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Methodological approach for participatory formulation of agricultural technical assistance plans with territorial approach

Abordaje metodológico para formulación participativa de planes de asistencia técnica agropecuaria con enfoque territorial

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Abstract

The collective identification of needs and shared decision-making in projects' formulation for agricultural development is a process that requires the identification of participatory methodologies to promote active and reflective engagement of producers. The aim of this study was to evaluate a methodological approach for participatory formulation of technical assistance plan with territorial approach. Matrix analysis for the identification and prioritization of the most limiting technical assistance factors for milk production was performed and alternative solutions were defined, through participatory workshops with farmers. The results show the advantages of a collective reflection with stakeholders and quantitative tools reducing subjectivity in decision-making, improving participation in their own development and identifying acceptable alternatives to farmers and viable to the municipality in order to improve the lack in pasture and forage management, implementation of good agricultural practices (GAP) and rational use of agrochemicals.

Key words: Participatory approaches, rural extension, agricultural planning, milk chain.

Resumen

La identificación colectiva de necesidades y la toma conjunta de decisiones en la formulación de proyectos para el desarrollo agropecuario es un proceso que requiere la identificación de metodologías participativas para fomentar el compromiso activo y reflexivo de los productores. El objetivo de este estudio fue evaluar un abordaje metodológico para la formulación participativa de planes generales de asistencia técnica con enfoque territorial. Se realizó un análisis matricial para la identificación y priorización de los factores más limitantes en asistencia técnica para la producción de leche y se definieron las alternativas de solución, por medio de talleres participativos con los productores. Los resultados permitieron evidenciar las ventajas del proceso de reflexión colectiva por parte de la comunidad beneficiaria y de las herramientas cuantitativas, reduciendo la subjetividad en la toma de decisiones, mejorando la participación de los beneficiarios en la planificación de su propio desarrollo y la identificación de alternativas aceptables para el productor y viables en su implementación por parte del municipio para superar las deficiencias en el manejo de los suelos y de las pasturas, la implementación de buenas prácticas y el manejo racional de agroquímicos.

Palabras clave: Metodologías participativas, extensión rural, planificación agrícola, cadena láctea.

Introduction

Rural development in Latin America and in particular in Colombia, has evolved its direction towards a territorial approach. This different way of conceiving the rural development and the set of actions have allowed the reformulation of the approach towards a determined space or territory (Schejtman, 2010). It means that territory has a higher role from de location of the development processes (Molina, 2010a). therefore, the territory can be seen as a space of interactions, relationships and synergies, considering its endogenous potential, human and social capital, with resources and specific assets, economic, cultural, environmental and political aspects, among others (Benedetto, 2006; Mancano, 2010; Molina, 2010a; Moncayo, 2003). Schejtman and Berdegué (2004) raise an articulator concept of rural territorial development (RTD) as "a process of productive and institutional transformation in a given rural area, which aims to reduce rural poverty and inequality." Facing the productive is taken into account the introduction of product, process and management innovations, among others; similarly, the institutional transformation, highlight the territory by considering the particularities of the environments and regions, seeking to modify the structures of links between actors (Schejtman, 2010)

According to Molina (2010b) this territorial approach is important also for the service of agricultural technical assistance, because the current demands of globalized markets imply understanding the production problems at farm level considering it as a production unit integrated into the territory in which they are made and whose competitiveness is closely related to it. However, technical assistance has had a predominantly oriented to the production process, regardless of other aspects of the territory approach. This situation, according with Molina (2010b), can be reverted by organization of the producers and their integration with local entities, to build a long term strategic vision of the productive activity, which agrees with the priorities of the territory and that respond to their interests (Landini, 2010) and the reality of their social, environmental and institutional environment (Méndez, 2006).

In Colombia, the agricultural technical assistance is regulated by the Law 101, 1993, Law 607, 2000 and the Decree 3199, 2002 (MADR, 1993; MADR, 2000; MADR, 2002), which establishes the Municipality Council for Rural Development (CMDR) as space for coordination of policies and programs aimed at the development of rural areas and has among its functions to identify priorities and needs for agricultural development of the municipality and intervene in the management of possible solutions by the Municipal Commission of Technology and Technical Agricultural Assistance; these instances, however, have not been implemented in most municipalities in the country.

Furthermore, Colombian legislation for technical assistance, established as a planning tool to ensure coverage, quality and relevance of the service in the country, the General Technical Assistance Plan - PGAT tool that is based on the participation of the producers to identify and solve real problems, leading to increasing competitiveness, sustainability and profitability of agricultural production, in a context of local development, according to the socioeconomic and cultural conditions of the target population (MADR, 2011).

In this sense, the territorial approach of the agricultural technical assistance gives a context for the concept of participation as a process oriented so that the target population takes an active involvement in decision making related to their own local processes to think, discuss, plan, manage, implement and monitor the implementation of development (Bejar, 1980). In this sense Karl (2000) states that participation cannot be imposed, but the determination to participate must arise from a decision and a personal commitment, with provision for collective action to facilitate reflection. Meanwhile Oakley (1991) suggests the existence of three types of participation; 1) involve the community in programs or projects already defined, 2) organize the community to intervene in the definition of programs or projects and 3) allow the community to decide and act on the issues considered as essential for its development.

In this context, the participative approach for the agricultural technical assistance plans, are referred to the third type of participation defined by Oakley (1991), which means, involve the community in the decision and acting processes on the aspects that are considered essential for the development, using methodologies that allow: 1) identification of specific needs with the target population (Chambers, 1983), 2) group designing of solution alternatives to the specific problems (Landini, 2012),

3) strengthening social capital to improve the adoption of knowledge generated in the process and further consolidation of interventions, helping to gaining in community ownership to initiatives that are generated in their territories (Pérez, Maya and Farah, 2001).

Participation needs an active and commitment of the population, where the seeking aims to transform power relations between the community and institutions, but also among the community itself, to get beyond a participatory identification of needs and joint decision-making, towards a strengthening of social capital (Landini, 2012; Chambers, 1983; Silvetti, 2006).

In fact, for a most effective participation of the community is needed a convergence of common interests and commitments of the target actors, situation that, according to Boucher (2006), is only possible if there a collective action from an organized group where capabilities for relation, forms of trust, regulation sets and conflict interchange and resolving of a society in a territory are shaped (Ramos and Salcedo, 2011).

Similarly, for Salas *et al.* (2005) and Pomeón *et al.* (2006) the collective action is linked to horizontal relationships between actors and their capacity of coordination as well, that generate advantages which are difficult to achieve if the group acts isolated, it means, that at local level from a group of actors, joint strategies can be generated for greater competitiveness.

In this regard, another important territorial approach to technical assistance aspect is related to the social capital, defined as the content of certain relationships and social structures, such as attitudes of trust given in combination of behaviors of reciprocity, cooperation and networks, so that the links between people and other actors improve and interactions are strengthen, improving the organization and intervention capacity of communities (Bærenholdt and Aarsæther, 2002; Ostrom, 2000; Rueda and Muñoz, 2011; Zarazúa *et al.,* 2012), giving more benefits to whom stablished this kind of relationships, in the frame of a collective action and facilitating the efficiency through coordinated actions but, also getting benefits focused in the capacity of adoption of technological innovations by the producers and their technology transfer.

In consequence, the methodological approach to participative formulate a plan for technical assistance with territorial approach should aim to the strengthening of the social capital, because involving communities and other local actors in the plan formulation looks for achieving productive transformations, but also institutional ones, developing a trust environment among people, groups and institutions relationships and setting up a vision of rural territorial development. For this reason, the objective of this study was to evaluate the methodological approach for participatory formulation of agricultural technical assistance plans with territorial approach.

Materials and methods

Territory of study

The study was performed in the municipality of Bello, situated in the center of the Department of Antioquia, Colombia, in the subregion known as Aburra Valley. Its rural area is divided in two sectors composed of 19 territorial units known as villages, an area located at 2000 MASL is composed by the villages: La Unión, Charcoverde, Sabanalarga, La China, Cuartas, El Tambo, La Meneses, El Carmelo, Jalisco, La Palma and Buenavista and another area located between 1600 and 2000 MASL comprised the villages: Potrerito, Hato Viejo, Los Espejos, Primavera, Tierradentro, Quitasol, Granizal – Croacia. The farms visited during the study are located between 6° 18′ 29″ and 6º 25’ 57” N and between 75º 31’ 20” and 75° 37′ 12″ W. Bello contributes with 5% of the milk production in the Department of Antioquia, which is 21,900,000 l/year on an area of 14,023 ha with 447 mil producers, being the 82% small farmers with an average area of 31,3 ha and average production of 15 l/cow per day (Governorship of Antioquia, 2010).

Participatory approach

For participatory formulation of technical assistance plan a facilitator interdisciplinary team was formed, it was composed of professionals from the agricultural, livestock, environmental, forestry, social and administrative areas, who were trained in activities aimed at ensuring active community participation methodologies, settled dynamic and playful way throughout the process, starting with prior knowledge of producers and promoting group spaces for knowledge sharing and dialogue between them.

The central axis of the process was the collective reflexion for the analysis of information

and decision taking in a participative manner by using techniques of matrix analysis (Sánchez, 2003) that contribute to reduce the subjectivity in decision making and have as advantage the easiness in comprehension by the participants, low cost and less time used for implementation.

Data compilation and analysis

The first stage of the descriptive research process was the identification of the needs from the prioritization of the productive chain. To carry out this phase a structure survey was designed that was evaluated by the expertise to verify the pertinence of the questions. The sampling technique used was random, using a normal distribution with a confidence level of 95% and a maximum allowed error of 5%, where the estimated parameters *P* and *Q* adopted 50% as value since no previous studies on the target population are available. From a target population of 447 producers, the definitive size of the sample, after using the correction factor for the population finitude, was 103 producers.

The survey was applied with the voluntary participation of the producers by visits to the farms where the survey was applied to identify the technological limiting factors that were used, additionally, to get essential knowledge of the population and promote the active participation of the different members of the community.

Once the productive chain was priority, the critical factors for development of the primary level were identified. For that, six participative workshops were performed in the rural area between October – December, 2012 which included 58 producers. The call was done by personal invitation to the community leaders that are in frequent contact with the municipal administration, written invitation to the local organizations registered on the town hall databases and, through diffusion in the public educational institutions located at each village. For the workshops the used methodology included the presentation of the technical equipment and the goals of the activity, group work assisted by technical persons, socialization of the results in plenary and collective discussion to reinforce the group agreements.

To prioritize the limiting factors in the primary level of the productive chain an adaptation of the prospective structural analysis from Godet (2007), evaluating the importance of each limiting factor on the development of the productive chain and the viability of its solution in time and cost terms, using a scale from 1 to 10, where 1 is the lower level and 10 is the higher. The results were plotted on a Cartesian plane with the horizontal axis with importance and the vertical one with viability. Limiting factors to prioritize were defined as the one in the right-upper quadrant of the figure that correspond to those over the average for both parameters: importance and viability (Figure 1).

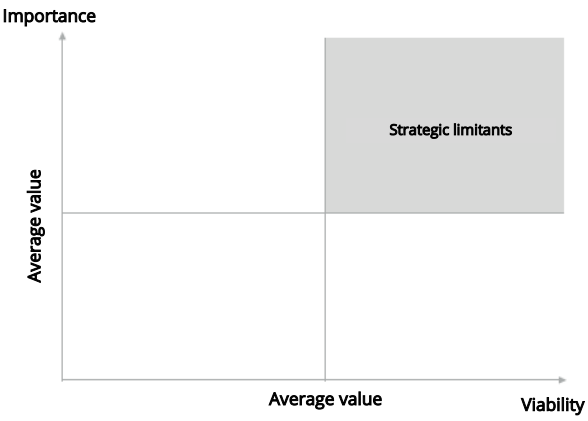

Figure 1. Matrix for identification of strategic limiting factors

The second phase consisted on the design of alternatives of solution for the prioritized limiting factors, for this an adaptation of the evaluation and evaluation matrix of the alternatives proposed by Sánchez (2003) was used, in this one the acceptability is used, it means, how attractive or acceptable is each alternative according to the social, cultural and economic conditions of the farmers and its viability in implementation in terms of time and cost. A percentage scale is used where 1 is the lowest level and 100 the highest level. The results were plotted on a Cartesian plane using acceptability in the horizontal axis and viability in the vertical axis. The alternatives were classified as bad, inadequate, deficient, good or very good according to their location in the Cartesian plane as indicated in the Figure 2. The alternatives with priority were the ones classified as good or very good ones. In this phase were also defined the goals to achieve in each limiting factor from the prioritized alternatives of solution (Figure 2).

The third phase of the process consisted on the definition of indicators and goals of the technical assistance plan by a participative workshop in the Municipal Council of Rural

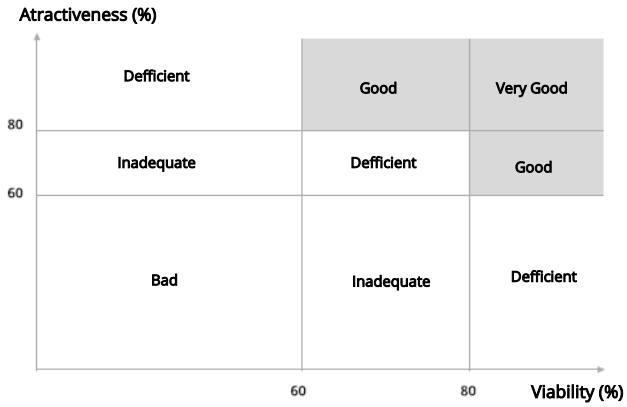

Figure 2. Matrix for prioritation of alternatives.

Development (CMDR), in which the number of target producers and expected goals were defined. This phase ended with the global revision and approval of the technical assistance plan that includes costs and program of activities. To carry on this phase a reactivation of the CMDR was done, for this, during the farm visits and participative workshops the process of forming the Council and its importance was explained to the producers, promoting their participation in it. Later, a program on training on the operability of the Council and its role on the identification of the prioritized needs for agricultural development of the municipality and the alternatives for solution together with defining the priorities for the UMATA and the follow up of its execution through the Municipal Commission of Agricultural Technical Assistance (MADR, 1993).

Results and discussion

Identification of needs

The main agricultural activity identified in the area of study was the milk production in 47.6% of the farms, followed by vegetable production in 11.7% and pork and coffee production with 9.7% each one; results that indicate that the milk production chain was the priority to formulate the PGAT.

78% of the farms dedicated to milk production is managed by its owners, 18% of producers are renters and 4% are employed by the owners of the land for productive activity. The predominant race in the area is Holstein and the most common system is the conventional rotational grazing; however, the practice of calibrating to adjust the charge capacity of the capacity and scheduling rotation periods is not used by producers.

Regarding access to services, 56% of farmers receive technical assistance, and 50% of them receive it from the Cooperative of producers from the region with a frequency of four times per year; 3% are served by the municipality occasionally. Seventy-one percent of farmers do not have access to credit and 58% of farmers surveyed do not keep records of production, 37% of farmers surveyed had not received training on their productive activity; 79% of them said to need training in good farming practices and 12% in artificial insemination.

According to the information supplied by the producers, the limiting aspects for the development of the productive chain identified were deficiencies in: implementing good livestock practices, certification of the farms as brucella free and management of records for decision making in the farm.

Based on the opinions expressed by the producers in the workshops and the findings in the farm visits, the participative workshops allowed the identification and agreement with the producers in the following aspects as the limiting factors for developing a primary level of the dairy chain in the municipality, in order of importance: (1) deficiency in producers training, (2) lack of information and communication channels among producers and with them and the municipal administration, (3) deficiency in managing and administration of the water resources, (4) limited access to technical assistance, (5) water contamination and inadequate management of the waste from the productive chain, (6) deficiency in loan offers that are accessible for the farmer, (7) deficiency in the use of soil analysis for the implementation of fertilization plans, (8) deficiency in associativity, (9) deficiencies in the technification of the productive system, (10) lack of programs with gender approach, (11) problems with commercialization, (12) deficiency in infrastructure for animal handling, (13) low percentage of farms certified for good practices and (14) high cost of inputs.

Given these results, several aspects can be highlighted, among them, the deficiency in training that was evident during the farms visits, in which it was found that 37% of the surveyed producers did not receive any training in his producing activity and 79% of them state

the need of getting training in GAP, need that agrees with the problem of low number of GAP certified farms. The workshops made evident problems in other components of the chain, different from the productive, social or environmental, like the gender approach and management of water and waste; moreover, the economic component associated with input costs was not highlighted as with high importance, although in livestock it is named as cause of the high production cost for milk.

According to the results from the prioritized limiting factors matrix, the aspects in the quadrant for strategic limiting factors that have to be prioritized to improve the primary level of the chain were: (1) deficiencies in the training of producers, (2) lack of information and communication channels among producers and with them and the municipal administration, (3) limited access to technical assistance and (4) inadequate management of the waste from the productive chain (Figure 3). These aspects are associated, mainly, with the access to information and knowledge, which evidences the need stated by the producers of having access to the public services and compulsory assistance of the municipality to the small farmers and the relevance of implementing plans of agricultural technical assistance, formulated in a participative manner.

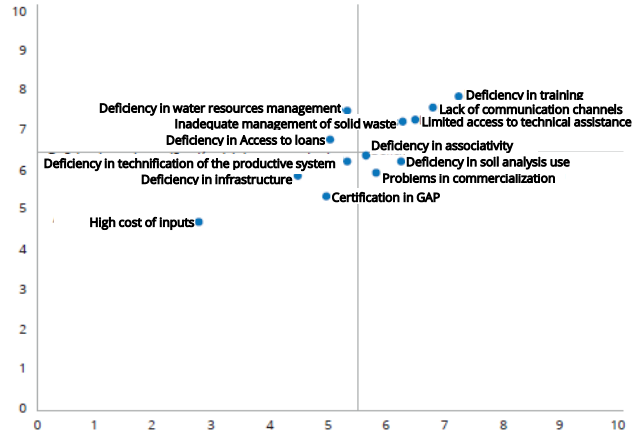

Figure 3. Matrix for priorization of limiting factors.

Design of solution alternatives

The participative workshops leave as solution alternatives to the strategic limiting factors identified, according to its acceptability degree, the following: (1) technical assistance in livestock feeding and management of pastures and forages, (2) training on soil restoring to improve productivity, (3) assistance to the producer in the implementation of GAP, (4) training in the rational use of agrochemicals, (5) implementation of information and communication systems for producers, (7) assistance in livestock breading, (8) training on the management of reproductive records, (9) training on plant sanitary and allelopathy managements and, (10) training in the implementation of friendly practices with the environment.

Based on these results and the results of the participative workshop with the technical personnel of the municipal administration, alternatives for solution were defined and an analysis for technical and economic viability to surpass the prioritized limiting factors and the acceptability of such alternatives for the producers was performed. According to the matrix results, the prioritized alternatives for solution were: (1) technical assistance in the management of pastures and forages, (2) technical training on soil management, (3) assistance to the producer for the implementation of GAP, (4) training on rational use of agrochemicals, (5) training on record managing and, (6) training on alternative sources of supplementation (Figure 4).

These results showed the advantages of the collective reflexion process by the target community and the quantitative tools as the matrix analysis (Godet, 007; Sánchez, 2003) used for the definition of the solution strategies. The conscious participation of the producers reduced the subjectivity in decision making and identification of the acceptable alternatives for

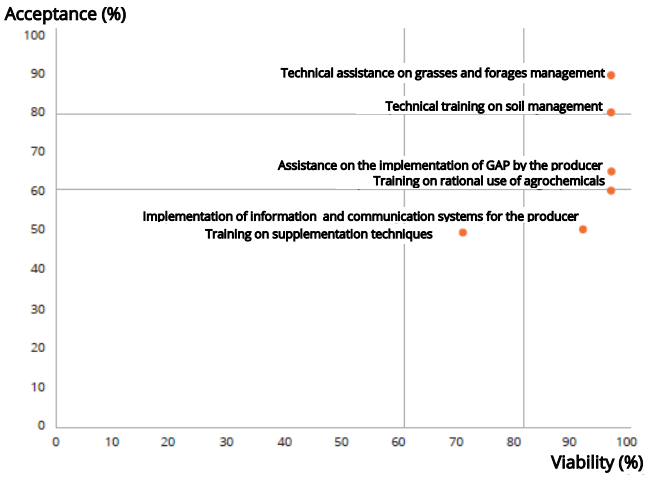

Figure 4. Matrix for prioritization of alternatives.

the producer with viable implementation by the municipality, this to solve a common problem in Colombian livestock, the poor soil and pastures management, which are fundamental for milk production and importantly affect the production cost. Moreover, the technical personnel of the municipality of Bello and the community knew in deep a method that can be used to solve future problems, as strategy for strengthening them as actors of their own developmental process (Landini, 2012).

Strengthening of the social capital

The reactivation of the CMDR as tool to strengthen the social capital allowed the development of participative workshops having representatives of the producers, of the institutions that are present in the territory and the technical personnel of the municipality, in which a total of 90 producers were defined as target population to be attended according to the budget availability for plan execution in 12 months. To implement the plan, the participative workshop with agricultural technical personnel of the municipal administration costed 30 million COL$ (15,000US$) that correspond to: (1) demonstrative plots for technical assistance in pasture and forages management (18,000,000 COL$), (2) visits to farms and field days to assist the producer in implementation of GAP (9,000,000COL$), (3) demonstration of the method to train on the rational use of agrochemicals (1,500,000COL$), (4) demonstration of the method for technical assistance in soil recovery (1,500,000 COL$).

The participatory approach towards the promotion of development of social capital, based on trust, cooperation and network work (Rueda and Muñoz, 2011) allowed the consolidation of a final scenario of process through the integration of the Municipal Council of Rural Development, as entity facilitating the participation of the different public and private entities that act in rural and local development. . This participating organism with the majority representing farmers, reduced the subjectivity in decision making, since this second scenario for collective reflexion favored the design and definition of the PGAT scope: (1) increase the productivity to 16 l/cow per day by increasing the pastures and forages production, (2) reduction of the production costs by 3% through reduction in the consumption of concentrated food as consequence of increases in the production of pastures and forages, (3) reduce the colony forming units (CFU) in 10% to get a bonus for the milk quality, (4) reduce the pasture production cost in 10% by reducing the cost of agrochemicals use.

Additionally, the instrument for tracking and monitoring was defined, an application on a spreadsheet that allows to define the goals of the plan and to introduce quarterly progress and graphically throws the percentage of completion of each goal and of the plan as a whole, with a system of alerts like traffic light, where green means more than 80% compliance, yellow 60 to 80% compliance and red less than 60% compliance. It was also defined that this process will be conducted by the Municipal Commission of Agricultural Technology and Technical Assistance to be created within the CMDR. This collective decision-making, can create conditions for the consolidation of a participation focused on strengthening social capital.

The formulation of technical assistance plan for the dairy chain municipality of Bello, addressed a methodology consistent with the stages of participation raised by the World Bank, from consultation and sharing of information with producers, in which was given importance to scientific knowledge, local knowledge, sharing of knowledge and promoting the networking (Magnani and Struffi, 2009, MARD, 2011), involving producers in making decisions for the consolidation of a plan tailored to the local needs. In addition, participatory implementation of a plan of agricultural technical assistance, promoting group knowledge sharing among stakeholders spaces, allowing the articulation of tacit knowledge of the producer with explicit knowledge, constituting a contribution to the plan on proposals solution more tailored to their socio-productive reality with greater possibilities of appropriation and adoption of technologies and changes according to the findings of Cáceres (2006).

Conclusions

The research represents a methodological approach to the technical assistance with territorial approach, inasmuch as elements which promote productive and institutional transformation articulate. The first one, through the use of tools and quantitative methods of easy comprehension, oriented to the conscious and structured participation of the farmer population in the identification of needs and alternatives for solution. The second, by means of co-

llective action processes based on cooperation and trust and, the dynamization of CMDR as instrument to strengthen the social capital.

The participatory approach of the agricultural developmental processes have been used indistinctively to denominate the processes in which the community is involved for the socialization of programs or projects already defined by an external agent, or in the best case, to intervene in the definition of their needs without involving them in the identification of alternatives of solution or in the execution, following and evaluation phases.

The results of this study show how the methodological approach used here allowed the involvement of the community in all the phases of the project, such as: diagnosis, problem prioritization, alternatives of solution, implementation and follow up to the technical assistance. The CMDR constitutes a place for participation and planning, where the farmers can participate through their major representation.

On the other hand, the methodological approach allowed the improvement of decision making in the planning of technical assistance because the proposed tools favor the collective reflexion of the farmers and the decision matrix and, contribute to the reduction of the subjectivity. Likewise, the use of graphic representations and tables, allowed participation of rural population with low educational level, making easy the perception and recognition of their own reality at the group level.

Similarly, the methodology gives practical and conceptual elements that contribute to institutional transformations in the creation of the Municipal Council of Rural Development and, through the improvement in relations among the municipality actors, taking as support the strengthening of the social capital and facilitating the insertion of rural communities in topics such planning, decision and evaluation of the technical assistance, in the frame of the current regulations.

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