

# **Influence of Inappropriate Basic Sanitation and Lack of Access to Drinking Water in the Community Development of Azama, Otavalo Canton**

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**Abstract:** This research work focuses on describing how inappropriate basic sanitation systems and the lack of accessibility to water suitable for human consumption (potable or safe) influence the community development of Azama. This urban community is part of the Otavalo canton. Through the identification of the characteristics of the basic sanitation service, access to safe water and the management classes implemented, as well as the particularities of the community development of the referred sector given the significance that each of these elements represents integral health, both physical and psychological of each human being at any stage of the life cycle. Throughout this research, it is possible to identify that the sanitation service and drinking water systems correspond to human rights that guarantee a dignified life for people and favor community development that strengthens the organization and participation of the community. However, there is still a lot to work from the public field and, where appropriate, also the collaboration of private entities to promote the comprehensive well-being of the inhabitants of the Azama community from their active social participation.

**Key-Words:** sanitation; drinking water; community development; sustainable planning.

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## **1 Introduction**

Basic sanitation and accessibility to drinking water or safe water suitable for human consumption within any context, both rural and urban, independent of the State or nation to which it belongs, heads the 2030 Agenda, a document that stipulates optimizing the quality of said water. The quality of this resource should be guaranteed through preventive measures established to avoid its

contamination and, on the contrary, promote the appropriate treatment of wastewater to preserve the comprehensive safety of all people [47]. Within this framework, the Sustainable Development Goals (SDGs) within the sixth objective describe guarantees so that the entire population has access to water throughout the year and includes guidelines for sustainable management and compliance with

basic sanitation systems for the whole human being [44]. In the urban sector of Azama, one of the parishes of the cantonal center of the city of Otavalo, Imbabura, Ecuador, a different reality is seen. Therefore, it exposes the urgent need to improve sanitation systems and safe water, which considerably influences the community development; once it impacts the population, physical and mental health is transgressed by the inconsistencies within such components.

Developing the definition around sanitation is essential to understand the dynamics between the environment, human beings, and other living beings that cohabitate on Earth. Environmental quality is essential to ensure a healthy life. For this reason, all people have the right to health, which, as if that were not enough, depends significantly on a clean environment [60].

Regarding this topic, Martínez and Rengifo *et al.* [64] mention that sanitation is the procedure through which inappropriate family, community, and regional factors, attitudes, and practices that put health at risk are recognized and valued; this diagnosis seeks to establish and prevail this problem for your attention. Sanitation is the responsibility of the State. So, it is a vital function of the public health system whose purpose is to control, reduce, or eliminate the risks derived from specific natural, physical and social environment scenarios that predispose the affectation of health. Moreover, it restricts the human being from his individual and collective rights.

Safe basic sanitation is defined as accessibility to optimal facilities and services created to guarantee the integrity of people in their homes and of those workers who are in charge of the processes of eliminating human biological waste, who collaborate in each of the stages of this system (retention of sanitary batteries, emptying, mobilization, and treatment both in situ and *ex-situ*) and the final disposal [12].

In this line, sanitation can also be defined as the set of technical networks and services that favor creating a healthy environment through the control of environmental pollution resulting from rainwater, wastewater, solid waste, and water used in human consumption [33]. Then, it is represented as the systems built to preserve the natural or artificial environment created by the human being, within ideal conditions to promote the development of people from an individual and collective approach

[8]. Concerning this issue, basic sanitation aims to reduce the elements that put the quality of life of human beings at risk. However, it is significant to carry out a timely diagnosis to regulate the fundamental operations to obtain an optimal process in terms of comprehensive hygiene [60].

The elements that make up the basic sanitation system are: drinking water supply; management and timely final disposal of biological waste (feces and urine) and wastewater; effective management and final disposal for solid waste [56].

In this framework, the Latin American Conference on Sanitation (2007) reveals that good hygiene practices promoted based on improving sanitation procedures contribute significantly to the comprehensive well-being of human beings through the conservation of the environment, protection of comprehensive health, and poverty reduction. In this sense, it is essential to guarantee that all population groups, regardless of their geographical location, have sanitation conditions to lead a full and healthy life in pollution-free environments [60].

On the other hand, drinking water is defined as that one is qualified without any restriction as appropriate for human consumption [16]. Drinking water, also defined as safe, must comply with various safety and quality standards decreed by national and international authorities and organizations for its supply [24].

Drinking water is described as clean water, free of bacteria, contamination, or other degrading agents, the foundation on which prosperous, sustainable and equitable societies are built. The proper management of ecosystems allows the population to access and consume quality drinking water. Therefore, a fundamental requirement is the intervention and cooperation between public and private sector companies with the government's backing at each level, local and indigenous communities, Non-Governmental Organizations (NGOs), and other actors [70].

Then, drinking water (safe drinking water) is defined as the vital liquid that does not produce any significant health risk when consumed or used in domestic and hygienic routines throughout life, considering the different lassitudes and physiological alterations that the human being can present in the different stages of the life cycle. The individuals who are most predisposed to contract diseases transmitted through water are infants up to

five (5) years of age, elderly individuals, and those who live in unhygienic conditions [49].

Finally, around community development, it is defined as the territorial space that promotes the restoration of the power of the community based on the technocratic direction for the reduction of poverty rates through programs and projects where the entire community participates [68]. In this sense, it is presented as an essential factor for strengthening the social organization, which produces benefits to all the inhabitants [72].

It is based on community management which is not limited to infrastructure. Instead, it addresses the operations, administration, and maintenance of all the systems part of the sector, the care of sources, accessibility to drinking water, management of biological waste, and sewage water. Thus, to achieve the sustainability of each of these services, it is necessary to strengthen local capacities through participatory procedures based on awareness and training of community members on issues related to sanitation and drinking water systems as a fundamental strategy [18].

### **The basic sanitation as a Human Right**

As of 2008, sanitation is considered an essential axis for the United Nations, Human Rights (access to water as a human right since 2010 and as an independent right as of 2015) and the World Development Agenda [55].

According to the United Nations [73], basic sanitation corresponds to a human right that grants the power to access guaranteed sanitation services to promote human dignity, from affordability and accessibility to generating social and cultural acceptance.

Likewise, since 2013, open defecation has been put to an end through the call of the Assistant Secretary-General of the United Nations. Also, the Millennium Development Goals, safe sanitation, treatment, and reuse of sewage are presented as an essential component [56].

### **The access to water as a Human Right**

Access to an adequate source of clean and/or safe water is essential to comply with the chain of safe sanitation, cleaning, maintenance of personal protective equipment, facilities, containers, and others - including personal and domestic hygiene. In fact, water is essential for cleaning after defecation in most countries, so the absence of this service can cause people to defecate in places near surface water sources. On the contrary, if adequate pipes ensure

the household water supply, the whole community will be encouraged to install and use hygienic batteries (World Health Organization [80].

Nevertheless, the regulations stipulated towards water may differ in form and nature in different countries or regions. That is, there is no universal method that applies to all States. However, the development and application of legislation should be based on existing regulations and projects related to water and the government's health. That is, the methodology implemented in one country may or may not work if it is replicated in other nations. Consequently, to develop an appropriate regulatory framework, each country needs to examine the weaknesses in its systems and capacities [52].

The Sustainable Development Goals in target 6.1 call on all States to achieve equitable and universal access, characterized by affordable prices for drinking water. This goal is monitored through indicators provided by the services provided by safely managed drinking water supplies. That is, drinking water from a better supply will promote its availability every day of the year and meet sanitary standards as well as prevent contamination by feces or chemicals [56].

### **Basic sanitation and access to drinking water in human health as part of community development**

Safe sanitation and access to clean water are essential for health and are therefore considered fundamental human rights; Its functions range from the prevention of infections to the maintenance and improvement of general health. In this sense, inconsistencies in sanitation generate diseases and infections such as: diarrhea, considered a public health problem and is one of the leading causes of diseases and, in the worst cases, cause of infant mortality in children under five years, especially in low- and middle-income nations [61].

Inappropriate sanitation causes untreated tropical pathologies such as *geohelminthiasis*, *isschistosomiasis* and *trachoma* that cause a high morbidity burden at the international level [51]; and vector-borne diseases such as lymphatic filariasis and West Nile virus fever [52,75] as a consequence of poor sanitation that favors the proliferation of *Culex* mosquitoes [56].

Cases characterized by unsanitary conditions, poor basic sanitation, and lack of access to safe drinking water are associated with stunting [20], which affects approximately one in four children under the age of 5 [74], a product of diarrhea associated with other diseases [43], environmental enteric

dysfunction [17] and helminthiasis [83]. The lack of adequate sanitation, including the lack of access to drinking water, facilitates the emergence and spread of drug resistance, by increasing the risk of infectious diseases [31], greater use of antibiotics is required against preventable infections [55]. In addition, inadequate management of fecal waste from communities and health centers can favor resistance to bacterial or viral infections [39].

Hygiene and safety in health establishments must always include adequate access to drinking water, the essential elements for the prevention and control of infectious diseases, and the assurance of the quality of care; especially to avoid the exposure of workers and users to infections [81] and mainly to protect pregnant women and newborns [10].

The requirements that guarantee safe water, suitable for human consumption, are based on regulations managed by the health system that begins with constructing appropriate infrastructures, monitoring, planning, and timely follow-up [82].

Access to an adequate sanitation system and drinking water suitable for human consumption in the family nucleus, educational establishments, workplaces, public spaces, health institutions, refugee centers, and detention centers is essential to promote the well-being of the human being [35] including mental disorders such as anxiety resulting from shame and embarrassment [30] associated with defecation in shared facilities or outdoors [55].

Clean and accessible water is essential for public health and community development, regardless of its intended use (e.g., consumption, food production, domestic, creative use). Thus, improving the supply and quality of water suitable for human consumption will allow compliance with all the components and processes of an adequate basic sanitation system and, therefore, will promote water management as a renewable but vulnerable and scarce water resource, managed promptly, can boost the economic growth of each country and help reduce poverty rates [56].

### **Strategies for basic sanitation**

Basic and environmental sanitation systems are a matter of international concern and uncertainty. It has been shown daily that they correspond to an essential need to guarantee the healthy life of human beings and all the species that inhabit planet Earth [60].

Around 2.4 billion human beings internationally live in unsanitary conditions. Their hygiene habits are inappropriate, which is why exposure to fecal waste and sewage favors the risk and predisposition for the spread and incidence of infectious diseases. Based

on these statistical data, timely sanitation systems contribute to reducing risk factors that favor the appearance of pathologies [50].

Environmental sanitation requires implementing strategies that ensure that each of the processes carried out within this system is efficient, effective, and timely. In addition, they are connected with the culture and identity of the citizenry. So, the people are integrated into these procedures from their social processes [60].

Environmental education and awareness are essential for the population to carry out responsible actions that ensure the transmission of conceptions around sanitation, with a level of complexity appropriate to the recipient so that the development of communicative models about the risks involved in the improper management of solid waste and wastewater is stimulated to ensure that the inhabitants understand the significance of the interaction between poor basic sanitation, health risks and the community development [22].

In this regard, the educational process around sanitation must be present in the education of citizens because this system is essential to promote health and preserve the environment. Nevertheless, community participation without a sense of belonging will not make human beings aware of the magnitude of this issue [60].

### **Municipal management**

Rojas [66] points out that municipal management is based on local governments. These are considered service institutions aimed at constructing infrastructure and executing works for the benefit of each of the parishes, communities, and sectors that make up the canton where they are located in the Municipal Government. In ancient times there were limited possibilities for the action of officials (mayors and public servants) around the development and strengthening of the progress of their areas, however today. That vision was discontinued and has gradually been overcome since many cantons have been immersed in decentralization processes, which support and provide regional and municipal governments with the proper tools and resources required to occupy greater autonomy both in the management and distribution of resources.

In this sense, decentralization has a notorious impact on municipal management and local administrations' performance. Under this form of governance, powers are fully transferred to local authorities, who have full administrative, political, and financial autonomy in their own right—the different levels of government [27].

For its part, Armas [3] mentions that the municipal manager is in charge of orienting and guiding the location and satisfaction of the needs of each citizen that are part of the sector. It is based on the municipal administration whose purpose is to obtain adequate resources to meet the identified requirements and ensure optimal, effective, and efficient allocation. Meanwhile, the management of the municipalities becomes an essential tool for the municipal administration and, at the same time, safeguards the fulfillment of the obligations of the authorities and other public sector servants towards their inhabitants.

### **Municipal management in the Otavalo canton**

The management led by the Autonomous Decentralized Municipal Government of Otavalo (GADMO) is based on the participatory approach proposed by the Council for Citizen Participation and Social Control to comply with the obligations and responsibilities assumed by the authorities and other public servants that. They make up the institution where each citizen participates dynamically and cooperatively for the city's progress that respects the legislative and regulatory framework for accountability after the end of each year [14].

### **Municipal management and social and health conditions**

The health of a territory weakens not only its citizens but also undermines the independence and autonomy of the entire sector and, in particular, of the entire institution in charge of municipal management because this entity must also make sure to include standards and policies governed by health systems, where each person has the power to control their health to maintain their autonomy and certify the restitution of health. However, when the procedures defined within municipal management lack guidelines regarding health, sanitation, and access to water, it is likely that there are deficiencies in the capacity of such management, violating this right [67].

Global Water Partnership (2003) postulates that the services endorsed by municipal governments have not improved in recent years. On the contrary, the inefficiency of the services that favor or worsen socio-sanitary conditions is appreciated. In the same way, the subsidies decreased, so the coverage rates have not increased. Likewise, the infrastructure and quality of drinking water services suitable for human consumption have deteriorated, particularly in rural areas. The organization, planning, drafting,

and construction of new systems pertinent to the service have diminished remarkably. Meanwhile, there are also difficulties regarding the monthly rates, which for political reasons, do not cover the costs to operate and maintain the drinking water networks and basic sanitation systems, so there is no recovery between cost and investment as a result, funds are always scarce.

Municipal management's preventive and promotional actions are described as solid and concrete practices. Nonetheless, the greatest challenge is the procedures around coordination both within and between the jurisdictions required to provide timely health care [63].

Likewise, accessibility to drinking water continues to be a source of uneasiness and concern [67]. According to, the statistical figures issued by the United Nations reports reveal that, as of 1990, around two (2) and a half million citizens have access to: drinking water, electricity, and biological waste management; however, about six hundred and sixty-three (663) million individuals lack said access. It is estimated that approximately two thousand four hundred (2,400) million inhabitants do not have access to essential services and only have toilets and/or latrines made by hand. In this context, the number of residents who lack access to essential services and sanitation systems is colossal, so there is still too much to do [36].

Junqueira et al. [36]. point out that the lack of water availability not only complicates the quality of life. Besides, the consumption of contaminated water brings negative consequences on health, especially gastrointestinal pathologies such as acute diarrheal diseases (EDAS), gastroenteritis, cholera, and cysticercosis. Diarrhea is caused, among other factors, by drinking contaminated vital fluids and corresponds to the second main causal factor of infant death worldwide.

Molina et al. (2018), within the report issued by the National Institute of Statistics and Censuses [INEC], indicates that in the Republic of Ecuador, around 70.1% of the inhabitants have procedures that ensure safe water management, in other words, that number of people has enough water nearby, of quality, that comes from renovated facilities. 85.9% of citizens have sanitation systems only within a basic level, characterized by having toilet facilities for the exclusive use of each household. Nevertheless, it cannot be affirmed that the population uses sanitation processes appropriately because there is no information about wastewater treatment.

In Peru, a country that is also part of South America, it reveals that among individuals who consume

water from the national public network based on the location of their home area, 94.8% of urban residents maintain access to this service. However, only 76.3% of the inhabitants of rural areas have these benefits [34].

Despite this, the governors and public officials of the municipal government have granted some property rights towards democratic governance following the regulations in force and, according to various estimates, have established the primary mechanisms to face the lagging structure of the municipal governors. However, they have not provided a solution to the lack of inspection of food and primary agricultural procedures from transport and local commerce that do not comply with sanitary regulations, which favors the violation of the right to health [67].

Along with inappropriate hygiene habits "from the farm to the table," people consume contaminated food, which favors the suffering of various gastrointestinal disorders, especially acute diarrheal diseases. It is essential to understand and put into practice the sanitary conditions from the transportation of primary agricultural foods and internal local trade to reduce the uncertainty of contamination and safeguard people's health [71].

### **Community management**

Community management is the highest expression around the participation of the inhabitants; This component involves sequential decision-making processes through which the future of a sector is established considering the requirements for the development of sanitation and safe water. In this, administrative criteria intercede because they present support structures made up of competencies, norms, administrative organizations, procedures, human talent, and socioeconomic elements, whose situation favors the institutions that provide said services to fully attend to the requirements of the beneficiaries [6].

These groups are headed by subjects that incorporate various individual and collective interests, which favor the performance of different roles during decision-making. For this reason, community management is defined as a managerial skill that focuses on managing material and economic resources and symbolizes the ability to decide and resolve conflicts for the benefit of community members [18].

Community participation is a process incorporated in the constitution of an organization whose members have the legal right to represent the community, temporarily, to represent and protect the

interests of the community. In many cases, they are culturally hybrid social organizations since their members correspond to rural areas or are immigrants from the countryside to the city [25].

### **Inappropriate basic sanitation within community development**

The existence of inadequate sanitation systems is a problem that threatens people's physical and psychological health; Several studies determine that specific populations around the world defecate in the open air due to the lack of essential services to avoid environmental contamination due to fecal exposure [82].

In low- and middle-income countries, rural areas lack quality health care. The same happens in cities because, despite efforts to maintain safe sanitation, the pace of urbanization has not fully satisfied this need, mainly due to the high cost and time that these procedures require. Therefore, it is essential to address social challenges to ensure basic sanitation to protect public health and thus promote community development [55].

In this sense, in the 21<sup>st</sup> century, the effects of the scarcity of safe water and shortage of environmental and basic sanitation systems represent a significant gap in developed and underdeveloped countries; therefore, it considerably affects low-income inhabitants. The limitation in the provision of these services violates health. It favors the outbreak of various diseases and pathologies that harm the most vulnerable because these citizens consume and obtain water that is not suitable for human beings, which comes from wells, rivers, and other sources. In addition, they have to travel several kilometers to access this resource in specific communities. So, the sum of these negative characteristics considerably affects each aspect related to health, environment, and economy.

For this reason, the correct supply of drinking water and adequate management of solid waste are components that facilitate or hinder sanitation management; likewise, the Environmental Impact Assessment and Territorial Planning must be determined as local strategies for sanitation [78]. In this framework, the local territory and first-level health care are also part of the fundamental institutional framework for processing Environmental Health and, in particular, managing environmental sanitation because these are constituted by actions around promoting health and preventing disease with orientation to the control of risks that threaten comprehensive health in an anticipatory manner [13].

At the international level, sanitation is an appropriate alternative to improve the quality of life. Lake [40] details that to progress in terms of sanitation, it is unavoidable to achieve broad cooperation through private and public alliances with the participation of each of the members of all the communities and the increase in the level of awareness of citizenry in general.

Several investigations over time have verified that specific sectors and communities do not have the necessary conditions to promote health, so they do not have the quality of life. According to the Latin American Conference on Sanitation [15], 41% of the global population, that is, more than two thousand five hundred (2,500) million human beings, do not have access to conditions that ensure an optimal and healthy quality of life that can only be obtained through proper sanitation. According to these statistical figures, coordination between public institutions and private entities is essential to achieve alliances that favor the construction of optimal sanitation networks to protect people's health and reduce environmental pollution.

On the other hand, the lack of sanitation is one of the indicators of poverty rates worldwide, which is evident in population sectors with high rates of endemic and epidemic pathologies that reduce the individual and group development of communities [60]. In this framework, the Latin American Sanitation Conference (2007) describes that more than one hundred twenty (120) million Latin American citizens do not have access to timely sanitation systems because less than 15% of the sewage is treated correctly in central and southern America. Therefore, the evidence has verified that where there is no access to any system for the disposal of solids, waste, or sanitary facilities, sewage remains in the places where people live. Hence, the poorest groups are vulnerable to this situation's suffering.

In this sense, environmental sanitation must be considered a priority by government agencies and community organizations and not turn this need into an electoral proposal, which remains only promises [60].

### **Lack of access to drinking water in community development**

The supply of water corresponds to a fundamental element for human well-being; for this reason, its absence could cause the appearance of new and deadly diseases that, in the long run, harm thousands of human beings and the rest of the living beings in the environment. For this reason, this service must

be inspected so that this problem is counteracted. The existence of viruses, bacteria, and parasites causes severe problems in the population's health. These pathogens originate mainly from the inadequate handling of drinking water and the lack of drainage mechanisms. Harmful microorganisms favor the development of bacterial pathologies of water origin that cause mortality. However, identifying these organisms is difficult, so their elimination requires technical monitoring.

In the absence of drinking water, the population stores vital liquid inside and outside their homes, causing various types of diseases such as malaria, dengue, yellow fever, chikungunya, and others that affect the health of several people, especially in rural areas with climate tropical humid; therefore, the liquid resource is essential. Therefore, the abandonment and lack of responsibilities around the provision of the service causes serious problems. For this reason, the implementation of connections and appropriate systems to reduce the death figures [62].

## **2 Sanitary Problems**

Health problems constitute significant challenges for public and private systems throughout the world. In this sense, they are defined as problems that put lives, economic systems, and livelihoods at risk. A clear representative is climate change and the subsequent crisis generated by this situation, which spreads infectious diseases, contributes to malnutrition and aggravates cardiovascular, cerebrovascular, pulmonary pathologies (lung cancer), and pneumopathies, among other diseases [57].

Health systems at the international level are under tremendous pressure due to the rapid increase in demands faced by both health facilities and personnel, threatening to hamper and aggravate their effective functioning [58].

### **Social inequality**

Social inequality is understood as the socioeconomic disparity to which certain human groups are subjected; it originates from discrimination based on race, class, gender, diversity in physical abilities, religion, geographical origin, which are just a few examples. In fact, when exercised categorically (in other words, partially or excluding members of a group), it transforms it into a multidimensional fact that is incompatible with democratic principles [48].

In Latin America, social inequality is strongly linked to its productive matrix, which is characterized by high structural heterogeneity. In this sense, the essential determinant of inequality is directed by the socioeconomic stratum or social class, which also includes inequality of gender, ethnicity, life cycle, and territories that favor the increase in the magnitude and reproduction of said gaps and put at risk the physical and psychological integrity of people and the free exercise of their rights, access to education, health, decent work, spaces for participation, etc. [5].

### 3 Materials and Methods

#### 3.1 Approach, Scope and Design

We opt for descriptive research because it favors describing all the elements that make up the reality addressed [28]. In this framework, the objective of descriptive research focuses on detailing the particularities of certain phenomena using systematic criteria to describe the structure and behavioral patterns of the phenomenon analyzed, providing methodical information subject to comparison with other sources [44].

In this context, this project describes all the characteristics of basic sanitation and access to drinking water and how these factors affect the community development of the inhabitants of the Azama community, Otavalo.

In addition, the methodology applied in this project is quantitative since it is developed through a series of sequential processes, after which hypotheses are identified, the research variables described throughout the survey are tested, and then they will be analyzed and interpreted statistically with specific numerical values [29].

In this regard, this study analyzes the effects of the inconsistencies in the basic sanitation systems and access to drinking water in the community development of the town of Azama, canton of Otavalo, from the analysis of quantitative information obtained through the application of surveys to the participating sample.

#### 3.2 Variables

Contextually, the following variables were analyzed:

1. Sanitation and access to water suitable for human consumption are described as fundamental human rights and part of

the Sustainable Development Goals (SDG) [47]. For this reason, they correspond to fundamental components for the guarantee of the well-being of the human being.

2. Community development, a democratic process of training, in which individuals analyze their problems, find solutions, and intercede in decisions that affect both positively and negatively their community, which favors the development of awareness of the potentialities and qualities and allows taking responsibility for individual and collective development [38]. Therefore, this variable is essential for the proper interaction of the members of the Azama community, Otavalo canton.

#### 3.3 Sampling

The sampling of this work corresponds to 150 family nuclei made up of members between zero and ninety-five (0 and 95) years old who resided in the urban community of Azama during the last 15 years, which is part of the cantonal head of the city of Otavalo, located in Imbabura, Ecuador. However, since the number of individuals exceeds 100 subjects, a sample is obtained for better feasibility and ease of the researcher.

The participating sample is fifty (50) subjects; The procedure used to choose the participating sample was random, selected through decisional, non-probabilistic, and intentional sampling, following the following inclusion criteria: a) Age of the majority of the participants and b) Reside in the community for more than 20 years.

#### 3.4 Data Collection Techniques

A survey was applied to the study sample using a form developed with Google Forms in order to obtain data and information revealed through the opinion of citizens about the characteristics of the sanitation and water management systems in the Azama community and also to collect data about the processes developed and organized by the public servants of the Municipal Autonomous Decentralized Government of Otavalo for the benefit of the sanitation system and access to drinking water as part of community development in Azama.

#### 3.5 Data Analysis Techniques

According to the perspectives of several researchers, all the data collected through an investigation turns out to be significant for the scientific community. In



this sense, the information acquired through this study is analyzed and interpreted meticulously through specific criteria for its classification and ranking.

Thus, the techniques used in the data analysis were based on two procedures: the coding and tabulation of the results. The coding was carried out through the assignment of numerals to each question See Annex B (each question that is part of the survey is identified by a number), which favored the recognition of the variables and the determination of the type of frequencies most important for the interpretation and graphic representation.

Because the survey is made up of closed and semi-closed questions, numerical scale, nominal, open, filter, ordinal, multiple responses, filter, about facts and opinions in order to participants perceptions about the investigated topic, the categorization of qualitative answers in open questions was carried out by unifying the answers that presented the same meaning regardless of the structure in the wording in order to avoid redundancy through of establishing a standard text for this case.

For example, regarding the seventh question, *"If I mention the words sanitation service, what is the first thing that comes to mind?"* and *"What else do you consider what sanitation is?"*; the following similar answers were obtained: "order"; "cleaning"; "clean place," "clean water," "healthy place to live"; "community without garbage," "places without garbage," "health," "timely health services," "sewerage service," "sewerage," "clean place to live," "healthy community without pollution," "garbage collection," "waste management". All these correspond to the same response, this is "order, cleanliness, sanitation and timely sanitary services that promote a healthy place to live"; Therefore, it was necessary to group the texts and rewrite them as: "water control and its treatment in addition to garbage collection, adequate maintenance of sewers that promote a safe place to live."

Following the unification of these answers, their respective classification was carried out to establish new analysis variables resulting from the answers collected through open questions to transform qualitative information into quantitative information.

## 4 Results

This section is based on the quantitative study resulting from mixed surveys of the fifty (50) inhabitants of the Azama community belonging to the Otavalo canton. Here, the researcher and author

of this study carry out a detailed and profound analysis of the current situation regarding essential sanitation services and accessibility to drinking water systems and how these influence community development in the sector mentioned above.

At the same time, and taking into account the current social situation in the country, which is characterized by the various sanitary and biosafety measures issued by the competent international and national authorities, it was decided to apply the instrument (survey) through the use of the so-called ICT (Information and Communication Technologies), mainly using the Google Forms extension - which also facilitates the achievement of the stated objectives.

### 4.1 Sociodemographic Features

For the present study, the age trend between 16 and 70 years of participating subjects in the survey application that addresses the citizenship around questions that investigate the characteristics of the sanitation and drinking water systems in the Azama community is preserved. Also, to collect information on the actions carried out by those responsible for the Autonomous Decentralized Municipal Government of Otavalo to benefit these components as part of community development in Azama.

In Table 1 is shown that most of the participating individuals revealed having formal instruction in Basic General Education; however, the data suggest that a large part of the sample has also completed high school or does not have any level of education.

Table 1. Age of the participants.

Age	Frequency	%
16- 26	16	32%
27- 31	12	24%
28- 48	14	28%
49- 59	5	10%
60- 70	3	6%
70 +	0	0%
Total	100%	100%

Source: Own elaboration.

Besides, Table 2 shows a higher percentage of the participants in this project self-identify as indigenous, and a small percentage define themselves as mestizo.

Table 2. Level of studies of the participating subjects.

Study Level	Frequency	%
Basic Education	23	46%
High School	15	30%
Bachelor	1	2%
Master	0	0%
Other	0	0%
None	11	22%
Total	100%	100%

Source: Own elaboration.

Moreover, Table 3 presents the higher percentage of the participants in this project self-identify as indigenous, and a small percentage define themselves as mestizo.

Table 3. Ethnic self-identification of the participants.

Ethnic group	Frequency	%
Mestizo	4	8%
Indigenous	46	92%
Afro descendant	0	0%
Do not know, no answer	0	0%
Total	100%	100%

Source: Own elaboration.

## 4.2 Contextual Factors

92% of the participants consider that they only sometimes have access to essential services, while the remaining percentage classifies it as always. What apparently could negatively affect the comprehensive well-being of the said community.

According to Mehrotra et al. [45] or Lousada *et al.*, [42], essential services are one of the main components in which human development is established; in fact, these services are currently registered as constitutional rights and a condition for ensuring universal rights. However, today there is an increasingly vast discrepancy between this general pact and the reality perceived by human beings.

So, Table 4, tells us about the attention received by the services by the Autonomous Decentralized Municipal Government of Otavalo, the participating subjects reveal that both the health, education, and drinking water sectors receive zero surveillance by the competent institution.

Table 4. Access to basic services.

Alternatives	Frequency	%
Always	4	8%
Sometimes	46	92%
Never	0	0%
Total	100%	100%

Source: Own elaboration.

In Figure 1, it was inquired if the collaborators of this research would be willing to pay a specific economic value for the essential services of their community; a total of 91.8% assured that if they were part of this proposal.

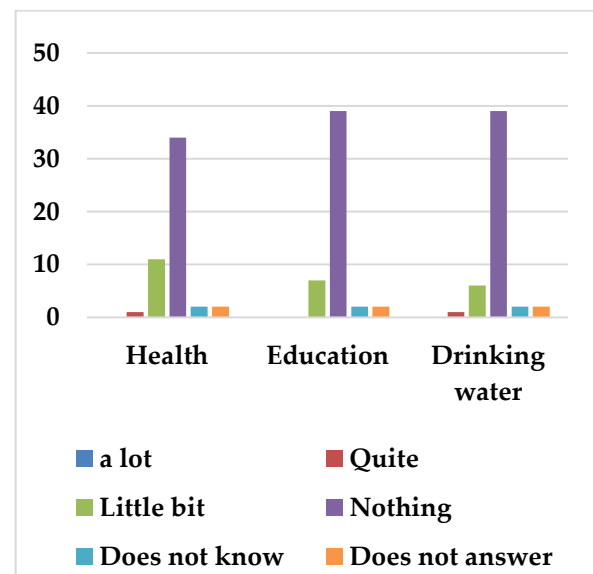


Fig. 1: Attention to basic services.

Source: Own elaboration.

Contextually, Table 5, finally, reveals that the participants were asked about the changes they consider should be implemented in their community regarding essential services. The answers are open since they cover the opinions of the study subjects who coincide in the following terms: "responsibility of the municipality to improve water and sanitation conditions," "intervention of the municipality to take care of the quality of water and sanitation," "responsibility of authorities to manage the best quality of water and sanitation," "pay for water and sanitation," "that water has a cost so that it improves" therefore, this information is synthesized and summarized in "implement services that have a cost and provide sanitary services, water, and adequate sanitation for the community members." In this sense, it can be ensured that the community agrees to pay an economic value in exchange for the maintenance of sanitation services and systems, including the management of water quality so that it

is safe for human consumption and ensures the integrity and health of the inhabitants.

Table 5. Availability to pay an economic value for basic services.

Alternatives	Frequency	%
Yes	46	92%
No	2	4%
Maybe	0	0%
Do not know/do not answer	2	4%
Total	100%	100%

Source: Own elaboration.

### 4.3 Drinking Water

On the other hand, regarding the satisfaction perceived by the water available in the Azama community, 78% of the participating subjects say they are never satisfied with the vital liquid supplied in the sector; in contrast, the remaining percentages describe it as sometimes (10%) and always (12%). According to the United Nations [47], water, commonly called the vital liquid, is part of the epicenter for sustainable community development and is essential for energy, socioeconomic progress, ecosystems, food production. Therefore, it is essential for the well-being of human beings. Likewise, it is a decisive part of adaptation to climate change, and it is a strong link between the environment and society.

On the other hand, there is an evident relationship between water quality and the guarantee of the right to health. In this sense, it is evident that this component is a health priority at a programmatic level. Along these lines, the Alma Ata Declaration (1978) points out the importance of access to water as a tactic to ensure the health of communities, where the adequate development of sources of drinking water and sanitation is prioritized.

Table 6 show us when it was inquired about whether the participating subjects know where the water available for consumption comes from, the response trend reveals that 60% of the vital liquid is supplied from springs; in contrast, 22% assure that the water comes from wells.

Table 6. Satisfaction of the participating regarding the water they consume.

Alternatives	Frequency	%
Always	6	12%
Sometimes	5	10%
Never	39	78%
Do not know/do not answer	0	0%

answer		
Other	0	0%
None	0	0%
Total	100%	100%

Source: Own elaboration.

After asking about what is the first thing that the participants think when hearing or reading the words drinking water, the majority of subjects wrote terms similar to "clean water," "water suitable for human beings," "quality water without contamination," "water that receives treatment"; For this reason, the contributions are summarized in "pure, clean water that receives treatment and is suitable for human consumption." (Figure 2).

In this line, the participants' opinions were also inquired about how much attention the Autonomous Decentralized Municipal Government of Otavalo provides so that the water is safe for human consumption. The responses reveal that 78% perceive that this service does not receive any type of attention from the mentioned institution; Likewise, 20% assure that the attention is little, while 2% say they do not know or prefer not to answer.

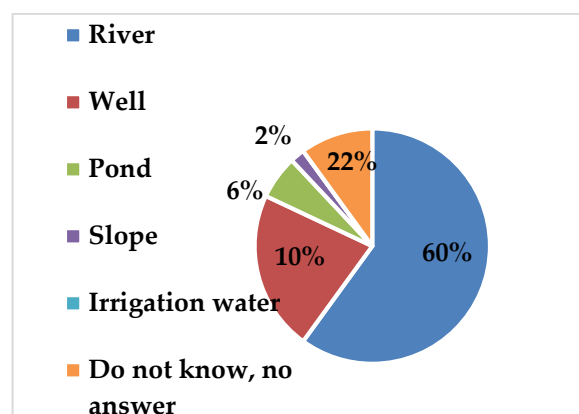


Fig. 2: Place of origin of the water consumed by the participants.

Source: Own elaboration.

The poor quality of the vital liquid and its relationship with the appearance of diarrhea as the primary pathology diagnosed were also addressed. Faced with this question, 81.6% of the participants agree with a relationship. In this sense, the subjects studied presented this pathology at some point in their lives after consuming water that was not safe or intended for human consumption (Figure 3).

The World Health Organization (2019) points out that contaminated water unfit for human consumption could cause the transmission of pathologies such as cholera, diarrhea, typhoid fever, dysentery, and poliomyelitis. It is estimated that

approximately more than five hundred two thousand (502,000) deaths per year result from diarrhea caused by contaminated drinking water.

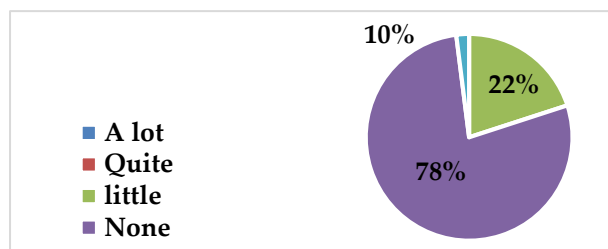


Fig. 3: Attention to water so that it is suitable for human consumption.

Source: Own elaboration.

In this regard, it was questioned about the number of times the inhabitants had to go to a medical center due to abdominal pain and skin lesions caused by *fungi*. The results indicate that 68% of participants have attended twice a year; 14% never; 12% do not know/do not answer, and 6% four times a year. (Figure 4).

Inefficient and non-existent water and sanitation services or poor and inadequate management put the population at risk and predispose to the appearance of diseases such as dysentery, cholera, hepatitis A, other diarrheas, poliomyelitis, and typhoid fever.

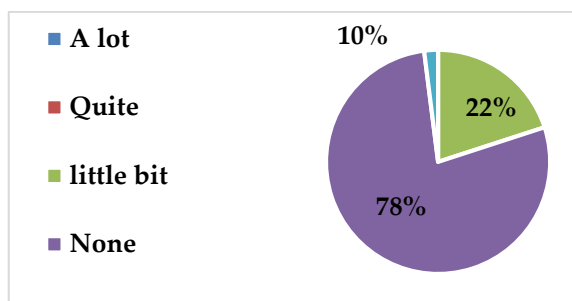


Fig. 4: Poor water quality and its relationship with pathologies associated with diarrhea.

Source: Own elaboration.

#### 4.4 Basic Sanitation

About basic sanitation, an open-type question was raised to collect the opinion of the participating subjects about what they think when they read or hear the terms basic sanitation. Regarding this, most individuals responded that this service refers to water control and its treatment, in addition to garbage collection adequate maintenance of sewers; In addition, everyone agrees that sanitation favors a healthy, clean environment, without contamination, which allows for better living conditions.

In this context, they questioned whether they consider that each family within their community has facilities that favor the elimination of feces,

urine, and sewage. The data reveal that 74% believe that the recurrence is sometimes; 18% describe it as never, while the remaining percentage represents it as always.

Table 7. Existence of facilities that favor the elimination of faeces, urine and sewage in the family environment.

Alternatives	Frequency	%
Always	5	10%
Sometimes	27	54%
Never	9	18%
None	0	0%
Do not know/do not answer	9	18%
Total	100%	100%

Source: Own elaboration.

Regarding the type of sanitation services (wastewater treatment) that the participating subjects usually use in their home, the following answers were obtained: 85.7% use public sanitation and water services. In comparison, 12.2% refer to not knowing or prefer not to answer (Figure 5).

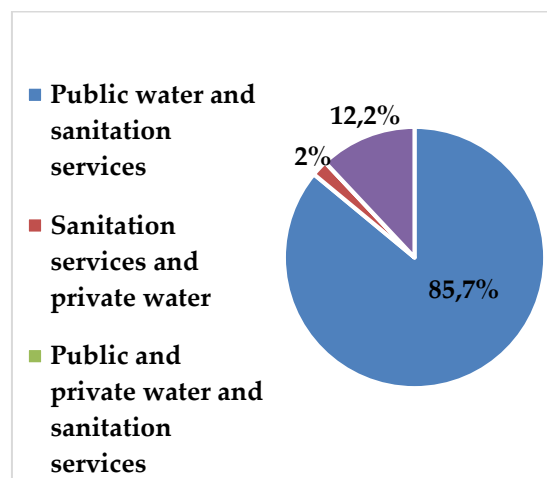


Fig. 5: Type of sanitation services.

Source: Own elaboration.

#### 4.5 Community Development

The participants' opinion was inquired about how much attention they give to the authorities of the Municipal Decentralized Autonomous Government to community development. The data reveals that 72% of the inhabitants of the Azama sector receive no type of care; also, 14% indicate that the attention is little, while 12% state that they do not know (Figure 6).

These results reveal that the community development of the community is neglected and therefore does not grant the benefits that the

attention and appropriate participation of the population in this component implies. Several authors mentions that community development is a category for human progress that favors transformation for the common good of the population following the paradigms of communication, ways, and styles of life as well as the needs of the inhabitants.

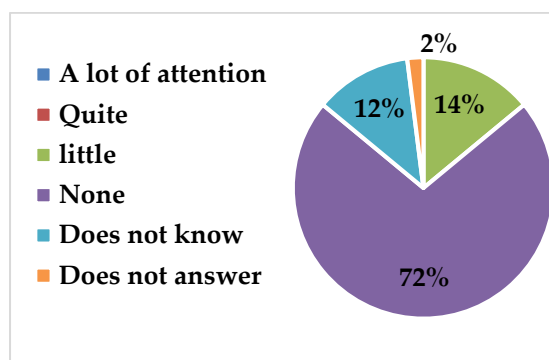


Fig. 6: Availability to pay an economic value for basic services.

Source: Own elaboration.

In this context, the rights and obligations of the inhabitants of the Azama community were investigated and, in particular, if they are respected and enforced or if they are never guaranteed. When faced with this question, the data reveals that 22% of the inhabitants perceive that duties and rights are occasionally exercised; 20% rate it as rarely; 18% never, which shows little or no attention to this component (Figure 7).

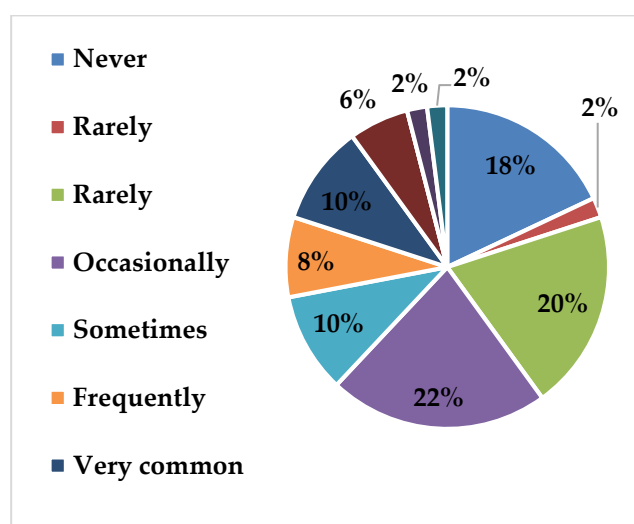


Fig. 7: Respect for the rights and obligations of the inhabitants of Azama.

Source: Own elaboration.

## 5 Results Discussion

### Basic services

According to the participants' points of view in this study, it can be ensured that the perception regarding accessibility to essential services in the Azama community belonging to the Otavalo canton is worrying because the inhabitants believe that only Sometimes they have access to these.

Despite development, Latin America is still classified as an unequal region worldwide. This lack of equality is reflected through the gaps between the rural and urban sectors regarding accessibility to water and sanitation. Approximately 14% of citizens residing in rural areas do not have drinking water services. In contrast to these figures, in the urban area, 98% of the inhabitants have access to drinking water services, and 90% have access to basic sanitation (Development Bank of Latin America [CAF], [4]).

Likewise, Feldman (2017) assures that the lack of attention to essential services in the rural sector represents a significant challenge for the sustainability of the population settlements of said places due to the lack of accessibility to safe water for human consumption and health promoter and the scarce essential sanitation services favor the increase of diseases and pathological comorbidity.

The universalization of access to essential services is conceived as a universal right of the human being. The guarantee around the accessibility to the vital drinkable liquid and sanitation is part of the Sustainable Development Goals (SDG), which implies going into and attending to the needs of the communities furthest from the urban centers and dispersed from the population centers, that is, those located in large cities. In this sense, projects must be proposed that ensure the quality of life of the inhabitants who reside in rural dwellings with residents of low socioeconomic status, characterized by the limited presence of public institutions and restricted access to essential services [27].

### Sanitation and access to water and its influence on community development

The results of this study reveal that the sanitation systems in Azama are inefficient since approximately 74% of the families in this community have facilities that favor the elimination of feces, urine, and sewage. Institutions of the public system administer this right. However, there is a lack of attention on those responsible for the Autonomous Decentralized Municipal Government

of Otavalo, which puts the lives of the community's inhabitants at risk.

In this sense, the inhabitants of this area present high risks that affect their well-being, health, and survival [43], so it is essential to implement projects that favor compliance with all sanitation systems from the origin and characterization of Sewage; understanding of excreta disposal systems; treatments and final disposal and ecological sanitation [11].

On the other hand, the data regarding the vital liquid describes that 60% of the vital liquid supplied for human consumption in the Azama community comes from natural springs; In this context, 78% of the inhabitants state that they are dissatisfied with this basic service. The data collected also shows that the inhabitants perceive that the authorities of the Autonomous Decentralized Municipal Government of Otavalo do not pay attention to projects, guidelines, or proposals that make the water suitable for consumption by people - which is why the figures show that 81.6% of the participants consider that poor quality water has caused pathologies associated with diarrhea on some occasion, which is why around 68% of the citizens have had to go to the hospital at least twice a year to treat diarrheal illnesses.

In this line, it can be ensured that the right to access to water in the inhabitants of the Azama sector is being violated, which determines the need for the authorities and competent public servants to plan, structure, implement and execute programs and projects with them in order to eradicate the difficulties caused by the lack of access to drinking water.

According to the United Nations (2018), water, in addition to being a human rights issue, corresponds to a growing need that is difficult to reconcile due to the notable environmental deterioration. This makes it difficult for rural territorial areas to have this service and, on the contrary, to be left in oblivion.

Therefore, it can be ensured that water quality is fundamental for promoting health and the social and economic development of each country. In other words, quality water, health, and economic development are mutually reinforcing and are essential to achieve sustainable development and human well-being. Disease and poverty rates are a demanding binomial with destructive solid power for any society due to its complex approach. In general, the economic emphasis is prioritized so that most of the time, the interventions and actions are

refutable, repeatedly returning to the initial conditions. Thus, to find the appropriate sustainable measures that favor continuous improvement and progress, the health of all individuals must be fully assumed.

In another field, community development is described as a method of intervention that requires the participation of all members of a community, which favors the processes of articulation and participation between the population and the institutions that, through pedagogical processes, promote social participation through the skills and abilities of each individual and of the mediating organizations, which allows the realization of specific predetermined and common objectives for the improvement of the socioeconomic and cultural conditions of each community, and whose consequences can be valued in a continued in order to identify shortcomings and correct mistakes with new processes that reduce adverse consequences. In contrast to the usual community practice, this approach is understood as community interventions, carried out urgent actions in response to urgent and emerging situations within the community to respond to situations that cause social and coexistence deterioration [9]. In this, inappropriate sanitation and lack of access to drinking water represent a detrimental factor that hinders the development of the community and all its inhabitants.

## 6 Conclusions

Based on the criteria exposed by the participating subjects, it is revealed that the sanitation system in the Azama sector belonging to the Otavalo canton is deteriorated, which is why the need to implement protocols and programs that work for the benefit of this right is determined. Considered elementary within the Sustainable Development Goals (SDGs).

Along these lines, around access to drinking water suitable for human consumption, it is ensured that there is a need to work on improvement plans that guarantee the right to vital liquid that promotes the life, health, and integral well-being of each of the inhabitants of Azama. It is not enough to pipe water from springs, but it is necessary to implement adequate processes to purify water.

In this sense, it can be identified that the sanitation service and drinking water systems correspond to human rights that guarantee a dignified life for people and favor community development that strengthens the organization and participation of the community. However, there is still a lot to work



from the public field and, where appropriate, also the collaboration of private entities to promote the comprehensive well-being of the inhabitants of the Azama community from their active social participation.

## 7 Study Limitations and Further Research Lines

The limitations identified during the preparation of this research focus on the scarce bibliographic material on community development in the sectors of the canton of Otavalo. Likewise, it was challenging to find official documents that evidence the implementation of programs focused on improving this component.

Also, it can be ensured that there is little availability of literature about essential sanitation services and access to drinking water in both rural and urban communities that are part of the canton of Otavalo, which hampered the conceptual, theoretical formulation and contrast of information prior to the one proposed in this research.

Finally, regarding the perspective of this study, it can be anticipated that if the needs around accessibility to drinking water and appropriate basic sanitation systems are not met, community development will be hampered and will gradually seriously affect the population participation and social management carried out in Azama.

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