Prioritizing Public Policy Implementation for Rural Development in a Developing Country via Multicriteria Classification

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Abstract: Despite the growing global interest in promoting rural development as a strategy to guarantee food security, in developing countries there are large gaps to achieve a sustainable countryside, mainly in rural areas. This research work delves into a methodological approach definition to establish the baseline for the public policy implementation and prioritize the intervention needs in the different items considered in an integral rural development public policy. The proposed methodology combines a qualitative characterization of needs and goals, a social cartography, a quantitative characterization of indicators and the use of multicriteria classification for prioritizing development policies. Eight localities with sixteen small rural settlements are taken as a research unit, to apply the proposed methodology and determine the implementation level of a public policy. The results show that a set of priority policies that both meet the authorities' objectives and the population's needs can be defined. Moreover, a vector of priority is proposed to define the weakest items, as a guide to local government administrations to focus efforts on interventions to achieve greater impacts on the rural community development under study. Finally, via a double field validity assessment, those strategic lines are hierarchized and analyzed regarding their potential relationships, as a social system.

Keywords: rural development public policy; analytical hierarchy process; multicriteria classification; social cartography

1. Introduction

Rural development is a problem of social and economic nature, which is required to be addressed in a manner taking into account its complexity (De los Ríos-Carmenado et al. 2013). This problem has a social and cultural profile (Maiorano et al. 2022) where it is required to know and understand the historical relationships mediation that outline dominant groups that in many cases exacerbate poverty in rural sectors of society (Zamarreño-Aramendia et al. 2021). The different actions of the rural development can be of various nature (Pangratie et al. 2020), mainly related to relationships between stakeholders or networks (Murdoch 2000), information and communication technologies (Naldi et al. 2015; Salemink et al. 2017), infrastructure development (Barrios 2008; Liu et al. 2022), capability development (Naldi et al. 2015; Torre et al. 2023), public policy making (De Janvry et al. 2002) or financial issues (Padmanabhan 1988), among others. Those actions are at different maturity levels and relate directly to the conditions of life of rural farmers, the main population of those areas (Brauer and Dymitrow 2014). The discussion raised by (Maîtrot 2022) even has to do with the relationship between rural poverty and hierarchical relationships within poor farming families. The author raises a relationship even with access to financing and problematizes access to microfinancing as an unsuccessful strategy so

that these families can access the necessary resources to develop their productive activities. The foregoing raises the hypothesis that rural development must be imperatively linked to the regional and national development plans from governments. Some works formulate the need to formulate a public policy for rural development, mainly in developing countries where those areas represent a major potential in fruits, vegetable and livestock production, on which the main cities within the country depend (Drescher 2002). To answer that need, an Integral Rural Development Public Policy needs to be formulated based on the efforts of various institutions and the rural community of the area under study, with a planning horizon of 10 to 20 years (Belshaw 1977; Popper 1993). In the development of public policies, an interactive planning and problem-solving approach will add more robustness to the solutions proposed, since they will deal more suitably with the real needs of the different stakeholders (Ackoff 1977). The bases of interactive planning and the interests of structuring needs and problems can be seen in (Ackoff 1997). This approach has numerous applications in the so-called social systems (Jackson 1982), including that of agricultural development (Jiménez 1992), mainly from a cooperative, economic perspective (Rojas Palacios et al. 2022). Ashley and Maxwell (2001) propose a vision of rethinking agricultural development proposing a set of indicators and strategies, as well as an analysis method based in narratives. The impacts of technologies and their opportunities in rural policy making are examined in (Salemink et al. 2017) via a systematic literature review. Abreu and Mesias (2020) propose a framework to assess rural development with a set of unified indicators, completing the works of (Belshaw 1977; Popper 1993; Ashley and Maxwell 2001). Sustainability in agriculture and livestock is also an important issue to consider in rural development, mainly the implications of sustainable practices in rural development (Auliah et al. 2022). Last but not least, (Castro-Arce and Vanclay 2020) introduce the notion of social innovation and propose a framework to support rural development on a community perspective, and (Ogujiuba and Mngometulu 2022) develop the notion of social investment and study their influences in rural development, which is not always positive.

Although different works deal with assessing and assisting rural development, no systematic approach for prioritizing policies, based on an objective principle, has been found. Moreover, these types of methods need to be developed for field-related research, i.e., the one that answers the needs of a real problem and with an aim of being replicable and applicable in practice. There is then a need to structure the understanding of requirements and needs of both populations and policy makers for more effective policy making and having robust support for decision making.

This research takes place in a context of development in a sensible region in Colombia, of rural nature and low development indexes. The effort to formulate a rural development policy in this region is oriented towards formulating an intention embodied in five dimensions of study: economic, social, environmental, political, and cultural. Additionally, each dimension is associated with 24 strategic lines, 85 lines of action, and 106 indicators. This structure seeks to measure the public policy implementation level according to commitments defined in it. The contribution of this research focuses on defining a starting point or what has been called "base line", from which progress can be measured in concert between the rural community and the public administration. The additional contribution from this research work is to look at becoming a guide for interested parties to support the policy development and implementation in a coordinated manner. Specifically, this research presents a methodological proposal for collecting information to observe the development state of each of the public policy dimensions in the rural area studied. The geographic study area includes eight rural settlements and is called El Placer Node in this document.

This paper aims to propose a methodology for policy prioritization in the context of the rural development of a developing country region. The methodological proposal includes the hierarchical analytical process (AHP) applied to experts in rural topics issues, to make structured judgments about the state of dimensions in the specific geographic area, with an aim to support a priority categorization based on a category classification analysis. In addition, surveys and social cartography are used to carry out direct consultations

with the community. This made it possible to collect first-hand information and, through field visits, experientially validate various aspects included in public policy. Subsequently, a contrast is made with secondary information sources, to provide complementary and contrasted information or, difficult to obtain in direct consultation. As a result of the methodological process, a general analysis of prioritization is presented, with the use of a tool called ABC multicriteria, which allows suggesting a possible intervention route in rural development processes. In Section 2, the main methodological issues, and the methods used, are presented, focusing on the articulation between characterization, social cartography, criteria definition and the ABC multicriteria method. Section 3 presents the main results of the research leading to the definition of categories of policies in a prioritized relation. Finally, Section 4 discusses those results and addresses the main application issues of the framework.

2. Background—The Vectors of Rural Development

Studies on rural development are numerous to point out the need of a suitable policy proposal and deployment to ensure the efficient development of rural regions (De Janvry et al. 2002). Those policies are developed following two main complementary and connected visions: that of inclusive growth and that of social improvement.

Since reducing inequality has become a major concern of development policies (Ali and Son 2007), the first notion that appears to be directly related to the development of rural policies is that of **inclusive growth**, which can be defined as an "*economic growth that is distributed fairly across society and creates opportunities for all, as well as its potential ability to reduce the widened income gap that exists between high- and low-skilled jobs*" (Heshmati et al. 2019). Inclusive growth needs, then, the deployment of financial and economic policies that reduce socio-economic inequalities and at the same time increase productivity (Thomas and Hedrick-Wong 2019), and aim to reduce barriers to inclusion through access to financial support and knowledge. To that end, the different policies and actions can be categorized in basic inputs (those that are crucial to reducing inequalities), enabling inputs (those that enable basic inputs and contribute to a fair increase of productivity) and complementary inputs (those thst support basic and enabling inputs to make inclusive growth continuous, accepted, and sustainable). Those inputs can be of a purely financial nature (Reddy 2010), of a socio-economic nature, mainly related to labor (Kvist 2020), or of a resource access nature (Ghanem 2014). Recent developments in inclusive growth are seen in (Thomas and Hedrick-Wong 2019; Heshmati et al. 2019).

The other notion related to development policies is that of **social improvement**, which remains more heterogeneous since there are various slight variants of its signification (Weiss 2000), however, it is also an important vision of rural development policy. In this vision, financial inclusion and economic growth is not a goal itself but a part of a more complex system (which can be considered as a social system in the sense of Gharajedaghi and Ackoff 1984). A social system is seen as a system in which parts can decide (i.e., are purposeful, since they are made by human beings or groups of humans) and the whole is also purposeful (Ackoff and Emery 2005; Ulrich and Probst 2012), so the social improvement of a community (seen as a social system) needs to take into account the individual development of each of its parts (and their decision implications) as well as the group decision and improvement issues. Improvement is a primal goal of policy making (Sweet 2011) and can be of different nature. Social improvement englobes, then, all categories of improvement that allow to improve globally a social system, mainly a community, towards policies and programs (Beyer 1969). Thus, social improvement implies individual improvement of families (Massie 1849). According to (Collins and Swann 2003) social improvement is a collective action that reflects a positive change on communities. This social improvement is then related to individual issues, like personal health (Beyer 1969) or education (Reimers 2013), to family issues, like the family's nutrition or wealth (Maldonado and Moya 2013), and community issues, related to the evolution of the social

system that individuals, families, economic, and political stakeholders create around a common territory (Lawson 1993).

In both visions, the development of local populations passes through a series of levers and vectors (McCann 2002), which are the conditions and needs for which a community can pursue an inclusive and social development. Various authors deal with those elements that drive development and influence policy making, showing that their natures and relationships are different and can be categorized (Terluin and Roza 2010; Hălbac-Cotoară-Zamfir et al. 2019). Those levers and vectors are not policies but elements that compose them, that can enable or push the development when they are present or limit it when not. Different works in literature studied those levers and vectors in different ways, and most of them agree on the following categories:

1. Individual financial levers, like the access to financial resources, subsidies, specific loans, banking strategies and other financing possibilities for individual to develop rural activities (Reddy 2010; Tabares et al. 2022).
2. Family socio-economic improvement, i.e., other economic actions to increase the individual and familial wealth, like employment creation, support to family income or economic improvement of familial units (Briones 2013; Kvist 2020).
3. Individual health and nutrition (World Health Organization 1961), like food assistance programs, increasing of individual health follow-up or giving basic and enabling health conditions to individuals and families (Lawson 1993; Gonzalez-Feliu et al. 2018).
4. Education and training (Maldonado-Mariscal and Alijew 2023), in terms of access to basic education at both the elementary/high school (Lawson 1993) and university level (Umpleby and Shandruk 2013), as well as of specific education and training programs for local rural populations (Collett and Gale 2009).
5. Community enabling and social cohesion (Shucksmith and Chapman 1998), which aim to develop the community and increase the links between their members (Hart et al. 2014).
6. Cultural issues (McCann 2002), aiming at maintaining and developing the culture specificities of rural communities.
7. Agricultural resource improvement, i.e., increasing access to fields, water, crops and other land and water resources necessary for agriculture.
8. Political drivers (Giessen 2010), i.e., policy and political actions and levers that support the development of a territory, such as relationships between local and national politics, the development of laws, or collaborative policy-making forums, among others.
9. Other issues not included above, like coordination among stakeholders (Reina-Usuga et al. 2012), communication (Meyer 2003) or participation issues (Oakley and Marsden 1984), among others.

Most works see three main sets of conditions for both individual (or familial) and regional development. The first is health and nutrition (World Health Organization 1961), since malnutrition, sickness, and lack of sleep, among others, have a negative impact on concentration and generally on individual effectiveness (Boliko 2019), so they condition the predisposal of each individual to social improvement (Maldonado and Moya 2013). The second is that of wealth (Ratner 2019), since the economic capabilities of individuals have a strong influence on their capacities of improvement (Bebbington 1999). Some authors give a particular importance to economic and financial capabilities, which are the basis of inclusive growth (Thomas and Hedrick-Wong 2019; Ghanem 2014) and one of the reasons behind the most accepted development policies, i.e., subsidies, employment creation, support to trade, etc. Third, the improvement of individual (family) capabilities, through education and training (Lawson 1993) or through entrepreneurship capabilities (Tabares et al. 2022) are required to have an improvement that lasts throughout the timeline, and is seen as one of the main conditions of social improvement (Bebbington 1999). Those three categories of conditions (or drivers) are related: health is crucial to ensure that individuals contribute to work (then earn money) and study or train (so to education); at the same time, without wealth, health and nutrition can be compromised and, without public support, so can education; finally, education is generally required to increase wealth via a more qualified

workforce. From these reasons, we can consider that financial levers (1), socio-economic improvement (2), individual health and nutrition (3), and education and training (4) are the basic inputs that need to be considered in policy making, and at the same time can be seen an enabling inputs. For that reason, (Maldonado and Moya 2013; Gonzalez-Feliu et al. 2018) define a set of policy actions for rural improvement, which can be completed from works cited above to include the consideration of the four sets of levers and vectors we have discussed, leading to the following categories of policies:

- Primary economic improvement, aiming at increasing the financial and socio-economic capabilities of individuals and families.
- Cost reduction to increase nutrition and health accessibility, in order to improve individual and family health conditions and improve their socio-economic conditions.
- Food access initiatives, as well as health access initiatives, giving the possibility to families of improving their health and nutrition by directly providing part of their needs instead of economic support.
- Education, training, and monitoring programs or education access initiatives, to improve individuals' competencies. These could be completed by work access initiatives that would both improve competencies and wealth.
- Promotion and development of self-production for food autonomy, which is aimed mainly to support health and nutrition but can have an impact on competencies and socio-economic improvement.

Finally, it is important to recall that policies are made of different elements of which those drivers can be part, but remain composite elements. The acceptability and the prioritization of those policies is in general made by decision makers (policy makers) on the basis of their needs, as well as their political willingness and commitment, but cannot be perceived in the same way by the inhabitants of rural areas (mainly farmers), who are not always aware of the complexity of the policy process and the relationships between drivers. Therefore, it is important to include both policy makers and rural inhabitants in the decision-making process of rural development policies, and consider both their mutual priorities and their basic needs and requirements, as well as the relationships between the defined and prioritized policies.

3. Methodology

Intervention in rural development processes implies an integral approach to the different aspects identified as development components. Accordingly (De Janvry and Sadoulet 2005), the rural intervention program's success implies having access to assets, improving the context, offering social security, and achieving the social incorporation of the poor people in rural areas. Some prioritization procedures to intervene in rural activities development have been proposed. Massoud et al. (2022) present a model with the support of decision trees to prioritize the agricultural chores. Kaghazchi et al. (2022) propose a multicriteria Analytical Hierarchic Process (AHP) model with Topsis and fuzzy logic, to select an irrigation method for agricultural purposes considering the objectives of sustainable development. Lastly, authors such as Diallo and Wouterse (2022) use a social matrix methodology as a strategy to identify the best support alternative in rural development, based on the different financing sources impact to advance in the intervention. They conclude that government financing is the most effective according to the simulations carried out in six different scenarios of African countries. Since the main goal of the proposed methodology is to support decision making in prioritizing policies for rural development, and those policies can have different impacts, so they need to be evaluated via a set of criteria (Abreu and Mesias 2020), a multicriteria approach is chosen. More precisely, an ABC (or pareto) analysis is proposed, combined with a multicriteria method to compare the different policies using various criteria. The combination of both methodologies is then used as a tool to prioritize intervention needs, based on a baseline identified as a starting point for the implementation of a rural development public policy. The defined policies are finally grouped into strategic lines and classified into four categories, corresponding to

the quartiles of the final score of the multicriteria analysis. The methodological strategy is approached considering the following basic tools and elements:

1. A survey is used as a tool for consulting primary sources to quantify relevant aspects of the public policy indicators. Additionally, the use of social cartography is a fundamental element in participatory research with community intervention. Those elements allow us to characterize and structure the decision problem.
2. A secondary sources review is conducted as a strategy of information completeness and contrast gathered in the primary sources regarding the indicators. That review, combined with experts' feedback, supports the definition of criteria and gives quantitative inputs for the multicriteria analysis.
3. The use of AHP (Analytic Hierarchy Process) as a tool for consulting experts linked to the agricultural sector of the country, region, and town or local community, is the basis of the prioritization analysis.
4. An information contrast analysis about policy implementation state is used as a result to the consultation tools applied, for the possible intervention alternatives prioritization.
5. The elaboration of an ABC classification is proposed for a final list of policies with their prioritization levels.

The research development strategy suggests consultation at three levels as shown in Figure 1. The consultation with experts, the community, and of secondary sources such as information from institutions and/or research works related to the public policy topics is carried out. Each component was consulted with different tools (community farmers via surveys and the social cartography, experts were consulted to feed the AHP tool and institutions gave the secondary data needed to set the context and understand the situation. With all those sources and results, an alignment was made to define the suitable policies and their prioritization, then an analysis phase lead to the definition of a final set of policies and their deployment issues.
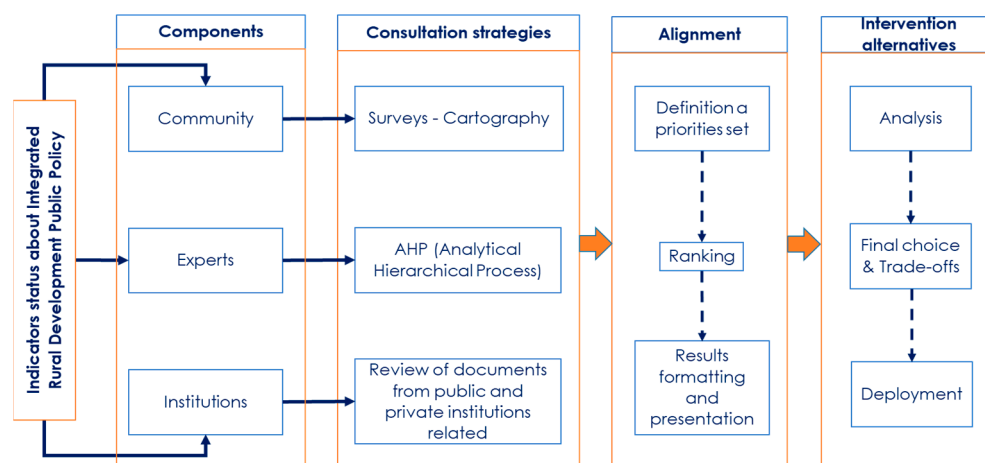
Figure 1. Representation of the methodological process (own elaboration).

The analytical hierarchical process (AHP) is part of the knowledge area of multicriteria decision-making techniques. In this sense, it can be said that a large number of everyday life events can be reduced to problems requiring multicriteria decision making. Vassileva et al. (2005) state that decision-making problems can be divided into two classes depending on how they are formally declared. The first one poses a finite number of alternatives that are explicitly expressed in tabular form. These are called discrete multicriteria decision-making problems or multicriteria analysis problems. The second presents a finite constraints number that are expressed in the functions form, defining an infinite number of viable solution alternatives. These are called continuous multicriteria decision-making problems or multicriteria optimization problems. In the multicriteria analysis and optimization

problems, several criteria are optimized simultaneously among feasible alternatives set. In the general case, no alternative manages to optimize all the criteria; it is observed that each improvement in the value of one criterion leads to a deterioration of at least one other criterion value. This alternative set is called the set of non-dominant alternatives or Pareto optimal solutions, and each alternative in this set could be a solution to the multicriteria problem. To select an alternative, additional information established by the decision maker must be available. The information provided by the decision maker reflects their overall preferences concerning the quality of the alternative sought. Many of the real-life problems in practical management can be formulated as problems of choice, ordering, or resources ranking, such as strategies, projects, offers, products, and portfolios, to mention a few topics. In addition, Vassileva et al. (2005) also state that multicriteria optimization problems refer only to choose problems. On the other hand, Zopounidis and Doumpos (2002) define that when considering a set of discrete alternatives that are described by some criteria, different types of analysis are found to support decision makers. Among these types of analysis, it is considered to choose the best alternative within a limited set of them; to establish a ranking of the alternatives ordered from the best to the worst and finally, to classify and order the alternatives within a predetermined homogeneous group. According to the author, these types of analyses lead to a specific evaluation result.

Social cartography, according to Barragán-León (2019), is a participatory technique, which aims to represent the ideas and concepts from human being perceptions, freely and spontaneously translating what can be called the territory interpretation and its complexities by a community. The author refers to the heterogeneity and plurality of language, which allows it to be translated into a product of social character. For this author, social cartography is a collective exercise that does not require a rigid structure but allows free expression that facilitates self-diagnosis in the community, with the use of simple instruments such as a paper sheet. In a complementary manner, Vélez Torre et al. (2012) consider that this participatory tool allows the formulating of ideas and then systematizing them according to the knowledge that a community has about its territory. In this sense, different related aspects that affect people's daily life are involved. These aspects involve economic, political, cultural, environmental, and social dimensions that are the study object in this research. Additionally, surveys are used in research as an effective information collection means (De Leeuw et al. 2012).

In general, research implies gathering information from available secondary sources that can complement the analysis. In concordance, a systematic documentary analysis approach is proposed. This structured methodology (Fitzgerald 2012) identifies in an orderly manner the existing works on a particular interest topic, allowing to identify gaps concerning the specific state about a topic under investigation. Additionally, it facilitates understanding the research contribution. For this research work, this methodology supports the current status analysis about dimensions studied, within the rural development public policy framework.

3.1. Experts Consultation

Sinclair (2002) ensures asking communities in the public policies formulation is a successful strategy, showing positive implications related to mutual education and learning, community member's satisfaction and policy innovation. In addition, these policies are backed by broad community support and lasting process implementation results. In the same way, Olmedo and O'Shaughnessy (2022) used a consultation tool to the community-based rural social enterprises, to establish their contributing to rural development. The foregoing remarks indicate the relevance of using this strategy to collect information. In this research, "experts" are considered as people who, either personally or on behalf of an organization or institution, have detailed information on the sector due to their interaction with agricultural activities, work in the agriculture field, the development of related public functions, and, in general, their academic and labor experience

The experts, in this case, consisted of:

a. Rural entrepreneurs, made up of owners or representatives of companies in the region.

b. The rural development public policy Oversight Committee, made up of the rural area peasant leaders.

c. The rural area leaders, who in this context became the public policy managers together with the community, municipal government agencies, academic entities, and the regional conciliation commission, among others, make them experts in agricultural and rural policy issues.

In this specific case, the AHP (Analytic Hierarchy Process) was applied considering the following steps:

1. The AHP tool application objective is defined as: To consult the judgment on the current state of the public policy dimensions and strategic lines formulated in it.

2. Definition of criteria and sub-criteria: the agreement is made up of 5 dimensions, 24 strategic lines, 83 action lines and 106 indicators. The 5 dimensions are used as criteria and the 24 action lines as sub-criteria.

3. Instrument Design: A mixed instrument is developed, supported on Microsoft Excel, where two electronic sheets are built. The first consults the development state perception for each dimension, using a rating scale from 1 to 5, where 1 is very little or not at all developed and 5 is excellently developed. This corresponds to a Likert Scale of 5, and reflects the expert's perception on the development of each dimension (Douxchamps et al. 2017). In the process (see Figure 2), first, the policy dimensions are presented to farmers, related to each dimension. Each action line represents a perception criterion. A questionnaire is designed to collect the perceptions, using the Likert scale and link the answers to the AHP tool in a similar way as on Reddy et al. (2021). Then, a set of workshops (similar to focus groups but more direct) are deployed to collect the data. Finally, collected data about perceptions are processed, consolidated, and analyzed.
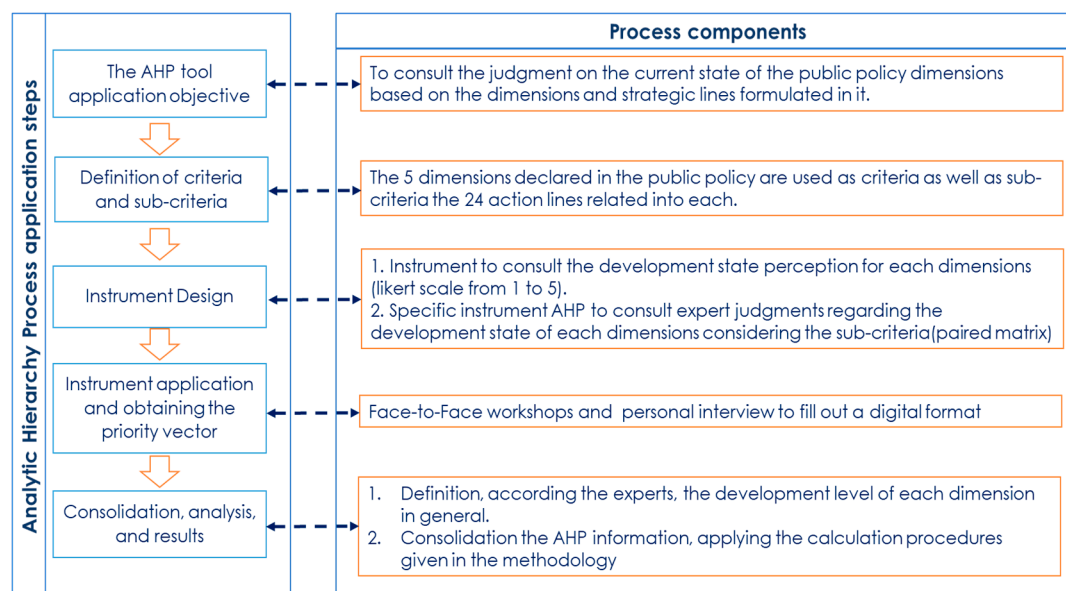
Figure 2. AHP application chart (own elaboration).

The second tool is designed specifically for the AHP, and it is used to consult expert judgments regarding the development state of each dimension considering the sub-criteria, which in this case includes the 24 strategic lines.

4. Instrument application and obtaining the priority vector: To the instrument application, the strategy used is to conduct face-to-face workshops with the oversight committee and farmer leaders and, for rural entrepreneurs, a personal interview via telephone is used with the support of the team's surveyors, who, based on the specific questions of the survey, fill out the virtual format.

5. Consolidation, analysis, and results: Once the survey has been applied, the information is consolidated in two stages, seeking to contextualize the paired assessments made in the second stage within the general context of the development of each dimension. The first stage makes it possible to establish, according to the experts, the development rating of each dimension in general. This rating is reported as an average between 1 to 5, according to the score given by the experts. The second stage consolidates the information in the AHP, applying the calculation procedures given in the methodology, and results are translated into a priority vector. According to the score obtained, it is ordered the highest priority and the lowest priority. In this case, it is interpreted in the order of the least developed dimension to the most developed. It is understood that the least developed are prioritized in that it needs more immediate intervention.

This result will later be compared with those obtained from the primary sources to establish coincidences and differences.

3.2. Community Consultation

In this study, "community" is understood as all the people who live in the region called El Placer Node, who share interests and coexist in similar conditions. The rural zone studied is made up of eight settlements and sixteen villages, as shown in Table 1.

Table 1. Settlement and villages in the studied rural zone (own elaboration).

Settlement	Villages	Settlement	Villages
Rio Loro	Rio Loro—La Mesa	El Placer	El Placer
Los Bancos	Los Bancos, La Venta, El Jardín	Crucero Nogales	Crucero Nogales
Frisoles	Frisoles, La Florida	El Salado	El Salado, San Agustín
El Rosario	El Rosario, Santa Rosa, Santa Rita	La Playa del Buey	La Playa del Buey, El Topacio

The rural zone studied covers approximately 502 square kilometers and has an estimated population of 332 inhabitants. These are mostly small towns and villages with a dispersed population. The following activities were carried out for this consultation:

1. The dimensions, strategic lines, lines of action, and indicators of the public policy for the integral rural development of the considered area were identified.

2. A consistency matrix was used to define the units of observation and the questions related to the public policy indicators and their calculation formula. Additionally, the definitions that allow interpreting each one of the dimensions, strategic lines, lines of action, and variables are established, to have a unified conceptual basis, which is not contained in the definition of the policy. Based on the indicators' scope and the qualitative assessment of the research team, the questions are assigned to the survey questionnaire or included in the social cartography questions. According to this analysis, 54 questions for the survey and 67 guiding questions for the social cartography emerged. Information is contained in Figure 3.

3. The survey instrument is designed, which also includes questions related to the population characterization. This survey is consolidated through an Excel macro.

4. The social cartography methodology is designed and the application procedure for the consultation workshop is defined.
5. The information is consolidated to define the indicators status about rural development public policy, based on the primary sources consulted.
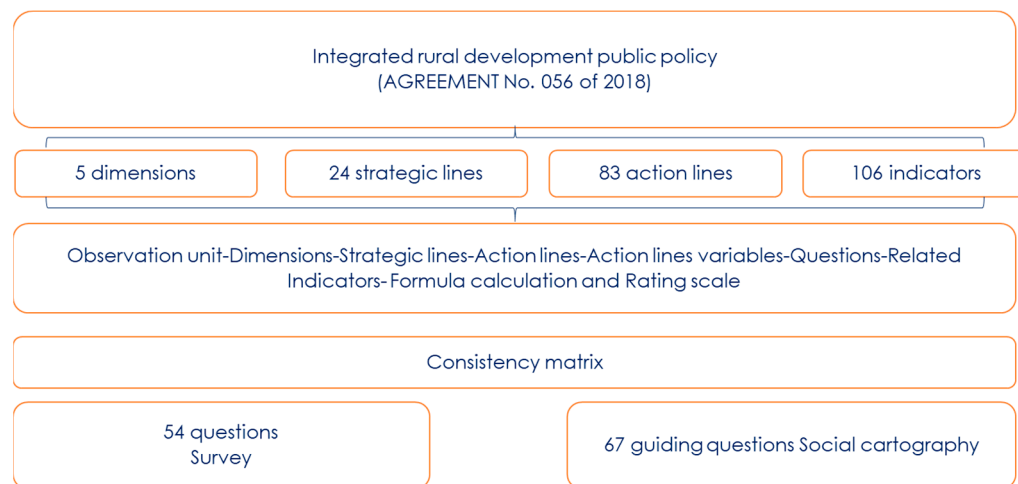
Figure 3. The community consultation process to collect primary information (own elaboration).

Later, it is possible to consolidate the indicators' information by combining the survey and cartography information, as well as the complementary data obtained independently and exclusively from others source of consultation.

3.3. Secondary Sources Consultation

In this work, "secondary sources" are understood as documents that report organized information related to the rural development public policy issues. These documents include institutional reports and reports from public and private organizations, as well as research papers.

The information collection from secondary sources is carried out supported in a consistency matrix, according to the following steps:

1. Once the public policy indicators and their relationship with the survey questions and social cartography have been identified, the sources of secondary information that can be reported as sources of consultation are selected.
2. Institutions and documents for consultation are identified through a search in academic databases and the institutional pages of the related public entities.
3. Information reported in electronic sources is gathered and information is requested from the different government agencies when it is not available online.
4. The information is collected and consolidated for each indicator according to the available documents.

The consolidation of available information makes it possible to respond to the related public policy indicators and is used as a source for contrasting information with the measurement of the status of the public policy indicators consolidated in the primary information gathering stage.

3.4. Gap Analysis by Contrast for Prioritization

In this research, "analysis by contrast" is understood as the analytical methodology that allows identifying the characteristics of the results obtained from the application of the community consultation through surveys and mapping, as well as the contrast with secondary sources on the status of the indicators, to define a prioritization that serves as a guideline for possible intervention projects.

As an analysis methodology for prioritization, the multicriteria decision analysis approach involves the various criteria that impact a decision and links them in a more complex form than a weighted sum or average (Grierson 2008). The method proposed here aims to value each criteria participation under the Pareto principle approach, allowing the efforts to focus on priority aspects.

A "criterion" is understood as the valuation assigned from the "Community" to each indicator related to the strategic lines in the rural development public policy.

This procedure makes it possible to define a priority to formulate intervention actions according to the development level observed with the information-gathering instruments used. On the other hand, this analysis is carried out within the strategic lines scope, and it is related to the indicators and dimensions included in the public policy. In this sense, the methodological steps are described below:

1. Assigning a value to each indicator: The value assignment to each indicator is performed, taking as criteria the calculations obtained from the survey, cartography, and literature review. The information obtained from primary sources is prioritized according to score rating.
2. Score the indicators according to the value obtained: The indicators scoring is assigned by the technical team taking as reference the "Rating Table" designed with rating ranges between "Null" and "Very High" development levels. It is related to quantitative values between 0 and 1, and the values obtained in the previous step according to Table 2.

Table 2. Ranking rates.

Rate Description and Ranges	
Null	0
Very Low	0.01–0.20
Low	0.21–0.40
Intermediate	0.41–0.60
High	0.61–0.80
Very High	0.81–1

3. Reordering from lowest to highest: Based on the rating obtained for each indicator, the results are ordered from lowest to highest. It is understood that the lowest rating corresponds to a more critical indicator or one that reports a lower development level. Score participation is calculate adding the scores obtained for 100% of the indicators as described below:

    (a) A summation is made of all the scores given to the indicators.
    (b) According to the total calculated, the respective percentages of each indicator are measured concerning the total.

4. ABC classification: Classification is made considering three criticality zones: Zone A is the most critical and corresponds to those indicators organized from the lowest to highest score value, achieving cumulative participation of 40% of the total. Zone B, those with a cumulative score between 41% and 80% of the total, and Zone C, which would be the lowest priority, with indicators with a cumulative score between 81% and 100% (Table 3).

Table 3. Cumulative scores for choice of the ABC category.

Classification Criteria	
A	0–40%
B	41–80%
C	81–100%

5. Finally, the results obtained in the matrices are ordered according to the dimension and strategic line of each indicator.

With the above methodology, a gap analysis matrix is constructed, which us allows to define those dimensions and strategic lines that require priority attention.

4. Results

The following are the results obtained from expert consultation about this rural area development status in the social, economic, environmental, political, and cultural dimensions. These results allow ordering from less to more developed, with each strategic line related to each dimension analyzed.

In a second step, the measurement to each indicator is related to each strategic line, which in turn feeds the dimensions under study, is carried out. This measurement is obtained from direct community consultation through surveys and social cartography and then it is contrasted with information secondary sources related to institutional reports and previous research, among others.

Finally, a gap analysis is performed based on the results alignment obtained from the expert consultation and those obtained from the direct community consultation. This alignment is based on the multicriteria analysis, which makes it possible to establish priorities around the vital issues that require urgent attention. It is used to support a potential intervention route.

Three groups of experts were consulted in the objective development: Node Committee, Rural Leaders, and Rural Entrepreneurs.

Through a diagnostic instrument, a total of 28 people, distributed among 10 rural entrepreneurs, 10 members of the Node Committee and 8 rural leaders, were consulted on the relative development status for each dimension and its variables according to their perception. On the other hand, the AHP instrument was applied to a total of 48 people, distributed among 11 rural entrepreneurs, 8 members of the Node Committee and 29 rural leaders, to perform the paired comparison between variables.

The experts consulted assessed the comparative development level in terms of their judgment on a scale of 1 to 5 for each dimension and strategic line related. On the scale, a score of one (1) is a very poor rating and a score of five (5) is an excellent rating. It allows identifying the relative value between dimensions.

Figure 4 shows the behavior of the total average ratings per dimension according to the experts' evaluation. Environmental dimension is the most developed among five evaluated. However, no dimension reaches the minimum score of three (3.0).

In addition, the economic dimension and then the political dimension are the lowest rated. Finally, in the individual evaluations, the rural leaders group expressed the need to work on young people's opportunities offered in terms of economic activities and leadership.

This first consultation makes it possible to establish the context in which the comparative assessments will be carried out using the Hierarchical Analytical Process (AHP). It is then necessary to specify that when carrying out the process proposed by the AHP of making paired comparisons, these dimensions have a relative weight based on the development level of each dimension. In this sense, prioritization will be defined based on the concept that the highest priority is defined by those strategic lines that have the lowest level of development.

Continuing with the objective, the AHP (Analytical Hierarchical Process) methodology is applied considering an additional group of experts conformed with the Municipal Council for Rural Development and the Oversight Committee of the Integral Rural Development Public Policy, which were handled in this research as a single group.

The hierarchical analytical process is applied in this study down to the sub-criteria level, to prioritize those strategic lines that are considered the highest priority from the experts consulted (see Figure 5).
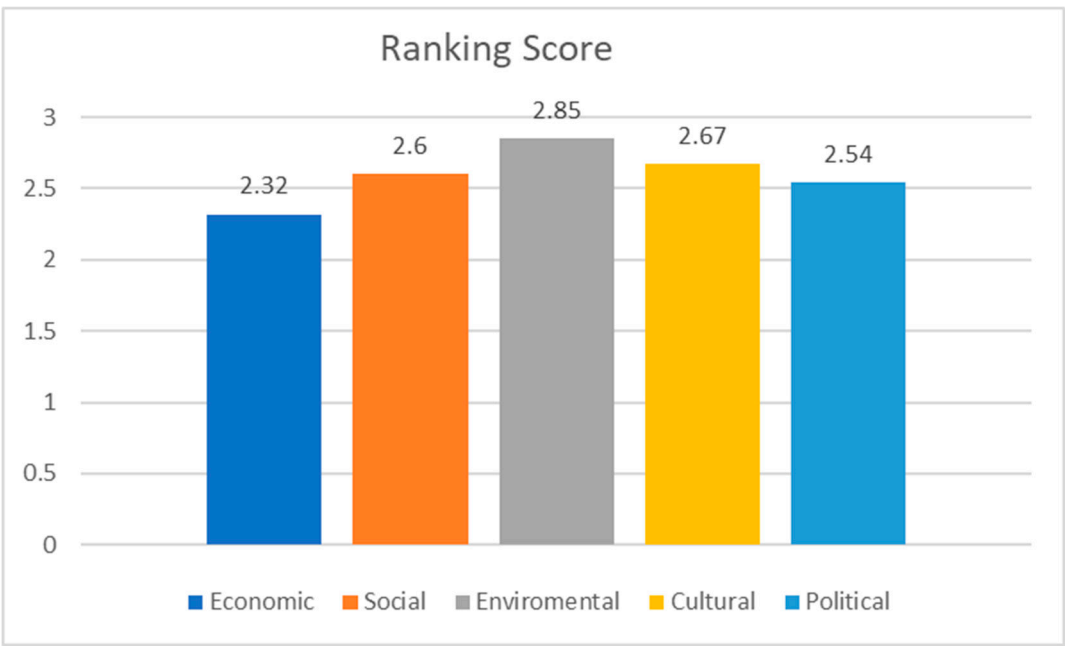
Figure 4. Comparative development level rating of the dimensions in the Integral Rural Development Public Policy.
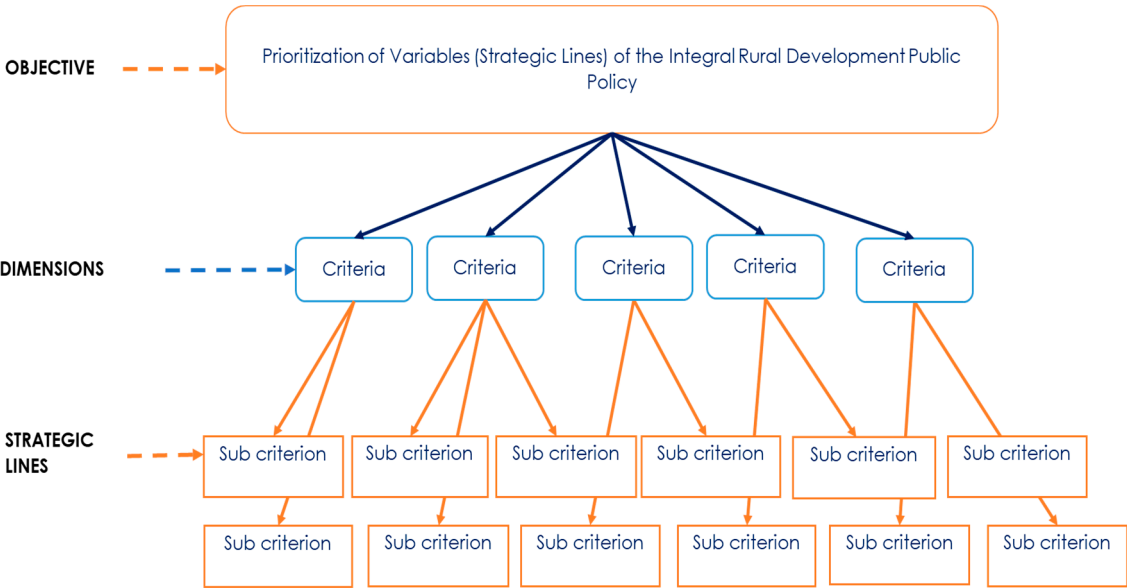
Figure 5. Representation of the Analytical Hierarchical Process—AHP.

In this case, the dimensions are taken as the criteria, and the strategic lines that make up these dimensions as the sub-criteria.

A rating scale is used where experts are consulted about their judgment on the comparative level of development on both dimensions and strategic lines, treated in this study as Criteria and Sub-Criteria. To that, a Likert scale of 9 can be used, 1 being the lowest priority or importance, and 9 the highest. In this scale, a value of 5 will be the neutral or equally developed value. The experts were interviewed directly in person and/or with the support of recreational activities for working with the community, in all cases, face-to-face exchanges allowed the main information for rating criteria and sub-criteria to be obtained.

Once the evaluations were obtained for each strategic line, the evaluations obtained using the paired comparison of each dimension according to the experts' criteria are

presented below, followed by the results obtained from the priority vector obtained as a consolidation of the judgment of the experts consulted.

The priority vector refers to the results ordered from the lowest level to the highest level of development, according to the data consolidation obtained in the expert consultation. In this sense, this would be the first approximation to the order in which any intervention interest should be approached to support the development of rurality in the context of public policy.

Continuing with the analysis, Figure 6 shows a consistency index obtained below 10%, which guarantees the reliability of the results presented. It can be observed that in three of the four groups of experts (Oversight Committee and Municipal Council, leaders, and Rural Entrepreneurs) the most developed dimension in the rural area is the economic dimension; on the contrary, the Nodes Committee considers the environmental dimension to have a higher level of development. Additionally, for three of the four groups of experts (Oversight Committee and Municipal Council for Rural Development, Rural Leaders and Rural Entrepreneurs) the dimension with the lowest level of development is the cultural one; on the contrary, the Nodes Committee expresses that the political dimension is the least developed.
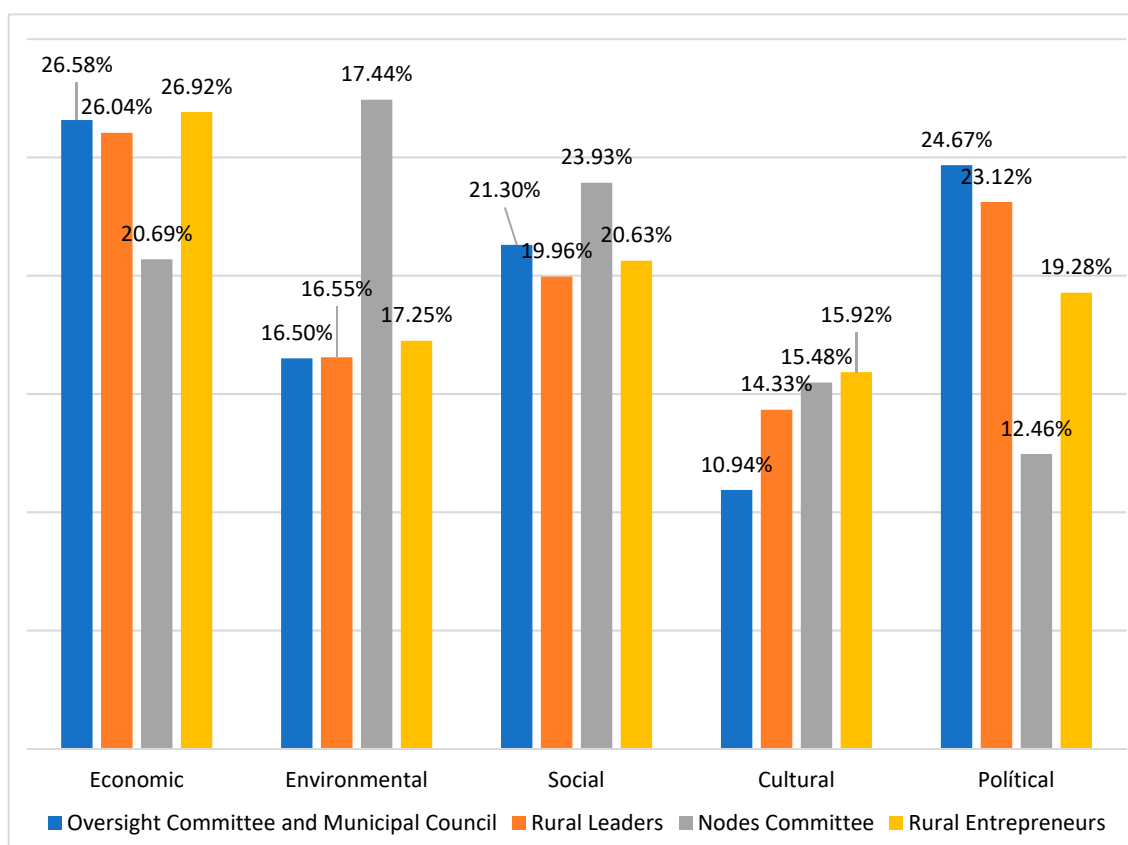
Figure 6. Consolidated valuation by dimension.

It can be seen that the cultural dimension is the one value with the lowest level of development, with an average value of 14.17%. It is followed by the environmental dimension with a value of 19.44%, very close to the average value of 19.88% for the political dimension. In any case, the economic dimension is the best valued in its comparative development with 25.06%, followed by the social dimension with an average value of 21.45%.

In a complementary manner, the consolidated assessment of the total number of experts is developed through the AHP methodology. To obtain the consolidation of the dimensions, the compliance with the data consistency index is validated, as well as the use

of the normalized data matrices, which yields the value of the consolidated priority vector by dimensions (see Table 4).

Table 4. Results vector priority by dimensions.

Economic	Environmental	Social	Cultural	Political	Cc
25.33%	20.04%	22.19%	12.81%	19.62%	0.13%

This vector yields a very consistent result concerning the individual analysis performed up to this point. The consistency coefficient is below 10%, which guarantees the reliability of the results presented. In general terms, the economic dimension is the one with the highest level of development (25.33%), followed by the social dimension (22.19%) and the environmental dimension (20.04%). The dimensions with the lowest level of development are political (19.62%) and cultural (12.81%).

The results obtained show a priority vector, which is interpreted as the priority for intervention based on the level of development evaluated according to the judgment of the experts consulted (see Figure 7).
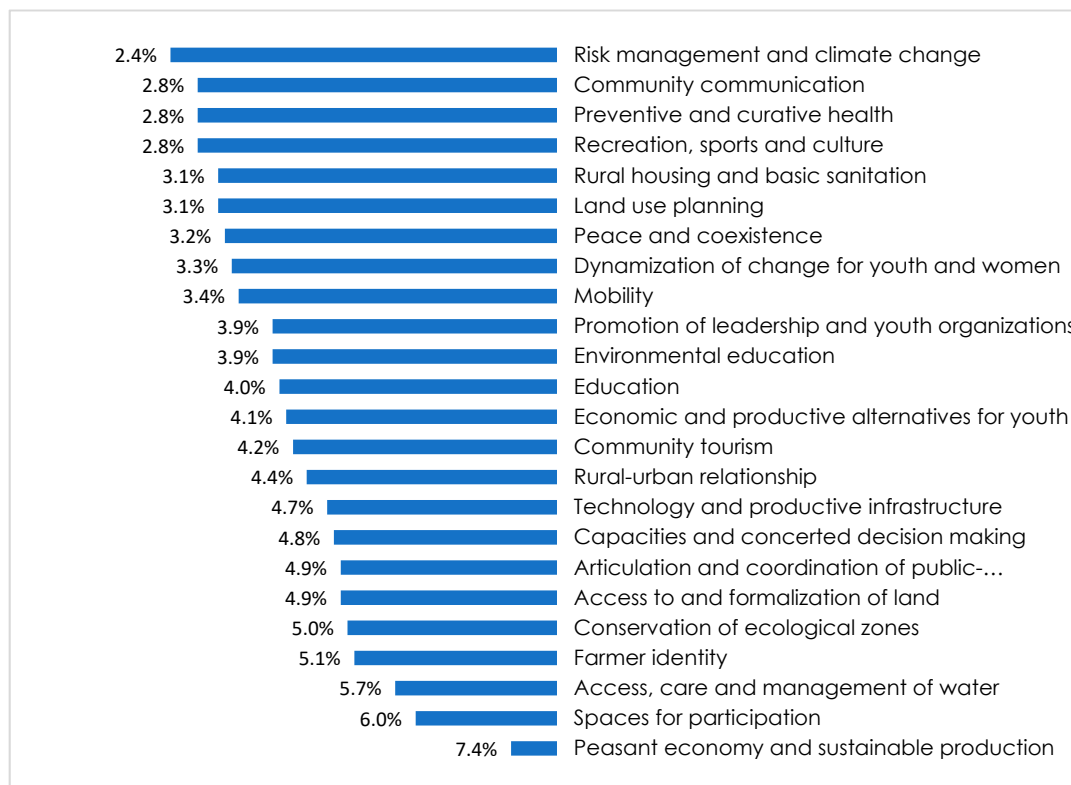
Figure 7. Vector priority of variables—strategic lines.

The 24 strategic lines are ordered here without a relationship to its dimension. To guide the reader, Table 5 presents an intentional grouping by quartiles, where the variables are divided into groups of 25% to verify how many variables correspond to each Dimension and to offer a relational view of the grouping.

What can be inferred from this classification is that the most critical dimension in terms of the variables studied (strategic lines) of rural development public policy, considering the judgment of the experts, is the social dimension. This considers that four out of six strategic lines of this dimension are located in the lowest quartile of the development level. This is also noticeable because the three remaining variables of this dimension are in the second lowest quartile of the development level.

Table 5. Grouping by quartiles of the priority vector.

Quartile	Dimension	Strategic Line	ODL	Variable Types
Q4 (Low priority proposals)	Economic	Peasant economy and sustainable production	7.4%	2 political, 2 environmental, 1 cultural, and 1 economic variable
	Policy	Spaces for participation	6.0%	
	Environmental	Access, care, and management of water	5.7%	
	Cultural	Farmer identity	5.1%	
	Environmental	Conservation of ecological zones	5.0%	
	Policy	Articulation and coordination of public-private-community institutions	4.9%	
Q3 (Middle priority actions)	Economic	Access to and formalization of land	4.9%	4 economic, 1 cultural, and 1 political variable
	Policy	Capacities and concerted decision making	4.8%	
	Economic	Technology and productive infrastructure	4.7%	
	Cultural	Rural-urban relationship	4.4%	
	Economic	Community tourism	4.2%	
	Economic	Economic and productive alternatives for youth	4.1%	
Q2 (Secondary set of priorities)	Social	Education	4.0%	3 social, 1 cultural, 1 environmental, and 1 political variable
	Environmental	Environmental education	3.9%	
	Policy	Promotion of leadership and youth organizations	3.9%	
	Social	Mobility	3.4%	
	Cultural	Dynamization of change for youth and women	3.3%	
	Social	Peace and coexistence	3.2%	
Q1 (Main set of priorities)	Environmental	Land use planning	3.1%	4 social and 2 environmental variables
	Social	Rural housing and basic sanitation	3.1%	
	Social	Recreation, sports, and culture	2.8%	
	Social	Preventive and curative health	2.8%	
	Social	Community communication	2.8%	
	Environmental	Risk management and climate change	2.4%	

Similarly, it can be seen that three of the five variables (strategic lines) of the *environmental dimension* are located in the first two quartiles of the lowest level of development. In the second quartile of less development are variables linked to the social, cultural, environmental, and political dimensions.

In general, the variables (strategic lines) that top the list of intervention priorities (Q1) according to the judgment of the experts consulted are *Risk management and climate change, Recreation, sports and culture, Preventive and curative health, Community communication, Land use planning, Rural housing and basic sanitation, and Peace and coexistence*.

5. Discussion and Generalization Issues

In this study, 90 families were surveyed, where 281 people are part of the family composition. In total, 24% of the households surveyed are located in the settlement Frisoles, which includes the village of La Florida, 20% in La Mesa, 16% in Los Bancos, 11% in El Placer, 10% in Crucero Nogales, 6% in Playa del Buey, 6% in Santa Rosa, 3% in San Agustín, 2% in El Topacio, 1% in El Jardín and 1% in La Venta, as shown in Figure 8. With respect to socioeconomic stratum, 67% live in stratum 1, 12% live in stratum 0, 4% in stratum 2 and 2% in stratum 3. The surveyed sample is then representative of the rural population of the considered area, allowing relevant information for the definition of the decision problem and the construction of the prioritization categories.

Concerning the base line for public policy, it can be said that concrete and orienting data were obtained concerning the implementation level of the policy. This information supported the development of the final prioritization category classification. Moreover, the household survey information was crucial to consider the local population needs and acceptability issues related to policies. The novelty of this research arises, then, in the mixed-method framework, which combined a qualitative and interactive preparation and characterization phase to build the multicriteria analysis model, resulting on a broad participation of the rural community. That important contribution of the community allowed increasing the tool effectiveness with the community involvement in aspects related

to their own development. In the study case, the results show a very low development level in all dimensions that make up the comprehensive rural development public policy. Indeed, interactive planning in a multi-stakeholder, multi-purpose context supports more robust decisions and a more realistic representation of the decision problems. More precisely, implying both the communities and public policy makers in a collaborative process result in a set of criteria and indicators and a solution for prioritizing policies, which is shared and accepted by the different parties, supporting consensus search and a final choice whose results are more enduring. In this sense, understanding that the policy was built with broad community participation, elements are identified that are linked to a community bad perception or skepticism regarding the public policy implementation. The cartographic analysis allowed us to demonstrate, through the construction of stories, the little credibility in the effective policy application.
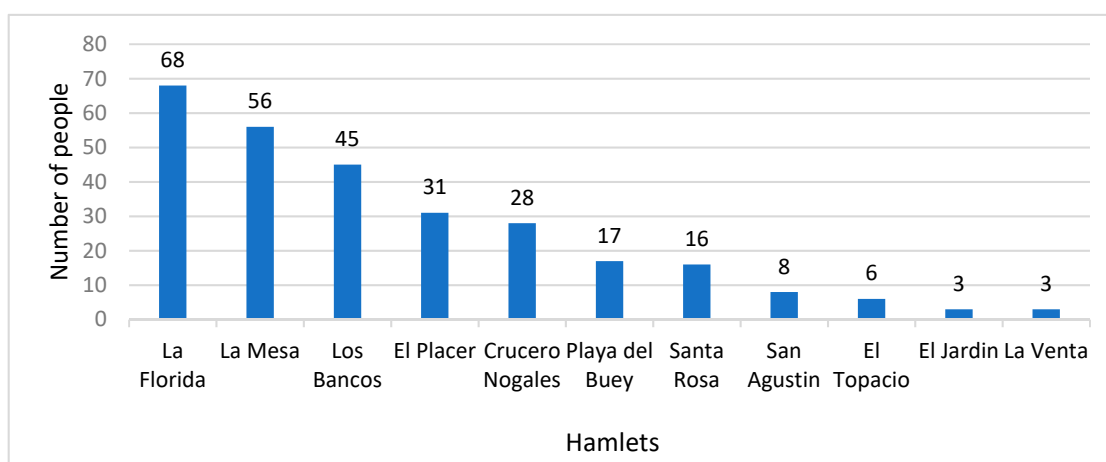
Figure 8. Distribution of surveys by hamlets. n = 281.

In the prioritization of the dimensions included in the public policy sees a first group (Q4) with two political, two environmental, one cultural, and one economic action lines, whereas all other economic action lines are in the second group (Q3). Note that, according to the proposed methodology, education is set as "middle priority" action (Q2) with the highest ODL of the category (4.1) closer to the lower ODL of the second group (4.0, economic and productive alternatives for youth). We also observe that identity and participation, which are broad and conceptual notions, remain in Q1 and their real transformation into policies should need precisions. It is important to note that, in the construction of the prioritization method, the researchers remained neutral, and the results are given from the communities' needs and goals mainly. Therefore, they are influenced by the knowledge of local populations, and a lack of systemic thinking would limit the final categorization. A systems-thinking consensus-search method should be developed further to deal with this lack. In any case, this work presents itself as an interest both in theory and in practice since it allows the creation of a first social cartography of the local communities, their needs, and their expectations. Moreover, since the proposed tool is a decision support (so it does not substitute the decision maker), the proposed prioritization can be used by local authorities to motivate their choices in terms of policy making, giving them a basis for decision making, but their final choice could also include what they consider as priorities (e.g., education).

To generalize those results, it is important to address the main relationships between those action lines included in the public politics, both in the given context and in possible application fields. In the context of the development of solutions for more sustainable food systems related to citrus production in the Mediterranean area (Daus 2023), a generalization of this methodology is proposed using as study case the Mediterranean area. To do this, a twofold qualitative validation assessment is carried out. A first valuation is made on the main field of the research, in Colombia. A second draw, to assess the generalization

and transferability issues of the results, is carried out in the context of an improvement project of citrus production and distribution in the Mediterranean area. In both cases, first an analysis of current secondary data on peasants needs, requirements, and current policy actions (Peña Orozco et al. 2021; Kazi Tani et al. 2022), by Yusuf (2023), is made, to state on the nature of the proposed policy guidelines (essential, enabling, or complementary). A first set of essential, enabling, and complementary policies is defined, then confirmed a second time by a set of eight experts (two from Algeria, one from Egypt, one from France, one from Spain, and three from Colombia, two of them from different regions than that of the initial research). That confirmatory assessment allowed us to define the following actions lines of the politic public as essential, enabling, and complementary.

After assessing the feedback of all eight experts and the secondary data regarding needs and requirements in rural development in the two considered regions (Colombia and the Mediterranean area), the prioritized actions of the public politic have been associated to their essential, enabling, or complementary nature, In the two regions, 21 of the 24 action lines were related to the same nature, and only 3 of them had a slight difference. This shows that the appreciation of policy strategic guidelines is quite similar in two different contexts and shows the transferability possibility of the proposed set action lines considered in the policy. After regarding the different viewpoints and flexibility of each expert, the final, agreed classification of policy actions was proposed, as stated below (Table 6). For table construction purposes, all policy actions of the same quartile are considered as equivalent in importance, the new classification shows the priorities per quartile then per nature (i.e., supposing that for each level of priority, essential policy actions will be needed at a basis, then enabling ones will increase the deployment of essential ones, and finally complementary ones can take place after deploying essential and enabling policy actions):

Table 6. The essential, enabling, and complementary nature of policies per priority quartile.

Quartile	Dimension	Strategic Line	Nature
Q4 (Low priority proposals)	Economic	Peasant economy and sustainable production	Essential
	Policy	Articulation and coordination of public–private–community institutions	Essential
	Environmental	Access, care, and management of water	Enabling
	Environmental	Conservation of ecological zones	Enabling
	Policy	Spaces for participation	Complementary
	Cultural	Farmer identity	Complementary
Q3 (Middle priority actions)	Economic	Access to and formalization of land	Essential
	Cultural	Rural-urban relationship	Essential
	Economic	Technology and productive infrastructure	Enabling
	Economic	Economic and productive alternatives for youth	Enabling
	Policy	Capacities and concerted decision making	Complementary
	Economic	Community tourism	Complementary
Q2 (Secondary set of priorities)	Social	Education	Essential
	Social	Peace and coexistence	Essential
	Policy	Promotion of leadership and youth organizations	Enabling
	Social	Mobility	Enabling
	Cultural	Dynamization of change for youth and women	Enabling
	Environmental	Environmental education	Complementary
Q1 (Main set of priorities)	Social	Preventive and curative health	Essential
	Social	Rural housing and basic sanitation	Essential
	Environmental	Land use planning	Enabling
	Social	Recreation, sports, and culture	Complementary
	Social	Community communication	Complementary
	Environmental	Risk management and climate change	Complementary

The three policy strategic lines that were slightly different in each field were *Articulation and coordination of public–private–community institutions*, seen as essential in Colombia and enabling in the Mediterranean region, *Environmental education*, seen as complementary

in Colombia (where the main issues concerning education are more related with direct competencies in farming and management) and enabling in the Mediterranean area, where the environmental issues and the energy and economical management are starting to take an important place in education), and *Promotion of leadership and youth organizations*, seen as essential in Colombia and enabling in the Mediterranean area. For environmental education, it appeared as a possible evolution (or complement) of the education strategic line (which is considered as basic), and the links to other policies remain indirect and more complementary than enabling, so it has finally been considered as complementary. In the other two cases, after an exchange with the experts, it seems that those actions have an impact on the acceleration of other action lines, so they are considered as enabling.

Table 6 shows a set of essential policy strategic guidelines considered as non-priority in Colombia. This can be explained by the fact that those policies are partially existing and their development is less important for peasants that the proposal of land access or economic growth. This appreciation is shared in the Mediterranean area, where water is a main issue: promoting the access to water and to land remains a high priority because the current accesses are not widely and fairly distributed, whereas rural housing and basic sanitation, preventive and curative health, education, and peace and coexistence are issues considered as present, at least at levels that are accepted as being more than a minimum threshold (and this in both areas). Moreover, in the Mediterranean area, the main needs of education are related to the capacitation of people in the creation of competencies that increase productivity, and the strategic line is seen as the development of basic education. Finally, this classification does not mean that complementary policy actions are not important, but shows that some policies are needed before others to ensure a continuous and robust rural development. Indeed, this assessment confirms what previous works in policy making stated: some actions lead to others, so the proposed policy strategic guidelines would be hierarchized. Figure 9 shows the hierarchy of essential policy strategic lines, as agreed by the eight experts of the two regions:
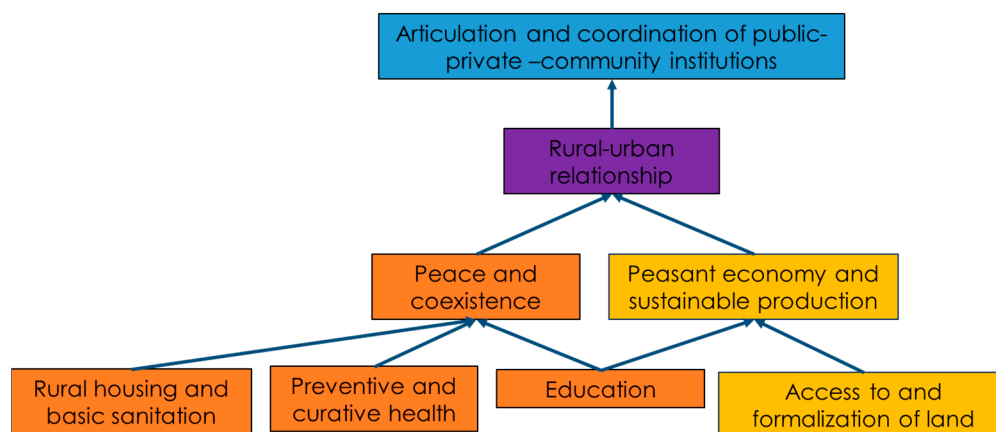
Figure 9. Hierarchization of the eight essential policy actions according to the validation assessment.

It is observed that housing and basic sanitation, health issues, education, and access to land (and its formalization) are the basis of the essential actions lines of the policy. They are required to develop others and lead to peace and coexistence (housing, health, and education) and to peasant economy (education and access to land). In other words, education is essential to develop other policies, and without minimum living and health conditions it is difficult to develop coexistence policies. Then, to develop peasant economy, access to land is mandatory, as well as education. Then, those two issues (peace and coexistence, and peasant economy and sustainable production) are required to develop policies improving urban–rural relationships (since productivity needs to be efficient and a minimum of coexistence is required to ensure good relationship conditions). Then, the last strategic line in this hierarchy is the articulation and coordination among institutions. This is not a classification of importance or priority, but a complementary vision that shows

how the development of one strategic or action line can lead to the development of others that are essential in the public policy. This hierarchy has been seen to be similar in both Colombia and the Mediterranean area, showing that the basic needs of peasants are similar and then the framework is transferrable (See Figure 10).
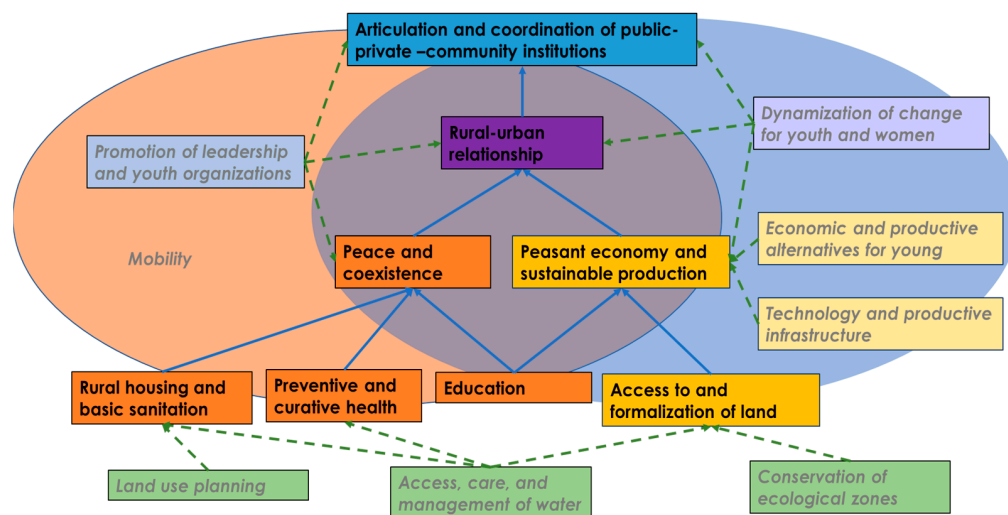
Figure 10. Inclusion of enabling policy actions in the hierarchization according to the validation assessment.

Finally, we can complement this hierarchy with enabling strategic lines. Enabling actions are not a requirement for the policy but support their development and their acceleration. We observe that three environmental strategic lines will enable the basis of essential action lines, mainly related to the good disposal of resources and their environmental quality that guarantees farming efficiency and can support an improvement of life conditions. Although the sensibility to water and ecology was higher in the Mediterranean area (for climate and cultural reasons), we observe that those issues are also present in Colombia (although a higher importance is given to technology and peace because of its historical context). The two economic enabling strategic lines (productive alternatives for young and technological and productive infrastructure) enable the peasant economy. Technology and productive infrastructure are seen in both contexts as the main economic policy strategy to pursuit, and corresponds to the needs formulated by the various experts and institutions. Then, the promotion of leadership and youth organizations, and the dynamization of change for youth and women, enable the four non-basic essential strategic lines (i.e., those in the three higher levels in the hierarchy), showing the big importance of youth and equity to sustainably develop a rural territory. Finally, two strategic lines are transversal and enable a wide set of both essential and enabling policies: mobility, which has been appointed as enabling but has a strong support in individual and collective development, and spaces for participation, which has a strong impact on cooperation, communication, and economic development, including the relationships between cities and rural areas.

Last but not least, it is important to question the role of social capital in this development strategy (Robison and Schmid 1994; Saikouk and Badraoui 2014). Indeed, social capital is essential in a company's development (Häuberer 2011) and sustains also the resilient development of territories, being a major asset in rural development (Auliah et al. 2022). To develop social capital, different actions can be carried out (Dubos 2017) from which the development of individual and collective capabilities is crucial. Education is one of the main essential policy actions, without which most of the developments will not be efficient. This has been seen as a main issue in Colombia and in the Mediterranean area, with two main categories of educational actions: the first is the basic education, for children and youth, to guarantee high school education standards and increase the number of university inscriptions in those areas; the second is a more professional, applied education, aimed at

training farmers into farming, production, logistics, and management needs that will have a direct impact on their productivity. To those, sustainable production and more generally responsible and sustainable management will be needed to have a consistent and resilient development (Irwin et al. 2023). This issue joins also the high importance of developing competencies (and leadership) among young and women, as shown in Figure 10. Indeed, this figure illustrates how a joint development of inclusive policies allows the improvement of social development, first for individuals (and families) and then for their respective communities.

6. Conclusions

In this paper, an integrated framework is proposed in order to prioritize the critical topics included in the rural development public policy. It combines a problem characterization phase, a social cartography and an AHP ABC analysis in an interactive way, implying both the rural communities and the policy makers. The proposed categorization system offers a priorities orientation. However, it is evident that there is a greater complexity to be able to address all the dimensions proposed in the public policy for integral rural development. The concurrence of efforts from the public and private sectors is necessary, in addition to the decisive participation of the rural community to advance the development of rurality.

The prioritization methodology presented in this document becomes a very helpful tool in consolidating efforts and lead the local communities to be conscious on their needs and opportunities of development, as well as helped public authorities to develop an integrated, global development policy. Moreover, it is a tool that can be generalized for group problems as addressed in this research. Finally, towards an expert consultation, its transferability has been assessed (mainly on the Mediterranean area) and a hierarchization of policies has shown the importance of considering a double key or reading (prioritization and essential/enabling/complementary nature of policies). The used methods being standard, it can be adapted to different contexts, if a guiding team ensures the rigorous and systematic deployment of the methodology. Further developments of this research see the extension of the methodology to test other multicriteria techniques (such as ANP, ELECRE III or MAMCA for multi-actor multicriteria analysis), developing a unified consensus-search technique to enhances the agreement between parties involved to support lack of knowledge of local populations at the moment of characterizing the priorities, and the application of the methodology to other contexts of rural or even urban development.

Finally, the methodology and results remain at a local level, and since different forms of administration and coordination between local and supralocal entities are sometimes needed to enhance those policies, the proposed framework should be complemented with other frameworks that emphasize such particularities, such as national–regional coordination actions, national education campaigns, or supranational planning, which will be part of a further development of the research, in the context of citrus production in the Mediterranean area.

Author Contributions: Conceptualization, D.L.P.-O. and J.G.-F.; methodology, D.L.P.-O., M.E.L.-E. and A.M.P.R.; software: A.M.P.R. and G.N.M.; validation, D.L.P.-O., M.E.L.-E. and J.G.-F.; formal analysis, M.E.L.-E. and J.G.-F.; investigation, D.L.P.-O., M.E.L.-E. and A.M.P.R.; resources, D.L.P.-O., and J.G.-F.; data curation, M.E.L.-E., A.M.P.R. and G.N.M.; writing—original draft preparation, D.L.P.-O. and J.G.-F.; writing—review and editing: D.L.P.-O., M.E.L.-E., A.M.P.R., J.G.-F. and G.N.M.; supervision, D.L.P.-O. and J.G.-F.; project administration, D.L.P.-O.; funding acquisition, D.L.P.-O. and J.G.-F. All authors have read and agreed to the published version of the manuscript.

Funding: A major part of the research (methodology, data collection and first analyses) was funded by the Regional Conciliation Commission from Colombia, in its regional development programs. Another part of the research (mainly on validation, applicability, and generalization) was funded by ImPULse (Innovation in the by-ProdUct Supply chain of citrus in the Mediterranean area), PRIMA Call 2020-Section II—Project n. 26.

Informed Consent Statement: Not applicable.

Data Availability Statement: The surveys' details (in Spanish) and the indicators' calculation are property of the Regional Conciliation Commission. However, part of the data produced in this research are available upon request to the corresponding authors.

Acknowledgments: This work would not have been possible without the commitment and determination of the Regional Conciliation Commission, which gave not only funding but also institutional and mediation support to carry out the research. The technical team is very grateful to the Agriculture Secretary in Buga-Valle del Cauca-Colombia, and its officials, who provided all their support to develop this work. Special thanks also to the leaders from the rural zone, the Municipal Council for rural development, the Public Policy Oversight Committee, the rural entrepreneurs, and all the members of the Nodes Committee, as well as the rural communities, for their participation and collaboration in the execution to this work. The authors would also like to thank the experts consulted for results validation in both Colombia and the Mediterranean area.

Conflicts of Interest: The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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