

# Qualitative Analysis of Operation or Governance Models for Autonomous Communities of Rural Commerce

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## Abstract

In rural communities, an efficient operation or governance model is crucial for fostering sustainable development and improving the quality of life of its inhabitants. According to World Bank data, nearly 45% of the rural population in Latin America lives below the poverty line, facing challenges such as limited access to basic services, education, and technology. The implementation of participatory governance models that involve local actors in decision-making has proven to be a catalyst for optimizing resource management and generating inclusive economic opportunities. This approach not only strengthens the social fabric but also promotes equity and resilience in the face of challenges such as climate change and fluctuations in agricultural markets. This study aims to explore the use of frameworks employed as successful cases for building digital communities or implementing improvement or governance models that enable better management or address a common area of interest. This is achieved through a qualitative analysis supported by a systematic literature review of 54 research articles published between 2018 and 2022, following clear discrimination criteria.

**Keywords:** Operation model, Rural communities, Commerce, Food supply chain, Literature review.

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## 1. INTRODUCTION

Most of the countries of Latin America and the Caribbean are still in an incipient stage of appropriation and use of information and communication technologies (ICTs) in the small and medium-sized enterprise sector in the primary sector, due to the persistence of important gaps in the sector. The ICTs have become an indispensable instrument in all sectors of economic, social and cultural activity (ECLAC, 2006). Today, access to and use of these technologies are essential for achieving national objectives related to development, growth, and social well-being, thereby fostering the desired rural digital inclusion.

According to the vision of the Economic Commission for Latin America and the Caribbean (ECLAC) at the ELAC 2015 Conference, the digital and data revolution are two of the biggest paradigm shifts on a global scale, and both can drive new business models, new public policy tools and new forms of citizen

participation supported by the digital economy, to create more supportive and equitable societies (ECLAC, 2016).

In the case of Mexico, the most recent National Survey on Availability and Use of ICTs in Homes (ENDUTIH) in 2017 from the National Institute of Statistics and Geography (INEGI, 2021). Additionally, only four out of ten people have access to the internet, meaning that 40 million individuals lack the opportunity to benefit from these networks. Moreover, small and medium-sized agricultural enterprises urgently require the incorporation of ICTs as a tool to enhance both productive and commercial management.

Although, rural communities have little access to technologies, computers, cell phones and social networks are part of the daily lives of new generations, influencing their social practices, their ways of relating and their identity (Conacyt Information Agency, 2019). Although providing digital devices to people in rural communities does not guarantee reducing the digital

divide or generating an impact on society, it is important to provide technological literacy and develop skills in the users of these technologies so that they can take advantage of them, in addition to working on a collective and reflective use of ICTs for the benefit of communities.

Additionally, insertion into external markets requires having permanent and updated information, and in this sense, the use of digital sources and the interaction that they enable provide significant advantages to those who manage them (ECLAC, 2012), which is why the aim is to have an overview of the most efficient models of operation/governance in general on supply chain issues in the primary food sector, rural communities and the creation of digital communities to more precisely guide the approaches of projects focused on the aquaculture sector in Mexico.

This article aims to explore how operation models of governance have been applied, the types of actors that have been implemented, and the tendency of use to successfully integrate into the internal supply chain as a powerful tool for operational improvement.

## 2. METHOD AND CLASSIFICATION FRAMEWORK

In this section a methodology framework is described, with the main objective being the analysis of high-impact contributions to model their importance in understanding the system, supported by precise evidence to outline future research (Klug, 2013).

From a methodological point of view, this literature review addresses a systemic, explicit, and reproducible approach for the identification, evaluation, and interpretation of the existing information as a key tool for decision making (Al-Qatawneh & Hafeez, 2015). It differs from traditional reviews by being systematic, clear and easy to understand (Silamani J. Adolf Guirao Goris, 2015). In the present literature review it will be important to have a methodological structure to follow and which is presented below through sections A) Data collection, B) Data analysis and C) Synthesis and classification framework.

### A. Data collection

The data collection used in this article was organized according to the following steps:

#### Step 1: Research question

These questions provide direction and focus on the analysis. The central questions of the research are:

1. What operation or governance models exist for autonomous trading communities?
2. What complications do rural communities face when trading products?
3. What are good practices in rural trading communities?

#### Step 2: Search for contributions

This step is based on selecting articles by a high impact database that is available to the analyst and the context of the research, such as ScienceDirect®, Scopus®, Emerald Publishing®, Web of Science®, Taylor & Francis Group®, IEEE®, Wiley® among others.

For this review, Scopus®, Taylor & Francis Group® Science Direct® and Dialnet® sources were selected. The first is because it is a database of summaries and citations of worldwide scientific literature, covering a wide variety of disciplines and subject areas, in addition to being updated regularly to include new articles, guaranteeing the most recent information (Codina, 2017). The second and third were selected because there is relevant information in a preliminary exploration carried out previously. And the last one is considered as an alternative to Latin America research.

In databases, search for specific words related to Rural community, Digital platform, Operation model or Governance model and Commerce. In addition, selection criteria, such as research type articles (research articles and literature review), language (English) and period time (2018 - 2022).

The articles were found through the institutional resources of the Advanced Technology Center, CIATEQ, entered the database in December 2022 using the following standard chain:

( "rural community" OR "farm" ) AND ( "digital platform" OR "digital community" ) AND ( "framework" OR "governance" OR "Cooperative strategy" ) AND ( "food supply chain" OR "food supply" OR "fresh food supply chain" ) AND ( "commercialization" OR "commerce" OR "market" ) AND ( LIMIT-TO ( SRCTYPE , "j" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) OR LIMIT-TO ( DOCTYPE , "re" ) ) AND ( LIMIT-TO ( PUBYEAR , 2023 ) OR LIMIT-TO ( PUBYEAR , 2022 ) OR LIMIT-TO ( PUBYEAR , 2021 ) OR LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) )

#### Step 3: Classification and evaluation of selection criteria

The initial collection of 59 articles was reviewed to identify those contributions that did not meet either the research focus or the previously defined selection criteria. Of all articles, 31 were found in Scopus®, 6 in Taylor & Francis Group®, 21 in Science Direct® and 1 in Dialnet®. It is important to note that 3 articles were discriminated for duplicates and 2 for not meeting the selection criteria. The final collection of articles to review totals 54.

## B. Data analysis

The sample articles were considered with the clear objective of analyzing and identifying patterns by country, tools and other characteristics regarding the topics addressed. These insights can serve as recommendations for researchers interested in the topic of a model for creating digital communities in the future.

The classification framework for this article is segmented into just one part, consisting of year of publication, country where the study was conducted, source or Journal of publication among others. Under the concepts discussed above and the filters applied to the set of articles, a digital spreadsheet database was utilized as a means of classification for this literature review. A specific taxonomy was designed to process the information and obtain relevant findings, considering the aspects described in Section C.

## C. Synthesis and classification framework

The classification framework for this article is depicted below:

1. Source – Identifies the prestigious database from which the article is sourced.
2. Year of publication – Indicates the year in which the article was officially published. This classification allows an analysis of trends in the evolution and growth of topics covered in the literature review.
3. Journal – Refers to the scientific or technological journal where the article was published. This criterion helps determine the most frequently used publication sources and assess the reliability of specific journals for future research.
4. Country – Denotes the primary country of affiliation for the majority of the authors. This classification facilitates an international comparison of research interest levels and provides contextual insights into the development of each study.
5. General approach – Categorizes the primary domain of each study. In this criterion, the considered fields include Agriculture, Aquaculture, Livestock, Commerce, Education, Politics and Other.
6. Model/Framework – Identifies whether the article presents a reference framework, conceptual model, or methodological structure for its research or proposal.
7. Proposed/Studied medium – Refers to the medium proposed or examined in each study, particularly those deemed innovative enough for publication in a scientific or technological journal. The classified mediums include social media, Digital Platforms or Websites, Assemblies or Social Gatherings, Simulation, Other Mediums, and Not Specified.
8. Implementation level – Describes the extent to which the proposed research has been applied, based on its objectives, limitations and approach. For this literature review, the classification includes Implemented/Commercial, Research, Proposal, or Not specified.

9. Key Actors – Identifies the presence of models or frameworks that incorporate specific actors, providing a clearer understanding of the study's proposal. This classification records the key actors most frequently referenced by authors.
10. Challenges – Highlights challenges related to the implementation of the simulation, explicitly discussed by the authors in their articles.

It should be noted that the collection of information from the articles was carried out with the help of Mendeley<sup>®</sup> software, which is a reference manager that allows documents in PDF format to be manipulated in an efficient and secure way.

## 3. CLASSIFICATION RESULTS

This section describes the result of the classification to provide relevant information to answer the research questions below.

### 1. Results by source

Initially, the Figure 1, related to the analysis of information sources in this systematic review, indicates that the majority of articles hosted in the scientific/technological community are found in the SCOPUS<sup>®</sup> database, accounting for 57% of the contributions. This aligns with the breadth of journals and the efficiency in providing visibility to these articles. It is followed by ScienceDirect<sup>®</sup> with 32% of the contributions. Although there may be some overlap between articles hosted in this database and SCOPUS<sup>®</sup>, it demonstrates distinct capabilities despite its close relationship with Elsevier<sup>®</sup>, a global information analysis company. Finally, Taylor & Francis<sup>®</sup> and Dialnet<sup>®</sup> account for 9% and 2% of the contributions, respectively.

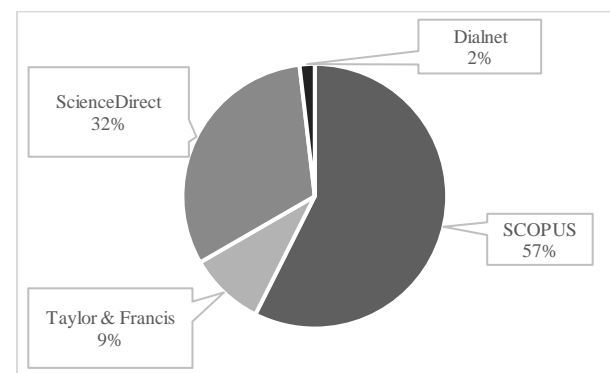
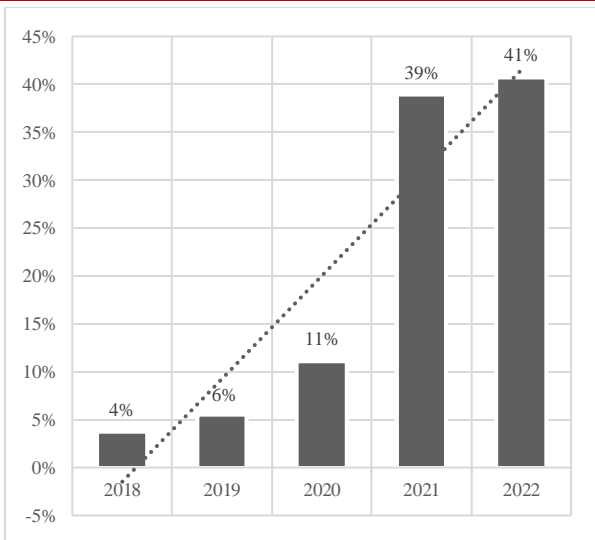


Figure 1: Results by source

### 2. Results by year of publication

The year of publication also represents an important point of interest for this research, as it provides a trend regarding the determined topics. In other words, it highlights the growing interest of the scientific and technological community in rural digital communities, food supply chains, and their models or frameworks for commercialization.



**Figure 2: Results by year of publication**

Therefore, the Figure 2 presents the trend in the use of knowledge related to the keywords, showing a positive upward trajectory. This indicates that the scientific community is increasingly focusing on these topics concerning rural communities and their productive chains, aiming for greater social impact. This trend can be attributed to the effects of the SARS-CoV-2 pandemic, as a significant increase is observed starting in 2020 compared to 2021.

**3. Results by Journal.**

Throughout the proposed time frame, Figure 3 shows that there are multiple scientific journals where the authors of the collected articles publish their research and findings.

A total of 43 different journals were identified, with the most frequent being: Journal of Cleaner Production, Agricultural Systems, British Food Journal, Knowledge Management Research & Practice, Sustainability (Switzerland), and Sustainable Production and Consumption.

**4. Results by country**

In a corresponding way, the Figure 4 presents a breakdown of all the countries involved in the compendium of reviewed articles, along with their frequency of contribution. It shows that the United Kingdom, China, Australia, and France are the countries that contribute the most to the topics of interest in this analysis, positioning them as key references in the field.

On the other hand, it is noted that the participation of Mexico is absent. Therefore, efforts must be focused on practical involvement alongside research to develop successful projects that are eligible for international publication.

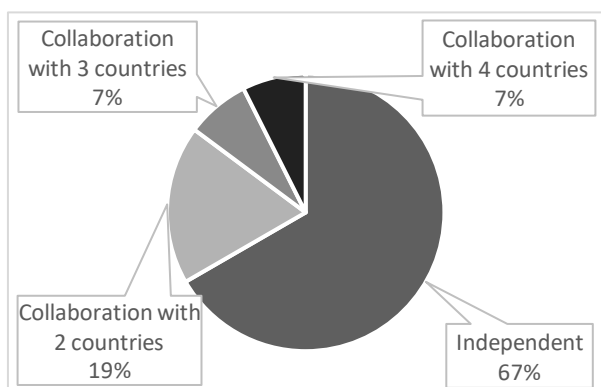


**Figure 3: Results by Journal**



**Figure 4: Results by country**

In this context, Figure 5 presents a graph illustrating how countries generally collaborate in relation to the publication of the topics covered in this work. It shows that independent publication and collaboration between two countries through their institutions are the most frequent alternatives.

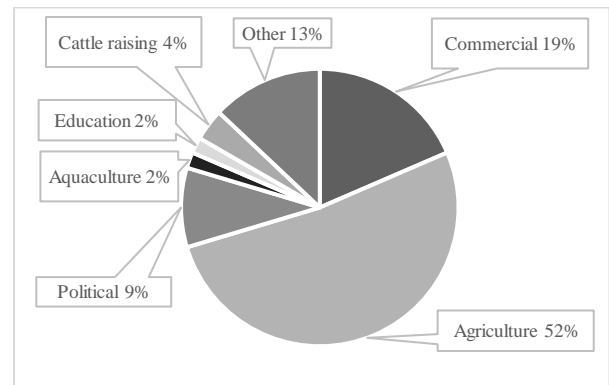


**Figure 5: Results by country collaboration**

**5. Results by general approach**

Regarding the approach of the contributions, the Figure 6 presents a summarized analysis, showing that Agriculture stands out with 52% of the contributions, equivalent to 28 articles discussing the

topic. In second place is the Commercial approach, related to activities such as showcasing, selling, and distributing food or business models, accounting for 19% of the contributions, or 10 articles in the compendium.

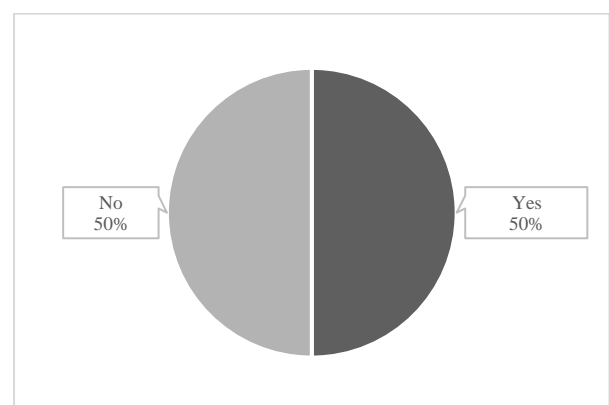


**Figure 6: Results by general approach**

The analysis identified 'Other' approaches not initially included in the classification, accounting for approximately 13% of the contributions. These approaches focus on various aspects, such as social and economic factors. Additionally, 9% of the contributions address more political aspects, such as regulations, policy proposals, or fair trade, corresponding to approximately five articles.

**6. Results by model/framework**

In the category related to the use, proposal, or implementation of a model or commonly referred to as a "framework," the Figure 7 shows that 50% of the reviewed articles present an initiative using this guide for the development of the research or published project.



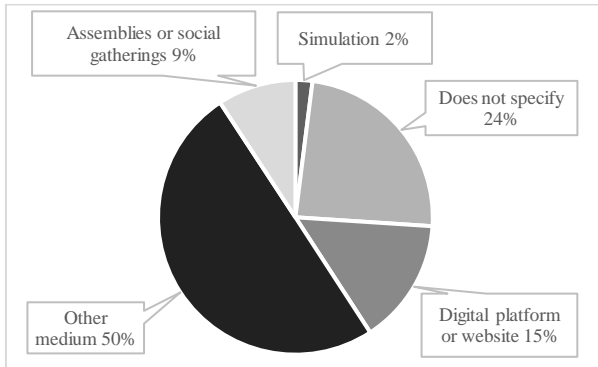
**Figure 7: Results by model or framework**

The remaining 50% corresponds to articles that do not present a framework initiative. However, the results and information they provide are still of interest to the research group.

**7. Results by proposed/studied medium**

The category related to the innovation proposed by the contributions is illustrated in the Figure 8 which indicates that 50% of the articles present a medium different from the initial classification of methodology

and classification framework. These contributions lead to proposals, business plans, or reflections of interest. In this context, 24% of the articles do not clearly specify their innovative aspect. Additionally, 15% of the contributions mention digital platforms related to their focus and proposed framework, primarily aimed at enhancing commerce and precision agriculture.

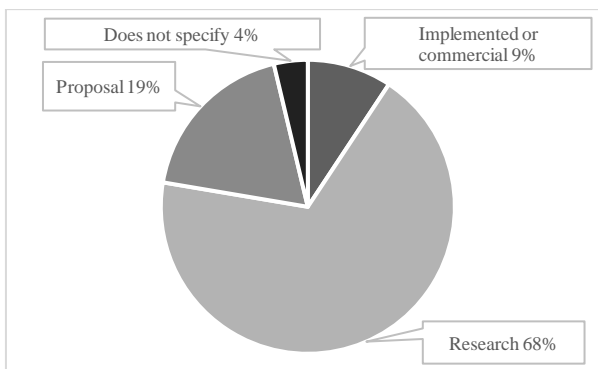


**Figure 8: Results by proposed/studied medium**

In this same context, 9% of the contributions address topics related to assemblies or cooperative groups as an innovative solution, specifically five articles from the total collected. Finally, only one article discusses simulation as a contribution to applied knowledge, representing 2% of the contributions.

**8. Results by implementation level**

To evaluate the effectiveness of the models proposed by the authors, Figure 9 presents the level of successful implementation for each contribution. It shows that 68% of the contributions focus on Research, meaning they propose follow-ups or continuations of the idea or project without reaching a practical evaluation due to various internal or external reasons.



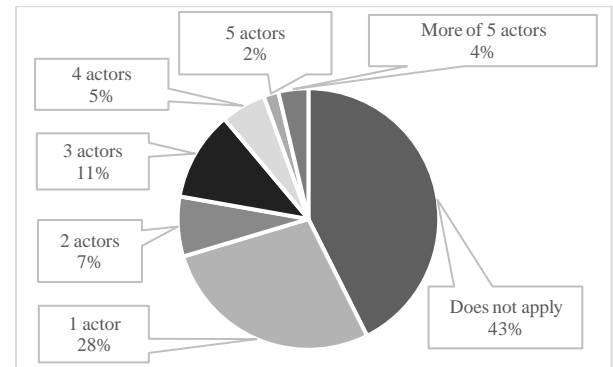
**Figure 9: Results by implementation level**

However, 19% of the contributions propose improvements without focusing on research and from early stages, even presenting hypothesis-based theories supported by literature. On the other hand, 9% of the articles validate the proposed approach through some novel means, which may be either commercial or purely functional. Finally, only 4% of the contributions do not clarify the level of implementation achieved or consist of

reflective or theoretical documents that, rather than validating a method, encourage critical thinking.

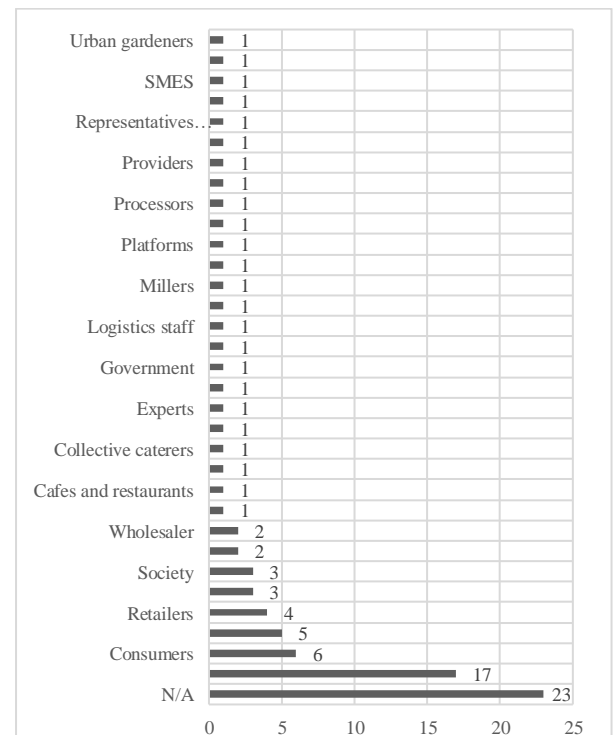
**9. Results by mean actors**

Finally, the analysis reveals that 43% of the contributions do not include a schematic of actors for the proposed approaches and/or models, as shown in Figure 10 it also highlights that the authors often consider only a single actor in their proposals, which are predominantly administrative entities or resource management organizations, along with other involved actors.



**Figure 10: Results by mean actors**

On the other hand, it can be observed that the authors propose up to more than five key actors, representing scenarios that are more aligned with an initial improvement process compared to relying on a single manager. Additionally, the Figure 11 provides a breakdown of the actors considered relevant in the rural food supply chain, aiming to understand their perspectives for optimizing the proposed solutions.



**Figure 11: Results by kind of actors**

## 4. CONCLUSIONS

The achievement of this document's objectives contributes to addressing the research questions posed, highlighting contributions that present models or frameworks related to the food supply chain, rural communities, digitalization, and commerce. These contributions serve as references for proposals aimed at fostering autonomy and effective commercial interaction in rural communities. This process first requires identifying the key actors in the productive chain under study or proposal.

It is important to emphasize that one of the most complex challenges highlighted by article authors is the use of digital tools. They stress the need for connectivity and the availability of electronic devices to enable better interaction among rural groups and commercial activities, fostering healthy competition. The lack of information and regulations is also noted as a significant challenge, as it is necessary to balance the benefits and responsibilities in economic activity. Furthermore, the lack of investment in the concept of precision agriculture is an issue that must be approached delicately in proposals for developing countries, as most of the analyzed contributions related to ICTs in agriculture originate from European countries.

Additionally, the need for coordination and management in business processes is emphasized, from producing raw materials in the fields to the commercial process. This is evident in literary contributions that reveal interconnected actor schemes to validate proposed solutions, where multi-actor approaches are apparent. In this same context, the use of ICTs can have a positive impact, provided there are clear guidelines for usage, cooperation, and investment, ensuring that cultivation processes are enhanced and leveraged intelligently within a more transparent commercial environment.

As an important area of opportunity, the participation of Mexico in topics related to rural communities, food supply chains, technology usage, and operational models is imperative. The country possesses abundant natural resources and a strong foundation in primary activities, which could drive numerous research projects with the support of expertise from previous studies. It is also recommended to leverage the positive trend in addressing these topics to benefit the most critical links in the food production chain, particularly raw material sectors such as agriculture, aquaculture, and livestock.

It is worth mentioning that there were limited contributions related to aquaculture production. However, the review was developed with a more generalist perspective, establishing a precedent for creating rural digital communities in these largely neglected sectors and encouraging private investment.

## 5. ACKNOWLEDGEMENT

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