Extensionist competencies index: a tool for the development of extensionist capacities?

Índice de competencias del extensionista: ¿una herramienta para el desarrollo de sus capacidades?

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Abstract: Identifying the basic competencies that a professional should possess to fulfill his or her role as an extensionist is important, since it favors the connection with the communities being accompanied. Therefore, the objective of this study was to determine the level of perception of the development of competencies of the extensionists, by means of an instrument designed by the authors, on a scale from one (critical situation) to five (optimal situation) using a rubric defined for each competency. The extensionist competencies index (ICE) for Antioquia was 4.1 and for Santander 3.8, which showed the potential and options for improvement to focus efforts on updating and training extensionists, which in the cases analyzed were focused on conflict resolution, information management, the ICT implementation in accompaniment processes, and alignment with the sector's own regulations and policies.

Keywords: agricultural development, capacity building, social innovation.

Resumen: Identificar las competencias básicas que debe poseer un profesional para cumplir su rol como extensionista es un aspecto importante ya que favorece el vínculo con las comunidades acompañadas. Por ello el objetivo de esta investigación consistió en determinar el nivel de percepción de desarrollo de competencias de los extensionistas, por medio de un instrumento diseñado por los autores, en una escala de uno (situación crítica) a cinco (situación óptima) utilizando una rúbrica definida para cada competencia. Como índice de competencias del extensionista (ICE), para Antioquia se obtuvo 4.1 y para Santander 3.8, lo cual evidencio las potencialidades y opciones de mejora para enfocar los esfuerzos de actualización y formación de los extensionistas que en los casos analizados se enfocaron en la resolución de conflictos, la gestión de la información, la implementación de tic en los acompañamientos y la alineación con la normatividad y políticas propia del sector.

Palabras clave: desarrollo agropecuario, fortalecimiento de capacidades, innovación social.

INTRODUCTION

Identifying the basic competencies that a professional should possess to fulfill their role as an extensionist is very important. It favors the connection with the communities being accompanied and the compliance with the principles established by the National System of Agricultural Innovation (SNIA). They define agricultural extension as an accompaniment process aimed at agricultural producers to help them develop capacities for self-management and sustainable development, based on knowledge management, problem diagnosis and solving, and an exchange of experiences, thus contributing to improving the quality of life of agricultural producers (Congress of the Republic of Colombia, 2017).

In this context, not only technical but also social, methodological, and organizational competencies are considered (Movahedi & Nagel, 2012). It is not enough to have the technical

knowledge to fulfill the purpose of extension; it is also necessary to have social knowledge and the capacity to develop conflict resolution techniques (Davis & Sulaiman, 2014), among others.

Therefore, as stated by Fernández & Peña (2012), a deep and continuous reflection on the teaching-learning process is required, given that those who conduct extension activities in the different territories must possess competencies that allow them to implement techniques and strategies for the development of skills and attitudes based on being, knowing, and doing in the communities they accompany.

Consequently, the objective of this study was to determine the level of extensionist competencies in order to create a competencies development plan. This plan will be in line with the purpose of the agricultural extension service and the program in which it is conducted.

THEORETICAL FOUNDATION

Extension as a service is the association of the ideas, management, technologies, and resources necessary for bringing well-being to those whose livelihoods depend on agricultural activities and who lead their lives in rural areas (Davis et al., 2020). That being said, extension should be geared toward promoting networking and contributing to associative work in the communities (Ekepu et al., 2017; Hellin, 2012; Ochieng et al., 2018). Consequently, to allow them to fulfill such a purpose, whoever provides this service must consider the continuous updating and development of competencies as a constant goal (Davis & Terblanché, 2016).

In view of the above, the education and training of extensionists should be seen as a long-term investment (Zenete et al., 2012), as they strengthen the development of extensionist competencies. This strengthening leads to greater job satisfaction, which translates into more efficient and effective extension services, favoring the sustainability of the processes and improving their quality.

As such, it is essential to create spaces that allow extensionists to train and acquire skills and competencies to face the daily challenges of their work and the many factors involved in fulfilling their tasks (Gboku & Modise, 2008). A few examples are competencies aimed at innovating and creating alternative solutions based on systemic thinking oriented toward achievement and assertive communication.

However, the competencies an extensionist requires are not a generic list. They will necessarily depend on the objectives of the program in which they execute their work. Additionally, the level of development varies for each extensionist depending on their accumulated personal experience (Levy-Leboyer & Prieto, 2001). Considering the above, a training plan for extensionists must include elements that allow them to develop the skills required for their specific context based on their previous skills.

According to Article 33 of Act 1876 of 2017, which regulates the National System of Agricultural Innovation, one of the requirements to guarantee the quality of the service of the Agricultural Extension Service Provider (EPSEA) is the development of human resource competencies (Congress of the Republic of Colombia, 2017). Therefore, as proposed by Russo (2013), using the competency approach in extensionist training becomes a construction process that should not be worked upon unilaterally; all those involved should play a part.

Bearing in mind what the agricultural extension service seeks from focusing on developing human, social, and technical capacities in the accompanied communities, agricultural extensionists must possess competencies for conflict resolution, network management, and ICT implementation, which contribute to achieving this goal.

However, this law does not establish an instrument for determining the level of extensionist competencies. Implementing an index for measuring extensionist competencies is therefore

fundamental, as training extension professionals is a valuable tool for improving their service. To this end, we propose the tool designed by Castaño et al. (2021), which is based on the perception that professionals have regarding the level of development of their competencies in the technical, social, organizational, and methodological domains. Actions for improvement may be defined based on these, as proposed by Gboku & Modise (2008).

METHODOLOGY

Design, population, and sample

This work combines quantitative and qualitative methods. It divides data collection into two stages, prioritizing quantitative or qualitative data at the researcher's discretion and then integrating them for the final analysis (Sampieri et al., 2010).

The population is comprised of 24 professionals in charge of developing agricultural extension programs from the Faculty of Agricultural Sciences of Universidad de Antioquia. We used a purposive convenience sample, considering access to groups, their experience, their availability to participate, and their trajectory. They also belonged to two projects in which they had to undergo a selection process to show their eligibility.

The sample consisted of twelve (12) extensionist professionals; six (6) located in the municipalities of Caucasia and Necoclí in Antioquia and six (6) located in the municipality of San Vicente de Chucurí in Santander. The extensionists in Antioquia belonged to the Territorial Laboratories project, which provided technical, social, and business accompaniment to 42 cacao producers. The extensionists in Santander belonged to the project for strengthening agricultural enterprise, which provided technical and human accompaniment to 50 producers associated with the National Federation of Cocoa Growers (FEDECACAO) to strengthen the self-management capacities of the accompanied producers.

Data collection and analysis

We used kobotoolbox (2020) for data collection. With this tool, we created a survey on the extensionists' perceptions regarding the level of development of their competencies. We included four question categories, one for each selected domain and five competencies for each domain. The survey used a scoring system on a scale from 1 to 5: 1 is a competency that is not developed at all, and 5 is a fully developed competency.

The answers were averaged by taking the total score the extensionists gave for each competency and dividing it by the total number of evaluated competencies. The resulting number was the index score, which determines the level of development of the competency as perceived by the extensionists. With this score, we can prioritize which competencies should be strengthened.

Subsequently, for each of the prioritized competencies, a training plan was designed as follows: 1) the competencies were selected with the participating extensionists, 2) each competency and level of development was defined, 3) the current state of the competencies was evaluated, and 4) a training and education plan was designed based on the evaluation results.

Variables and instruments

Four domains were considered as the latent variables: 1) social, 2) technical, 3) organizational, and 4) methodological. The observable variables (competencies) for the social domain were a) goal

orientation, b) assertive communication, c) adaptability, d) problem solving, and e) context analysis. For the technical domain, a) ICT knowledge, b) preparation of meeting materials, c) information management, d) general and basic knowledge, and e) writing proficiency. The variables for the organizational domain were a) decision making, b) network management, c) alignment with public policies, d) monitoring and evaluation, and e) strategic planning. Lastly, for the methodological domain, a) use of graphic material, b) creativity, c) ICT implementation, d) guiding role, and e) resourcefulness.

RESULTS AND DISCUSSION

Competency development index

The competencies index scored 4.1 for the extensionists in Caucasia and Urabá and 3.8 for the extensionists in San Vicente de Chucurí. These results were obtained by applying the mean to the answers of both groups of extensionists. After scoring the ICE, the results were classified into three ranges: a) High: competencies scored between 4.0 and 5.0, b) Intermediate: competencies scored between 3.0 and 3.9, and c) Low: competencies scored between 1.0 and 2.9 (Figure 1). This classification allowed prioritizing the competencies to be strengthened, namely, those in the intermediate and low ranges (ICE between 1.0 and 3.9). These ranges include the competencies with the lowest perception and, therefore, with the most significant opportunity for improvement.
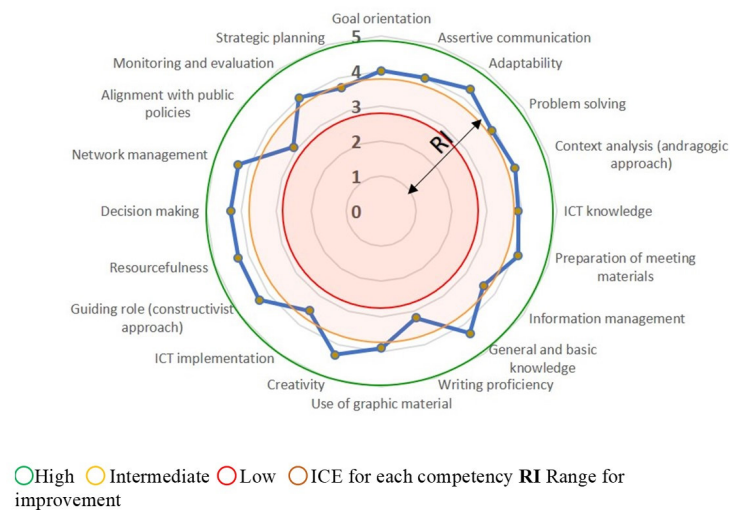

○High ○Intermediate ○Low ○ICE for each competency **RI** Range for improvement

Figure 1. ICE results by competency and classification range. **Source:** Authors

The results show similar perceptions in both groups of extensionists for the social, technical, and methodological domains. Whereas, in the organizational domain, the difference in perception is more noticeable in network management and alignment with public policies (Table 1).

Table 1. ICE score by domain in each group of extensionists

Domain	Antioquia	Santander	Average
Social	4.2	3.9	4.1
Technical	4.0	3.5	3.8
Methodological	4.4	3.7	4.0
Organizational	4.0	4.0	4.0

Source: Authors

In the social domain, problem solving is a competency to be improved, with a score of 3.9. The extensionists agree that they only manage to develop a few alternative solutions to problems by evaluating the pros and cons before selecting them. Likewise, strengthening extensionist competencies for context analysis holds significant relevance. Through this, they can generate relationships of trust and legitimacy for communicating ideas more assertively, which will contribute to the social appropriation of knowledge, thus improving the quality of the extension service (Birner et al., 2009; Mur et al., 2016). These results are consistent with Landini (2016) and Zenete et al. (2012), who highlight this as an essential competency for developing the role of extensionists.

Within the technical domain, the interviewed extensionists gave their writing proficiency a score of 3.2, making it a competency to be improved. The extensionists recognize the grammar rules for writing and producing texts; however, they find it challenging to identify the appropriate way to produce texts distinguishing between scientific, technical, or merely communicative texts. These results are consistent with the findings of Meister (2000) and Zenete et al. (2012), who highlight the value of this competency in the environment of knowledge globalization and the capacity to communicate ideas clearly and appropriately.

In the methodological domain, ICT implementation received a score of 3.5. Extensionists acknowledge the existence of technological and communication resources to aid in their role but do not manage to implement them successfully in their meetings and accompaniments. This competency calls for improvement because, following Pérez et al. (2016), these tools contribute to reducing the difficulties of access to information and help globalize knowledge. However, other authors, such as Parra & Méndez (2005) and Soto-Hernández et al. (2020), have encountered difficulties in ICT implementation due to connectivity and infrastructure issues and lack of access and skills for using these tools in rural communities. Therefore, ICT implementation should not be seen as the only way of providing extension services.

In the organizational domain, alignment with public policies is a competency to be improved in the extensionists of Antioquia, while network management should be strengthened in the extensionists of Santander (Figure 2). These shortcomings can be attributed to the natures of their respective extension programs and the specific strengths of the institutions that implement them. Moreover, decision making, expanding management capacities, problem solving, and satisfying individual and social needs were aspects that the extensionists highly emphasized for this domain. This is in line with what was proposed by Méndez (2006) and Cano (2004), who state that the extensionist profile should include these capacities.
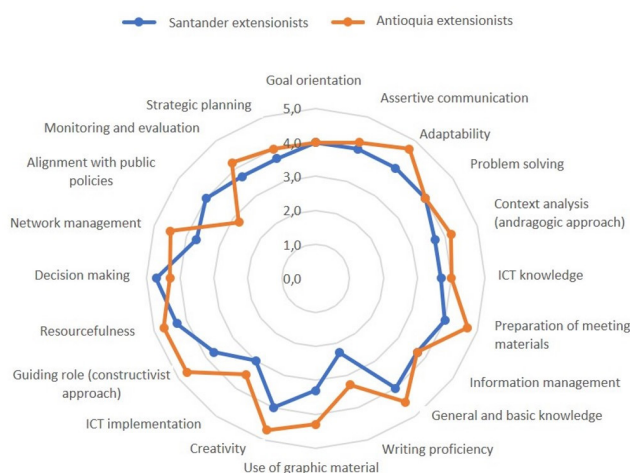

Figure 2. Competency-specific ICE results for each group of professionals. **Source:** Authors

None of the twenty evaluated competencies had a perception range lower than 3.0, which can be attributed both to the experience of the professionals who participated and their continuous reflection on how they fulfill their role as extensionists. This result can be regarded as human talent potential or success in the institutions' selection processes.

Competency prioritization

To select the competencies to be strengthened in the training process, we considered aspects such as the competency-specific ICE scores and the scope and estimated length of the study. The competency with the lowest ICE score was chosen for each domain, which resulted in four competencies and four corresponding training modules to be developed with the extensionists (Table 2). At the end of the training process, we expect an improvement in the perception of the specific competencies covered in each module.

Table 2. Prioritization of the competencies requiring strengthening

Latent variable	Observable variable	Initial score	Competency
Social	Problem solving	3.9	Identifying conflict-generating situations within productive and social contexts and following the necessary steps for resolution within the framework of their role as agricultural extensionists
Technical	Writing proficiency	3.2	Managing information according to communicative intention and the rules established in their role as agricultural extensionists
Methodological	ICT implementation	3.5	Effectively and efficiently incorporating digital tools and resources in their relationship, communication, and accompaniment processes as agricultural extensionists
Organizational	Alignment with public policies	3.1	Understanding the regulatory and conceptual environment for alignment with extension-related public policies in the agricultural sector

Source: Authors

Design of the training plan

Each module will cover 12 hours of work: 4 hours of accompanied work and 8 hours of independent work, for a total of 48 hours. A training module is designed for each prioritized competency following the learning-by-doing methodology (Sánchez-Cañón et al., 2019) (Table 3). This methodology allows for meaningful learning, using the experience of the extensionists to adapt the theoretical contents and put them into context by implementing them in their workspaces.

Table 3. Modules for the competencies requiring strengthening

Prioritized competency	Training topics for strengthening the competency	Contents
Identifying conflict-generating situations within productive and social contexts and following the necessary steps for resolution within the framework of their role as agricultural extensionists	Identifying the type of problem	Background, description methods, participatory problem recognition techniques
	Classifying the type of problem	Concept, characteristics, types, methodologies
	Selecting the most convenient solution	*Decision-making techniques, phases, qualification criteria, procedures. *Problem analysis methodologies and possible solutions, components, problem-solving schemes, decision making, procedures
	Implementing the solution	Process for solution traceability

Source: Authors

Table 3. Continued...

Prioritized competency	Training topics for strengthening the competency	Contents
Managing information following communicative intention and the rules established in their role as agricultural extensionists	Data collection	Type of information, data classification, understanding of personal data protection laws, regulations for archiving and document management, types of reports, processing techniques, report writing techniques, basic computer security methods
	Recording information	Document structure, types, and categories
	Selecting information	Elements, characteristics, composition, styles, genre classification, types of sources, regulations on information confidentiality
	Writing documents	Characteristics, textual coherence, politeness conventions, styles, elements, classification, definition, techniques, rules, types
Effectively and efficiently incorporating digital tools and resources in their relationship, communication, and accompaniment processes as agricultural extensionists	Identifying digital tools and resources "ICT recognition"	Concept, information and communication techniques, resources, elements, functions, actions
	Selecting digital tools and resources	ICT plan construction and evaluation
		Planning and executing appropriate strategies for the agricultural extension process
	Implementing ICT strategies	Considering the context and needs of the accompanied population
Understanding the regulatory and conceptual environment for alignment with extension-related public policies in the agricultural sector	Concepts related to the role of the agricultural extensionist	*Definitions of the concept of extension: rural extension, farming extension, agricultural extension.
		*Differences between professional service, technical assistance, comprehensive technical assistance (Act 607 of 2000) and rural extension (FAO), agricultural extension (Act 1876 of 2017)
	Regulations related to the role of agricultural extensionists	Regulations, laws, and strategies related to the National System of Agricultural Innovation (Act 607 of 2000) and related decrees
	Participation spaces within the regulatory framework related to the role of agricultural extensionists	Municipal Rural Development Councils (CMDR), Departmental Agricultural Extension Plans (PDEA), SNIA Superior Council, Sectional Agricultural Development Councils (CONSEA), Municipal Rural Development Committees

Source: Authors

No training plan designs have been found in the literature that consider the particularities of the program in which the extensionists conduct their work. In addition, most of them focus on capacity building in the communities and neglect the importance of continuous and contextual training for the professionals accompanying them.

Since this is a proposal that includes the particularities of the extension programs, its implementation must consider its effectiveness based on the evaluation of the results of the training plan. Furthermore, appropriate improvements and changes should be implemented according to the specific nature of the program.

Selecting the contents that allow developing the competencies perceived as weak allows for evaluating the difference and effectiveness of the training by verifying changes in the perception of the extensionists.

Some authors in the literature include competencies and competency development within the profile of the extension professional. However, none talk about the level of development of these competencies. Thus, this proposal is an important contribution specific to the extensionist.

Through this work, we have identified that the concepts of capacity and competency are used interchangeably, without considering their differences or how they contribute to the development of one another. Additionally, there is relevance in combining extension approaches and recognizing the importance of a paradigm shift in such approaches. These two aspects make it challenging to understand the value of continuous improvement and competency development in professional extensionists.

CONCLUSIONS

Continuous training processes that are aligned with the development of competencies contribute to improve the perception of extensionists regarding the degree of development of these competencies because they allow training, the exchange of experiences and the construction of new knowledge.

Evaluating through an index at the end of any training process contributes to its improvement and evolution and provides the opportunity to verify the impact of the training on the subjects who received it.

This study was carried out with a non-probabilistic sampling, so its results are not generalizable; however, it constitutes a contribution to the development of competencies and the ICE as a tool that allows assessing the change in them. This contribution can be replicated in other extension programs, making the necessary adaptations according to the context.

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