Revista Innova Educación

ORIGINAL ARTICLE

Water management and evolutionary study for sustainable development in the Piura region, Peru

Gestión y estudio evolutivo del agua para el desarrollo sostenible de la Región Piura, Perú

Gestão da água e estudo evolucionário para o desenvolvimento sustentável na região de Piura, Peru

Miguel Alburqueque[1]
Universidad Nacional de Piura, Piura–Piura, Perú
https://orcid.org/0000-0002-1681-7563
malburquequev@unp.edu.pe (correspondência)

Carlos Marchena
Universidad Nacional de Piura, Piura–Piura, Perú
https://orcid.org/0000-0002-6510-7920
cmachenal@unp.edu.pe

Jéssica Ramos
Universidad Nacional de Piura, Piura–Piura, Perú
https://orcid.org/0000-0002-4537-4706
jramosv@unp.edu.pe

Elvis Ramírez
Universidad Nacional de Piura, Piura–Piura, Perú
https://orcid.org/0000-0001-5121-6344
eramirezs@unp.edu.pe

ABSTRACT. The objective was to propose a sustainable water management model based on an evolutionary study for sustainable development in the Piura region. This work was carried out under the hypothetical deductive paradigm, of a basic substantive type with a cross-sectional correlational design. Two questionnaires were used: questionnaire 1, applied to a sample of 220 families, to obtain information on water consumption, and questionnaire 2, applied to a sample of 36 professionals in the exercise of public administration, these instruments were complemented with bibliographic cards. The chi-square test (X^2), degrees of freedom = 32) was used with a significance level of 5% ($\alpha = 0.05$) to demonstrate the hypotheses raised. Comparing the experimentally obtained values ($X_P^2 = 75.88$ and $X_T^2 = 46.19$), we infer that $X_P^2 \gg X_T^2$ the Null Hypothesis was therefore rejected. The management model and the evolutionary study of water do contribute to the sustainable development of water.

RESUMEN. El objetivo fue proponer un modelo de Gestión sostenible del agua en base a un estudio evolutivo para el desarrollo sostenible en la región Piura. Este trabajo se realizó bajo el paradigma hipotético deductivo, de tipo sustantiva básica con diseño correlacional transversal. Se utilizaron dos cuestionarios: cuestionario 1, aplicado a una muestra de 220 familias, para la obtención de

---

[1] Doctor en ciencias ambientales por la Universidad Nacional de Piura, Perú.

| Desarrollo evolutivo, gestión sostenible. | información sobre el consumo de agua, y el cuestionario 2, aplicado a una muestra de 36 profesionales en ejercicio de la administración pública, estos instrumentos fueron complementados con fichas bibliográficas. Se empleó la prueba chi-cuadrada (X^2), grados de libertad=32) con un nivel de significación del 5% (α=0,05) con la finalidad de demostrar las hipótesis planteadas. Confrontando los valores obtenidos experimentalmente (x^2_P= 75,88 y X^2_T= 46,19), inferimos que $X^2_P >> X^2_T$ por lo que se rechazó la Hipótesis Nula. El modelo de gestión y el estudio evolutivo del agua si contribuyen al desarrollo sostenible del agua. |

| PALAVRAS-CHAVE

Desenvolvimento evolutivo, gestão sustentável. | RESUMO. O objetivo foi propor um modelo de gestão sustentável da água com base em um estudo evolutivo para o desenvolvimento sustentável na região de Piura. Este trabalho foi realizado sob o paradigma hipotético dedutivo, de tipo substantivo básico com delineamento transversal correlacional. Foram utilizados dois questionários: questionário 1, aplicado a uma amostra de 220 famílias, para obter informações sobre o consumo de água, e questionário 2, aplicado a uma amostra de 36 profissionais do exercício da administração pública, esses instrumentos foram complementados com fichas bibliográficas. O teste do qui-quadrado (X2), graus de liberdade = 32) foi utilizado com nível de significância de 5% (α = 0,05) para demonstrar as hipóteses levantadas. Comparando os valores obtidos experimentalmente (x^2_P= 75,88 e X^2_T= 46,19), inferimos que $X^2_P >> X^2_T$ a Hipótese Nula foi, portanto, rejeitada. O modelo de gestão e o estudo evolutivo da água contribuem para o desenvolvimento sustentável da água. |

1. INTRODUCTION

Today water has become a scarce resource in some areas, specifically due to poor water management. Water is essential for the development of life, because without it, neither plants nor animals would exist, indeed, neither would man himself survive without water. And although water occupies 75% of the total surface of the planet, only a small percentage is useful for human consumption, since the rest is not drinkable.

Because Peru is a multicultural, multilingual, multi-ethnic country with great environmental diversity, it is impossible to establish a standard governance model for water, which forces us to seek adequate responses to the realities of each region, since it would be unreasonable to pretend apply a model designed for an arid zone such as the coastal region, to the Amazon region where water is abundant and the problems are of another nature (Bernex, 2009).

In Latin America, water governance faces the problem of increasing demand for water resources; in addition, the increasing hydrological variability in a context of climate change, and the contamination that continues to proliferate (Hendriks & Boelens, 2016).

The availability of fresh water around the world is critical and is becoming more complex every day, due to factors such as contamination of the water resource, economic manipulation and the source of power (Marina, 2005). The availability of water is a current and complex problem in which a series of factors intervene that go beyond the population increase that increasingly demands this resource for human consumption, as well as to carry out economic activities (Durán & Torres, 2006).

Water resources management is an effective way to measure the supply and demand of water resources and improve the efficiency of their use and spatial allocation (Tiangui et al., 2021). The incorporation of new technologies has not been an easy task for water supply companies in the world, mainly due to budgetary restrictions, different organizational cultures, and lack of technical knowledge (Mizrav, 2020). Although water occupies 75% of the total surface of the planet, only a small percentage is useful for human consumption, since

Miguel Alburqueque; Jéssica Ramos; Carlos Marchena; Elvis Ramírez
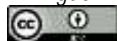
the rest is not drinkable (Gonzales, 2015). According to the World Health Organization - WHO, it mentions that water scarcity affects 4 out of 10 people in the world, while the water supply decreases, the cost and the demand grow at an alarming and unsustainable rate. Other studies indicate that climate change exacerbates the vulnerability of water resources and the water-energy-carbon nexus complicates water management (Wang et al., 2021).

The management of water resources has increasing attention and development of tools to support participatory decision-making (Lewis & Randall, 2017). Today, climate change, pollution, overexploitation of fisheries, loss of biodiversity, and mismanagement of water resources are important public concerns at the local, state, and even global scales (Ahmadov, 2020).

The global availability of fresh water is declining alarmingly (Ray et al., 2021), whose situation will worsen as the demand for water accelerates due to the expansion of the world population and the increase in wealth, urbanization and industrialization (Bakker, 2013).

The development of Integrated Water Resources Management was especially recommended in the final declaration of the 1992 International Conference on Water and the Environment, also called the Dublin Principles (Ecoticias, 2020).

Peru is a privileged country, it has 1.89% of the world's fresh water availability, it ranks 8th in the world ranking of countries with the highest amount of water (Ministry of Agrarian Development and Irrigation, 2021). Therefore, we must take care of it and administer it with justice and equity for all.

Our geography has determined the existence of 159 hydrographic basins in our territory, each of them has its singularities and needs, therefore, the National Water Authority (acronym in spanish ANA), through the Modernization Project of the Management of Water Resources comes promoting the creation, installation and management of water resources councils by basins as one of the most efficient and appropriate water management models for the country.

2. METHOD AND MATERIALS

Type, design and technique

The research corresponds to a quantitative approach, descriptive type and explanatory level. The direct interview was used by means of a sample survey and direct observation and the instrument was the questionnaire (Marroquín, 2013).

Population and sample

The study units were made up of urban families in the Piura region connected to the system and with a working water meter and administrators. The population under study was made up of 512 families and 36 administrators of companies in activity with tuition, which was obtained from the National Society of Industries in October 2015. Simple random sampling was used to take the optimal sample (Acosta, 2001); with a 95% confidence level and a 5% margin of error. Obtaining a sample of 220 families, in the case of administrators, since it is a small population of less than 50, we worked with 36 specialists.

Instruments

2 questionnaires and documentary analysis sheets were used, previously validated through expert judgment with a score of 95% for both instruments, questionnaire 1 with 67 elements obtained a Cronbach alpha = 0.797 and questionnaire 2 with 24 elements obtained an Alpha of Cronbach = 0.777 showing acceptable reliability. The other instruments (bibliographic files, observation files, documentary analysis guides and interview guides) served as a complement for the explanation and argumentation of the results.

Analysis of data

Two questionnaires were used to collect the information: Questionnaire 1, on water consumption, applied to a sample of 220 interviewees to capture socioeconomic information and consumer behavior variables. Questionnaire 2, on management instruments, institutional structure and favorable environment, applied to a sample of 36 interviewees, to capture information on management and sustainable development. The bibliographic record was also used for the compilation of information contained in databases, all this information allowed us to obtain a data, which was used in the structuring of the cross tables, used in statistical analysis for the measurement of non-parametric variables. 9 questions were answered and 5 categories were established, obtaining the respective frequencies according to how the interviewees responded.

3. RESULTS

Table 1

Frequency distribution association, divided into tables and Categories

Cuadros	Categorías										Total
	1		2		3		4		5		
1	12	8.78	10	9.89	8	9.88	5	6.44	1	1.0	36
2	9	8.78	12	9.89	9	9.88	6	6.44	0	1.0	36
3	4	8.78	1	9.89	13	9.88	7	6.44	2	1.0	36
4	4	8.78	6	9.89	13	9.88	11	6.44	2	1.0	36
5	19	8.78	12	9.89	3	9.88	2	6.44	0	1.0	36
6	8	8.78	10	9.89	13	9.88	5	6.44	0	1.0	36
7	5	8.78	4	9.89	14	9.88	12	6.44	1	1.0	36
8	12	8.78	13	9.89	10	9.88	1	6.44	0	1.0	36
9	6	8.78	12	9.89	6	9.88	9	6.44	3	1.0	36
Total	79		89		89		58		9		324

Note: The table represent questions (9) and categories (5).
Source: self made.

Table 1 shows the frequencies observed in the field, with the respective expected frequencies, which were calculated as detailed in the note of table 1. The results obtained allowed us to carry out a statistical management consisting of the determination of the X^2 obtained from the distribution table and that obtained experimentally; then proceeding to make the respective comparison.

The results for the expected frequencies, obtained analytically, were the following: 8.78, 9.89, 9.89, 6.44 and 1.00; by applying the following formula:

Miguel Alburqueque; Jéssica Ramos; Carlos Marchena; Elvis Ramírez

$$fe = \frac{Nn * Nc}{N}$$

For the calculation of the experimental chi-square test, it was carried out taking as data the expected frequencies obtained analytically and the observed frequencies obtained in the interviews; the experimental chi-square was determined for each category of study and then the general or total chi-square was obtained. For the calculation of the experimental chi-square, it was carried out based on the following formula:

$$X^2_{Tot} = \sum \frac{(fo - fe)^2}{fe}$$

Where: fo = observed frequency and fe = expected frequency.

Obtaining the following results for the experimental chi-square: 22.046, 7.393, 19.011, 17.43 and 10.00. Performing the summation of all the experimental chi-squares obtained for each observed case, the total experimental chi-square (75.88) is obtained.

$$\boldsymbol{X^2_{Exp} = 22.046 + 7.393 + 19.011 + 17.43 + 10.00 = 75.88}$$

With this result obtained, we infer that:

$X^2_P > X^2_T$ Given the: 75.88 > 46.194

Concluding that the experimental value exceeded the critical value, accepting the alternative hypothesis; which mentions the following:

H1: The management model and evolutionary study of water does contribute to the sustainable development of the Piura region.

4. DISCUSSION

The modeling for the demonstration of the general hypothesis was carried out by induction through interviews which determined the respective absolute and relative frequencies:

Figure 1.
Frequency graph of the affinity between the individual recipient of the good or service and the organizations that have a sustainable water development management model.

Miguel Alburqueque; Jéssica Ramos; Carlos Marchena; Elvis Ramírez
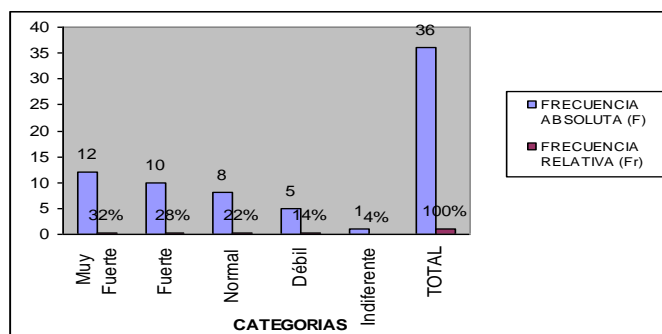
Source: self-made.

As stated, the United Nations Sustainable Development Goals (SDGs), adopted by all UN member states in 2015 (United Nations, 2017), providing a global platform that organizations increasingly use to work strategically and act in line with social responsibility (Madsen & Ulhoi, 2021). This is related to the result obtained, which determines that 32% of those surveyed believe that there is a "Very Strong" degree of affinity between the individual receiving the good or service and the organizations that are formally administered. Study carried out by Álvarez (2019) establishes that although it is true that some new trends translate this characteristic of the service as a differentiating factor, in the face of commercial and almost always external interactions, it is no less valid than the service, it is and should be the true reason for being, both for individuals and for organizations. Other studies mention that the increasing complexity of the environmental problem and its link with the way in which society consumes make it essential to understand the degree of consumer awareness about sustainable aspects (Jaca et al., 2018). For this reason, 28% of them consider that the existing affinity relationship between the individual who is part of the market receiving the good or service is of a "Strong" level. 22% consider this affinity relationship to a degree that can be seen as Normal, expressing this relationship without greater demands for interrelation than those commonly observed.

14% of the administration professionals surveyed maintain that there is an affinity between the individual, as part of the consumer or user public, and the organizations; in the order of "Weak", given mainly by the only commercial approach between the two, and finally, 4% indicated that they did not perceive any affinity relationship, since they support a strictly purchase-sale relationship (Jaramillo et al., 2015). Result that is reaffirmed with the chi square obtained for this case, which was: $x1^2 = 22.043$. Testing the alternative research hypothesis, which states that, individuals do show affinity with formally managed organizations.

82% of administration professionals who were surveyed responded to this question, that the predominant organizational structure is vertical, this result is related to what happens with the National Health Service of England (NHS) that constitutes a context institutional structure, which combines elements of hierarchy, markets and networks (Moran et al., 2021), this is due to the fact that organizations, especially public ones, maintain and sustain this structural type, which is contradictory to what other studies mention, in that the public administration is interested in the participation of public agents, civil society organizations and other actors in the corporate dimension, information flows or their encapsulation, inside and outside public organizations, and we consider the institutional environment to be decisive in which all act (Montero, 2021). The remaining 18% indicate that they recognize as emerging, rather than predominant, the horizontal structure, where teamwork and greater participation in decision-making are advocated, since the results indicate that decentralization favors the

exchange of information, complementarity of resources and the congruence of objectives and values, while formalization favors only the exchange of information (Idárraga & Campos, 2015).

Figure 2.

Frequency graph of opinion on affinity between organizational structure and empathy: individual-organization
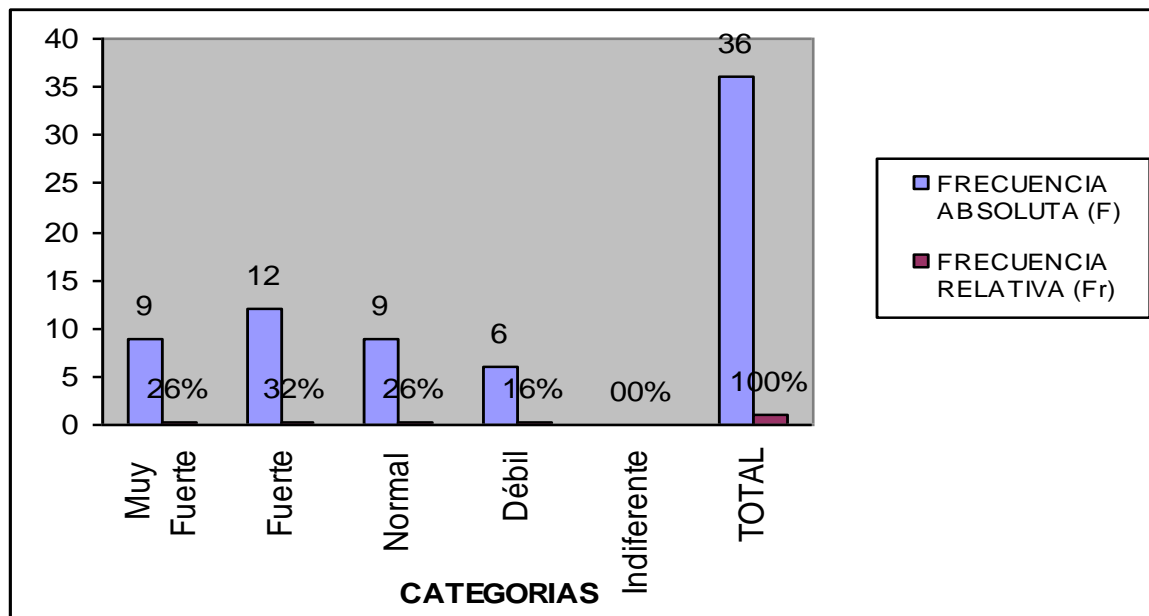
Source: self made.

Regarding the level of affinity between the organizational structure and empathy; It can be seen that 26% consider that it is at a level of "Very Strong", as a reflection of internal solidity, redundant in the expression of guarantee, and 32% consider that the relationship between the organizational structure and the corresponding empathy, A "Strong" level is observed, as well as 26% consider this relationship "Normal", basically centered as a functional need to serve the user in quality, cost, time, relevant we demonstrate how the empathic commitment of institutional entrepreneurs can nurture communities practices that co-create change in institutional fields (Linneberg et al., 2021). 16% consider that this relationship is "Weak", comparing it with the needs demanded by the market and demandable from it and from organizations. As the value $X_2^2 = 11.50$ is greater than $X_T^2 = 9.49$ (table critical value), is located in the rejection region, indicating that the null hypothesis must be rejected and the alternative hypothesis accepted.

Demonstrating that: "The organizational structure does have a related relationship with the empathy shown by formally administered individuals and organizations in the Piura Region".
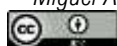
➢ Management instruments in organizations and the predominant organizational structure

80% of those surveyed consider as predominant the Legal - Political structure: Rigid, in organizations, an appreciation that arises from the numerical predominance of public institutions in the Region and the validity of the bureaucratic model (or approach) in them. A situation contrary to current visions or paradigm changes, in contrast to the aforementioned there are studies that mention that there is a growing interest among researchers and professionals to understand how the use of interorganizational systems (IOS) improves the performance of organizations, such as transformations towards more sustainable consumption and production; This cannot be achieved through the foundations and practices of conventional organizational management (Hestad et al., 2020); also the legal nature of the decisions, determines what type of actors could be involved in the decision-making process, how these decisions could be controlled in a market economy and how they directly or indirectly influence the sustainability of water supply and sanitation (Péter, 2007). It was concluded that the organizations do not have implemented corporate governance policies to follow to achieve the sustainable development of water resources; It was also determined that the evolutionary study of water, carried out, requires a legal treatment in order to protect the use of water as sustainable development.

Figure 3.

Frequency graph of the opinion on affinity between the production process and empathy: individual-organization.
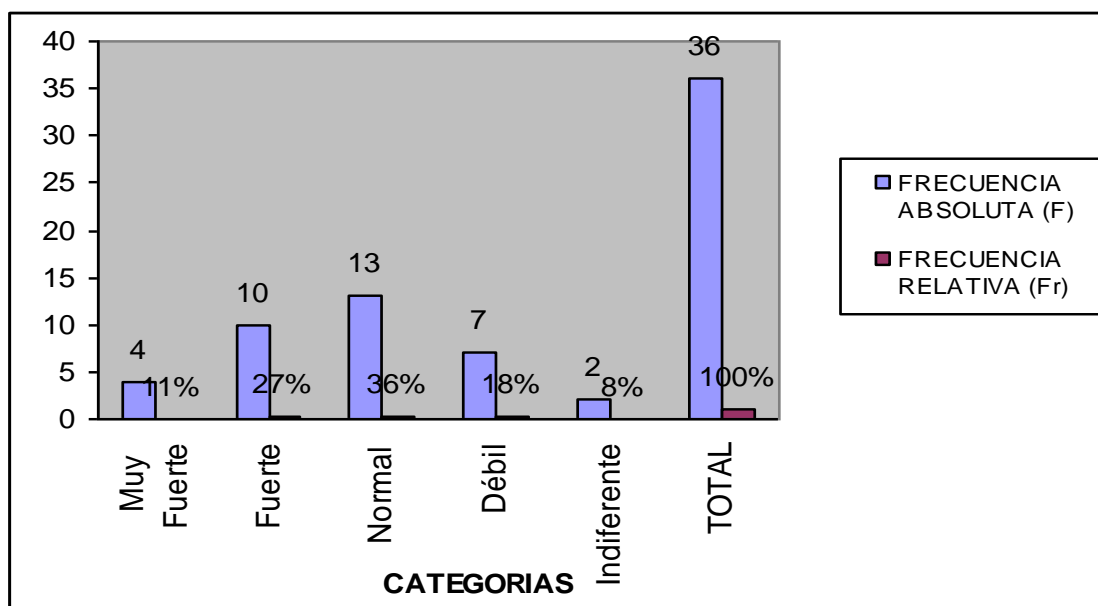
Source: self made.

Regarding this question, only 11% of those surveyed consider that there is a "Very Strong" relationship between the Legal - Political structure and Empathy: Individual - Organization, in the present study. 27% of the same collegiate administrators consider the relationship structure Legal - Policy and Empathy: Individual - Organization; it is referred to at the level of "Strong". This result reinforces what was mentioned by (Claver et al., 2011), which mentions that the results suggest that the organizational structure does not directly influence the result of the company, but indirectly through the competitive strategy, which reinforces the conception of organizational design as a strategic resource to achieve a competitive advantage. From the same results, it can

*Miguel Alburqueque; Jéssica Ramos; Carlos Marchena; Elvis Ramírez*
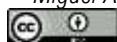
be seen that 18% of those surveyed need to perceive a "Weak" relationship between the indicators taken in the analysis. Only 8% consider appreciating a level of indifference between structure and empathy. This is related to the framework of political agreements that hold that the distribution of organizational power is important to understand the economic and political effects of institutions and policies (Khan, 2018). Resulting in a chi square value of $X_3^2 = 12.06$ is greater than $X_T^2 = 9.49$ (table critical value), is located in the rejection region, indicating that the null hypothesis must be rejected and the alternative hypothesis accepted.

Demonstrating that: "The evolutionary structure of water developed by organizations does have an affinity relationship with sustainable development".

Figure 4.

Frequency graph on affinity between the evolutionary structure of water and sustainable development: individual-organization
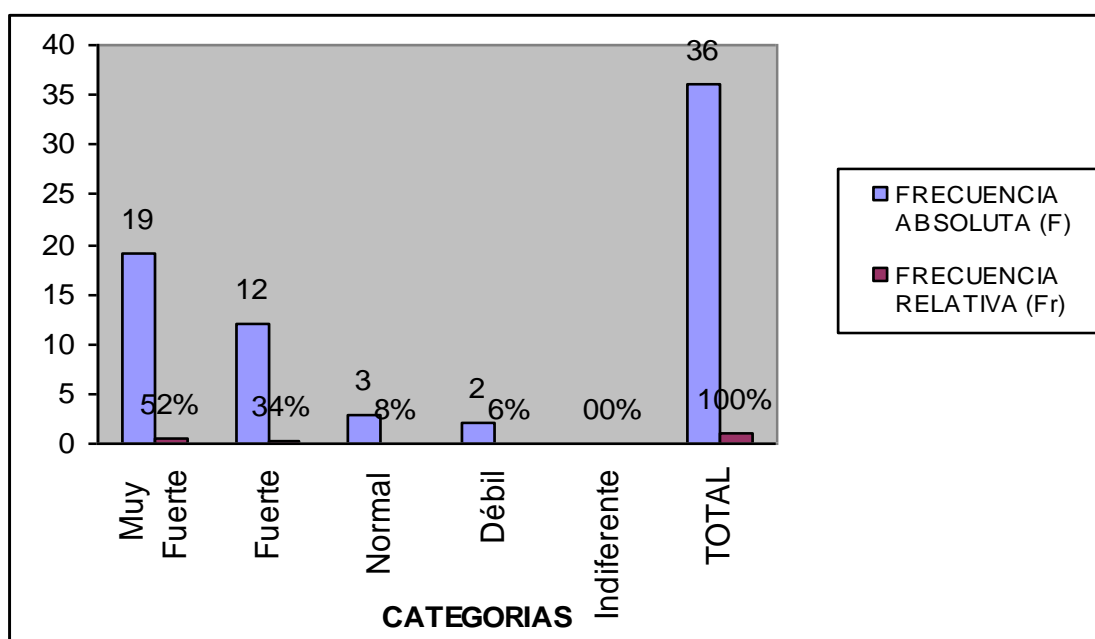
Source: self made

The analysis of the results obtained in the surveys shows two polar responses, on the one hand, more than half of respondents (52%) indicate a "Very Strong" relationship between demand and income level, while none (0%) indicates otherwise.

Likewise, 34% of those surveyed recognize a "Strong" relationship between demand and income level, as components of the market they serve, it is for this reason that the amount of water used for agricultural purposes increases gradually with the income of a country. That is, the higher the income, the more agricultural water was used. On the other hand, in high-income countries less water was consumed (Doungmanee, 2016). It should also be noted that the approach requires institutional strengthening, water pricing reform, and agricultural sector adjustment based on a virtual analysis of water trade (Chen et al., 2005).

Only 8% of formally managed organizations consider a relationship as "Weak", considering that the variety of demand forces organizations to present products (goods or services) within the reach of the different acquisition

capabilities; As is the case with the installation of meters, it reduces water consumption, thus preventing the consumer's economy from being affected (Ornaghi & Tonin, 2021). And, 6% consider this relationship as normal, since the accommodation between demand and income level occurs as a regular manifestation in the attention of consumer requirements and also by water consumption influenced by economic income and income, number of inhabitants per household to compare them with the values recommended by the WHO (Chambilla, 2019). Resulting in a chi-square value, equivalent to $X_5^2 = 35.94$ is greater than $X_T^2 = 9.49$ (table critical value), is located in the rejection region, indicating that the null hypothesis must be rejected and the alternative hypothesis accepted. Demonstrating with this result that: "The demand for water registered by formally managed organizations is related to the level of income of individuals, as components of the market".

> ➢ Corporate governance scheme that serves as a guide for organizations that implement a sustainable water development model related to their predominant production process.

As mentioned by some studies where they conclude that human resource management (HRM) is an important variable of corporate governments (Lima & Galleli, 2021). In general terms, the respondents have considered that the predominant structures are online and intermittent, defined by the nature of the good or services produced (Ortuste, 2014), in the structure by projects, this particular nature is only observed in particular cases. This contradicts the structural changes and non-linear dynamics that must be implemented in the institutions, for the strengthening of capacities (Rivera et al., 2009).

Figure 5.

Frequency graph of the relationship with the opinion on the demand for water and the level of income of the individual, as components of the market.
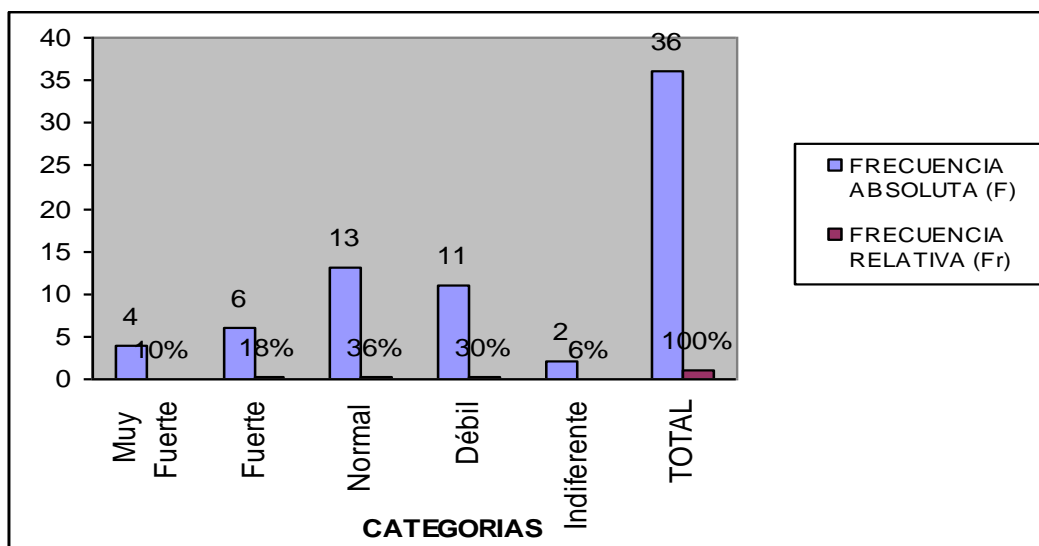
Source: self made

In this context, 11% of registered professionals considered that there is an affinity classified as "Very Strong" between the production process that takes place internally in organizations and market empathy (Villarroel, 2012). 27% of those surveyed consider the same relationship as Strong, precisely because they consider that the Productive Process must be adapted to the demands of the applicant since water has been the primary liquid par excellence and a fundamental consumption material for each individual (Chocho et al., 2020). Also other

studies related to the responses obtained mention that changes in consumer behavior and the complexity of organizational decision-making, regulations and environmental policies are the basis for transforming manufacturing processes to reduce the use of natural resources and the environmental impact (Marulanda & Figueroa, 2021). 36% consider this relationship as "Normal", by virtue of considering flexibility as a logical and necessary response to consumer sensitivity; as the increasing traction of sustainability in companies and environmental awareness of customers have forced organizations to adopt green processes (Sharma et al., 2021). 18% of those surveyed need to perceive a weak relationship between the organization, through its production process, and the empathy of the organization and its market; It is also important to know that the growing complexity of the environmental problem and its link with the way in which society consumes make it essential to understand the degree of consumer awareness about sustainable aspects (Jaca et al., 2018); however, researchers need to better understand how consumer values and perceptions of companies' market practices influence consumer support for companies that pursue sustainable business practices. In this sense, technological updating through the adoption of innovative technologies, as in big data analysis (BDA), can be seen as a key enabler to help address social challenges (El & Haddadeh et al., 2020). Only 8% indicated that they perceived with Indifference, the relationship that we analyzed through the questionnaire question. Reason for this, the experimental chi square value gave us $X_3^2 = 10.95$ is greater than $X_T^2 = 9.49$ (table critical value), is located in the rejection region, indicating that the null hypothesis must be rejected and the alternative hypothesis accepted. Demonstrating with this that "the productive process developed by the organizations does have an affinity relationship with the empathy between the individual and the formally administered organizations in the Piura Region".

General Hypothesis Test Using Chi-square

Our survey of 256 interviewees among consumers and duly registered professionals of the Administration, in exercise, has allowed to obtain the experimental results presented in this research work.

Carrying out the sum of all the experimental chi-squares obtained for each observed case, the total experimental chi-square is obtained (X_P^2) = 75.88, which is contrasted with the chi-square obtained from the chi-square table $(X_T^2$=46.194).

For the statistical verification of the hypothesis, using the chi-square test, a $X_t^2 = 46.194$, confronting him X_P^2=75.88, a $X_P^2 > > X_T^2$. Consequently, the null hypothesis (Ho) is rejected, showing the existence of the relationship between the Independent Variable, through its corresponding indicators, and the dependent variable; configuring the relationship between the proposal of the management model and the evolutionary study of water and its contribution to the sustainable development of the Piura region.

5. CONCLUSION

The analysis of water management at the regional level, taking as a reference the context in which it is developed and the global water management models (IWRM) contribute to the sustainable development of the Piura region.

The evaluation through indicators of sustainable development the real situation of water resources, contribute to sustainable development within the Piura region.

The determination of the quantitative analysis, through a balance of the water levels taking into account aspects such as: quality, use and consumption of water, contribute to sustainable development within the Piura region.

The evaluation of the impact that climate change has on the evolution of water resources and how it affects water management in the Piura region, contributes to sustainable development within the Piura region.

The implementation of a corporate governance scheme that serves as a guide for organizations contributes to achieving the sustainable development of water within the Piura region.

In conclusion, the proposal for a sustainable water management model based on an evolutionary study contributes to sustainable development in the Piura region.

REFERENCES

Ahmadov, E. (2020). Water resources management to achieve sustainable development in Azerbaijan. Sustainable Futures, 2. https://doi.org/10.1016/j.sftr.2020.100030

Bakker, P. (2013). Pathways to Improved Water Security - Reflections. *Aquatic Procedia*, *1*, 172–177. https://doi.org/10.1016/j.aqpro.2013.07.016

Bernex, N. (2009). *Situación General del Agua en el Perú* (pp. 1–12).

Chocho, E., Fernando, D., Bustos, B., & Bejarano, V. (2020). *Análisis multicriterio para el diseño de la planta de tratamiento de agua potable para la Vereda*. http://repository.unad.edu.co/handle/10596/37550

Chambilla, H. (2019). *Análisis del consumo de agua potable en el centro poblado de salcedo, puno*. http://www.scielo.org.bo/scielo.php?pid=S2518-44312019000100010&script=sci_abstract&tlng=en

Chen, Y., Zhang, D., Sun, Y., Liu, X., Wang, N., & Savenije, H. H. G. (2005). Water demand management: A
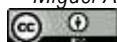
case study of the Heihe River Basin in China. *Physics and Chemistry of the Earth*, *30*(6-7 SPEC. ISS.), 408–419. https://doi.org/10.1016/j.pce.2005.06.019

Claver-Cortés, E., Pertusa-Ortega, E. & Molina-Azorín, J. (2011). Organizational structure and firm performance: An empirical analysis of the mediating role of strategy. *Cuadernos de Economia y Direccion de La Empresa*, *14*(1), 1–13. https://doi.org/10.1016/j.cede.2011.01.005

De Vries, L., & Doorman, G. (2021). Valuing consumer flexibility in electricity market design. In *Variable Generation, Flexible Demand* (pp. 287–308). Elsevier. https://doi.org/10.1016/b978-0-12-823810-3.00019-4

Doungmanee, P. (2016). The nexus of agricultural water use and economic development level. *Kasetsart Journal of Social Sciences*, *37*(1), 38–45. https://doi.org/10.1016/j.kjss.2016.01.008

Durán, J., & Torres, A. (2006). Los problemas del abastecimiento de agua potable en una ciudad media. *Espiral*, *XII*(36), 129–162. http://www.scielo.org.mx/pdf/espiral/v12n36/v12n36a5.pdf

El-Haddadeh, R., Osmani, M., Hindi, N., & Fadlalla, A. (2020). Value creation for realising the sustainable development goals: Fostering organisational adoption of big data analytics. *Journal of Business Research*, *131*, 402–410. https://doi.org/10.1016/j.jbusres.2020.10.066

FAO. (2011). La gestión del agua: tensiones globales y latinoamericanas. *Política y Cultura*, *36*, 157–176. http://www.scielo.org.mx/scielo.php?pid=S0188-77422011000200007&script=sci_arttext

Gonzales, J. (2015). *El acceso al agua potable como derecho humano - Jorge González González - Google Libros* (Club Universitario (ed.)). https://books.google.es/books.

Hestad, D., Tàbara, J., & Thornton, T. (2020). Transcending unsustainable dichotomies in management: Lessons from Sustainability-Oriented Hybrid Organisations in Barcelona. *Journal of Cleaner Production*, *244*, 118766. https://doi.org/10.1016/j.jclepro.2019.118766

Hendriks, J., & Boelens, R. (2016). Acumulación de Derechos de Agua en el Perú. *Anthropologica*, *34*(37), 13–32. https://doi.org/10.18800/anthropologica.201602.001

Jaca, C., Prieto-Sandoval, V., Psomas, E. & Ormazabal, M. (2018). What should consumer organizations do to drive environmental sustainability? *Journal of Cleaner Production*, *181*, 201–208. https://doi.org/10.1016/j.jclepro.2018.01.182

Jaramillo, R., Jaime, K., Pereira, S., & Guido, J. (2015). *Aspectos económicos del consumidor y su relación con la compra de agua sin gas de la empresa Begoro S.A.* Machala :UniversidadTécnicadeMachala. http://repositorio.utmachala.edu.ec/handle/48000/3838

Khan, M. (2018). Political settlements and the analysis of institutions. *African Affairs*, *117*(469), 636–655. https://doi.org/10.1093/afraf/adx044

Lewis, A., & Randall, M. (2017). Solving multi-objective water management problems using evolutionary computation. *Journal of Environmental Management*, *204*, 179–188. https://doi.org/10.1016/j.jenvman.2017.08.044

Linneberg, M., Trenca, M., & Noerreklit, H. (2021). Institutional work through empathic engagement. *European Management Journal*, *39*(1), 46–56. https://doi.org/10.1016/j.emj.2020.08.002

Lima, L., & Galleli, B. (2021). Human resources management and corporate governance: Integration perspectives and future directions. *European Management Journal*. https://doi.org/10.1016/j.emj.2021.02.004

Lv, H., Yang, L., Zhou, J., Zhang, X., Wu, W., Li, Y., & Jiang, D. (2020). Water resource synergy management in response to climate change in China: From the perspective of urban metabolism. In *Resources,*
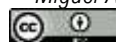
Conservation and Recycling (Vol. 163, p. 105095). Elsevier B.V. https://doi.org/10.1016/j.resconrec.2020.105095

Lv, T., Wang, L., Xie, H., Zhang, X., & Zhang, Y. (2021). Evolutionary overview of water resource management (1990–2019) based on a bibliometric analysis in Web of Science. *Ecological Informatics*, *61*, 101218. https://doi.org/10.1016/j.ecoinf.2021.101218

Madsen, H., & Ulhøi, J. (2021). Sustainable visioning: Re-framing strategic vision to enable a sustainable corporate transformation. *Journal of Cleaner Production*, *288*, 125602. https://doi.org/10.1016/j.jclepro.2020.125602

Marina, A. (2005). *El agua, recurso estratégico del siglo XXI: strategic resource in the 21st century*. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0120-386X2005000100009

Marín-Idárraga, D., & Campos, L. (2015). Organizational structure and inter-organizational relations: Analysis in health care public institutions in Colombia. *Estudios Gerenciales*, *31*(134), 88–99. https://doi.org/10.1016/j.estger.2014.08.004

Marulanda-Grisales, N., & Figueroa-Duarte, O. (2021). Classifying and studying environmental performance of manufacturing organizations evidence from Colombia. *Journal of Cleaner Production*, *279*, 123845. https://doi.org/10.1016/j.jclepro.2020.123845

Marroquín, R. (2013, agosto). Metodología de la investigación [Conferencia]. Programa de Titulación 2013, Lima, Perú. http://www.une.edu.pe/Titulacion/2013/exposicion/SESION-4-METODOLOGIA%20DE%20LA%20INVESTIGACION.pdf

Moran, V., Allen, P., Sanderson, M., McDermott, I., & Osipovic, D. (2021). Challenges of maintaining accountability in networks of health and care organisations: A study of developing Sustainability and Transformation Partnerships in the English National Health Service. *Social Science and Medicine*, *268*, 113512. https://doi.org/10.1016/j.socscimed.2020.113512

Ornaghi, C., & Tonin, M. (2021). The effects of the universal metering programme on water consumption, welfare and equity. *Oxford Economic Papers*, *73*(1), 399–422. https://doi.org/10.1093/oep/gpz068

Ortuste, F. (2014). R*ecursos naturales e infraestructura*.

Péter, J. (2007). Law and sustainability: The impact of the Hungarian legal structure on the sustainability of the water services. *Utilities Policy*, *15*(2), 121–133. https://doi.org/10.1016/j.jup.2007.01.003

Ray, L., Pattnaik, R., Singh, P., Mishra, S., & Adhya, T. (2021). Environmental impact assessment of wastewater based biorefinery for the recovery of energy and valuable bio-based chemicals in a circular bioeconomy. In *Waste Biorefinery* (pp. 67–101). Elsevier. https://doi.org/10.1016/b978-0-12-821879-2.00003-x

Rivera, M., Robert, V., & Yoguel, G. (2009). Cambio tecnológico, complejidad e instituciones: el caso de Argentina y México. *Problemas Del Desarrollo. Revista Latinoamericana de Economía*, *40*(157). https://doi.org/10.22201/iiec.20078951e.2009.157.7766

Sharma, S., Prakash, G., Kumar, A., Mussada, E. K., Antony, J., & Luthra, S. (2021). Analysing the relationship of adaption of green culture, innovation, green performance for achieving sustainability: mediating role of employee commitment. *Journal of Cleaner Production*, *303*, 127039. https://doi.org/10.1016/j.jclepro.2021.127039

122