

## **Assessing Rural Finance and Accounting Management skills in small-scale farmers of Los Rios – Ecuador**

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**Abstract:** This research aims to analyze the financial management of small-scale producers mainly dedicated to family farming. The study was carried out in the province of Los Rios, where it explains the main issues regarding the pros of having accounting and management for farmers and issues related to not keep financial records. The data were collected through a semi-structured survey which was carried out on small-scale producers who are engaged in family farming. Descriptive statistics were used to explain the main hypothesis of the study. As a result, more than 50% of producers, even when presenting small incomes, tend to keep a record of incomes and expenses, in a formal or informal method, independently of not having proper training or extension services that support this management. Producers of Los Rios have a great source of biodiversity, indicating they harvest approximately 79 species and supporting self-consumption and food security. Finally, public policy implications for decision making are presented in the discussion.

**Keywords:** Rural finance, accounting, agriculture, small-scale, producers, management.

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### **1. Introduction**

Due to globalization, finances have become one of the most important tools in any economic activity (Lindao, Lindao, Holguin, & Carpio, 2016). However, for people living in rural areas present limitations considering even basic knowledge of accounting or finance, which does not allow them to keep records of incomes and expenses (Grossman et al., 2014) and, take important management decisions about their production activities.

On the other hand, the Constitution of the Republic of Ecuador in its Article 27: "Education is essential for the knowledge, the exercise of rights and the construction of a sovereign country", which constitutes a strategic axis for national development. However, there are several comments regarding the education (in finance and accounting areas) in rural areas or the agriculture producers. As a result, there is a clear need for a robust agricultural finance system in small scale producers (Abate, Rashid, Borzaga, & Getnet, 2016).

According to ESPAC (2017), Los Rios is one of the most important provinces in the agricultural matter because of the positive repercussions in the Ecuadorian economy, and a path that allows farmers to use to obtain economic sustenance. Even though smallholder farmers produce 86% of the country's agricultural production, they are resource-poor and on average, own less than one hectare of land (Carrión & Herrera, 2012).

This could imply that a potential high credit demand (mostly coming from smallholders) that is unlikely to be approved by the banking system, because of the risk, transaction cost and the lack of access to adequate investment inputs (Hoff & Stiglitz, 1990) and even more difficult for women farmer access to formal credit (Fletschner & Kenney, 2014). Usually in developing countries, the mainstream financial institutions lack the capacity to serve resources to poor households and smallholder farmers (Obo, 2009).

Therefore, besides informal sources, low-income households and smallholders heavily rely on financial cooperatives and microfinance institutions or even in informal credits, which are now the forerunners in delivering financial services to farmers (Santos, Párraga, Torres, Galarza, & Calderón, 2017). Their contributions are notable in lending small-uncollateralized loans, in savings mobilization, and in inculcating financial literacy in society (Motsoari, Cloete, & van Schalkwyk, 2015).

On the other hand, those small-scale farmers are mostly dedicated to family farming. According to Toader & Roman (2015), family farming is a subject of great importance for the sustainable development of

rural communities and the promotion of a healthy lifestyle. family farming is a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labor, including both women's and men's (FAO, 2014). This is the predominant form of agriculture in the food production sector for both developing and developed countries (Juárez, 2011). Thus, subsistence and semi-subsistence small farms are of particular importance in the current global agricultural policy (Davidova & Thomson, 2014). They are a way of life, through which much of the rural population provides their livelihood.

The purpose of this study is to inform the financial environment in small-scale producers in the Province of Los Rios – Ecuador, focusing on their issues such as contributions and resources, accounting records, and information systems, which could influence the development of many families. Then, the question that guides our study is: Do small-scale producers in the province of Los Rios keep finance methods or accounting records that could support their production activity?

Extension services are important to create knowledge in rural areas. According to Menconi, Grohmann, & Mancinelli (2017), a participatory rural planning process (PRPP) is imperative where “it is an inclusive path that aims to compare and integrate the expert knowledge with the local knowledge for the taking over of responsibility and shared commitments”. Therefore, Baloch & Thapa (2018) proposed strategies with a bottom-up approach that have been designed through the use of participatory tools to support the generation of knowledge by voice and opinion of farmers. Menconi et al. (2017) highlight the use of participatory strategies, which support the improvement of the empowerment level, empirical knowledge and existing relationships between actors and interest groups in the territory inside the PRPP, where these agents are mainly the farmers and other participant involved in these production activities.

The article is presented according to this structure: i) introduction including main theories that support our study, ii) methods introducing tools to collect information, iii) main results and analysis of data and iv) discussion and conclusion based on the hypothesis presented.

## **2. Literature Review**

Millions of people in rural areas of the developing world are poor because they have very little money and not because of a lack of capacity to manage it. While some studies reveal that microentrepreneurs produce high rates of income on the capital they invest, the problem is that they lack access to sufficient funds, which translates into a low profit pool and perpetuation of their poverty(FAO, 2005).

In this conceptual framework, rural people empowerment is multidimensional. It occurs at the micro level in the individual, the family; at the macro level, in the community and wider spaces(Bjorn-Soren Gigler, 2014). Empowerment starts from one's own conscience at an internal level, so it is necessary that the environment encourages it through information, that is, that farmers know their rights and that there are economic and social programs that support them(Mathur & Agarwal, 2016).

The analysis of the evolution of rural finance in Latin America could deepen and adjust to different contexts of the region, being more exhaustive with the approaches and moments(Tapella & Frigerio, 2011).There are at least three approaches where rural financing has crystalized: i) the “productive” credit approach, which prevailed from the 1950s to the late 1980s in the different rural credit programs; ii) the “financial markets” approach, dominant since the 1990s, which laid the foundations for the new rural financing policies (Alvarado, 1996); and iii) the “microfinance” approach, which emerged in the 1990s and is constantly evolving.

Previously "rural finance" and "agricultural credit" were equivalent concepts(FAO, 2005). Today the focus is broader: the future of poverty reduction is about investing in all aspects of rural development and not just in agriculture. The proliferation of rural areas promotes the improvement of infrastructure, which boosts the competitiveness of production. But there can only be development when a rural area is able to attract and sustain rural investment thanks to a conducive environment to operate, adequate financing products and attractive returns.

The literature insists on the development of high capacities of the professional to enhance their contribution towards a rural economy model, whose main resources are represented by knowledge(Bolívar, 2015). Work, raw materials, and capital are replaced as essential resources to enhance productivity, growth and social equality. However, it is necessary to identify routes that make it possible to strengthen the required professional skills and introduce them from pre-professional training(Nino, 2011).

## **3. Methods**

This research is predominantly descriptive with the objective of support the main hypothesis presented at the beginning of this research.

### 3.1 Design

A semi-structured questionnaire was used to gather information about the investigation of farmer entrepreneurial types. The survey was conducted in the households of the participant's prior request for written consent. These data were obtained from a survey conducted across the agriculture producers in Los Ríos, which included items based on qualitative interviews. The sample was a simple random probability sampling of 133 surveyed farmers (with confidence: 90% and error: 7%), where the primary purpose of the survey was to investigate attitudes towards the production activity (farm size and products) and farmer characteristics (demographics).

### 3.2 Data Analysis

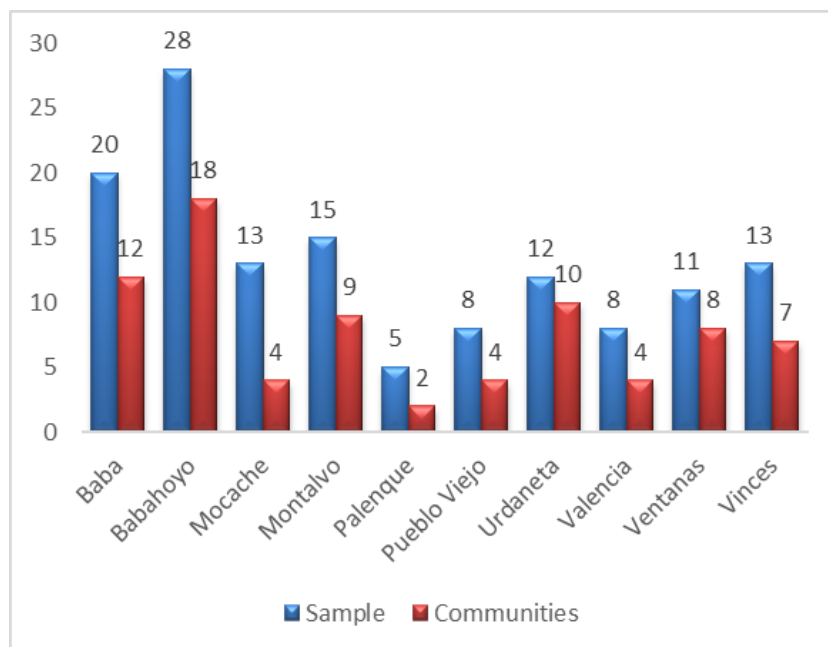
For statistical analysis, after tabulating the information, the aim is to present the results of the main survey information using descriptive statistics. As the study is qualitative and quantitative-based, different types of variables are studied, such as quantitative: (number of hectares, production), dichotomous (demographics, accounting-related), scalar (agrees with... decision making, participation) and binomials (gender, association). It was planned to carry out a structured analysis of the information obtained, to generate an explanatory model appropriate to the reality of small-scale producers in the province.

## 4. Results

A quantitative and qualitative analysis was developed using descriptive statistics to explain the results obtained from the study population. Mainly, the aim was to support the hypothesis with the data collected in a synthesized method. This study managed to collect data in 10 different cities of the province, reaching 78 communities, where small-scale agricultural producers are concentrated, as can be seen in Figure 1:

The province of Los Ríos is one of the 24 provinces of Ecuador, located in the coastal region of the country. Its total population is 527,559. Babahoyo is its capital and its most populated locality is Quevedo. In the province, water is an important resource because it bathes its lands and makes it the most fertile area in Ecuador and from there it gets its name. (Naranjo, 2004)

According to ESPAC (2017), Los Ríos stands out for its agricultural activity being the main source of production, it occupies the first place in the republic in the production of cocoa and is second in the coast in the production of coffee, having also the rice production and fishing as important activities. (ESPAC, 2017).



**Figure 1:** Sampled communities in Los Ríos

Initially, we presented some demographic information, in Table 1 are detailed the main products that were mentioned by small-scale producers. It should be noted that the surveyed producers have approximately 1 to 15 hectares, with an average of 6.02 hectares for their production. The top 10 products are mentioned as following:

**Table 1:** Productive analysis of Los Rios

<i>Product</i>	<i>Percentage</i>	<i>Sale destination</i>	<i>Home consumption</i>
Rice	32,74%	79,6%	20,4%
Cocoa	24,66%	97,2%	2,8%
Maize	14,80%	70,0%	30,0%
Plantain	9,42%	50,0%	50,0%
Soy	6,28%	100,0%	0,0%
Orange	4,48%	75,0%	25,0%
Banana	3,14%	80,0%	20,0%
Tangerine	1,79%	50,0%	50,0%
Corn	1,35%	100,0%	0,0%
Sugar cane	1,35%	33,3%	66,7%

Within its production, Los Ríos farmers mainly grow rice, cocoa, and corn. In addition to the products mentioned in Table 1, it was also mentioned to have family gardens and small farms, in which fruit, vegetables, and herbs products are harvested. Table 2 present the product species studying the mentioned crops as primary, secondary, and additional products and, they harvest approximately 79 products supporting the biodiversity and the food security in small-scale producers' families.

We present the top relevant crops and their destination, i) mainly destined for sale such as rice, cocoa, and corn; ii) destined for home consumption, mainly fruit species such as orange, watermelon, and mango; iii) grown in family gardens, rich in plant and herbal species and iv) smaller species such as oregano, passion fruit or coconut. Species diversification supports adequate consumption and contributes to the nutrition of farmers, in turn improving the well-being of the community and the health and safety of its inhabitants (Kennedy, Ballard, & Dop, 2011).

**Table 2:** Species diversification

<i>Mainly sale destined</i>	<i>Mainly self-consumption destined</i>	<i>Harvested in family gardens</i>	<i>Minor harvested crops</i>				
Rice	58%	Orange	18%	Peppermint	6%	Oregano	4%
Cocoa	35%	Watermelon	17%	Pumpkin	5%	Passionfruit	4%
Maize	25%	Lemon	14%	Yucca	5%	Soursop	3%
Banana	19%	Mango	13%	Lemongrass	5%	Coconut	3%
Plantain	12%	Melon	8%	Beans	4%	Tangerine	3%
Soy	8%	Papaya	8%	Coriander	4%	Cherry	3%
Sugar cane	4%	Guava	8%	Aloe	3%	Tomato	3%

Instead, Table 3, collected information about the producers' income, analyzing different categories that represent: i) poverty line, ii) minimum wage, iii) basic basket of goods, iv) medium income, and v) higher incomes. Also, it analyzes its family income, if they keep off-farm income and/or agricultural insurance according to each construct.

**Table 3:** Producers' finance according to family income

<i>Income Interval</i>	<i>Family income</i>	<i>Off-farm income (Yes= 30.83%)</i>	<i>AgriculturalInsurance (Yes = 23,31%)</i>
\$1.00 – \$85	12,78%	5,88%	23,53%
\$85.00 - \$400.00	48,12%	35,94%	20,31%
\$400.00 - \$714.00	21,80%	24,14%	27,59%
\$714.00 - \$1000.00	12,03%	50,00%	18,75%
Higher than \$1000.00	5,26%	28,57%	42,86%

Approximately 48.12% of producers are located on the poverty line, in which some manage to reach the basic salary, in terms of family income, however, 35.94% of these producers generate off-farm income mainly in agro-industrial activities, for other large farmers or companies. On the other hand, the high-income ranges also show off-farm income, mostly in commercial activities or small ventures. In terms of agricultural

and livestock insurance, between 18% and 28% of farmers have insurance, except for the producers who have the highest profit (greater than \$ 1,000.00) in which 42.86% have insured their crops against adverse risks. In Table 4, we aimed to analyze the percentage of producers that could access to extension services, training, and accounting management, according to each income construct.

**Table 4:** Accounting management according to family income

<b>Income Interval</b>	<b>Extension Services</b> (Yes = 27.8%)	<b>Technology Training</b> (Yes = 28.8%)	<b>Accounting Records</b> (Yes = 71.0%)
\$1.00 – \$85	29,41%	11,76%	58,82%
\$85.00 - \$400.00	31,25%	26,56%	75,00%
\$400.00 - \$714.00	20,69%	31,03%	72,41%
\$714.00 - \$1000.00	18,75%	25,00%	50,00%
Higher than \$1000.00	42,86%	85,71%	85,71%

The extension service to small-scale producers in Los Ríos is limited, both from the public sector and academia. Farmers who declare income of more than \$1000, have obtained extension services in 42.85%, for the rest of the groups, the percentages of producers do not exceed 31.26%. On the other hand, small producers declare that less than 31.03% have received training related to technology, social networks, and the internet, in the case of the group with the highest income, 85.71% declare knowledge. While, more than 50% keep records of income and expenses to control their production, even those who are in the poverty line, where 58.82% declare having income and expenses records, evidencing that accounting is not an issue of income, any economic level in farming have the possibility of carrying accounting of incomes and expenses, even when they have limited extension services and training.

**Table 5:** Producers' finance according to education

<b>Education Level</b>	<b>Family income &gt; min wage</b> (Yes = 39.1%)	<b>Off-farm income</b> (Yes= 30.83%)	<b>Agricultural Insurance</b> (Yes = 23,31%)
Incomplete School	21,4%	27,8%	33,3%
Complete School	30,6%	22,9%	19,4%
Incomplete High School	23,8%	19,4%	23,8%
Complete High School	48,4%	40,0%	25,8%
Incomplete College	44,4%	50,0%	14,3%
Complete College	75,0%	50,0%	25,0%
Post-graduate Program	100,0%	100,0%	0,0%

In Table 5, we evaluated the relationship between income and education level, where only 38.1% of surveyed farmers report an income superior to the minimum wage, 30.8% have off-farm, income, and 23.3% keep agricultural insurance. As it was predicted, the family income increased according to the level of education, and 21.4% of the surveyed producer with incomplete school exceed the minimum wage, while it starts to increase in percentage. However, even when the producer has completed high school or incomplete college, no more than 50% could reach a minimum wage. The producers with complete college and post-graduate programs are above this percentage.

Furthermore, it is evidenced that having an off-farm income could improve income, and it is also related to the level of education. The producers with no complete high school are above 27.8%, while the producers with complete high school and superior levels exceed 40%. Regarding agricultural insurance is not directly related to the level of education, only the 33.33% of the surveyed producers keep insurance, where less than 33.33% of each education construct has included this service into their expenses.

Then, it is imperative to measure the accounting management criteria according to the level of education. Table 6 synthesizes this information, where producers indicated only 27.8% could access to extension services coming from public institutions or academy, and 28.8% of farmers are trained in technology services. However, 71% of the surveyed producers keep records of accounts and finance to control their income and expenses, sometimes, in not formal methods, but they make their effort to have control.

**Table 6:** Accounting management according to education level

<i>Education Level</i>	<i>Extension Services</i> (Yes = 27.8%)	<i>Technology Training</i> (Yes = 28.8%)	<i>Accounting Records</i> (Yes = 71.0%)
Incomplete School	33,3%	11,1%	88,9%
Complete School	25,0%	13,9%	65,7%
Incomplete High School	23,8%	23,8%	55,0%
Complete High School	29,0%	36,7%	80,6%
Incomplete College	14,3%	64,3%	78,6%
Complete College	50,0%	61,7%	66,7%
Post-graduate Program	0,0%	100,0%	100,0%

The extensions services are variable in every level of education, and it doesn't have a lineal behavior of increasing, while training is increasing according to the level of education. Only 11.1% of farmers are trained when they have incomplete school, those values are increasing, further college education has higher values, from 61% to 100%. Finally, farmers keep records independently of their level of studies. More than 55% of the farmers in each construct keep accounting records, in both, formal and informal methods.

## 5. Discussion

Based on local development and the well-being of the community and producers, new strategies are imperative, such as extension efforts by public institutions or academia focused on learning paths on issues of PC utilities, internet, and social media, implementation of new technologies, associativity, and better innovation mechanisms for having more action within the value chain (Bada, Rivas, y Littlewood, 2017).

When the farmers have a better knowledge of accounting and finance management, they could improve in: i) better skills development for controlling their current production activity, ii) boost the saving capacity of the farmers, as the ability to access to credit and, iii) contribute to higher levels of associativity, where farmers are more consolidated to work in groups and access to new benefits (Santos, Párraga, Galarza, & Torres, 2016). Thus, public policies must be focused on the intervention on training and other support programs for increasing the level of knowledge of farmers in the order they could generate better methods of control and accounting.

According to the farmers' perception some limitations are important to highlight, i) age and gender are also important for learning, they consider higher ages are not willing to learn new methods, ii) they experiment difficult barriers for accessing credit, investment and innovation packages, iii) they consider public and financial institution consider them risk agents, and it is difficult to manage any transaction, then, they usually hold back to try (Hoff & Stiglitz, 1990).

We motivate further research in this area, initially, with a greater sample in every community to validate the results are maintained. Then, extension service and education, we propose participatory rural appraisal methods based on bottom-up strategies (Solano, Fernández, & López, 2018), thus, we know what the strengths and weaknesses are and look up to solve them. Finally, methods to keep biodiversity in their crops (Rose et al., 2019), and better ways to get into the value chain, to promote the products, not focusing just on main products but on the additional products they present.

## 6. Conclusions

As reflected in these results, the main hypothesis of this study could be approved. Farmers keep accounting records independently from their level of education and income, in formal or informal ways. For farmers, its economy is based and sustained on productive processes, where the availability of resources are used to develop and elaborate products that allow them their subsistence (Parraguez et al., 2018).

In conclusion, most farmers in Los Ríos province keep a record of their economic activities regarding their production in formal or informal methods. Furthermore, their resources as capital and knowledge have not allowed them to properly manage their financial accounts, however, they are trying to control them. Thus, the lack of incentives and programs that support farmers is necessary for their local development and mostly in finance and management issues.

Additional benefits were found in this study when analyzing economic activity. The producers mention harvesting approximately 79 different plant species, among vegetables, fruits, and herbs. This biodiversity could support food security because most products are self-consumption destined and also, improving local (and even rural) development, affecting both, farmers and the community level.

Besides validating the research hypothesis, we consider it is a replicable and extrapolated element that contributes to the generation of knowledge and innovation, by obtaining useful and reliable qualitative results, which also improve the collective situations of the farmers and communities.

### References

- [1] M. F. A. Lindao, C. A. A. Lindao, J. R. Holguin, and F. L. P. Carpio, "Modelo de sistema contable y de control para los agricultores de la comuna Loma Alta. Santa Elena, Ecuador," *Obs. la Econ. Latinoam.*, vol. 226, 2016.
- [2] J. Grossman *et al.*, "La prestación de servicios a los pequeños agricultores: Últimas novedades en materia de finanzas digitales," *Enfoques*, vol. 94, pp. 1–16, 2014.
- [3] G. T. Abate, S. Rashid, C. Borzaga, and K. Getnet, "Rural Finance and Agricultural Technology Adoption in Ethiopia: Does the Institutional Design of Lending Organizations Matter?," *World Dev.*, vol. 84, pp. 235–253, 2016.
- [4] ESPAC, "Encuesta de Superficie y Producción Agropecuaria Continua," 2017.
- [5] D. Carrión and S. Herrera, *Ecuador rural del siglo XXI : soberanía alimentaria, inversión pública y política agraria*. 2012.
- [6] K. Hoff and J. E. Stiglitz, "Imperfect information and rural credit markets: Puzzles and policy perspectives," *World Bank Econ. Rev.*, vol. 4, no. 3, pp. 235–250. <http://www.jstor.org/stable/3989876>, 1990.
- [7] D. Fletschner and L. Kenney, "Rural Women's Access to Financial Services: Credit, Savings, and Insurance," in *In: Quisumbing A., Meinzen-Dick R., Raney T., Croppenstedt A., Behrman J., Peterman A. (eds) Gender in Agriculture*. Springer, Dordrecht, 2014.
- [8] D. D. Obo, *Microfinance in Ethiopia: elixir or poison?* 2009.
- [9] A. Santos Ordoñez, C. Párraga Lema, M. Torres Naranjo, J. Galarza Villamar, and F. Calderón Vega, "Implementación de métodos participativos para la identificación de problemáticas socioeconómicas de los agricultores: el caso de la asociación 'Dios con nosotros,'" *Yura Relac. Int.*, pp. 115–125, 2017.
- [10] C. Motsoari, P. C. Cloete, and H. D. van Schalkwyk, "An analysis of factors affecting access to credit in Lesotho's smallholder agricultural sector," *Dev. South. Afr.*, vol. 32, no. 5, pp. 592–602, Sep. 2015.
- [11] M. Toader and G. V. Roman, "Family Farming – Examples for Rural Communities Development," *Ital. Oral Surg.*, vol. 6, pp. 89–94, 2015.
- [12] FAO, "World Agriculture Watch," *FAO's definitions of family farming*, 2014. .
- [13] V. Juárez, "Agricultura Familiar Agroecológica Campesina en la Comunidad Andina," *Rev. Agroecol.*, 2011.
- [14] S. Davidova and K. Thomson, *Family farming in Europe: Challenges and prospects*. 2014.
- [15] M. E. Menconi, D. Grohmann, and C. Mancinelli, "European farmers and participatory rural appraisal : A systematic literature review on experiences to optimize rural development," *Land use policy*, vol. 60, pp. 1–11, 2017.
- [16] M. A. Baloch and G. B. Thapa, "The effect of agricultural extension services: Date farmers' case in Balochistan, Pakistan," *J. Saudi Soc. Agric. Sci.*, vol. 17, no. 3, pp. 282–289, Jul. 2018.
- [17] FAO, "Finanzas para los pobres rurales," *FAO*, p. <http://www.fao.org/ag/esp/revista/0511sp3.htm>, 2005.
- [18] S. B. Bjorn-Soren Gigler, *Closing the Feedback Loop- Can Technology Bridge the Accountability Gap?* 2014.
- [19] P. Mathur and P. Agarwal, "Self-help groups: a seed for intrinsic empowerment of Indian rural women.," *Equal. Divers. Incl. An Int. J.*, vol. 36, pp. 182–196, 2016.
- [20] E. Tapella and M.-M. Frigerio, "Crédito rural y pequeña agricultura . Aprendizajes a partir del caso del Programa Social Agropecuario en Argentina," *Cuad. Desarro. Rural*, vol. 8, no. 67, pp. 17–43, 2011.
- [21] J. Alvarado, "La innovación en las tecnologías crediticias," *Rev. Debate Agrar.*, vol. 21, pp. 2–13, 1996.
- [22] A. Bolívar, "Un currículum común consensuado en torno al marco europeo de competencias clave. Un análisis comparativo con el caso francés," *Rev. la Asoc. Insp. Educ. España*, vol. 23, pp. 1–35, 2015.
- [23] E. Nino, "La desigualdad en el acceso a la educación universitaria argentina," *Lecciones y Ensayos*, vol. 89, no. 1, pp. 351–366, 2011.
- [24] M. Naranjo, *La cultura popular en el Ecuador tomo XI Los Ríos*. 2004.
- [25] G. Kennedy, T. Ballard, and M. Dop, *Guidelines for Measuring Household and Individual Dietary Diversity*. Food and Agriculture Organization of the United Nations, 2011.
- [26] L. M. Bada Carbajal, L. A. Rivas Tovar, and H. F. Littlewood Zimmerman, "Model of associativity in the production chain in Agroindustrial SMEs," *Contaduría y Adm.*, vol. 62, no. 4, pp. 1118–1135, Oct.

- 2017.
- [27] A. Santos-Ordoñez, C. Párraga-Lema, J. Galarza-Villamar, and M. Torres-Naranjo, "University Extension in Service of Rural Communities: The Case of "United we are more" community bank.," *Eng. Innov. Glob. Sustain. Proc. 14th Lat. Am. Caribb. Conf. Eng. Technol.*, no. 119, pp. 20–22, 2016.
- [28] C. Solano Lara, A. Fernández Crispín, and M. C. López Téllez, "Participatory rural appraisal as an educational tool to empower sustainable community processes," *J. Clean. Prod.*, vol. 172, pp. 4254–4262, 2018.
- [29] D. C. Rose *et al.*, "Integrated farm management for sustainable agriculture: Lessons for knowledge exchange and policy," *Land use policy*, vol. 81, pp. 834–842, Feb. 2019.
- [30] E. Parraguez-Vergara, B. Contreras, N. Clavijo, V. Villegas, N. Paucar, and F. Ther, "Does indigenous and campesino traditional agriculture have anything to contribute to food sovereignty in Latin America? Evidence from Chile, Peru, Ecuador, Colombia, Guatemala and Mexico," *Int. J. Agric. Sustain.*, vol. 16, no. 4–5, pp. 326–341, 2018.

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