedures

Instruments:

1) The Interview: With this technique, data is obtained from each resident, and it consists of a dialogue between two people: The interviewer "researcher" and the interviewee. The purpose of this technique is to obtain information from each resident, who is the one with water stress and is part of the investigation.

2) The Survey: With this technique, data is obtained from several people with water stress who are part of the study area, and whose opinions are valuable for the consolidation of data.

3) Collection of data from health centers in the district of San Martín de Porres.

	Week No. 01	Week No. 02	Week No. 03	Week No. 04	Week No. 05	Week No. 06	Week No. 07	Week No. 08	Week No. 09	Week No. 10
Workplan										
Approval of the Work Plan										
Advisors										
Appointment of Advisors										
Preparation of the Work										
Work plan analysis										
Setting up the instrument										
Data collection										
Cabinet Work										
Collected information filter										
Information validation										
Conclusions of the work										

Procedures:

1) You work with a sample of the population.

2) The data is compared with that published by the INEI.

3) The theories most appropriate to the reality of the area will be taken.

4) A water stress scale will be sought with which to compare and synthesize in the local reality where the Miramar and Paramonga housing programs are located.

E. Data analysis and ethical considerations

Analysis of data:

1) A statistical table will be made of the economic investment by the residents.

2) Calculations will be made to quantify all the data obtained.

3) The common actions that each resident takes as a consequence of water stress will be highlighted.

4) A ratio or average incidence of diseases caused by the lack of drinking water and sewerage is consolidated and will result.

5) A water stress scale will be sought with which adequate and superlative levels are compared.

Ethical considerations:

1) The data collection will have the signature of each person surveyed in order to validate and avoid doubts regarding the information obtained in the field.

2) Value: research should seek to improve health or knowledge.

3) Scientific validity: Research must be methodologically sound, so that research participants do not waste their time with research that must be repeated.

4) The selection of human beings or subjects must be fair: research participants must be selected fairly and equitably and without personal prejudices or preferences.

5) Favorable risk/benefit ratio: the risks to research participants must be minimal and the potential benefits must be increased, the potential benefits for individuals and the knowledge gained for society must outweigh the risks.

6) Informed consent: Individuals must be informed about the research and give voluntary consent before becoming research participants.

7) Respect for participating human beings: Research participants must keep their privacy protected, have the option to leave the research, and have their well-being monitored.

IV. Administrative Aspects

A. Activity Schedule

TABLE II
SCHEDULE OF ACTIVITIES

B. Research Budget

A base budget is estimated at S/ 7,500.00 (seven thousand five hundred soles with 00/100).

C. Sources of Financing

The source of financing is with own resources.

V. Conclusions

The quality of life of the inhabitants in the Miramar and Paramonga housing programs is significantly affected by the impact of water stress.

The relationship between water stress and quality of life in the residents of the Miramar and Paramonga housing programs is evident, highlighting the importance of addressing this problem.

The problems related to the water supply directly impact the quality of life of those who reside in the Miramar and Paramonga housing programs, manifesting the urgency of effective solutions.

The presence of water stress generates negative repercussions on various aspects of the daily lives of residents in Miramar and Paramonga, underscoring the need for interventions to improve the situation.

The study reveals that water stress has a detrimental impact on the quality of life of the inhabitants in the Miramar and Paramonga housing programs, highlighting the importance of strategies to mitigate this impact.

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