

Performance determinants for agroindustrial projects in collective actions of small farmers

Determinantes de desempenho para projetos agroindustriais em ações coletivas de pequenos agricultores

William Sbrama Perressim¹ , Mário Otávio Batalha¹ 

¹Grupo de Estudos e Pesquisas Agroindustriais (GEPAI), Departamento de Engenharia de Produção, Universidade Federal de São Carlos (UFSCar), São Carlos (SP), Brasil. E-mails: williamcapi@hotmail.com; dmob@ufscar.br

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Abstract: The important economic and social role of agroindustrial collective actions does not eliminate the challenges related to the sustained feasibility of these enterprises. This article presents and discusses the main determinants that affect the performance and feasibility of collective agroindustrial projects, assessing the importance of each determinant for establishing the future performance of enterprises. A systematic literature review supported the structuring of the proposed analytical framework, which suggested the use of 24 determinants grouped into five factors. Afterwards, a panel of 20 experts used a multiple-criteria decision-making method, the Simple Multi-Attribute Rating Technique (SMART), to evaluate the relative importance of the determinants proposed by the model. The framework indicates the importance of each determinant on the performance of the collective agroindustrial projects, allowing the user to apply it with a decision-making tool. The proposed model combines and incorporates a wide number of sparse determinants in other works and highlights the factor “management, operation and finance” as a factor of success in making projects feasible.

Keywords: collective action, farmers’ organization, agroindustrial, family farmer, performance; feasibility.

Resumo: O importante papel econômico e social das ações coletivas agroindustriais não elimina os desafios relacionados com a viabilidade sustentada destas organizações. Este artigo apresenta e discute os principais determinantes que afetam o desempenho e a viabilidade dos projetos agroindustriais coletivos, avaliando a importância de cada determinante para o estabelecimento do desempenho futuro da iniciativa produtiva. O desenvolvimento de uma revisão sistemática de literatura apoiou a estruturação do framework analítico proposto, que sugeriu a utilização de 24 determinantes agrupados em cinco fatores. Em seguida, um painel com 20 especialistas determinou a importância relativa de cada determinante, recorrendo a técnica multicritério SMART para ponderação. O framework indica a importância de cada determinante no desempenho dos projetos agroindustriais coletivos, permitindo aos stakeholders destas organizações a aplicação como um instrumento de tomada de decisão mais assertivo. O modelo combina e incorpora um amplo número de determinantes, superando outros estudos que consideram um número limitado, e, ainda, destaca o fator “Gestão, Operação e Finanças” como condição relevante para o sucesso dos projetos.

Palavras-chave: ações coletivas, organizações de agricultores, agroindustrial, agricultura familiar, desempenho, viabilidade.

1. Introduction

The identification and analysis of project success determinants aimed at increasing agricultural and agroindustrial productivity have been the focus of attention of researchers in economics, management and sociology, among other fields. These projects have important potential to contribute to the improvement of agricultural productivity and yield and, consequently, the sustainable reduction of hunger and poverty (International Fund for Agricultural Development, 2016).



In this context, agroindustrial collective actions stand out for the relevance of their economic and social roles. Around the world, most rural development policies are based on promoting the development of collective actions, intermediated by associations and cooperatives of small farmers. Found in large numbers and having extensive representativity, these enterprises play a role in creating more favorable conditions for small rural farmers (Hellin et al., 2009).

A collective action can be understood as the joining of forces of two or more actors (individuals, companies or institutions) to obtain a specific desired result (Narrod et al., 2009). Therefore, collective action stems from the identification of a common interest by a group of individuals or entities, and recognition that this interest could be served through joint, coordinated actions (Olson, 1965). In agroindustrial systems, these collective initiatives can assume various forms, such as cooperatives, associations, networks, clusters, local production arrangements, and production agglomerates (Ménard & Klein, 2004). However, cooperatives and associations have been the most numerous and successful initiatives (Wenningkamp & Schmidt, 2016).

Public and private initiatives to promote the production capacity and commercialization of family farms have given these entities an important strategic role in the pursuit of territorial economic development and social inclusion (Orsi et al., 2017). The positive effects of these enterprises are widely recognized and provide important conditions for the feasibility of small-scale agricultural activities (Latynskiy & Berger, 2016; Ahado et al., 2024). In Brazil, around 3.9 million establishments are classified as family farming or 77% of the total, responsible for 67% of the people employed in agriculture and 23% of all agricultural production (Instituto Brasileiro de Geografia e Estatística, 2019.)

However, collective production and governance structures have restrictions and conditions particular to these enterprises (Ensslin et al., 2014; Briggeman et al., 2016) that impose considerable challenges for management practices and economic feasibility. These challenges include: (i) conflicts of interest inherent to agroindustrial cooperatives (Cook, 1995); (ii) the presence of governance conditions intrinsic to initiatives involving groups of people (Wilson et al., 2013); and (iii) lack of resources and/or heterogeneity of the socioeconomic conditions of the farmers involved (Di Gregorio et al., 2012). Therefore, the characteristics of collective rural projects significantly limit the performance and feasibility of production initiatives. Despite the importance and potential of these initiatives, the results for many enterprises, especially in developing countries, have revealed many unsuccessful cases and failures (Shiferaw et al., 2011; Neves et al., 2019), with ambitious, unachieved objectives (Markelova & Mwangi, 2010).

In spite of the efforts of researchers and public policymakers around the world, knowledge about the determinants to measure the effectiveness of collective production initiatives and their capacity to generate benefits for their members is still limited (Latynskiy & Berger, 2016). This knowledge gap is even more pronounced when looking at agroindustrial enterprises. Defined here as production units that operate within the agro-industrial system (SAI), that is, in the set of activities that contribute to the production of agroindustrial products, from the production of raw materials to the arrival of the product to the consumer (Batalha, 2021).

The literature is not conclusive in pointing out a model that comprehensively consider the peculiarities of rural collective action in the performance evaluation process (Donovan et al., 2017). It is possible to identify clear limitations in the literature (Sellare et al., 2023). Most studies that have investigated the feasibility of collective rural organizations have used a limited number of characteristics and attributes, and many fundamental factors for efficient analysis are often overlooked (Gyau et al., 2014). Most have focused on assessing the characteristics of farmers (individuals) and not those of enterprises (groups) (Serigati & Azevedo, 2013), thereby limiting the quality of the results obtained.

In view of the above, this article explores which determinants affect the performance and feasibility of collective agroindustrial projects. It also assesses the importance of each determinant for establishing the future performance of enterprises. To achieve these objectives, this article proposes a conceptual framework that incorporates the main performance determinants for collective agroindustrial projects. The investigated performance determinants must be understood as the factors, conditions or characteristics of diverse nature and origin that affect the performance of the project and the reach of the expected objectives.

This framework was validated by experts with recognized experience in the rural development projects. The proposed analytical model enables identifying and understanding the possible effect of each determinant on the future performance of a project, making it possible to select and develop more efficient production projects that have a greater likelihood of success. Furthermore, targeted management actions can enhance the results and competitiveness of the small rural organization, which often lacks the essential competitive conditions in increasingly dynamic markets. This context, considering that the prosperity of cooperatives in Brazil is a decisive factor for food security and sustainability of agricultural activities in the country (Ferreira da Silva et al., 2022).

In addition to this introduction, the article presents a brief theoretical foundation, followed by a detailed methodology of the investigation, moving on to the presentation and discussion of the results, and the conclusions. At the end, the reader has access to the references used and the appendix.

2. Theoretical Foundation

Rural collective actions may take several institutional forms, the most common being rural cooperatives and associations. Regardless of the institutional form, the common and central point between the collective organizational models of the agro-industrial system is, according to Markelova et al. (2009), the voluntary action of a group of people in pursuit of a shared goal.

These collective organizations act with multiple purposes, promoting many services to its members with the function of raising the economic and social welfare (Corsi et al., 2017), for example, adding value to the activity, reducing transaction costs, and accessing new markets for marketing. In small-scale agriculture, the benefits are even more evident, considering the great challenges of this segment in relation to the organization of production, adding value and marketing (Silva & Nunes, 2023).

The collective enterprise not only generates benefits to the producers, but it is also worth mentioning that they face particular challenges, especially the cooperatives, which are (Vitaliano, 1983):

- (i) Free rider problem: individuals who access benefits without incurring costs to the organization;
- (ii) Horizon problem: the member tends to seek short-term benefits from the organization, as there is no incentive to accumulate capital;
- (iii) Portfolio problem: acting together, individuals tend to take greater risks than acting alone;
- (iv) Control problem: wrong choices may occur due to collective control – associates, professional managers, councils;
- (v) Problem of influence costs: some individuals can influence decisions for particular interests;

The performance of the venture also depends on other variables related to the group condition, such as the level of trust, reputation, and reciprocity among members (Ostrom, 1990). The theoretical foundations are best presented in section 4.1 and 4.2, considering the results of the systematic review. Now the study moves on to its research method.

3. Methodology

In order to build the conceptual framework, a systematic literature review was performed, with the objective of identifying and qualifying the determinants found in the literature. To assess the relative importance of each determinant, 20 experts were then interviewed, using the multiple-criteria method called the Simple Multi-Attribute Rating Technique (SMART). The procedures will be detailed below.

3.1. Systematic literature review (SLR)

Systematic literature reviews (SLR) enable researchers to recognize and assess existing intellectual knowledge on a topic, making it possible to create research questions and incorporate more solid knowledge (Tranfield et al., 2003). The study protocol was divided into three stages: planning, execution, and analysis of the results (Almeida Biolchini et al., 2007). The guiding question was: "Which determinants impact the performance of agroindustrial collective actions?". A set of keywords that represent the constructs "Agroindustrial" ("Agricultural"; "Agribusiness"; "Farm" and "Rural"), "Collective Action" ("Collective Action and Common pool resource") and "Performance" ("Performance"; "Management"; "Viability"; "Feasibility"; "Effective"; "Income"; "Profit" and "Result") were identified and tested on search platforms.

The information search was conducted in three databases: Web of Science, Scopus and Scielo. Only articles published in English and Portuguese were selected. The protocol did not define the initial period for the search, but the data extraction occurred in April 2018. The SLR was performed with support from the software StArt (State of the Art through Systematic Review), provided by the Federal University of São Carlos (UFSCar). Figure 1 presents the stages carried out and the results of each filter adopted.

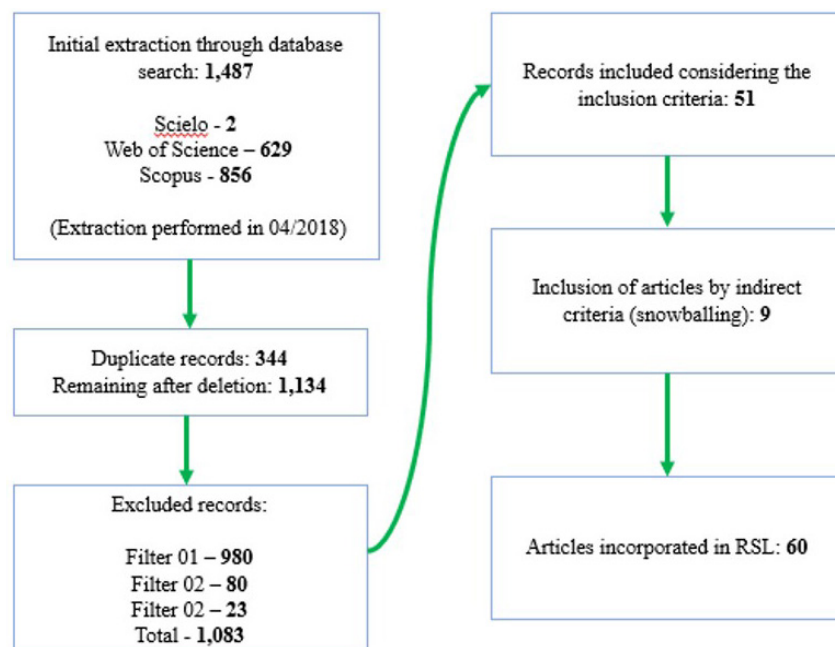


Figure 1. Structure Systematic Literature Review

The initial search yielded 1,487 articles, of which 353 were excluded for being duplicates. Reading the title, abstract and keywords (Filter 1) resulted in 154 articles selected. Inclusion

and exclusion criteria were applied to support the decision, for example, exclusion of studies classified in non-adherent research areas (eg, biology and biotechnology), and studies that did not directly address the performance of collective action. The other filters (2 and 3) also applied exclusion and selection criteria. After reading the introduction and conclusion (Filter 2), 74 articles were chosen for full reading (Filter 3). Following this reading, 51 articles were selected and nine were included for cross-referencing, for a total of 60 studies used.

The stage identified 454 determining factors for the success of the collective enterprise. Considering the allocation in five factors the percentage distribution found was the following: 36.10% - "group characteristics"; 23.90% - "trust, commitment and participation"; 22.34% - "management, operation and finances"; 9.35% - "individual characteristics", and 8.31% - "local infrastructure". The duplicate and similar determinants were grouped, and considering the premises of the study, 24 different determinants were selected and organized into five factors.

The study considers that the success of the collective enterprise can be defined in several ways. The success or failure of the performance achieved depends on the individual objectives and goals of each group (Lopes et al., 2015). Performance is a subjective phenomenon that can be interpreted differently according to the socio-economic context and the audience in question (Ishak et al., 2020). The experts were guided to consider success as the enterprise's ability to achieve the productive and economic goals indicated in the initial project.

3.2. Hierarchization of the factors and determinants

In a prior stage, a panel of experts was invited to validate and indicate the importance of each determinant identified in the bibliographic search. To quantify and transform the importance into a numerical scale, a multiple-criteria decision-making method, the Simple Multi-Attribute Rating Technique (SMART), which was developed by Edwards (1971), was applied. The tool is based on the premise that an alternative is formed by certain criteria and their values, and each criterion has a weight that represents its importance in comparison to other criteria (Siregar et al., 2017). Therefore, it is possible to adequately convert the importance (weights) of factors into real numbers (Velasquez & Hester, 2013).

The application of SMART was structured into two stages (Gomes & Gomes, 2019). In the first stage, experts rank the criteria according to their perception of importance for each one, from most important to least important. To do this, interviewers asked the interviewee to *"rank in descending order the importance of each factor"*.

In the next stage, experts assess the relative importance of each criterion by answering the following question: *"compared to the least preferred factor, how many times do you consider the other factors more important for the project's performance?"*. This process starts with the least important criterion, which receives a weight equal to 10 units (following the technique's premises), up to the most important criterion, which receives higher and proportional weights according to its importance.

Finally, it is necessary to standardize the scores in relation to the total points assigned in the judgment. Thus, following the proposal of Goodwin & Wright (2014), the maximum value found is standardized as "1" and the others are proportional to this value, up to the minimum limit of "0"

Divided into three sections, the tool seeks to characterize the experts interviewed, then qualify each according to their knowledge and experience in the topic and, finally, obtain the experts' judgments in relation to each factor and determinant.

The selection of the experts started with identification of the institutions considered relevant in the process of implementing and developing rural programs and projects in Brazil and in the state of São Paulo. They are: Coordination of Sustainable Rural Development of the State of São Paulo – CDRS (9 experts); Land Institute of the State of São Paulo – ITESP (3 experts); Agribusiness Development Coordination – CODEAGRO (1 experts); National Cooperative Learning Service – SECOOP/SP (1 experts); Brazilian Micro and Small Business Support Service – SEBRAE (3 experts); Research Institutions and Universities (3 experts). The professionals who made up the panel of experts were selected within the sphere of these institutions.

The institutions were contacted, and the authors presented the objectives and the research instrument. Experts from these organizations who had the necessary qualifications for participation were then selected, possessing proven experience in technical assistance, management, and research focused on family farming, associations, and cooperatives. Among the functions performed, these professionals are responsible for project development, general area coordination, technical assistance to producers and organizations, field team supervision, and coordination, among other duties.

The interviews took place individually between September and November 2019. Eighteen in-person interviews were conducted by the authors, who went to the experts, and two interviews were done remotely. The results were processed in an electronic spreadsheet to standardize the data, normalize the judgments. The answers are processed quantitatively according to the position of the expert (Gomes and Gomes, 2019) and group the responses. A simple average of the judgments was applied to the grouping process, since, having met the selection criteria, the opinion of each expert had the same relevance. Having presented the method adopted to develop the study, it is possible to move on to discussing the results.

4. Results and discussion

4.1. Conceptual framework

The conceptual framework underlying the proposed analytical model was initially structured on the basis of models provided by Shiferaw et al. (2011), Fischer & Qaim (2014), Gyau et al. (2014), Donovan et al. (2017) and Amiquero et al. (2023). Alterations and new proposals were made to ensure the best inclusion of the performance determinants and their investigation in a structured way. Figure 2 presents the framework.

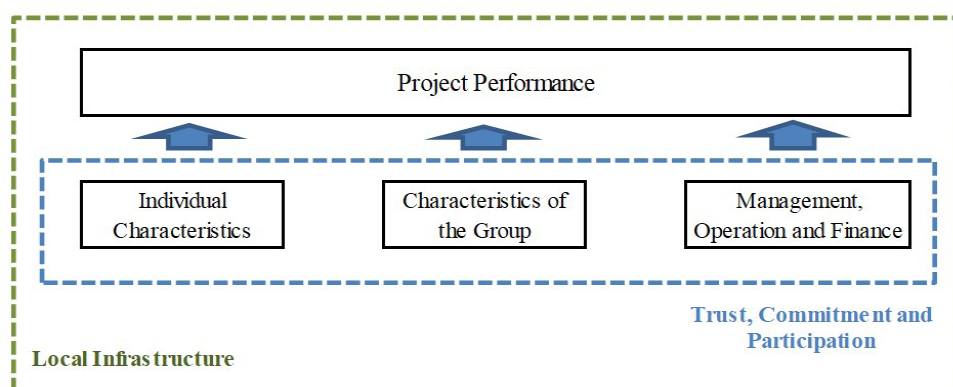


Figure 2. Conceptual Framework - Performance of Collective Agroindustrial Projects.

The review process enabled the identification of a broad set of determinants, substantially complementing previous studies that have adopted a limited number of conditions. The review identified that most of the previous studies were not dedicated to looking at determinants of a distinct nature, but were limited to one dimension, e.g. governance or individual characteristics. This amplitude allowed the proposed framework to be applied to a wide variety of collective rural enterprises, without restrictions as to audience, activity or geographic location. In addition, proposals structured into factors permit decision-makers to investigate or treat each factor independently, if necessary.

The proposed analytical model incorporated the “management, operation and finance” factor among the determinants to be investigated. This factor is often neglected in current models of analysis of collective agroindustrial projects, and when its determinants are evaluated, they are usually included individually and in factors that do not represent the management function. Most of the research is dedicated to the conditions of collective actions themselves, such as trust or leadership, neglecting, for example, the operational and technical capacity of the rural organization. This incorporation recognizes and assumes that the long-term feasibility of rural enterprises depends on adequate levels of business management of the organizations.

The framework considers that project performance is a direct function of the presence of the proposed factors - “Local infrastructure” (e.g., distance to consumer market), “Trust, commitment and participation” (e.g., collective and transparent decisions), “Individual characteristics” (e.g., educational level of producers) “Group characteristics” (e.g., presence of conflicts) “Management, operation and finance” (e.g., the financial condition) which are formed by the identified determinants.

Tables 1, 2, 3, 4, 5 and 6 present the determinants that make up the factors that participated in the proposed analytical model. Appendix A presents the coding of the articles used, in addition to the study locations, organizations investigated, projects, and performance dimensions (Agrawal, 2001; Bassi & Carestiato, 2016; Baynes et al., 2015; Call & Jagger, 2017; Coppock & Desta, 2013; Coulibaly-Lingani et al., 2014; Degrande et al., 2014; Francesconi & Wouterse, 2015; Hajjar et al., 2011; Gouët & van Paassen, 2012; Herbel et al., 2015; Islam et al., 2011; Jones, 2004; Werthmann, 2015; Turner et al., 2013; Tierling & Schmidt, 2017; Sisay et al., 2017; Stefani et al., 2017; Shiferaw et al., 2008; Schöll et al., 2016; Kaganzi et al., 2009; Place et al., 2004; Ragasa & Golan, 2014; Pretty & Ward, 2001; Ruben & Heras, 2012; Oerlemans & Assouline, 2004; Newbery et al., 2013; Mills et al., 2011; Knickel et al., 2008; Kola et al., 2014; Lamprinopoulou et al., 2006; Landolt & Haller, 2015; Liang et al., 2015; Lyon, 2003; McRoberts et al., 2013; Newbery et al., 2013; Wangel & Blomkvist, 2013).

4.2. Performance determinants

The performance determinants proposed by the model will be presented in the following.

Local infrastructure

The “local infrastructure” factor can be broken down into four determinants (see Table 1). The authors who observed the determinants are presented in “Appendix A” by the codes indicated in the tables (Tables 1, 2, 3, 4 and 5), example, Author [1]. This factor assumes that the environmental and local conditions where the organizations operate have a direct influence on project performance.

Table 1. Determinants - Local infrastructure.

Determinant	Description	Authors
Regular access to water, energy, telephony and Internet	Access to water is essential for activity; power supply failures cause losses; failures in communication systems impact activity	[9]; [14]; [19]; [40]
Access to technical assistance and support services	Technical assistance increases productivity; managerial support favors results; institutional and material support for production	[1]; [5]; [7]; [16]; [17]; [19]; [29]; [30]; [32]; [44]; [45]
Distance to the consumer market	Increases the cost of transportation; restricts and impacts the sale of products that require special transport conditions	[9]; [26]; [29]
Quality of local roads and bridges	Imposes mobility restrictions; increases the cost of transportation; reduces quality and generates post-harvest losses	[26]

Individual characteristics

The three determinants that compose the “individual characteristics” factor are presented in Table 2. They are directly related to the characteristics of the farmers who participate in the collective production activities associated with the rural enterprise under analysis.

Table 2. Determinants - Individual characteristics.

Determinant	Description	Authors
Experience and practical knowledge of agricultural activities	It generates better productive results (quality, productivity, cost); increases efficiency in agricultural production; favors the achievement of technical requirements;	[9]; [12]; [14]; [16]; [17]; [18]; [19]; [23]; [30]; [40]
Educational level of the farmers	Collaborates for the managerial performance of the producer; facilitates access to information and technologies; improves the business relationship;	[6]; [10]; [28]; [31]; [37]; [40]; [48]
Income level and social condition	Poorer producers are less involved in the organization; it implies a lack of resources for basic investments and financial collaboration; influences the volume sold;	[1]; [8]; [11]; [12]; [25]; [27]; [28]

Characteristics of the group

The six determinants that make up the “characteristics of the group” factor are presented in Table 3. They reflect the main characteristics of the groups responsible for the collective enterprises that can have an impact on the success of the enterprises implemented by the groups.

Table 3. Determinants - Group characteristics

Determinant	Description	Authors
Leadership of the organization and project	Leadership quality influences performance; it is the leader's role to attract producers, clarify information and promote the group's development; must present social and managerial skills and competences;	[1]; [3]; [5]; [7]; [8]; [12]; [11]; [13]; [15]; [17]; [16]; [18]; [19]; [21]; [23]; [22]; [30]; [31]; [37]; [38]; [40]; [41]; [50]
Conflicts, differences and internal disputes	Reduces cohesion and involvement; it is possible to implement mechanisms to minimize the condition; the unfair distribution of benefits and heterogeneity of the members raises the condition considerably;	[3]; [8]; [10]; [13]; [25]; [26]; [31]; [29]; [30]; [32]; [37]; [41]; [45]; [47]; [50]
Organization's relationship network	Improves commercialization and access to external resources; exemplified in building partnerships and in the relationship with stakeholders relevant to the business;	[2]; [11]; [20]; [21]; [24]; [34]; [36]; [42]
Group size	Preference for smaller groups due to the high level of cohesion and low cost of monitoring; larger groups may have an advantage in the scale of activity;	[1]; [10]; [11]; [13]; [16]; [17]; [21]; [26]; [28]; [37]; [38]; [50]
Opportunistic attitudes of producers	Recurrent condition in rural groups; represented by the “free-rider”; affects other determinants; can be minimized with clear rules for participation, use and exclusion;	[1]; [11]; [30]; [35]; [38]; [39]; [45]; [47]; [50]
Legal form of the group	Legal recognition is required; enables access to certain markets, in addition to legal certainty and legal guarantee;	[6]; [14]; [19]; [29]; [32]; [35]; [40]; [45]

Management, operation and finance

The “management, operation and finance” factor is made up of six determinants, as shown in Table 4. They are related to the business characteristics of rural organizations and are, therefore, highly relevant determining the performance and efficiency of collective initiatives. It is expected that in the absence of adequate levels of management and technical and commercial capacity, collective enterprises will encounter major difficulties in achieving their objectives.

Table 4. Determinants - Management, operation and Finance

Determinant	Description	Authors
Management capacity	Management qualification generates better results; exemplified by the ability of managers, the presence of skills, training, defined positions, meetings and management tools;	[1]; [3]; [12]; [14]; [16]; [18]; [21]; [23]; [29]; [37]; [39]; [40]; [41]; [43]; [44]; [48];
Technical and production capacity	Improves the operational efficiency of the enterprise; allows to reach productive and technical requirements; exemplified by the ability to differentiate food	[9]; [8]; [12]; [23]; [40];
Commercial capacity	Promotes commercial competitiveness; exemplified by building partnerships and coordination in the chain, in addition to adopting market orientation strategies and building commercial skills	[7]; [8]; [12]; [17]; [22]; [27]; [30]; [37]; [39]; [43]; [48]; [46];
Financial condition	Improves project development; the availability of resources avoids the lack of working capital, the delay in payment to producers and allows investment at an appropriate level	[8]; [9]; [11]; [12]; [14]; [15]; [28]; [40]; [44];
Enterprise infrastructure	It directly favors the operation; exemplified by the structural conditions of the enterprise (assets) - vehicles, machines, equipment and office	[12]; [18]; [24]; [32]; [43]; [48];
Foundation time and activity of the organization	Enterprises with a longer foundation time should present better results	[6]; [10]; [33]; [37];

Trust, commitment and participation

The five determinants that form the “trust, commitment and participation” factor are presented in Table 5. These determinants have their origin, for the most part, in the collective structure of organizations and in relationship between associates. There is widespread recognition of the direct effect of these factors on collective action that determine the overall performance of organizations executing projects.

Table 5. Determinants -Trust, commitment and participation

Determinant	Description	Authors
Participation of associates in activities	The participation of associates improves performance, exemplified by participation in collective sales, training, general meetings and commitments	[8]; [22]; [23]; [28]; [30]; [31]; [36]; [37]; [43]; [47]
Trust within the organization	Without trust there is no cooperation; long-term sustainable results demand trust between producers; the condition influences other determinants	[2]; [3]; [4]; [17]; [20]; [22]; [34]; [36]; [37]; [38]; [40]; [41]; [44]; [50]; [49]
Collective and transparent decisions	Collective and transparent decisions are more efficient, favoring the result; the producer feels active and responsible; deviations and failures are reduced	[2]; [11]; [16]; [17]; [18]; [24]; [30]; [32]; [35]; [38]; [39]; [40]; [41]; [45]; [47]
Cohesion and involvement among associates	Cohesion and involvement between producers will favor performance; the group must share common goals and interests; cohesion helps to make the collective production initiative work	[1]; [2]; [4]; [5]; [7]; [10]; [11]; [12]; [13]; [15]; [16]; [18]; [19]; [20]; [21]; [28]; [29]; [31]; [30]; [32]; [34]; [36]; [37]; [38]; [40]; [42]; [49]; [50]
Presence of collective structures and activities	Enterprises with a previous history of collective activities present less difficulties in new projects; if the record is negative, performance may be impaired	[4]; [7]; [10]; [12]; [19]; [28]; [31]; [40]

4.3. Importance of the determinants for performance

The conceptual framework developed was presented to and examined by a panel of experts. The objective of this methodological stage was to enable the experts to validate and, mainly, classify the various factors according to the importance they assigned to each factor for the success of collective agroindustrial enterprises of small farmers. The results presented do not allow us to identify statistical differences among the determinants, a condition that does not interfere with the quality of the material in view of the method and the objective of the study. It is important to point out that the experts, when asked, did not add any new determinants or factors to those already contained in the model under analysis.

The Table 6 presents the importance assigned (*W*) and overall classification (*OC*), first for each factor (*F*), numbered from 1 to 5 and, then, for each determinant identified with its factor (*F*), classified from first to twenty-first, according to its importance. The ordering of the factors follows the logic of formation and development of the collective rural organization, that is, in a given territory with its local infrastructure (1), individual producers (2) form a group (3) with their own characteristics, and need to carry out the management of the rural enterprise (4), considering an environment in which there must be trust, commitment and participation (5).

In the view of the experts, "trust, commitment and participation" is the most important factor for the success of projects, receiving a weight of 0.27, followed by the determinants of the "management, operation and finance" factor (0.23). The "characteristics of the group" factor occupied third place with 0.20, followed by "individual characteristics," with 0.17. "Local infrastructure" was ranked in last place, with 0.12. Following is a more detailed breakdown of the 12 determinants which, in the experts' opinion, contribute more significantly to the success of collective agroindustrial enterprises of small farmers.

Table 6. Importance of factors and determinants for the success of collective agroindustrial enterprises

F	Factor	W	OC	F	Factor	W	OC
1	Local infrastructure	0,12	5°	4	Management, operation and finance	0,23	2°
2	Individual characteristics	0,17	4°	5	Trust, Commitment and Participation	0,27	1°
3	Characteristics of the group	0,20	3°				
F	Determinant	W	OC	F	Determinant	W	OC
2	Experience and practical knowledge of agricultural activities	0,081	1°	2	Income level and social condition	0,039	13°
5	Participation of associates in activities	0,066	2°	1	Access to technical assistance and support services	0,038	14°
4	Management capacity	0,064	3°	4	Financial condition	0,036	15°
5	Trust within the organization	0,062	4°	3	Organization's relationship network	0,034	16°
5	Collective and transparent decisions	0,057	5°	5	Presence of collective structures and activities	0,030	17°
5	Cohesion and involvement among associates	0,055	6°	1	Distance to the consumer market	0,029	18°
3	Leadership of the organization and project	0,051	7°	3	Group size	0,025	19°
2	Educational level of the farmers	0,051	8°	4	Enterprise infrastructure	0,025	20°
4	Technical and production capacity	0,047	9°	3	Opportunistic attitudes of producers	0,024	21°
4	Commercial capacity	0,046	10°	3	Legal form of the group	0,024	22°
3	Conflicts, differences and internal disputes	0,041	11°	1	Quality of local roads and bridges	0,019	23°
1	Regular access to water, energy, telephony and Internet	0,039	12°	4	Foundation time and activity of the organization	0,016	24°

The experts interviewed attributed the most importance to “experience and practical knowledge of agricultural activities” in the overall classification, with a weight of 0.081. As farmers obtain greater experience and knowledge, it is expected they will have better production results and the necessary conditions to meet quality and productivity standards (Paumgarten et al., 2012). Individual production inefficiencies and incapacities will not have any direct effects on collective results.

The determinant “participation of associates in activities” of organizations was assigned the second greatest importance with a weight of 0.066. This expressive result was supported by the literature, which has also recognized the benefit of farmers participating in group collective activities (meetings, training, etc.) for the success of collective projects (Uetake, 2015; Lopes et al., 2015).

“Management capacity” ranked third overall, with a weight of 0.064, in the performance of initiatives, i.e., this determinant has an impact of 6.4% on the success of projects. The impact considers the assumptions of the study, among them that adequate performance (success) is a direct function of the presence of the determinants. This expressive result is in line with the recognized relevance of adequate levels of management in relation to the performance and economic sustainability of enterprises, especially agroindustrial enterprise. There is no lack of evidence that supports the impact of the process, as highlighted by Sebhatu et al. (2021). This situation largely justifies the insertion of determinants linked to management in the analytical model, as proposed in this article.

With a weight of 0.062, “trust within the organization” was the fourth most important factor. The literature has already pointed out the importance of this theme. It is expected that an adequate level of trust will be directly favorable for the results of collective actions and their production initiatives (Tadesse & Kassie, 2017). This determinant also favors other internal conditions of organizations.

The next two determinants, like the last, make up the “trust, commitment and participation” factor. They are “collective and transparent decisions,” with a weight of 0.057, and “cohesion and involvement among associates,” with a weight of 0.055. The first is conducive to the quality of decisions made and achieving combined objectives. The second is essential for the efficient operation of collective rural organizations. Without this condition, it is unlikely that projects will unfold. The results of Ahmad et al. (2024) observing collective organizations in Indonesia indicate the importance of cohesion.

The experts interviewed ranked “leadership of the organization and project” in seventh place among the determinants, with a weight of 0.051; i.e., it has an importance of 5.1% in relation to project performance (considering that all determinants have a summed importance of 100%). There is extensive literature that refers to the positive impacts of adequate leadership on rural enterprises, as well as being a condition that directly favors other determinants. Murunga et al. (2021) for example, highlight in their results the importance of leadership in collective organizations in Kenya. The leader is an actor responsible for motivating, aggregating and directing the action of the users involved, and must also have the skills and competences necessary for the efficient management of the collective enterprise (Markelova et al., 2009).

The “educational level of the farmers” is the eighth determinant, with a weight of 0.051. This result is justified by the expectation that more years of formal education will result in farmers having adequate levels of skill and educational competencies, which will promote better results in production activities (Barham & Chitemi, 2009).

The “management, operation and finance” factor has determinants in ninth and tenth place: “technical and production capacity,” with a weight of 0.047, and “commercial capacity,” with a weight of 0.046. The literature points out that technical and production inefficiencies can undermine the feasibility of projects, especially in small-scale rural organizations. The results of

Barry & Rousselière (2022) observing French cooperatives highlight the need to provide quality and efficiency in production processes. Adequate commercial capacity enables organizations to stay competitive in relation to the market and in terms of sales. In high-value markets, the cooperative is one of the only forms of access for small farmers (Fernando et al., 2021).

It is worth noting that the nine determinants with the highest importance accounted for 37.5% of the number of variables, with a cumulative importance of 53.56%. Special attention needs to be paid to these determinants due to their relevance for the success of businesses.

The “conflicts, differences and internal disputes” determinant occupied the 11th position, with a weight of 0.041. As the level of conflicts and disputes increases, it is expected that the success of projects will decrease (Jelsma et al., 2017). This condition is widely discussed in the literature because of its effect on the performance of collective initiatives, and due to specific characteristics of organizational models, such as distribution of benefits and heterogeneity among members.

Twelfth place was assigned to “regular access to water, energy, telephony and Internet,” with a weight of 0.039. Access to water is especially important for agricultural activities, without which they are not feasible, in addition to power failures, which can have a substantial impact. In addition to enabling access to information in general, access to modern communication technologies is increasingly essential for the insertion of rural production into more modern and lucrative channels of commercialization.

5. Conclusions

There are many challenges for the sustained viability of collective rural organizations. The collective form of ownership and governance, along with specific characteristics of family farmers and agroindustrial production and commercialization systems, result in strong singularities in the assessment and implementation processes of collective agroindustrial projects. The importance of this article is rooted in this context.

Therefore, this article contributes to efforts to provide decision-makers with an analytical framework that will enable them to evaluate the odds of success of collective agroindustrial projects by family farmers. The findings make it possible to identify which factors should receive greater or less attention in the selection and implementation process of collective agroindustrial production projects.

The construction of the framework collaborates with the scientific literature dedicated to discussing the determinants of efficiency in agroindustrial collective actions. Knowledge of the performance determinants of collective agricultural production actions is still limited. And the literature so far does not provide a model that is widely applied and that is recognized to be efficient in including the particularities of these enterprise.

The proposed framework surpasses much of the studies in the field, which adopt a limited number of determinants and often overlook fundamental factors. It also contributed to the inclusion of aspects that are not exclusively financial, especially linked to the relationship among members of collective actions.

The study advances considerably in this direction, as it incorporates conditions of a different nature and origin in a broad and structured framework, such as those related to local infrastructure, characteristics of the individual and the group, the quality of management and the environment of trust, commitment and participation within the enterprise. It allows, for example, the consideration of the education level of the producers and the marketing capacity of the organization—along with other determinants—in a structured manner.

The results indicated that the factors “trust, commitment, and participation” and “management, operation, and finance” were ranked first and second in terms of importance. This allows us to conclude that, considering the experts’ experience, these factors significantly influence the performance of the collective rural organization, thus stakeholders and decision-makers in the field should pay special attention to them.

The study further innovates by contributing to the literature through measuring the importance of determinants for the performance of the enterprise from the perspective of a wide range of specialists. The empirical measurement of the weight of each determinant is important and yields practical results. Firstly, it incorporates the real and qualified experience of specialists considering the context of family farming, differing from most studies that only consider the literature. Secondly, the classification of importance directly contributes to the direction of new investigations and provides practical managerial actions.

As a practical implication, the proposed framework enables various stakeholders, including public and private development agencies, technical assistance and rural extension agencies, organizations, banks, development institutions, to apply a structured tool for decision-making and selection of investment options. Furthermore, it enables the differentiation between conditions inherent to the enterprises, such as management and leadership capacity, and those that are situational, such as road quality and access to water and energy. This differentiation allows for the targeted direction of public efforts—through public policies—and private efforts.

The scientific literature and technical manuals of rural extension organizations do not seek to directly present the importance of each determinant in the performance of the collective rural business. In contrast, the framework sheds light on the need for differentiation and special attention to the determinants that have the greatest effect on performance.

Management measures can also be employed to tailor determinants to achieve better results. For example, between investing in the development of management capacity or expanding the network of an organization’s contacts, the first option was chosen, since it has a greater weight on performance.

Regarding the limitations of the study, the large number of determinants (variables) had a direct impact on the choice of the multi-criteria technique to be used and prevented the use of more robust multi-criteria techniques. The number of experts (20) meets the requirements of the multi-criteria technique but made statistical tests impossible.

In the future, it will be important to subject the developed framework to empirical validation testing to compare the results presented here with the real conditions and outcomes of projects already underway. A valuable research agenda could focus on developing variables to empirically measure each determinant and on efforts to incorporate the model into standard investment evaluation methods.

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Appendix A. Reviewed articles that analyse the determinants of the performance of collective agro-industrial projects.

Code	Authors	Countries	Organization	Project / Enterprise	Performance
[1]	(Agrawal 2001)	-	Collective Action / Group	Environmental management	Foundation time
[2]	(Pretty and Ward 2001)	Several	Collective Action / Group	Management of environmental resources	Overall performance
[3]	(Lyon 2003)	Ghana (Africa)	Collective Action / Group	Collective marketing to small producers	Benefits/Foundation time
[4]	(Jones 2004)	Ecuador (South America)	Cooperative (5)	Agricultural cooperatives of small rural producers	Project number; Income generated; Meeting efficiency
[5]	(Oerlemans and Assouline 2004)	European countries	Cooperative, Association and net (20)	Success stories in rural networks and collective actions	Productivity; Sales; Benefits; Recognition
[6]	(Place et al. 2004)	Kenya (Africa)	Collective Action / Group (87)	Seedling producers group	Collective Action / Group
[7]	(Lamrinopoulou, Tregear, and Ness 2006)	Greece (Europe)	Collective Action / Group	Study on the success of collective actions	Overall performance
[8]	(Shiferaw, Obare, and Muricho 2008)	Kenya (Africa)	Collective Action / Group	Access to the consumer market	Level of market access and marketing
[9]	(Knickel et al. 2008)	European countries	Collective Action / Group	Collective actions for agricultural marketing	Overall performance
[10]	(Barham and Chitemi 2009)	Tanzania (Africa)	Producer Groups (34)	Rural development project, food security and income of small rural producers	Access to the consumer market
[11]	(Kaganzi et al. 2009)	Uganda (Africa)	Association	Potato production for fast food supply	Access to the consumer market
[12]	(Markelova et al. 2009)	Several countries	Cooperatives and other groups	Market access and adding value	Level of access to markets and added value
[13]	(Markelova and Mwangi 2010)	African continent	Cooperatives and other groups	Organization of small producers for marketing	Access to the consumer market
[14]	(Hajjar et al. 2011)	Brazil (South America)	Association (3)	Forest communities and associations for forest exploitation	Business self-sufficiency of the project without external assistance
[15]	(Islam et al. 2011)	Bangladeshi (Asia)	Collective Action/Group	Group of farmers trained for rural extension	Number of events; Rural promotion, credit and group savings activity
[16]	(Mills et al. 2011)	Wales (Europe)	Cooperatives	Agricultural cooperatives for management and development of agri-environmental systems	Overall performance
[17]	(Shiferaw, Hellin, and Muricho 2011)	African continent	Collective Action/Group	Collective organizations of rural producers	Market access; Economic viability of the enterprise
[18]	(Gouët and Van Paassen 2012)	Asia and Latin America	Cooperatives	Agricultural marketing cooperatives for small farmers	Overall performance / access to markets
[19]	(Gouët and Van Paassen 2012)	Burkina Faso, Ethiopia and	Association (4) e Cooperatives (2)	Organization of producers and marketing of forest products	Overall performance
[20]	(Rubens and Heras 2012)	Ethiopia (Africa)	Cooperatives (5)	Agricultural coffee cooperatives	Financial capacity in payment to the producer; Volume received;
[21]	(Coppock and Desta 2013)	Kenya (Africa)	Collective Action/Group (16)	Group of women farmers and cattle ranchers	Income; quality of life

Appendix A. Continued...

Code	Authors	Countries	Organization	Project / Enterprise	Performance
[22]	(McRoberts et al. 2013)	Mexico (North America)	Cooperative	Implementation of the cooperative for milk processing	Producer's income; Feasibility in generating cash
[23]	(Newbery et al. 2013)	United Kingdom (Europe)	Association (15)	Local rural associations	Satisfação com a adesão; Disposição a investir na manutenção da associação
[24]	(Turner et al. 2013)	Ukraine (Europe)	Cooperative	Horticulture development project	Overall performance / producer income
[25]	(Wangel and Blomkvist 2013)	Sierra Leone (Africa)	Collective Action / Group (2)	Forest management and use	Collective level; Number of activities together; Rules and Monitoring System
[26]	(Coulbaly-Ingani et al. 2014)	Burkina Faso (Africa)	Collective Action/Group	Participatory exploitation and commercialization of forest resources	Economic, environmental and decision-making performance
[27]	(Degrande et al. 2014)	Cameroon and Congo (Africa)	Collective Action/Group	Marketing of forest products	Access to the consumer market
[28]	(Fischer and Qaim 2014)	Kenya (Africa)	Cooperative	Rural development project	Membership and intensity of participation in the group
[29]	(Kola et al. 2014)	Albania (Europe)	Cooperative	Cooperative for vegetable production	Probability of cooperation
[30]	(Ragasa and Golan 2014)	Congo (Africa)	Collective Action / Group (181)	Group of diversified agricultural producers	Supply of inputs and technical assistance;
[31]	(Uetake 2015)	Netherlands (Europe)	Cooperative	Agricultural cooperative for services and agri-environmental preservation	Overall performance
[32]	(Baynes et al. 2015)	Several countries	Collective Action / Group	Community and collective forest management	Overall performance
[33]	(Francesconi and Wouterse 2015)	Ghana (Africa)	Cooperatives (500)	Agricultural Cooperatives	Investment in physical and human capital; Risk
[34]	(Herbel, Rocchigiani, and Fernier 2015)	France (Europe)	Cooperatives	Agricultural Cooperatives for Mechanization	Benefits; Role in the agricultural system
[35]	(Landolt and Haller 2015)	Switzerland (Europe)	Cooperatives (2)	Cooperatives of milk producers on common pastures	Institutional robustness; Overall performance
[36]	(Liang et al. 2015)	China (Asia)	Cooperatives (147)	Agricultural Cooperatives	Sales revenue
[37]	(Lopes et al. 2015)	East Timor (Asia)	Cooperatives / Group (30)	Development project	Produção individual; Volume de estoque
[38]	(Werthmann 2015)	Cambodia, Vietnam and In	Collective Action / Group (6)	Fishermen and firewood collectors	Benefits; Foundation time
[39]	(Bassi and Caresiato 2016)	Italy (Europe)	Association (10)/ Group (9)	Group for the management of common resources in agricultural communities	Environmental, Social and Economic Feasibility
[40]	(Latynskiy and Berger 2016)	Uganda (Africa)	Association	Development project	Overall performance
[41]	(Schöll et al. 2016)	Vietnam (Asia)	Collective Action / Group (18)	Pig producers participating in a project	Increased income
[42]	(Call and Jagger 2017)	Uganda (Africa)	Collective Action/Group	Access, management and use of common pastures	Technical indicators
[43]	(Corsi, Marchisio, and Orsi 2017)	Chad (Africa)	Association	Development project	Access to the consumer market
[44]	(Donovan, Blare, and Poole 2017)	Peru (South America)	Cooperatives (4)	Cooperatives of rural cocoa producers	Financial Performance; Investment Capacity; Number of members; Relationship and governance network;
[45]	(Jelsma et al. 2017)	Indonesia (Asia)	Cooperatives / Groups	Production of palm oil by small producers	Productivity; Commercial Performance
[46]	(Orsi et al. 2017)	Chad (Africa)	Association	Increased sales, value creation and performance	Volume; Quality; Profit
[47]	(Sisay, Verhees, and Van Trijp 2017)	Ethiopia (Africa)	Cooperative (29)	Small rural seed producers	Overall performance
[48]	(Stefani et al. 2017)	Italy (Europe)	Association	Bread and wheat producers	Quality; Reputation in the activity; Economic return to the producer
[49]	(Tadesse and Kassie 2017)	Ethiopia (Africa)	Cooperatives (16)	Agricultural production and diverse marketing	Cooperative investment volume; Proportion of volume traded via cooperative and via market;
[50]	(Tierling and Schmidt 2017)	Brazil (South America)	Association (1)	Production and marketing of fruit	Generating value to the producer