

Analysis of citizen satisfaction in rural areas

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Abstract: This study examines the contentment and commitment of rural residents from three different perspectives. The first is environmental management, followed by municipal services and finally territorial planning. The study's objective is to analyze the causal relationships between the expected quality and perceived quality concerning perceived value, satisfaction and citizen loyalty to provide tools for decision-making to public managers. This research proposes a structural equation model to evaluate and validate five hypotheses. For this study, household-level surveys were implemented to a population sample of 450 families in the rural area of Tenguel in Ecuador. The results suggest that the public policies exercised by territorial managers significantly influence citizens' perceived value, satisfaction, and loyalty, which impacts social welfare. This research shows that there are deficient areas that negatively impact perceived locality, which decreases the perceived value. Such as firefighting service, municipal police, veterinary services, preservation of historical and cultural assets and activities, and facilities for community use.

Keywords: Territorial policies; management; citizen; satisfaction; loyalty; Structural Equation Model

1. Introduction

Public services in rural regions, territorial and environmental legislation, and population planning all need to be considered when attracting and organizing the people. To attain public satisfaction, these policies must be managed properly. Enhancing visitor expectations is crucial since they may influence whether they decide to settle in a place. Adequate management of these aspects is a differentiating aspect for the satisfaction of the citizen to the territory. This study makes an important topic contribution. (Bland et al., 2021; Chang, 2018; Edwards, 2009; Parasuraman et al., 1985). According to Luoma-aho (2007, 2008) and Luoma-aho et al. (2020), expectations of communication are shifting from being unidirectional to interactive. However, most public sector institutions have failed to adapt to this trend. To meet the emerging needs of interactive communication, the state must seek the means to meet citizens' expectations concerning access to technological tools that promote dynamic forms of communication adapted to the twenty-first century.

In the study of social behavior, the most prominent psychological tools base their studies on citizens' expectations. Ditto et al. (1995) propose three studies that analyze the attitude physicians should adopt with a patient exercising an authoritarian role in one case or egalitarianism in another. Study 1, conducted with a group of university students, showed that the authoritarian role is associated with more visits to medical

professionals. In Study 2, conducted on a group of older people, a sample of outpatients was examined, resulting in authoritarian attitudes associated with objective indicators of increased medical care. In Study 3, conducted on university students, all subjects preferred equal treatment. Their findings imply that patients' subjective impressions of doctors have a significant role in shaping their health-related attitudes and actions.

In this analysis, we focus primarily on two factors: satisfaction and loyalty. These have been investigated repeatedly in many contexts by several writers. Both are positively correlated, indicating that residents are more likely to report a high degree of well-being (as assessed by satisfaction with the whole range of municipal services) and to suggest the city to others as a desirable place to live (Chang, 2018).

The various policies that influence economic growth, such as territorial planning and infrastructures, to lessen the negative effects of pollution, noise, and traffic that these infrastructures cause, a balance between rural communities' municipal and environmental services is required (Henningsson et al., 2015; Holland, 2018; Jedwab et al., 2017; Maas et al., 2020; Suriya, 2018; Trombulak and Frissell, 2000; van Ryzin, 2004).

Moreover, another crucial consideration when selecting whether to settle down and suggest the city is the citizen's environmental experience. In addition to allocating funding and green points for cleaning and the selective collection of agricultural garbage, public institutions also control rules governing maximum noise levels (noise pollution). The literature has a number of definitions of quality, a group of traits that, when combined, reflect the excellence or allure of green environments, and demonstrate the allure of green spaces via numerous qualities such as size, nature, culture and history, calm, and amenities (Frank et al., 2016). Furthermore, the perceived quality and activity in green spaces were studied using a composite park attractiveness assessment. Therefore, the political decisions pertaining to public services have a growing impact on the quality of rural life, improving the efficiency and effectiveness of municipal services has become a top priority for public managers. In recent years, social scientists have made more efforts to evaluate the city's degree of good governance and the quality of its public services.

On the other hand, urban authorities and research groups like the Municipal Institute and the International City Management Association (1974) collaborated closely to produce quality indicators for green spaces, including three amenity criteria and two safety issues. Green spaces that serve as indicators of quality, three amenity criteria, and two safety aspects have been developed via close collaboration between several research organizations including the Municipal Institute and the International City Management Association (1974) and urban authorities. Furthermore, various academics have developed more reliable methods to measure satisfaction as a result of the provision of public services, which has improved our understanding of its functionality (Davern et al., 2017; Frank et al., 2016; Gautam, 2020; Giles-Corti et al., 2014; Gross and Elshiewy, 2019; Hooper et al., 2018; Institute and Association, 1974; Jim and Shan, 2013; Jimber del Rio et al., 2020; Khadka, 2020; Puška et al., 2021; Ralston et al., 2019; Zhang et al., 2013; Zhou, 2012). Other scholars in rural areas have tried to evaluate various public services in terms of satisfaction and loyalty measured

at the level of territorial roots (Alam and Mondal, 2019; Beeri et al., 2019; Ismail et al., 2020; Lai and Chen, 2011; Lombardo et al., 2019).

To illustrate, public services oversee the standard of public transportation, security, lighting, sewage, water quality, and other services like funerals and firefighting. Public services oversee the standard of public transportation, security, lighting, sewage, water quality, and other services like funerals and firefighting.

These services together create a perception of quality, which influences the decision of where to establish residence.

In relation on Territorial Planning research by Torre and Wallet (2015) emphasizes prioritizing rural considerations in urban development plans. Additionally, Suditu et al. (2014) highlights the importance of public administration in fostering balanced and sustainable development that improves citizen well-being. Their work underscores the need for sustainable territorial expansion within policy design to enhance the quality of life.

Over *The Growing Divide*, Studies like Zheng and An (2015) examination of China reveals a growing disparity in citizen satisfaction between rural and urban areas. This is particularly evident in access to sports facilities. Several studies (Azimi et al., 2019; Solís-Alvarado et al., 2019) employed surveys with yes/no options related to sports participation to measure satisfaction with factors like cost, distance, and variety of activities. These studies consistently show significant differences in satisfaction between rural and urban residents.

About *Satisfaction and Development*, Strosnider et al. (2017) studied rural areas in developed nations, finding that citizen satisfaction hinges on quality of life. In contrast, Requena (2016) explores subjective well-being in rural versus urban environments. Their research suggests that satisfaction in developed countries' rural areas is high enough for greater subjective well-being. However, in developing countries, rural areas struggle to compete with urban areas to foster emotional well-being.

Moreover, *In the Case of Developing Countries*, this research proposes studying satisfaction levels in a developing nation where rural areas haven't reached their full social and economic potential. Other studies (Newburn and Berck, 2006; Pascanu et al., 2016) analyze the factors influencing the choice between rural and urban living.

We used in our study The American Customer Satisfaction Index (ACSI) model, which has been approved for use in research on anticipated quality, perceived quality, perceived value, satisfaction, and loyalty, serves as the foundation for this analysis (Fornell et al., 1996; Fornell and Larcker, 1981a, 1981b, 1981c).

The study was based in three dimensions—territorial planning, municipal services, and citizen environmental experience—we propose to separate the anticipated quality and perceived quality in the current literature on citizen happiness and loyalty in rural regions. Citizens construct an overall sense of the value of the city in which they live based on the discrepancy between the perceived quality and the anticipated quality. On the other hand, the traditional theory of the Structural Equations Model also included the idea of moderating latent variables. In this research, we test three hypotheses on the impact of several factors on the relationship between city residents' sense of happiness and their opinion of the value they get from living there (Burgos, 2019; Lazhentsev and Ivanov, 2020; Le Roux, 2016; Montrone et al.,

2015; Yu and Debelaya, 2018).

The study is structured as follows: first, it presents an introduction, then the theoretical framework where the latent variables of the theoretical model are described, and in a third section, we describe the methodology used, followed by the results of the investigation. To end the article, the discussions and conclusions of the research are shown, we end the study with a list of the references used.

The model analyzes the causal relationships between perceived quality, expected quality, and perceived value measured as the difference between the two, as well as the causal relationships between satisfaction and loyalty. These causal relationships act as a means to measure the level of satisfaction and territorial roots of citizens, and to recommend rural areas as a destination to attract their residence. As a differentiating contribution to the classical ACSI (American Customer Satisfaction Index) theory, moderating causal relationships are defined, as well as a multi-group analysis in which the differences in perception between gender are analyzed. **Table 1** shows authors who have used this model in different studies (Chang, 2018; Chen and Chang, 2013; Parasuraman et al., 1985).

Table 1. Scales used.

Reference	Dimension	Indicators
(Ashley et al., 2001; Augeri et al., 2019; Billingsley, 2016; Brown and Glanz, 2018; Gurbuz and Cheu, 2020; Kamaruddin et al., 2012; Lestrelin et al., 2017; Too and Earl, 2010)	(EQTPR)	(EQTPR1), (EQTPR2), (EQTPR3), (EQTPR4), (EQTPR5), (EQTPR6), (EQTPR7).
(Averill et al., 1797; Brard, 2010; Curnin and Brooks, 2020; Farmer and Copenhaver, 2021; Giray et al., 2019; Green et al., 2015; Lundberg et al., 2015; Mendoza et al., 2020; Pinto et al., 2021; Shavitt and Barnes, 2020; Vassiliadis et al., 2021; Water UK, 2010)	(EQMS)	(EQMS1), (EQMS2), (EQMS4), (EQMS5), (EQMS6), (EQMS7), (EQMS8), (EQMS 9), (EQMS10), (EQMS11), (EQMS12), (EQMS13), (EQMS14).
(Keith et al., 2008; Ohnishi et al., 2016; Rogge et al., 2007; Sarker et al., 2018; Sri Poojitha and Rajasekhara Reddy, 2019)	(EQCE)	(EQCE1), (EQCE2), (EQCE3), (EQCE4).
(Ashley et al., 2001; Augeri et al., 2019; Billingsley, 2016; Brown and Glanz, 2018; Gurbuz and Cheu, 2020; Kamaruddin et al., 2012; Lestrelin et al., 2017; Too and Earl, 2010)	(PQTPR)	(PQTPR1), (PQTPR2), (PQTPR3), (PQTPR4), (PQTPR5), (PQTPR6), (PQTPR7).
(Averill et al., 1797; Brard, 2010; Curnin and Brooks, 2020; Farmer and Copenhaver, 2021; Giray et al., 2019; Green et al., 2015; Lundberg et al., 2015; Mendoza et al., 2020; Pinto et al., 2021; Shavitt and Barnes, 2020; Vassiliadis et al., 2021; Water UK, 2010)	(PQMS)	(PQMS1), (PQMS2), (PQMS3), (PQMS4), (PQMS5), (PQMS6), (PQMS7), (PQMS8), (PQMS9), (PQMS10), (PQMS11), (PQMS12), (PQMS13), (PQMS14).
(Keith et al., 2008; Ohnishi et al., 2016; Rogge et al., 2007; Sarker et al., 2018; Sri Poojitha and Rajasekhara Reddy, 2019)	(PQCE)	(PQEC1), (PQEC2), (PQEC3), (PQEC4).
(Abbaszadeh et al., 2015; Boll et al., 2014; Borst et al., 2008; Carteni and Henke1, 2017; Dwimirnani et al., 2017; Ercsey and Józsa, 2016; Huttinger et al., 2017; Quinton and Duinker, 2019; Rashid and Pandit, 2019; Saradj et al., 2018; Wedgworth et al., 2014)	(PV)	(PV1), (PV2), (PV3), (PV4), (PV5), (PV6), (PV7), (PV8), (PV9), (PV10), (PV11), (PV12), (PV13), (PV14), (PV15), (PV16), (PV17).
(Avermann and Schlüter, 2019; Chevtaeva et al., 2021; Cozzi et al., 2020; Damurski, 2012; MU et al., 2017; Wan et al., 2020)	(SATISFY)	(S1), (S2), (S3).
(Avermann and Schlüter, 2019; Chevtaeva et al., 2021; Hirmer and Guthrie, 2016; Martin and Tulla, 2019; Murray and Kline, 2015; Soediono, 2013; Wan et al., 2020)	(LOYALTY)	(L1), (L2), (L3), (L4), (L5).

The goal of the research is to provide public managers with tools for making decisions by analyzing the causal linkages between the constructs anticipated quality and perceived quality regarding perceived value, satisfaction, and citizen loyalty.

Therefore, this research is crucial for managers in charge of territorial public

policies in rural regions because it offers pertinent data on people's opinions that can be used to project activities that will raise the expectations of future residents who will be drawn to those expectations (KOLESNIK, 2019; Kozera et al., 2021; Montrone et al., 2015).

Furthermore, municipal managers in rural areas rely heavily on national and regional policies to promote the development and well-being of citizens. Despite this, there are many actions at the local level that can be carried out to improve satisfaction in the provision of public services. These actions are related to the dimensions investigated in this study, territorial planning, municipal services and environmental policies. The rural area determined for our study belongs to the Guayaquil canton, a territory with the highest population density in Ecuador, with a territorial area of 344.5 square kilometers and 2,698,077 inhabitants, part of the country's largest functional Municipal Autonomous Government, which provides public services to 16 urban parishes and 5 rural parishes (Ecuadorian Institute of Statistics and Censuses, n.d.; Municipal Decentralized Autonomous Government of Guayaquil, n.d.).

This study was carried out in the Tenguel small town, an eminently agricultural and aquaculture area. Its economy is concentrated on the production of bananas, cocoa and shrimp. It is the second largest Rural Parish in Guayaquil in terms of population, with 13,000 inhabitants. The distance with respect to its capital, Guayaquil, is 142 km, which makes this territory an appropriate place to carry out a study of causal relationships, since this distance determines the effectiveness of the provision of public services by the competent authorities.

In addition, proper management of territorial public policies helps citizens to be satisfied and loyal, which reduces depopulation in rural areas. This study is innovative because it uses a structured equation model with moderating variables of causal relationships between the perceived value of citizens in public services and citizen satisfaction (Holmgren and Merkel, 2017; Llorent-Bedmar et al., 2021; Sikorski et al., 2020; Stasiak, 1992).

Hypothesis

The variables used to measure the loyalty of citizens residing in Tenguel are: 1) expected quality of land and road planning (EQTPR) 2) expected quality of municipal service provision (EQMS), 3) expected quality citizen experience in environmental management (EQEEC), 4) perceived quality of land and road planning (PQTPR), 5) perceived quality of municipal service provision (PQMS), 6) citizen's perceived quality experience in environmental management (PQEEC), 7) perceived value (PV), 8) satisfaction (SATISFAC) and 9) loyalty (LOYALTY).

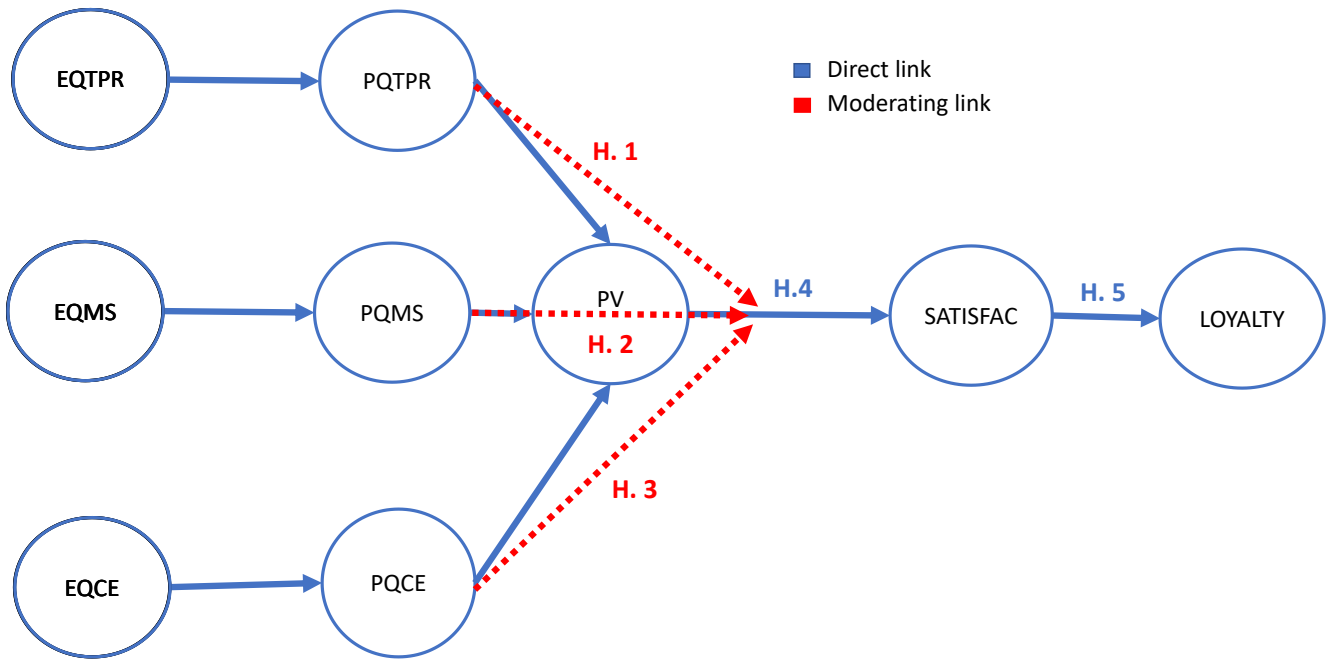


Figure 1. Theoretical model based on ACSI.

The following hypotheses (**Figure 1**) were formulated according to the theoretical framework and the reference literature:

Hypothesis 1 (H1). The relationship between the perceived value of the territory (PV) and citizen happiness is directly and considerably influenced by the perceived quality of the territorial planning experience (PQTPR) (SATISFAC).

Hypothesis 2 (H2). The direct relationship between the perceived value of the territory (PV) and citizen satisfaction is directly and considerably modulated by the perceived quality of the experience in the provision of municipal services (PQMS). The direct relationship between the perceived value of the territory (PV) and citizen satisfaction is directly and considerably modulated by the perceived quality of the experience in the provision of municipal services (PQMS) (Suyanto et al., 2019; Tung et al., 2017).

Hypothesis 3 (H3). The direct relationship between the perceived value of the territory (PV) and citizen happiness is directly and considerably modulated by the perceived quality of the citizen’s environmental experience (PQCE) (SATISFAC) (Biswas and Roy, 2020; Parayitam et al., 2020; Ramkissoon et al., 2018; Suyanto et al., 2019).

Hypothesis 4 (H4). Customer happiness is directly and profoundly influenced by the territory’s perceived value (PV) (SATISFAC) (da Silva et al., 2020; Kim and Lee, 2016; Lai and Chen, 2011; Nuviala et al., 2012; Zhao et al., 2020).

Hypothesis 5 (H5). Citizen loyalty is directly and strongly influenced by general citizen satisfaction (SATISFAC) (LOYALTY) (Lee et al., 2021; Osman and Sentosa, 2013; Soediono, 2013). this section.

2. Materials and methods

2.1. Data analysis

Regarding perceived quality, perceived value, level of satisfaction, and loyalty to public services in the rural area of Tenguel, the second rural parish in the Guayaquil canton with the largest territorial extension and population density, this study aims to establish the causal relationships between the observed and latent variables from a study of expected quality.

On the other hand, the information was gathered from a household-level opinion poll based on the American Customer Satisfaction Index (ACSI), which consists of 80 questions divided into 9 components. The study universe has a population of 13,000 people, so due to time and resource constraints, a simple representative random sample of 450 households was calculated with a margin of error of 5% and a confidence level of 95%. This yielded positive results from 428 families, with a representative from each household being surveyed (Ecuadorian Institute of Statistics and Censuses, n.d.).

A team of skilled interviewers gathered the data from April 3 to April 7, 2023, gathering pertinent sociodemographic data as well as the respondents' levels of quality expectations (expectations), perceptions, contentment, and loyalty for each item on the questionnaire. Each suggested item was given a Likert score on a scale from one to seven.

The sample includes individuals from every age group, degree of education, career, and income bracket. Utilizing surveys from reputable writers in satisfaction research, the validity of the questionnaire was confirmed (Farooq et al., 2018; Ozdemir et al., 2012).

For illustrate the methodology followed (**Figure 2**), once the literature related to the object of study has been reviewed, the theoretical model has been designed through the construction of latent variables. To give content to the constructs proposed in the study, a survey has been designed with various variables that integrate each of the constructs proposed. We proceed to collect primary data in a rural area of Ecuador, and the empirical model is calculated by implementing structural equations. The adjustment of the model and its corresponding validation is justified. Once validated, a hypothesis test is performed, then factorial loads derived from SEM (Structural Equation Models) are calculated to calculate the indices of each latent variable.

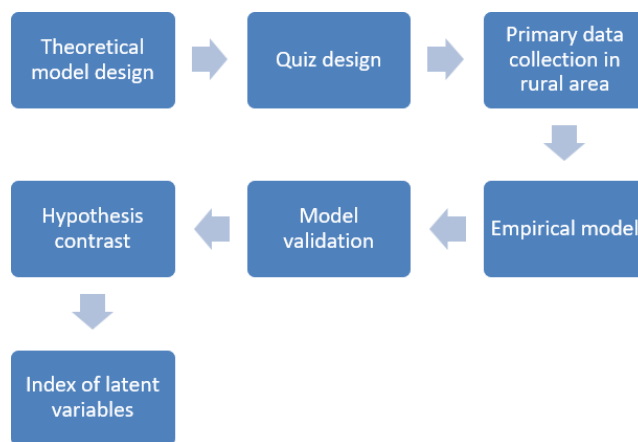


Figure 2. Workflow schema.

2.2. Methodology

The questionnaire consists of five sections:

Section 1: knowledge of road planning and territory planning. Zoning and land use planning, roads and pavements, traffic flow and crossings, public transportation, parking, address details, transportation terminal services, general satisfaction with the land use planning process, and viability are among the topics that may be discussed.

Section 2: has expertise in offering municipal services. Questions about quality/price ratio, good drinking water, sewage and sewage services, garbage collection service and environmental cleaning, parks and gardens, public lighting, preservation of historical and cultural structures, cultural activities, social facilities, and cemetery services, as well as general satisfaction with municipal services are all welcome.

Section 3: Citizen's Environmental Experience. Questions about noise minimization, air pollution, green areas, recycling points, global satisfaction in the citizen's environmental experience.

Section 4: Citizens' loyalty. Such as: Would you recommend the Municipality's services? Would you advise relatives or friends who now reside outside the city to relocate there? Would you suggest going on vacation there to relatives or friends that reside outside the city? Would you advise your friends or relatives to support the mayor? Would you cast another vote for the mayor?

Section 5: Sociodemographic information. Gender, age, education level, field of work, and family income level.

Citizens were always made aware of the study's academic goal and that their replies would be kept confidential. They were asked to consent to having their responses used in the research before the questions were ever asked. The survey was gathered in the morning, afternoon, and nighttime. Tenguel residents received the survey. Closed-ended questions were used to complete the socio-demographic profile. In the sample, 428 valid questionnaires were collected, with a sampling error of 5% and a confidence level of 95%.

This research proposes a model of causal relationships with nine constructs regarding expected and perceived quality, perceived value, satisfaction, and loyalty. These constructs are classified into three dimensions: Territorial Planning, Public Services, and Environmental Experience of the citizen. Each dimension includes a set of observed variables, assessed through 80 questions posed to a sample of 428 validated questionnaires. This approach provides relevant information on the level of satisfaction measured using a Likert scale from 1 to 7.

The survey was explained to the residents of the rural study area. Once they had no doubts about its content and gave their verbal consent for the academic use of their responses, the questionnaire was administered.

Some of the variables measured include zoning and planning, roads and pavements, traffic organization, public transportation service, parking services, address information, transportation terminal services, drinking water quality, wastewater service, garbage collection, cultural activities, firefighting, municipal police, sports services, public lighting, park maintenance, veterinary services, water pollution, air pollution, noise minimization, and green areas. Additionally, overall satisfaction in the dimensions of planning, services, and environment is assessed, along with questions such as: "Would you recommend the city as a tourist

destination?”, “Would you recommend your family and friends to live in rural areas?”, and “Would you recommend voting for the Mayor of Tenguel?”.

The results suggest that expectations in all three dimensions are high, perceived quality and perceived value are low, and the levels of satisfaction and loyalty are medium.

The model has been validated using the Warp PLS software. The observed variables and corresponding latent variables are shown in **Table 1**.

3. Results and discussion

In the results section, the calculations for validating the observed variables and the latent variables are grouped. Once the proposed model has been validated, its causal relationships are tested.

In **Table 2** shows the socio-demographic profile of the citizens. Regarding gender representation, 46.5% of citizens were women and 53.5% men. The survey was answered mainly by people under 30 years of age (41.8%) with secondary education (53.3%).

Table 2. Socio-demographic profile.

Variable	Category	Absolute frequency	Percentage
Gender (<i>n</i> = 428)	Man	229	53.5
	Woman	199	46.5
Age (<i>n</i> = 428)	>30	179	41.8
	[30–39]	71	16.6
	[40–49]	82	19.2
	[50–59]	51	11.7
	60 or more	46	10.7
	Studies (<i>n</i> = 428)	No studies	16
Primary school		89	20.6
High school		228	53.3
University		95	22.2
Postgraduate		1	0.2
Family income (<i>n</i> = 428)	Less than \$ 400	332	77.6
	Between 4001 and 2000 euros	95	22.0
	Between 2001 and 5000 euros	2	0.5

3.1. Examination of the qualitative data

The qualitative data explored addresses how civil society has expectations of the territory addressed from the perspective of maintaining or improving the well-being of all community capitals. The qualitative expectations and their degree of influence on their dependence are shown in **Figure 3**. The qualitative data collected are

organized to evaluate the degree of importance according to the repetitions of the respondents and the importance given to it at the level of the service’s influence and its dependence.

Among the main findings, the municipal services that civil society expects must be maintained, such as transportation terminal service, public and road lighting, cemetery services, social activities, public transportation service, wastewater, and sewage services. It can be seen that these services have a high influence and high dependence on the territory and the expectations of citizens.

Additionally, the municipal services that must be improved according to the expectations of civil society are zoning and urban planning, parking service, noise minimization, municipal police service, address information, parks, and gardens. These services have low influence and low dependence on the territory and on citizens’ expectations.

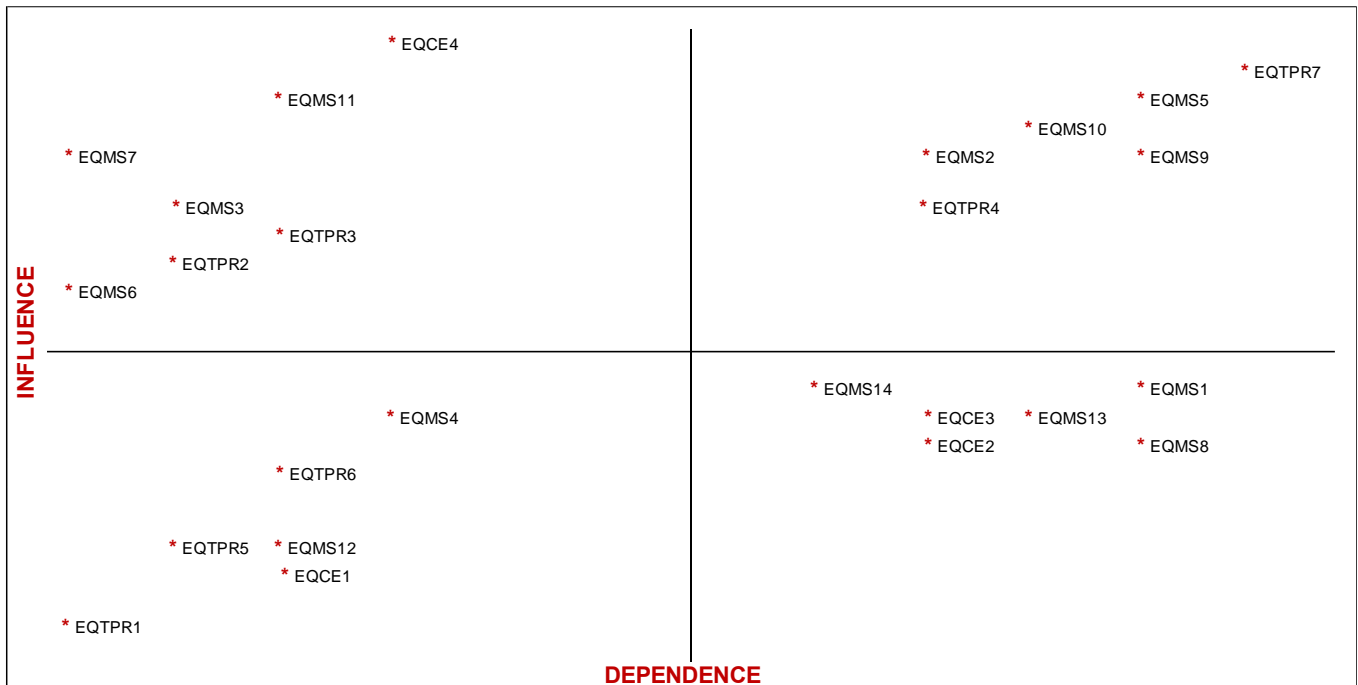


Figure 3. Qualitative diagnosis of expectations.

3.2. Examination of the items’ reliability independently

The suggested model was verified by testing the latent variables’ validity and reliability. Factor loadings and limiting probability for the observed variables are shown in **Table 3**. Researchers first examined the validity and reliability of the model’s latent variables, then examined the reliability of individual items inside the model.

Collinearity was assessed, and it was verified that the variance of the inflation factor (VIF) is more than five. The results showed that there was no collinearity between the variables used to measure the latent variables.

In **Table 3** provides the item analysis in the same format as **Table 2**. The factors loadings of the things might be established for their unique dependability in accordance with Fornell and Larcker (1981) and Barclay et al. (1995).

Table 3. Personal item dependability.

Latent variable	Observed variable	Standardized coefficient	Latent variable	Observed variable	Standardized coefficient	
EQTPR	EQTPR1	0.808 ***	PQMS	PQMS1	0.668 ***	
	EQTPR2	0.854 ***		PQMS2	0.650 ***	
	EQTPR3	0.856 ***		PQMS3	0.735 ***	
	EQTPR4	0.878 ***		PQMS4	0.693 ***	
	EQTPR5	0.824 ***		PQMS5	0.684 ***	
	EQTPR6	0.846 ***		PQMS6	0.728 ***	
	EQTPR7	0.907 ***		PQMS7	0.743 ***	
EQMS	EQMS1	0.876 ***	PQEC	PQMS8	0.759 ***	
	EQMS2	0.879 ***		PQMS9	0.666 ***	
	EQMS3	0.855 ***		PQMS10	0.722 ***	
	EQMS4	0.849 ***		PQMS11	0.718 ***	
	EQMS5	0.894 ***		PQMS12	0.563 ***	
	EQMS6	0.853 ***		PQMS13	0.722 ***	
	EQMS7	0.862 ***		PQMS14	0.642 ***	
	EQMS8	0.872 ***		PQEC1	0.623 ***	
	EQMS9	0.883 ***		PQEC2	0.535 ***	
	EQMS10	0.882 ***		PQEC3	0.683 ***	
	EQMS11	0.866 ***		PQEC4	0.625 ***	
	EQMS12	0.834 ***		PV	PV1	0.646 ***
	EQMS13	0.875 ***			PV2	0.641 ***
	EQMS14	0.873 ***			PV3	0.762 ***
EQCE	EQCE1	0.824 ***	PV	PV4	0.529 ***	
	EQCE2	0.871 ***		PV5	0.634 ***	
	EQCE3	0.872 ***		PV6	0.759 ***	
	EQCE4	0.866 ***		PV7	0.747 ***	
PQTPR	PQTPR1	0.708 ***	PV	PV8	0.634 ***	
	PQTPR2	0.700 ***		PV9	0.758 ***	
	PQTPR3	0.617 ***		PV10	0.797 ***	
	PQTPR4	0.671 ***		PV11	0.788 ***	
	PQTPR5	0.648 ***		PV12	0.606 ***	
	PQTPR6	0.729 ***		PV13	0.775 ***	
	PQTPR7	0.780 ***		SS14	0.695 ***	
LOYALTY	L1	0.907 ***	SATISFIED	PV15	0.557 ***	
	L2	0.887 ***		SS16	0.730 ***	
	L3	0.905 ***		SS17	0.629 ***	
	L4	0.834 ***		S1	0.842 ***	
	L5	0.806 ***		S1	0.901 ***	
			S3	0.891 ***		

$\alpha \leq 0,001$ (***), $\alpha \leq 0,01$ (**), $\alpha \leq 0,1$ (*).

3.3. Examining the trustworthiness of hidden variables

Cronbach’s Alpha and the composite reliability values are used to determine whether the observed items faithfully and adequately measure the latent variable to which they contribute. If they are more than or equal to 0.7, the observed items are valid (**Table 4**) (Nunnally and Bernstein, 1978).

Table 4. Composite reliability and Cronbach’s alpha.

Latent variable	Compound reliability	Cronbach’s alpha
PV	0.801	0.749
Satisfied	0.796	0.715
Loyalty	0.804	0.700
EQTRP	0.918	0.895
PQTRP	0.809	0.724
EQMS	0.928	0.916
PQMS	0.786	0.726
EQCE	0.904	0.858
PQCE	0.766	0.764

3.4. Convergent validity

Convergent validity is evaluated with the mean variance extracted (AVE) (**Table 5**). Values greater than 0.5 demonstrate convergent validity (Fornell and Larcker, 1981a, 1981b).

Table 5. Average variance extracted.

EQTRP	0.785
PQTRP	0.624
EQMS	0.694
PQMS	0.492
EQCE	0.837
PQCE	0.610
PV	0.472
SATISFY	0.752
LOYALTY	0.684

3.5. Hypothesis contrast

The suggested model’s (**Table 6**) goodness of fit was determined using the following measures: (the goodness threshold values are shown in the right column).

Table 6. Goodness of fit.

Goodness of fit			
Mean Path Coefficient (APC)	0.169	(Suharto et al., 2021; Suryaningtyas et al., 2019)	
Average R-squared (ARS)	0.144	(Fong et al., 2020; Maksum et al., 2021; Suharto et al., 2021)	$P < 0.001$
Adjusted mean R-squared (AARS)	0.141	(PRASILOWATI et al., 2021; Sijabat et al., 2020; Suharto et al., 2020)	
Average VIF (AVIF)	1,350	(Jati et al., 2019; Sholeh and Jakaria, 2021)	
Average Complete Collinearity VIF (AFVIF)	2,387	(Suharto et al., 2021; Veingerl Cic et al., 2020)	acceptable if ≤ 5 , ideal ≥ 3.3
Tenenhaus Gof (GoF)	0.391	(Kumar and Purani, 2018; Velayudhan, 2018)	small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36
R-squared contribution ratio (RSCR)	0.999	(Hendrarini et al., 2018; Wahyuni et al., 2021)	acceptable if ≥ 0.9 , ideal = 1
Sympson paradox relationship (SPR)	0.909	(Esmaeily et al., 2014; Nigro and Císaro, 2016)	acceptable if ≥ 0.7 , ideal = 1
Statistical Suppression Ratio (SSR)	1,000	(Realyvásquez et al., 2015; Sánchez-Sánchez et al., 2021)	acceptable if ≥ 0.7
Nonlinear Bivariate Direction of Causation Relationship (NLBCDR)	0.782	(Maksum et al., 2021; Riduansah et al., n.d.)	
Standardized root mean square residual (SRMR)	0.097	(Bentler, 2007; DiStefano et al., 2018; Iacobucci, 2010)	acceptable if ≤ 0.1
Standardized mean absolute residual (SMAR)	0.082	(Wilczynska et al., 2021)	
Standardized Threshold Difference Count Ratio (STDCR)	0.947	(Morrow and Conger, 2021; Sholihin and Ratmono, 2021)	
Standardized Threshold Difference Sum Ratio (STDSR)	0.810	(Fauzi and Sheng, 2020; Sholihin and Ratmono, 2021)	acceptable if ≥ 0.7 , ideal = 1

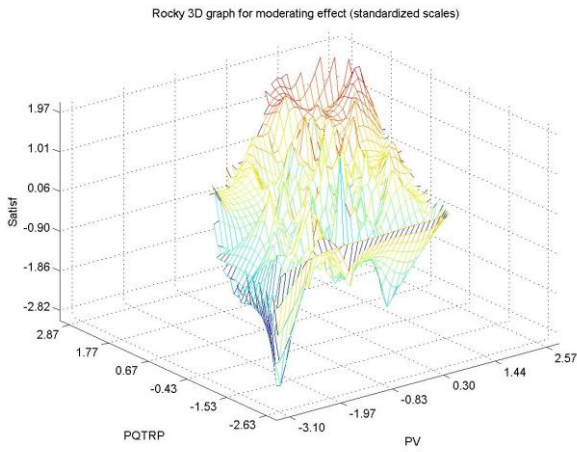
It is possible to validate that the findings obtained are trustworthy and support their application after assessing the validity of all the latent variables and making an acceptable adjustment. The factor loadings of each causal link were computed to complete the hypothesis test (**Table 7**).

Table 7. Hypothesis testing.

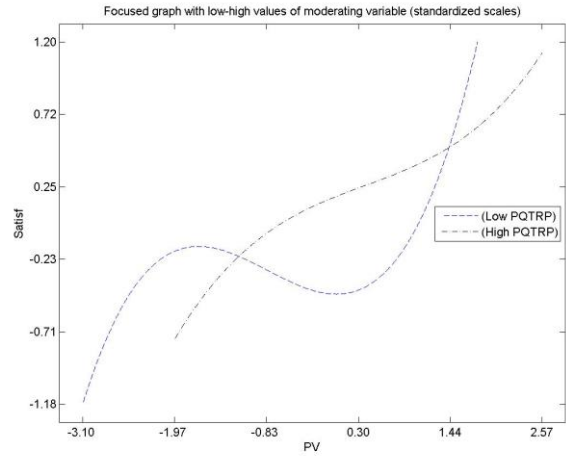
Hypothesis	Effect	Coefficient of causal relationship	Supported?
H1: PQTRP-> PV-SATISFAC	+	0.012	NO
H2: PQMS-> PV- SATISFY	+	0.084**	YES
H3: PQCE-> PV-SATISFAC	+	0.110 **	YES
H4: PV-SATISFY	+	0.228 ***	YES
H5: SATISFY-LOYALTY	+	0.136 ***	YES

$\alpha \leq 0,001$ (***), $\alpha \leq 0,01$ (**), $\alpha \leq 0,1$ (*).

Figures 4–8 show the graphic representation of the causal relationships of the proposed hypotheses.

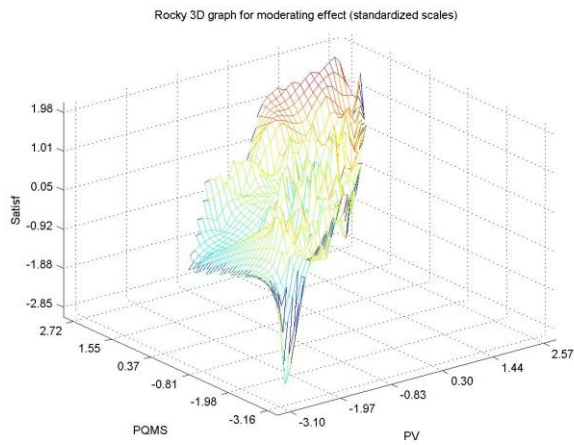


(a)

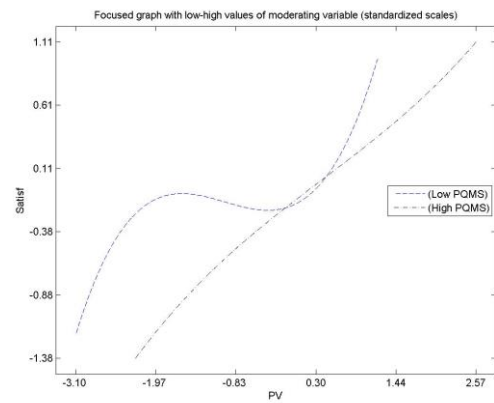


(b)

Figure 4. (a) Hypothesis 1 3D; (b) Hypothesis 1 2D.

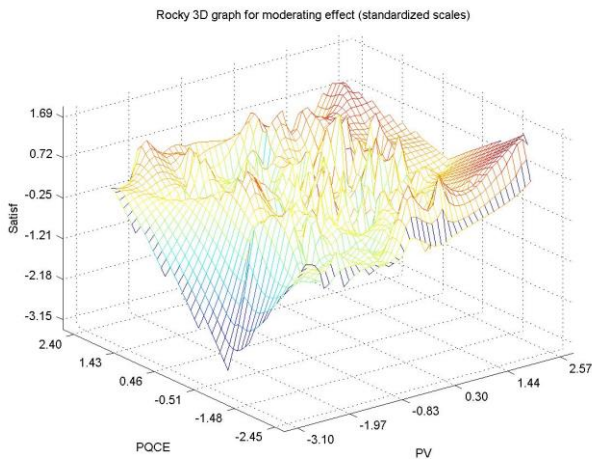


(a)

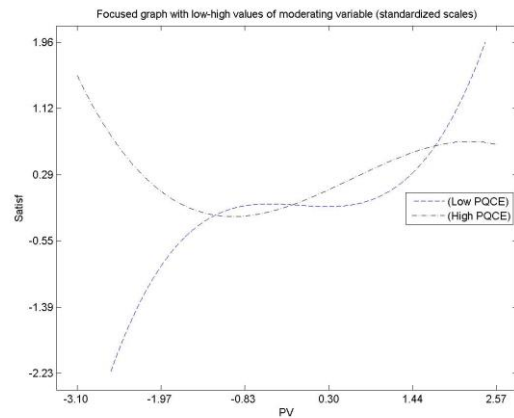


(b)

Figure 5. (a) Hypothesis 2 3D; (b) Hypothesis 3 2D.



(a)



(b)

Figure 6. (a) Hypothesis 3 3D; (b) Hypothesis 3 2D.

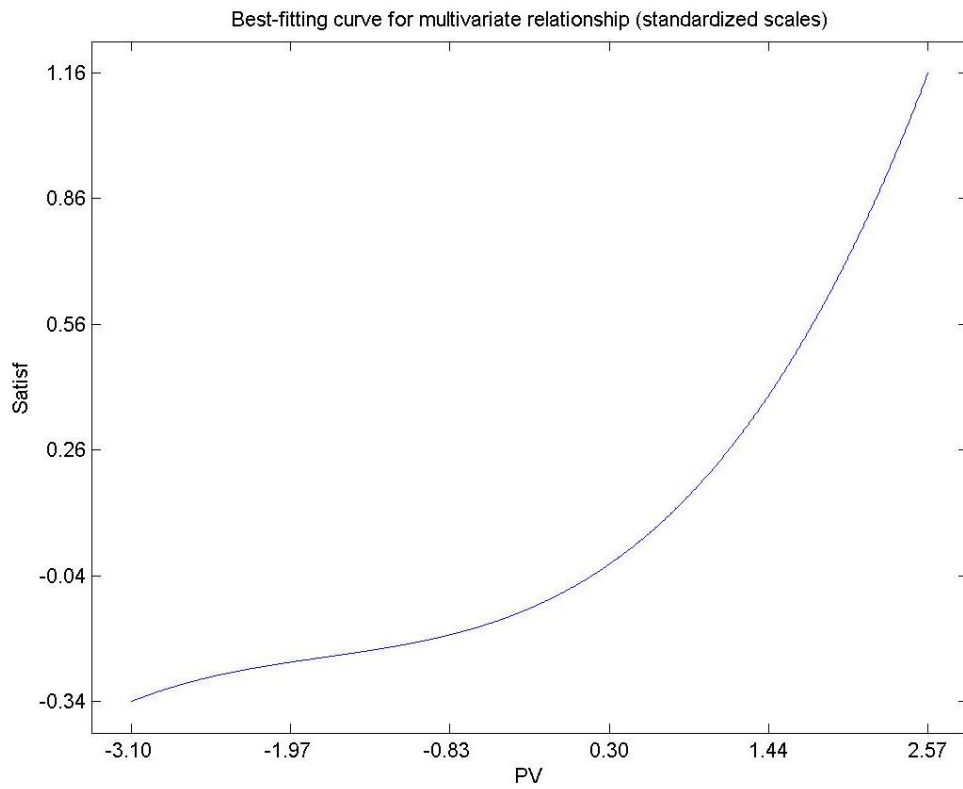


Figure 7. Hypothesis 4.

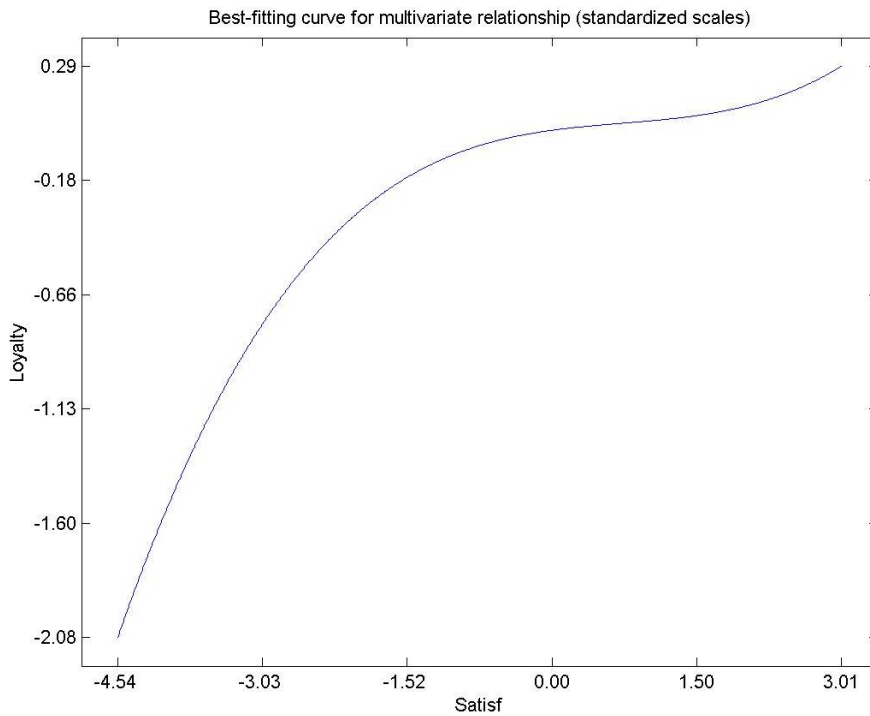


Figure 8. Hypothesis 5.

By carrying out the contract, the hypotheses (H2), (H3), (H4), and (H5) were verified. **Figure 9** displays the factorial loads of the causal linkages, both direct and

modulating. Every causal relationship's limiting probability tells us if a theory is consistent or not.

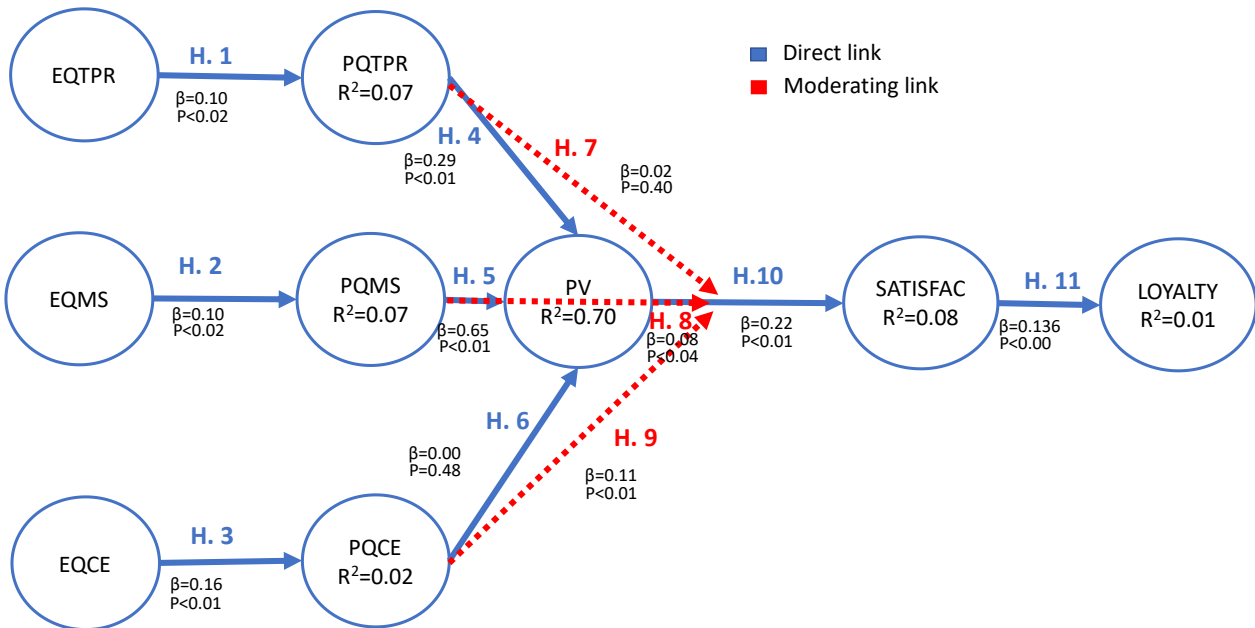


Figure 9. Loading factor and limiting probability of the proposed causal relationships.

3.6. Latent variable index

The results of satisfaction and loyalty surveys in rural regions may be compared thanks to a standardized index that was developed for this purpose (Castillo Canalejo and Jimber del Río, 2018; Song et al., 2012). The variables used in the calculation are:

- Being w_i i each one of the standardized structural coefficients of each item and \bar{x}_i the mean of the observed variable corresponding to its latent variable.
- On the other hand, to calculate the latent variable index (LVI), the sum from “i” equal to “1” to “n” of the product of the standardized structural coefficients with the mean of the observed variables has been calculated, the result has been divided by the sum from “i” equal to “1” to “n” of the standardized structural coefficients.

$$IVL = \frac{\sum_{i=1}^n w_i \bar{x}_i}{\sum_{i=1}^n w_i}$$

In Table 8 shows the indices calculated for each of the latent variables. imental conclusions that can be drawn.

Table 8. Index of latent variables.

Latent variable	Index out of 7	Index over 100%
EQTPR	6.884	98.343
EQMS	6.858	97.975
EQCE	6.785	96.924
PQCE	3.995	57.073
PQMS	3.920	55.998

Table 8. (Continued).

Latent variable	Index out of 7	Index over 100%
PQTPR	3.810	54.422
PV	3.698	52.826
S	4.865	69.500
L	4.620	65.998

4. Discussion

The level of contentment among rural residents affects their feeling of loyalty and place in their community. Rural residents may help reverse the depopulation of their communities by recommending and discussing their experiences in such environments with friends, family, and coworkers. Among its goals, public administration is the preservation of rural communities, safeguarding the long-term value of these residential areas, and attracting new people. As a result, the tools available to enhance the delivery of public services and undertake measures to maximize citizen satisfaction (Chen et al., 2019; Drew et al., 2016; Edwards, 2009; Gendel-Guterman and Billig, 2021; Institute and Association, 1974; Liu et al., 2020; Pinilla and Sáez, 2021; Roch and Poister, 2006; Stasiak, 1992) should increase.

Therefore, public policy in rural areas may benefit from an examination of residents' devotion to their communities. To better understand how different aspects contribute to satisfaction, this research proposes a structural equations model including moderating variables. The faithfulness of Tenguel's rural population is examined. Most of the research's assumptions were confirmed by the model's findings, meaning they may be utilized to boost a rural community's competitiveness, resolve problems, and draw in new residents.

Consequently, the environmental quality perceived by the citizen was one of the main causes of satisfaction and therefore, in the choice of the municipality as a residential destination. Within municipal services, the perceived quality of drinking water quality, public lighting, garbage collection and cleaning services, and cemetery services (Burgos, 2019; Green et al., 2015; Huttinger et al., 2017) stand out. Regarding territorial planning, the perceived quality of rural planning, paving, traffic and public transport stand out. Regarding territorial planning, the perceived quality of rural planning, paving, traffic and public transport stands out. The general satisfaction in the experience in territorial planning, municipal services and environmental experience is medium high.

Thus, when residents choose a rural location as their new home, they consider the discrepancy between the anticipated and actual quality of all aspects of its population, including territorial planning, roads, municipal services, and the environment. The citizen gathers information and forms an image of the desired dwelling in his head in order to establish residency. If the experience of using territorial and environmental policies is good, the perceived quality of the region is at least as good as the anticipated quality, and there is perceived value in the collection of municipal public services. All of these feelings, perceptions, and experiences add up to a rural citizen's sense of well-being, which encourages them to suggest the rural region to other people as a place to live.

5. Conclusion

In relation with the hypothesis the conclusion was:

Hypothesis 1: The study could not confirm that the quality of territory and road planning in rural areas has a direct and significant effect on the relationship between satisfaction and perceived value, as measured by well-being among local residents (**Figure 4**).

Hypothesis 2: The connection between satisfaction and perceived value is highly sensitive to citizens' perception of the quality of municipal services in their rural community (**Figure 5**). When the perceived quality of municipal services is low, the central sinusoidal pattern of the relationship between perceived value and satisfaction flattens. When the perceived quality is high, perceived value and satisfaction are directly related. Better municipal services enhance the contentment and well-being of rural residents, as they positively affect both perceived value and the relationship between perceived value and satisfaction.

Hypothesis 3: Perceived environmental quality has a direct and substantial effect on the relationship between satisfaction and perceived value for rural residents (**Figure 6**). When the perceived quality of the environmental experience is low, the central sinusoidal connection between perceived value and satisfaction flattens. When the perceived quality is high, the parabolic shape of the relationship flattens to the right, and the impact of the environment on this relationship weakens. Improving the quality of environmental services can boost satisfaction and well-being by enhancing perceptions of service value and strengthening the correlation between these perceptions and actual satisfaction levels.

Hypothesis 4: The study validated the direct impact of citizen satisfaction on loyalty and the subsequent recommendation of the rural region to family and Friends (**Figure 7**). Loyalty among residents both stabilizes and attracts people to rural areas. To enhance happiness and loyalty, public actors should optimize resource management in territorial policies, public services, and environmental management. High satisfaction levels marginally affect commitment; however, high satisfaction levels significantly increase loyalty among rural residents. Expectations, quality, and contentment significantly influence the decision to live in a rural area and recommend it to others, aligning with previous research.

Hypothesis 5: Content rural residents are more likely to advocate for their community to friends and family (**Figure 8**). Loyalty among residents stabilizes and attracts people to rural areas. To enhance happiness and loyalty, public actors should optimize resource management in territorial policies, public services, and environmental management. High satisfaction levels marginally affect commitment; however, high satisfaction levels significantly increase loyalty among rural residents. Expectations, quality, and contentment significantly influence the decision to live in a rural area and recommend it to others, aligning with previous research.

To sum up, in Tenguel's rural region, residents are more likely to be satisfied with life and recommend the location to others if asked. Citizens have high expectations for territorial development, municipal services, and environmental quality. However, deficiencies in firefighting services, municipal police, veterinary services, and social facilities negatively affect recommendations. While 18% of

residents would not recommend the area, 32% would. Overall, public satisfaction is deemed satisfactory, but improvements in municipal services are needed.

Consequently, for municipal managers, improving services such as municipal police, firefighting, social activities, and parking is crucial. Satisfied rural citizens are essential for retaining and attracting populations. The results align with existing literature, indicating that satisfaction positively influences loyalty and recommendations.

In conclusion, this research serves as a public policy tool for political, economic, and social actors to implement strategies for infrastructure improvement, economic development, education access, and private investment promotion. This strategy increases citizen satisfaction, job creation, and opportunities for farmers. The study highlights significant factors for rural residents, suggesting that enhancing perceived value can attract residents and tourists. Future research should expand the sample and monitor results over time to address current limitations, such as sample size and short timeframe.

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