


Evaluating management practices in horizontal cooperation SMEs networks: the Ecuadorian context

Avaliação das práticas de gestão em redes de pequenas e médias empresas (PME) de cooperação horizontal: contexto equatoriano

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How to cite: Rojas-Lema, X., Pumisacho, V., Alfaro-Saiz, J. J., & García, D. (2019). Evaluating management practices in horizontal cooperation SMEs networks: the Ecuadorian context. *Gestão & Produção*, 26(2), e4083. <https://doi.org/10.1590/0104-530X-4083-19>

Abstract: Small- and medium-sized enterprises (SMEs) play an important role in the economic growth of a country and of a sector. They seek to be incorporated into permanent productivity and competitiveness dynamics through a cooperation strategy. This article evaluated the application of management practices to horizontal SMEs networks of the dairy sector in Ecuador by following the constructivist methodology. The literature review and exploratory research indicated an understanding of cooperative work in the networks or Milk Collection Centers (MCCs) and identified the need to evaluate performance when applying management practices as an unavoidable element to enhance their operation and development. The construction phase took as reference a model for the evaluation of management practices in cooperation networks and contextualized it to the Ecuadorian environment. In the evaluation phase, three networks were evaluated, from which results and conclusions were obtained. The developed model identified six criteria with which the evaluations of MCCs were made, whose analysis allowed their performance level to be quantified and a proposal of some specific improvement opportunities for this sector and a group of SMEs.

Keywords: Cooperation networks; Management practices; SMEs; Performance measurement; Ecuador.

Resumo: Pequenas e médias empresas (PME) desempenham um papel importante no crescimento econômico de um país e setor; é através da estratégia de cooperação que elas procuram incorporar-se à dinâmica da produtividade e competitividade permanente. Este artigo avaliou a aplicação de práticas de gestão em redes horizontais de PME do setor de lácteos no Equador, seguindo a metodologia construtivista. A revisão da literatura e a pesquisa exploratória permitiram a compreensão do trabalho cooperativo nas redes ou Centros de Coleta (CC), assim como a identificação da necessidade de avaliar o desempenho das práticas de gestão como elemento básico para potencializar sua operação e desenvolvimento. A pesquisa toma como referência um modelo para a avaliação de práticas de gestão em redes de cooperação e contextualiza-o para a realidade equatoriana. A avaliação do nível de desempenho das práticas de gestão é feita em três redes; resultados e conclusões são apresentados. O modelo desenvolvido identifica seis critérios com os quais a avaliação dos CC é desenvolvida e cuja análise permite a quantificação do seu nível de desempenho e a proposta de oportunidades específicas de melhoria para este setor e grupo de PME.

Palavras-chave: Redes de cooperação; Práticas de gestão; Pequenas e médias empresas (PME); Avaliação do desempenho; Equador.

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1 Introduction

Change in economic landscape has brought about profound transformations in management practices, where the most flexible organizational forms gain importance if they are inclined toward market variations and they incorporate innovations more quickly (Bortolaso et al., 2013). In this scenario, small- and medium-sized enterprises (SMEs) have been identified with organizational schemes in networks or industrial groups that emerge as new market value products and associated production processes. Apart from being an exclusive commercial strategy, different cooperative work schemes are providing SMEs with new individual and collective strengthening mechanisms.

In developing countries, the highest potential for sustainable growth lies in the agroindustrial sector, where productive activities carried out by SMEs and their interorganizational relationships are probably the most important ones in food systems (Silva et al., 2013). Ecuador, in its vision for development over the next decade, has defined sectoral pillars in its industrial policy that sustain the country's economic growth; the agroindustry leads a group of prioritized sectors where, via the strategy of strengthening local chains, it seeks to facilitate the linkage of SMEs and large national enterprises in global value chains (Cimoli et al., 2017). In a set of subsectors with greater economic growth, we find high production levels of intermediate goods for national consumption and generators of employment, where dairy production stands out as one of the sectors with the highest local productive development potential (Bravo Velásquez, 2016).

Agroindustrial politics fosters the development of dairy chains by the following guidelines: development of primary production competitiveness; efficient use of the industry's installed capacity; promotion of innovation; access to the international market. In this context, production of fresh domestic milk receives an important contribution from the strata of SMEs with 22.79% (small-sized) and 19.09% (medium-sized), respectively (FAO, 2015b). Organizational relationship forms have been investigated, such as cooperativism and associativity, for the purpose of guaranteeing the capacity of response, quality and food security to clients.

These actions had a favorable impact on the quality of life of the participating business segments, which have found the mechanism to achieve the most competitive markets in cooperation networks or MCCs, and have minimized individual difficulties at the same time. MCCs contribute to milk marketing in terms of its concentration, analysis and maintenance under suitable conditions for industry (Padilla, 2017). Nevertheless, they demand specific evaluations and monitoring schemes to allow their development and they consider, at the same time, their heterogeneous reality that focuses on:

infrastructure, equipment, capacity for concentration, administration and delivery of milk. In line with this, the evaluation of cooperative management practices in MCCs provides an understanding of the internal functioning of organizational structures, and allows its level of performance and contribution to the network's integral development to be recognized. The corresponding analysis allows adaptation and improvement mechanisms to be implemented.

Bortolaso et al. (2013) points out that applying a set of analytical techniques allows the management practices undertaken by cooperative networks to be identified and analyzed. From their study in horizontal networks, an evaluation tool is derived that consists in the following criteria: strategy, coordination, leadership, network structure, processes and institutional relationships, with specific items to evaluate them all.

It is possible to think that an emphasis placed on understanding an advance made in management instruments could contribute to develop networks and to consolidate existing practices (Bortolaso et al., 2013). By taking this hypothesis as a basis, the following objectives in the present study were put forward: contextualize the model to the Ecuadorian environment and, from this point, raise the level of performance of cooperative management practices in three networks. The referred case made a theoretical effort to address a model that provides assertiveness to analyze these networks. After validating the model, field research allowed the the proposed criteria to be verified.

This article is organized into five parts, in addition to the Introduction: Section 2 describes the conducted research; Section 3 discusses the cooperation networks in SMEs of the Ecuadorian dairy sector and presents the contextualization process of the measurement model; Section 4 explains the contextualized model and the evaluation tool for cooperative networks; Section 5 offers and discusses the field research; finally, Section 6 presents the conclusions and opportunities for improvement at both the theoretical and practical levels.

2 How the research was done

Figure 1 summarizes the phases included in the research.

In Phase I, the hypothesis and study objectives were defined, which were generated from evaluating the case problems.

Phase II includes the development and validation of the contextualized model to the sector's reality, and SME networks were studied. For this purpose, in a first instance a literature review on the aspects that surround SMEs and their cooperative work was carried out to evaluate the model to be used and the selected SME sector, in addition to other information sources, which guided the study toward identifying

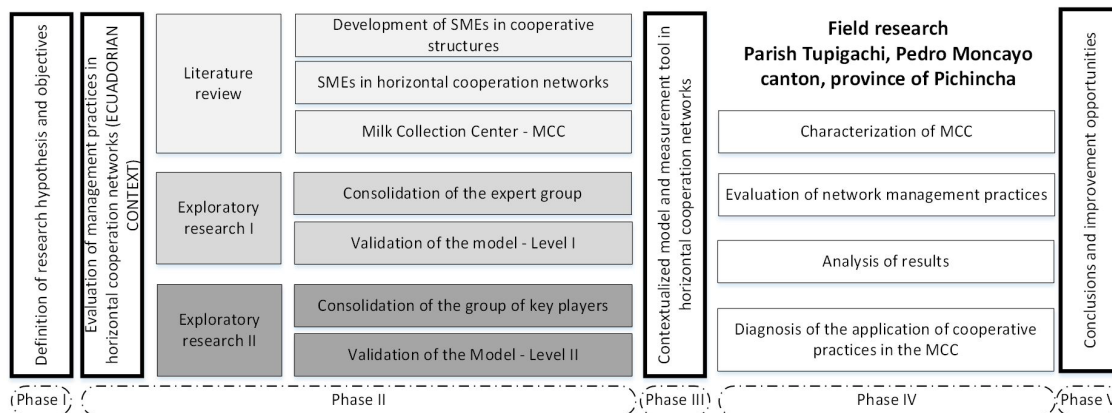


Figure 1. Research phases.

the measurement elements of the studied segment. Model validation was based on two specialized groups in the area: the first consisted in dairy sector experts from public and private productive environments, local research bodies and universities with whom the Delphi Method, which suggested: a) improving the selection of the most appropriate information sources and setting selection criteria for this purpose; b) facilitating the required efficient information transmission by improving collection techniques and seeking people to transmit information; c) developing and improving performance methodologies that integrate information and guarantee the quality of the drawn conclusions in Larrinaga & Rodríguez (2010). The second specialized group was made up of area managers who had led the horizontal association process, with whom the discussion method was used to know the current reality of their sector (Gutiérrez, 2010).

In Phase III, the reference model was established with the criteria needed to evaluate the sector's management practices. Accordingly, the evaluation tool was developed, which consisted in a questionnaire of 37 closed questions with easy-to-understand terms and three response alternatives (full compliance, partial compliance and non compliance). Numerical values were used to quantify: 5, 3 and 1, respectively.

Phase IV was undertaken through field research in three MCCs. According to Arias (1999), such research allows data to be collected directly from the reality where events take place, without any variable being manipulated or controlled. The used analysis tools were: participant observation and the questionnaire designed in a previous stage. The results obtained from the evaluation allowed us to assess the performance level of relevant management practices for networks. Each MCC was evaluated individually in which at least two network members participated. The results were analyzed at two levels, the first from an integral vision that analyzed network performance

through total effectiveness; the second was to analysis each network by evaluating the performance of five management practices.

Finally in Phase V, the study conclusions were reached and the improvement opportunities for future research in the field were determined by measuring the performance of SMEs in other sectors.

3 Evaluating management practices in SMEs' networks of horizontal cooperation: phase II

3.1 SMEs' development in cooperative structures

According to Gerolamo et al. (2008), a country's economic growth is positively associated with SMEs' work, which is substantially evidenced in developing countries. The dynamics that surround these organizations induces changes of a political, social, economic, technological and cultural kind that drive the generation of a new competitive environment for knowledge transfer and technology acquisition (European Commission, 2004; Villagrasa & Márquez, 2012). In Latin America, a high percentage of the SMEs that make up the business park are important sources of employment and significantly contribute to national production (Beverinotti et al., 2015). According to the European Commission (2004), cooperation processes have been developed, as revealed through the formation of mainly stable and societal relationships, motivated by a common culture or social basis, be it mostly of an informal nature.

Empirical evidence indicates that the countries which have achieved high levels of development are those that have made a structural change to diversify their productive actions toward modern economic activities with higher added value. In this environment, the development and promotion of food value chains obey the impulse of two interrelated elements; on the

one hand, the nature of final consumer markets and, on the other hand, the globalization process that surrounds these systems with economic, social and environmental dimensions. This reality refers to the collective participation of different stakeholders in the chain, located in four basic functions (links or phases): production, grouping, processing and distribution (wholesale and retail) (FAO, 2015a).

From the inclusive business model perspective, SMEs' participation through cooperative or partnership actions allows chain links to be strengthened, especially the production chain, where concepts such as "chains of networks" identify the already recognized horizontal links (networks) between groups of producers to formalize the supply of chain, and to thus guarantee its sustainability and importance at national and international levels (FAO, 2015a).

3.2 SMEs in horizontal cooperation networks

In developing countries, although SMEs have generally operated informally by incurring high transaction costs and suffering lack of scale, they represent most of the business group and, consequently, a significant participation of the total added value in priority sectors (Gerolamo et al., 2008; Silva et al., 2013). This supports the global trend of promoting the development of these organizations in strategic sectors by shaping the new business structure such as: regional blocks and cooperation networks (Olave & Amato, 2001; Magalhães et al., 2009); industrial districts (Schmitz & Musyck, 1994); the industrial cluster (Porter, 1998); the production system and innovative location (Cassiolato & Lastres, 2003); the local production arrangement (Santos & Guarneri, 2000; Cassiolato & Lastres, 2003; Galdámez et al., 2009).

Business cooperation networks are groups of enterprises from the same sector (or perform related activities) and from the same location which are more or less formally associated to meet a shared objective (Dini et al., 2007). The most relevant aspects of such collective action are the following:

- Membership with a business network is defined according to the rules set by the network itself (governance). The existence of common objectives, clear rules and sanctions, participation in decisions, communication among members are, among others, elements that contribute to the success of these configurations (Tálamo & Carvalho, 2010; Barcellos et al., 2012; Bortolaso et al., 2013);
- The collective actions undertaken by these organizations are designed and carried out to

generate competitive advantages for the exclusive benefit of member enterprises (Klein & Pereira, 2014; Alderete, 2015; De Rolt et al., 2017);

- The management body is constituted by beneficiary enterprises or their representatives (Tálamo & Carvalho, 2010).

Through horizontal network configurations, SMEs gain strategic advantages, such as better greater information and knowledge exchanges between enterprises, greater participation in product sales at fairs, lobbying, improvements to business processes, price negotiations with suppliers, joint marketing (Machado de Magalhães et al., 2009), sustainability (Barcellos et al., 2012), reducing market power differences, cuts in transaction costs and acting as a platform to overcome the barrier of limited resources to comply with global rules competition (Balestrin & Vargas, 2004; Machado Padilha, et al., 2012; FAO, 2015a).

3.2.1 SMEs' management in horizontal cooperation networks

The main argument for the formation of cooperation networks is the possibility of gains by collecting attributes from the involved stakeholders, arranged as a single structure that allows adaptation to a competitive environment from a collective vision (De Rolt et al., 2017). The horizontal cooperation networks established by SMEs are characterized by their collectively conceived strategy, a physical and financial structure that subsidizes the network's management, an institutional relationship that focuses on permanent interaction with stakeholders and, finally, processes which add value through a set of activities that take place in them (Bortolaso et al., 2013).

The management of these networks includes processes and practices carried out by a group of people focusing on managing efficiently in the interorganizational entity and on locating resources to achieve goals. It also includes significant changes in management practices and functions compared to those used in hierarchical organizations (Wegner et al., 2016). "For SMEs the adoption of advanced management practices in main business processes is key to improve their performance and competitiveness" (Ates et al., 2013, p. 29).

In line with this, and considering that these structures concentrate on increasing the competence of its members and on seeking market consolidation, the evaluation of the results in practices and functions which have adopted the demands of specific evaluation mechanisms that consider the existence of a context in which the individuality (trust and cooperation) of organizations co-exists with the collectivity of

relationships (development environment) (Castro et al., 2011; Reis & Amato, 2012; De Rolt et al., 2017).

Following (Matta, 2012), collective alliances based on the cooperation phenomenon combine characteristics such as: degree of knowledge and communication, collective action in both quantity and intensity terms (commitment), action results in economic efficiency and effectiveness terms, among others.

The network's performance evaluation or maturity reflects the levels of the network's conscious management (De Rolt et al., 2017), which highlights prominent business activities in the network (Naudé et al., 2014), while also pointing out elements of the diminished response that limit the network's joint operation to obtain sustainable and consistent long-term results (Ates et al., 2013).

3.2.2 Evaluating cooperative management practices

The study by Bortolaso et al. (2013) includes six distinctive management practices of horizontal networks made up of SMEs. Table 1 presents the proposal to evaluate and compare management practices in a cooperation network environment. The model identifies six characteristics or specific management criteria, as well as 13 items for a specific analysis. This tool is presented as a contribution to support instruments toward the growth and consolidation of horizontal cooperation networks. According to this model's theoretical basis, the present research applied the suggestions made by those authors, where "[...] the effective application of the model in networks is recommended to contribute to generate benchmarking of the best practices" (Bortolaso et al., 2013, p. 15) and develops a contextualization and model application in the cooperative networks of Ecuadorian SMEs in the dairy sector.

- The **strategy** at the horizontal network level is no longer an individual practice conceived as the collective way to achieve common objectives, which provides support to make comprehensive decisions (Barcellos et al., 2012; Bortolaso et al., 2013; Alderete, 2015);
- **Coordination** and cooperation between the network's enterprises reduce uncertainty and risks (Machado de Magalhães et al., 2009);
- Through **Leadership**, network growth is promoted (Bortolaso et al., 2013) for not only internal expansion or to include new members, but also for the vision toward new innovation and development paths;
- The existence of a physical and financial **structure** allows resources to become available for the administration of network operations (Martins et al., 2015), while it promotes the association of participants (Gerolamo et al., 2008) in a trusted environment which, in turn, promotes the structure's performance (FAO, 2015a);
- The **Process** gathers the set of activities carried out to transform input into output with the corresponding added value (Bortolaso et al., 2013), as well as the processes performed to direct the network's operation (Wegner et al., 2016);
- **Institutional Relationships** formalize the interaction with stakeholders, and establish links with suppliers, partners, government and educational entities (Bortolaso et al., 2013; Martins et al., 2015).

Table 1. Model for evaluating management practices in horizontal cooperation networks.

	Criteria	Specific items
1	Strategy	Formal strategic planning of the network Aligning of the enterprise strategy with the network strategy
2	Coordination	Coordination structure
3	Leadership	Leadership system
4	Structure of the network	Available resources Financial independence of the network
5	Processes	Internal communication process Administrative-financial process Negotiation process Expansion processes Marketing processes
6	Institutional relationships	Internal relationships External relationships

Source: Bortolaso et al. (2013).

3.3 Horizontal cooperation networks: Milk Collection Centers (MCCs)

Based on the study carried out by the Vice-Presidency of the Republic of Ecuador in 2015 to draw up the National Strategy for the Change of Productive Matrix (ENCMP), the improvement to systemic competitiveness was identified as a basic component to promote and develop productive linkages. Insertion into accelerated competitive environment demands selecting and targeting productive chains as a nucleus to develop industrial policies that generate a structural change in the country.

The production chains approach seeks to solve common problems for all the economic stakeholders involved by generating favorable conditions to perform production activity, and for its innovation and development. The chaining process seeks to be highly participatory and inclusive, and includes the social and economic groups that operate in each territory; large, medium and small producers, popular and solidary economy, indigenous and peasant communities, government agents and the university community.

For SMEs, production shaping helps overcome the barriers that surround productivity, innovation and access to markets (Padilla, 2017), and its correct identification and categorization allows the stimulation of support and intervention actions for inclusion in value chains with national and international presence. Table 2 presents the location of Ecuadorian enterprises according to their size by obeying the criteria of annual total sales, annual exported amount, value of total assets and number of workers, as references for the right location (Urmeneta, 2016).

Several joint work mechanisms have been used by different sectors and enterprises to raise their level of competitiveness with time. The dairy sector, and mainly dairy production in Ecuador, has undergone several productive transformations, such as that promoted by the Association of Livestock Farmers of the Sierra and Amazon regions, which promoted milk production in a rural sector via the operation of the first MCCs in the 2013, which started by delivering cold tanks in the Cayambe canton to five communities in line with the community cooperativism profile. The purpose of consolidating local milk supply networks was to strengthen local production and to

address more competitive markets through better quality conditions and responsiveness.

Given the major contributions that MCCs have made to the country’s dairy industry, the figure of collection centers has been implemented into eight provinces, with 52 MCCs located in the two regions (AGSO, 2016). MCCs have shown increased storage capacity, to the extent that the coordination of large processing industries with these networks on a daily basis ensures that raw material is supplied (Berríos et al., 2002).

3.4 Exploratory research: levels I and II

The validation process at its Level I used by the Delphy method for the first level was defined as the number of participants of the expert group based on the Rand Corporation (Astigarraga, 2003), which stipulates that according to the seven experts, the error in the answers diminished considerably for each added member. Accordingly, the group was consolidated with eight experts in the area. The group was made up of professionals related to the area through activities, such as quality control, executive management and R&D of important national and international dairies, researchers and academics from specialized centers in the product quality assurance field.

The first approach with experts was done by telephone where, after providing a detailed explanation of the research objective and the importance of their intervention in the process, they confirmed their participation. On June 15 2016, a questionnaire with 14 closed questions that addressed the criteria and the items proposed in the model was sent to each participant. The results of this first evaluation were tabulated and analyzed, which gave rise to a second evaluation round as unanimity in the answers to certain questions was lacking (June 21 2016). This second survey had 27 questions which placed a greater emphasis on those items with a wider diversity of responses.

The SurveyMonkey web tool was used to validate the information and to tabulate responses. The Level II validation was used by three MCC members, who acted as the President, Vice-President, treasurer, or were members. Together in this group, the model that

Table 2. Criteria for establishing the size of Ecuadorian enterprises.

	Annual total sales (USD)		Annual exported amount (USD)		Value of total assets (USD)		N° workers	
	Since	Until	Since	Until	Since	Until	Since	Until
Big	5000001	-	n.i	n.i	4000000	-	200	-
Medium	1000001	5000000	n.i	n.i	750001	3999999	50	199
Small	100001	1000000	n.i	n.i	100001	750000	10	49
Micro	1	100000	n.i	n.i	-	100000	1	9

n.i = no information. Source: Urmeneta (2016).

resulted from the Level I validation was collated, through which relevant aspects of the sector's current reality were analyzed by the discussion method (Gutiérrez, 2010). The used tool was a semi-open questionnaire. This stage was carried out in two sessions (August 4 and 16 2016) and the obtained information allowed consensual conclusions to be generated to define the contextualized model for the studied networks.

4 Contextualized model and evaluation tool for cooperative networks: phase III

After the process to validate the reference model according to the judgments of experts and leading users, criteria of strategy, processes and institutional relationships were identified as benchmarks to evaluate these networks. Coordination and leadership we combined in a single criterion that addressed the actions taken by the leader or representative chosen by network members, where trust was the characteristic that prevailed in the network.

The resources criterion was incorporated into the model as that which included the main elements to be managed both inside and outside the network. According to the validation group, it was too early to include the network structure in the evaluation criteria set because its actions currently concentrated on consolidation and permanence. Table 3 summarizes the results of the validation process.

For the experts and key stakeholder, the network's **Strategy** took cooperation among partners as a reference from which the exchange of knowledge and experiences occurred, which allowed daily difficulties to be solved in a more timely manner; technology exchange moved toward improving the process and product quality. Integrated strategic planning contributed to generate work plans and contingency

to respond to customer requirements. Finally, image and reputation determined the cooperative network's credibility based on the perceptions that customers have of the organization and its members (Human & Provan, 1997). These were the results of the balance struck between the decisions made and the actions taken by the organization (Carrillo et al., 2008). With this parameter, networks sought to consolidate their operation on the market by taking care of their customers' quality and response capacity aspects.

Through the **Resources** criterion, the financial, physical and human elements needed to undertake the network activities were combined. Resources management preceded the definition of action plans toward different structure and flexibility levels, which the network intended to include to reach new markets and to seek consolidated operations.

Starting from the agroindustrial sector to which the networks belonged, and their location in the value chain, the innovation, manufacturing and economic/financial **processes** were identified as being key. Through fresh milk production, networks supplied raw materials to large processing industries, which defined specific guidelines for volume and quality. At the same time, innovation within the network boosted the actions that promoted the search for new markets and the integration of more members to make way for product diversification. These two operational axes were leveraged by the financial process, which is the guardian for network sustenance.

Institutional Relationships concentrated on those triggered by external public and private entities (the stakeholders linked to networks' growth), and technology transfer and institutional strengthening were generated through established links. For the networks, the support provided by being organizations allowed them to identify not only potential markets, but also the sustainability of their productive activity.

Table 3. Contextualized model.

	Criteria	Specific items
1	Strategy	Transfer of information, knowledge, technology, and experience Development of network strategic plan Image and reputation
2	Resources	Financial resources Physical resources Human capital resources
3	Processes	Innovation Manufacture Economic / Financial
4	Institutional relationships	Relationship with public entities Relationship with private entities Strengthening trust
5	Coordination and Leadership	Macroculture Restrictions Specialized education

In **Coordination and Leadership** terms, the network identified two factors that promoted development; on the one hand, trust which positively influenced the interactions among groups (Vázquez-Valencia & Aguilar-Benítez, 2010), to which the macro-culture must be added that involved the relationship between the organizational culture generated by collaborative activities; on the other hand, the influence of society’s values and the industrial environment where activities are carried out (Jones et al., 1997). From the assessment, internal constraints and educational level are identified as elements that limit their performance as a result of the characteristics of a production environment shaped fundamentally by family economy. In this space, the internal policies and regulations established in the network formalized the guidelines that directed their work.

5 Fieldwork results: phase IV

The fieldwork included the participation of three MCCs: the Agricultural Association for Development of San Pablito - AAPEDSPA (MCC1); the Association of livestock production El Lecherito - ASOPROGALECH (MCC2); the Association of Women JATUN ÑAN (MCC3). They are organized by associations that dedicated to the produce fresh milk in the Pichincha province, the Pedro Moncayo canton and Tupigachi, with suitable physical spaces to collect the product.

The study was supported by the following public and private entities: Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP), Decentralized Autonomous Government of the Pedro Moncayo Canton, Cooperation for Training Foundation and Technical Assistance in Organic Agriculture (COAGRO), and two universities in the country.

Table 4 presents information about the number of partners, number of clients, daily production,

production costs and sales price, which allowed the initial MCC characterization to be made.

Considering the number of workers per enterprise (Urmeneta, 2016), the study networks were included in the small business segment with a very limited number of clients. The daily production depended on the number of associates, but not on the production costs of the equipment and facilities adapted for the cold storage of products, which gave similar values as they shared the same operating conditions. The sales price agreed with customers showed the negotiation power and strategy of each network, although it was supervised by the regulatory agency’s rules. MCC1 obtained the best price for its product *versus* networks 2 and 3 (network 1 had the best price for its product) with a difference of 0.015 USD/L and 0.01 USD/L, respectively.

The financial management results within networks were designed for the solvency and dynamism of joint actions; the financial requirement promoted by each network showed its partners’ level of cooperation and integration toward expansion and development plans. The economic contributions for such management were 0.01 USD/L for MCC1, 0.005 USD/L for MCC2 and 0.04 USD/L for MCC3, respectively.

The evaluation process gave an accumulated score per criterion and network, which allowed the analysis of performance in total effectiveness terms. These results are presented in Table 5.

MCC1 demonstrated 77% efficiency in compliance with cooperative management practices, which was the highest value compared to the other two networks, followed by MCC2 and MCC 3 with 65% and 59%, respectively.

By means of individual analyses, it was possible to better distinguish these criteria developed in each network, as well as those that need improvement

Table 4. MCCs characterization.

Cooperative networks	Nº Associates	Nº Customers	Production L/day	Production cost (USD/L)	Sale price MCC (USD/L)	Sale price - associate (USD/L)
MCC1	38	2	1200	0.35-0.38	0.45	0.44
MCC 2	43	2	1300	0.35-0.38	0.435	0.43
MCC3	27	1	900	0.35-0.38	0.44	0.40

Table 5. Evaluation of cooperative management practices in MCCs.

Criteria	MCC1	MCC2	MCC3	Maximum rating
Strategy	26	16	14	30
Resources	43	29	35	45
Processes	33	35	25	55
Institutional relationships	24	24	24	30
Coordination and Leadership	17	17	11	25
TOTAL	143	121	109	185
Efficacy	77%	65%	59%	100%

and demand the incorporation of specific actions to enhance performance. In Figure 2a, b and c these networks results are presented for MCC1, MCC2 and MCC3, respectively.

5.1 Results and discussion

In (a), the performance levels achieved by each network criterion ranged between 60% and 96%, which better performance levels toward the strategy and resources criteria with values of 87% and 96%, respectively. Complementary actions evidence this at the agricultural level that the network has developed to enlarge its products/customers portfolio, based on both a strategic plan abenefits to transfer information, knowledge and experience, which motivated and solved the concerns raised in the network. With actions that guarantee quality products and processes, the network sought to strengthen its image and reputation that its customers perceived. Physical, financial and human resources covered the network operation needs, although the importance of expanding the network with more members to support product supply stood out. The institutional relationships criterion achieved an 80% performance

level, which evidenced the consolidation of links between public and private institutions, which have led to projects being undertaken to improve the network. Along the same lines, relations with customers and suppliers remained within the group of improvement actions, and also as priorities to be made.

The coordination and leadership criterion achieved a 68% performance level, which helped identify actions that strengthened the group’s confidence and communication, such as a space created for sharing experiences related to cattle breeding, milk production, as well as actions that guarantee food security, which have favored the development of partners who reported a lower level of education. However, it will be necessary to include guidelines to formalize the inclusion of new members and undertaking activities internally. Through the process criteria, 60% efficiency was determined, and although the manufacturing process was fully established, its formalization remains latent through a manual that includes policies, procedures and maps. Innovation by developing new products is a motivating aspect

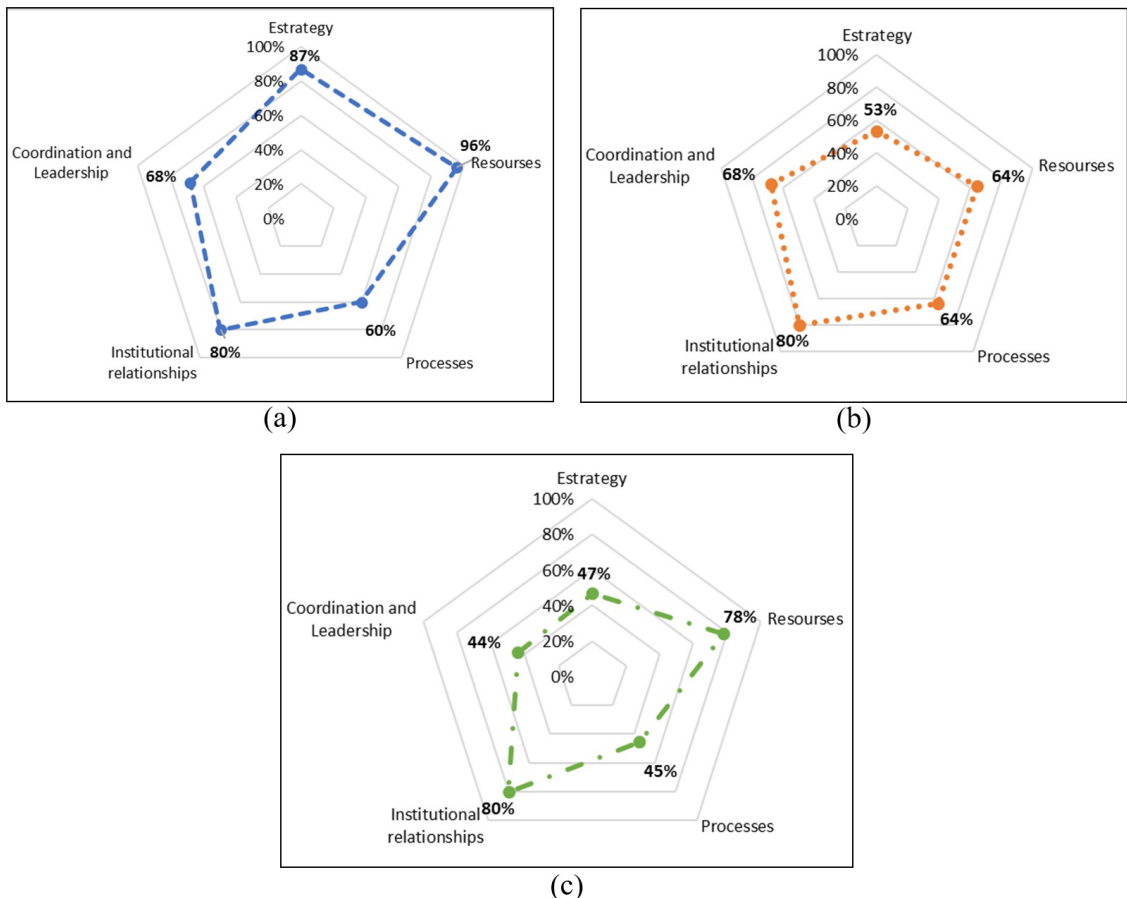


Figure 2. Panel of the evaluation results to apply cooperative practices: (a) MCC1; (b) MCC2; (c) MCC3.

for the network, but its development level is still in an incipient stage.

In (b), the performance level of the criteria fell between 53% and 80%, with strategy starting from the lowest level through resources and processes, coordination and leadership and institutional relationships. With an 80% performance level for the institutional relationships criterion, both MCC2 and MCC1 focused their efforts on generating links with public and private institutions, which allowed multidisciplinary projects to be undertaken with emphasis placed on strengthening knowledge and productive activity skills, despite the need to develop strategies to strengthen relationships with customers and suppliers also being identified. The coordination and leadership criterion achieved 68% efficiency and, despite being reinforced by spaces for information and socialization of ideas, it still requires actions that trigger the network growth to be formalized by increasing the number of partners and their level of education. The processes and resources criterion reflect 64% efficiency, which indicates, on the one hand, the need to emphasize actions to improve resources management and, on the other hand, is the lowest result compared with the other networks. For processes management, the need to include documentation on maps, measurement mechanisms and the formalization of activities for the formal milk storage process was evidenced. Finally, lack of mission, vision and business objectives was evidenced, which limited drawing up long-term plans.

In (c), the performance levels reached by the networks ranged between 44% and 80%, which left coordination and leadership, processes and strategy at the lowest levels with 44%, 45% and 47%, respectively. At a strategic level, the network had difficulties when considering its business objectives, and its business mission and vision were not established, although there was awareness of the relevance of these guidelines, and activities focused on formalizing operations with only their customers.

Coordination and leadership obtained 44% compliance, aspects related to values and principles that are still to be established, as well as work and improvement guidelines for members and new members. The process criterion reached 45% with activities that concentrate in manufacturing and the economic performance of production, which left some space for innovative product or process schemes.

Regarding the resource criterion, the network has shown special interest in adapting its facilities so as to comply with standards that guarantee food product safety; for this purpose, and given the awareness of the economic investment required, it came over as the network with the highest economic remuneration for collective storage activities by members; other

networks pointed out the importance of horizontal growth with more members that would contribute to product volume. Regarding institutional relationships and other networks, strong links were identified with public and private organizations that trigger business development projects, as were limited actions to promote strategic alliances with customers and suppliers.

6 Conclusions

- The study confirmed the need to contextualize the model proposed by Bortolaso et al. (2013) after the validation stages identified the strategy criteria, resources, processes, institutional relationships and coordination and leadership as being the correct criteria to evaluate the performance level of MCCs;
- The evaluation of management practices in the MMCs indicated big differences in networks management; the results of the efficiency levels identified MCC1 as the best performing network with 77%, followed by MCC2 with 65%, and finally by MCC3 with 59%;
- The level of performance achieved by the institutional relationships criterion in the three networks was 80%, which represented the horizontal actions generated from public and private institutions to develop these networks that form part of the national and provincial strategic plan for the productive development of prioritized value chains;
- In the networks, the need for process criteria strengthening was identified. The results pointed out a concentration of activities at an operational level, which left aside the tactical and strategic levels;
- From the evaluation of the resources criterion, the manifest need of networks to incorporate more members to allow the network to expand was evidenced; this action was seen as strategic as it will allow better financial support for networks through the economic participation of new members and, moreover, a better response capacity for customer demands;
- The actions taken from a basis of trust and cooperation allowed coordination and leadership practices to be developed in the network, which concentrated in the representatives chosen by popular vote;

- The systematic process undertaken with the model's validation and contextualization, and its application, allowed real performance results to be achieved that can be used in the next improvement stage;
- Despite the fact that using information technologies was not considered a key element to develop cooperative practices, experts and key actors emphasized the importance of incorporating them at the development levels that included a more complex networks structure;
- The study found that small producers and businessmen (network members) faced similar problems, which limited their development and integration into more competitive value chains. Among the needs, they indicated lack of access to quality inputs, technological development, insipient financial support, and also limited knowledge about the market and its commercial potential;
- The study demonstrated the need to evaluate other networks in the sector to reinforce the effectiveness of the diagnosis and to formalize improvement and sustained development strategies toward scope and effectiveness;
- One critical identified aspect was the importance of having a relevant tool to assess the reality of the studied networks, which identified the need to address mechanisms and frameworks that consider the characteristics, factors and limitations of this and other priority sectors for the country's productive development;
- The management practices evaluation at the cooperative level showed that the business environment surrounding these SMEs networks was dynamic, and was influenced by the consolidation of globalization, customer primacy, creativity, innovation and intense competition that permanently affected the performance of the formed structures. This information can guide researchers and other stakeholders, as well as government institutions, universities, research centers and private sectors, to combine their efforts toward constructing an integral and relevant performance measurement system that not only contemplates the seasonal evaluation of operations, but also includes control and monitoring mechanisms to lead to integrated plans with improvement actions.

References

- Alderete, M. V. (2015). Redes de pymes: una visión desde las teorías de club y de equipo. *Revista de Economía Institucional*, 17(32), 317-348. <http://dx.doi.org/10.18601/01245996.v17n32.11>.
- Arias, F. G. (1999). *El proyecto de investigación: guía para su elaboración* (3ra ed.). Caracas: Episteme.
- Asociacion de Ganaderos de la Sierra y Oriente – AGSO. (2016). *Centros de acopio*. Retrieved in 2016, July 26, from <http://agsosite.com/centros-de-acopio/>
- Astigarraga, E. (2003). *El método Delphi*. San Sebastián: Universidad de Deusto. Retrieved in 2016, July 26, from http://www.unalmed.edu.co/~poboyca/documentos/documentos1/documentos-Juan%20Diego/Plnaifi_Cuencas_Pregado/Sept_29/Metodo_delphi.pdf
- Ates, A., Garengo, P., Cocca, P., & Bititci, U. (2013). The development of SME managerial practice for effective performance management. *Journal of Small Business and Enterprise Development*, 20(1), 28-54. <http://dx.doi.org/10.1108/14626001311298402>.
- Balestrin, A., & Vargas, L. M. (2004). The strategic dimension of the horizontal networks of SMOs: theorizations and evidences. *Revista de Administração Contemporânea*, 8, 203-227. <http://dx.doi.org/10.1590/S1415-65552004000500011>.
- Barcellos, P., Borella, M., Peretti, J., & Galelli, A. (2012). Insucesso em redes de cooperação: estudo multicaseos. *Revista de Gestão dos Países de Língua Portuguesa*, 11(4), 49-57.
- Berrios, L., Ayca, J., Leguizamón, F., & Umaña, V. (2002). *Barreras a la competitividad y respuestas de pequeños productores rurales en Nicaragua*. Nicaragua: CLACDS. Retrieved in 2016, July 26, from <http://www.bio-nica.info/biblioteca/Berrios2002ProductoresRurales.pdf>
- Beverinotti, J., Coj-Sam, J., & Solís, G. (2015). *Dualidad productiva y espacio de crecimiento para las Pymes en Costa Rica*. México: BID. <http://dx.doi.org/10.18235/0000133>.
- Bortoloso, I. V., Verschoore, J. R., & Antunes, J. (2013). Práticas de gestão de redes de cooperação horizontais: proposição de um modelo de análise. *Contabilidade, Gestão e Governança*, 16(3), 35. Retrieved in 2016, July 26, from <https://cgg-amg.unb.br/index.php/contabil/article/view/543>
- Bravo Velásquez, E. (2016). *La regulación empresarial en la producción de alimentos: impactos en la vida campesina* (1ra ed.). Quito: Universidad Politécnica Salesiana.
- Carrillo, M. V., Castillo, A., & Tato, J. L. (2008). El “valor” de lo intangible: la gestión de la reputación corporativa: el caso de la marca “Telefónica”. In *Actas do 5º Congresso da SOPCOM: Comunicação e Cidadania* (pp. 317-327). Portugal: Associação Portuguesa de Ciências da Comunicação.

- Cassiolato, J. E., & Lastres, H. M. (2003). O foco em arranjos produtivos e inovativos locais de micro e pequenas empresas. In J. E. Cassiolato, H. M. M. Lastres & M. L. Maciel (Eds.), *Pequena empresa: cooperação e desenvolvimento local*. Rio de Janeiro: Relume Dumará. Retrieved in 2016, July 26, from http://www.concepcaoconcursos.com.br/images/upload/file/SEBRAE_SE%202014/Refer%C3%Aancia%20Bibliogr%C3%A1fica%20do%20SEBRAE_SE/Cassiolato,%20Arranjos%20e%20Sistemas%20Produtivos%20e%20Inovativos%20Locais.pdf
- Castro, M., Bulgacov, S., & Hoffmann, V. E. (2011). Interorganizational relationships and results: a study in a network of horizontal cooperation of the central region of Paraná. *Revista de Administração Contemporânea*, 15(1), 25-46. <http://dx.doi.org/10.1590/S1415-6552011000100003>.
- Cimoli, M., Castillo, M., Porcile, G., & Stumpo, G. (2017). *Políticas industriales y tecnológicas en América Latina*. Santiago: CEPAL.
- De Rolt, C. R., Dias, J., & Peña, F. (2017). Análise de redes como ferramenta de gestão para empreendimentos interorganizacionais. *Gestão & Produção*, 24(2), 266-278. <http://dx.doi.org/10.1590/0104-530x1885-16>.
- Dini, M., Ferraro, C. A., & Gasaly, C. (2007). *Pymes y articulación productiva: resultados y lecciones a partir de experiencias en América Latina*. Santiago de Chile: Naciones Unidas, CEPAL, Unidad de Desarrollo Industrial y Tecnológico.
- European Commission. European Network for SME Research. (2004). *SMEs and co-operation*. Luxembourg: Office for Official Publications of the European Communities.
- Galdámez, E. V. C., Carpinetti, L. C. R., & Gerolamo, M. C. (2009). Proposta de um sistema de avaliação do desempenho para arranjos produtivos locais. *Gestão & Produção*, 16(1), 133-151. <http://dx.doi.org/10.1590/S0104-530X2009000100013>.
- Gerolamo, M. C., Carpinetti, L. C. R., Fleschutz, T., & Seliger, G. (2008). Clusters e redes de cooperação de pequenas e médias empresas: observatório europeu, caso alemão e contribuições ao caso brasileiro. *Gestão & Produção*, 15(2), 351-365. <http://dx.doi.org/10.1590/S0104-530X2008000200011>.
- Gutiérrez, B. (2010). *Introducción a los métodos cualitativos: el grupo de discusión*. Barcelona: Universidad Politécnica de Catalunya. Retrieved in 2016, July 26, from <http://upcommons.upc.edu/handle/2117/12384>
- Human, S., & Provan, K. (1997). An emergent theory of structure and outcomes in small-firm strategic manufacturing networks. *Academy of Management Journal*, 40(2), 368-403. <http://dx.doi.org/10.2307/256887>.
- Jones, C., Hesterly, W. S., & Borgatti, S. P. (1997). A general theory of network governance: exchange conditions and social mechanisms. *Academy of Management Review*, 22(4), 911-945. <http://dx.doi.org/10.5465/amr.1997.9711022109>.
- Klein, L. L., & Pereira, B. A. D. (2014). Contributions to the interorganizational network management: determinant factors to lead partner companies to exit. *Revista Eletrônica de Administração*, 20(2), 305-340. <http://dx.doi.org/10.1590/1413-2311068201239395>.
- Larrinaga, O. V., & Rodríguez, J. L. (2010). El estudio de casos como metodología de investigación científica en dirección y economía de la empresa: una aplicación a la internacionalización. *European Research on Management and Business Economics*, 16(3), 31.
- Machado de Magalhães, J., Daudt, C. G., & Ross Phonlor, P. (2009). Vantagens proporcionadas às pequenas e médias empresas por meio da união em redes de cooperação no contexto do venture capital. *Revista de Administração Contemporânea*, 13(4), 583-603.
- Machado Padilha, A. C., Gallon, C., & De Mattos, P. (2012). Fatores condicionantes da implementação de estratégias competitivas e cooperativas: o caso das indústrias de joias de Guaporé-RS. *Revista Ibero-Americana de Estratégia*, 11(2), 34-69. <http://dx.doi.org/10.5585/riac.v11i2.1726>.
- Magalhães, J. M., Daudt, C. G., & Phonlor, P. R. (2009). Advantages provided to small and medium-sized enterprises through cooperation networking in the context of venture capital. *Revista de Administração Contemporânea*, 13(4), 583-603. <http://dx.doi.org/10.1590/S1415-6552009000400005>.
- Martins, I., Rialp, A., Rialp, J., & Aliaga-Isla, R. (2015). El uso de las redes como propulsor para la orientación emprendedora y el crecimiento de la pequeña y mediana empresa. *Innovar*, 25(55), 117-130. <http://dx.doi.org/10.15446/innovar.v25n55.47227>.
- Matta, A. (2012). Aportes del análisis de redes sociales a la gestión de estrategias de cooperación empresarial. *Redes: Revista Hispana Para el Análisis de Redes Sociales*, 23(2), 146-177. <http://dx.doi.org/10.5565/rev/redes.442>.
- Naudé, P., Zaefarian, G., Najafí Tavani, Z., Neghabi, S., & Zaefarian, R. (2014). The influence of network effects on SME performance. *Industrial Marketing Management*, 43(4), 630-641. <http://dx.doi.org/10.1016/j.indmarman.2014.02.004>.
- Olave, M. E. L., & Amato, J., No. (2001). Redes de cooperação produtiva: uma estratégia de competitividade e sobrevivência para pequenas e médias empresas. *Gestão & Produção*, 8(3), 289-303. <http://dx.doi.org/10.1590/S0104-530X2001000300006>.
- Organización de las Naciones Unidas para la Alimentación y la Agricultura – FAO. (2015a). *Desarrollo de cadenas de valor alimentarias sostenibles: principios rectores*. Quito: FAO.
- Organización de las Naciones Unidas para la Alimentación y la Agricultura – FAO. (2015b). *Pequeñas economías: reflexiones sobre la agricultura familiar campesina*. Quito: FAO. Retrieved in 2016, July 26, from <http://www.fao.org/3/a-i4955s.pdf>
- Padilla, R. (2017). *Política industrial rural y fortalecimiento de cadenas de valor*. Santiago: CEPAL.

- Porter, M. (1998). Clusters and new economics of competition. *Harvard Business Review*, 76(6), 77-90. PMID:10187248.
- Reis, A. P., & Amato, J., No. (2012). Aprendizagem por cooperação em rede: práticas de conhecimento em arranjos produtivos locais de software. *Produção*, 22(3), 345-366. <http://dx.doi.org/10.1590/S0103-65132012005000023>.
- Santos, A. M. M. M., & Guarneri, L. S. (2000). *Características gerais do apoio a arranjos produtivos locais* (Vol. 12). Rio de Janeiro: BNDES Setorial. Retrieved in 2016, July 26, from <https://web.bndes.gov.br/bib/jspui/handle/1408/2988>
- Schmitz, H., & Musyck, B. (1994). Industrial districts in Europe: policy lessons for developing countries? *World Development*, 22(6), 889-910. [http://dx.doi.org/10.1016/0305-750X\(94\)90060-4](http://dx.doi.org/10.1016/0305-750X(94)90060-4).
- Silva, C. A., Baker, D., Shepherd, A., Jejane, C., & Miranda, S. (Eds.). (2013). *Agroindustrias para el desarrollo: resultado del Foro Mundial sobre Agroindustrias* (Global Agro-Industries Forum). Rome: FAO.
- Tálamo, J. R., & Carvalho, M. M. (2010). Redes de cooperação com foco em inovação: um estudo exploratório. *Gestão & Produção*, 17(4), 747-760. <http://dx.doi.org/10.1590/S0104-530X2010000400009>.
- Urmeneta, R. (2016). *Dinámica de las empresas exportadoras en América Latina: el aporte de las pymes*. Santiago: CEPAL.
- Vázquez-Valencia, R. A., & Aguilar-Benítez, I. (2010). Organizaciones lecheras en los Altos Sur de Jalisco: un análisis de las interacciones productivas. *Región y Sociedad*, 22(48), 113-144.
- Villagrasa, A. M. M., & Márquez, D. Z. (2012). Potencialidades del clúster como opción estratégica promotora de competitividad en las pymes de cacao del estado Sucre, Venezuela. *Revista Ciencias Estratégicas*, 20(27), 51.
- Wegner, D., Bortolaso, I. V., & Zonatto, P. A. F. (2016). Small-firm networks and strategies for consolidation: evidence from the Brazilian context. *Revista Brasileira de Gestão de Negócios*, 18(62), 525-544. <http://dx.doi.org/10.7819/rbgn.v18i62.2301>.