Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 24, Issue 3, 2024
PRINT ISSN 2284-7995, E-ISSN 2285-3952

FILLING THE KNOWLEDGE GAP: HOW THE ABSENCE OF AN AGRICULTURAL EXTENSION SYSTEM DRIVES ROMANIAN FARMERS TO SEEK ADVICE AND INFORMAL CONSULTANCY ON SOCIAL MEDIA, INCREASING THE MISINFORMATION RISK

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Abstract

This study explores the role of informal agricultural consultancy through Facebook groups in Romania, particularly in the absence of a formal agricultural extension system. With no structured support in place, Romanian farmers have turned to social media platforms, especially Facebook, to seek advice, share knowledge, and engage in peer-to-peer learning. This study analyzed 20 Facebook groups from January 2023 to May 2024, focusing on group dynamics, user engagement, and the quality of discussions. Findings highlight that while these groups offer valuable real-time discussions on critical topics such as machinery maintenance, pest control, and sustainable farming practices, they also suffer from inconsistencies in the quality of information shared. The absence of expert moderation has led to varying degrees of accuracy, with some groups being prone to misinformation. The study suggests that integrating these informal platforms with a formal agricultural extension system could improve the quality of advice provided to farmers. A hybrid system, modeled after successful international frameworks like the American agricultural extension service, could combine grassroots knowledge-sharing with expert-backed guidance and structured training. However, risks such as misinformation, over-reliance on social media platforms, and the absence of a cohesive extension service continue to pose significant challenges. In conclusion, while Facebook groups play a crucial role in filling the advisory gap, they cannot replace a formal agricultural extension system. Further research is needed to explore how these informal platforms can be better integrated with professional services to enhance Romanian agriculture and rural development.

Key words**:** *agriculture extension system, informal consultancy, information accuracy, misinformation risk, social media*

INTRODUCTION

In Romania, the absence of an official and functional agricultural extension system has created a significant gap in farmers' access to technical information, professional advice, and educational support necessary for the development of a modern and competitive agricultural sector [26]. Agricultural extension systems are critical in many countries as they facilitate the transfer of knowledge between universities, research institutes, and farmers, ensuring the implementation of best practices and technological innovations [1]. Without such infrastructure, Romanian farmers have been compelled to seek alternative sources of information, one of the most prevalent being Facebook groups.

These Facebook groups have emerged as informal consultancy platforms, where farmers share experiences, resolve technical issues, and seek advice from other members of the community. These groups are accessible and provide a fast-response forum where anyone can post questions or suggestions. However, the use of these platforms raises concerns, particularly regarding the quality and accuracy of the information exchanged, as there is no formal validation or control mechanism in place to ensure reliability[22].

The situation in Romania starkly contrasts with the American agricultural extension model, which is built on a well-structured system

where universities and academic institutions collaborate with farmers to ensure a constant flow of accurate and relevant information [28]. In the United States, each state has a publicly funded extension system that provides free access to professional agricultural consultancy [3]. The lack of such a system in Romania has led to a reliance on unofficial sources, such as Facebook groups, for access to agricultural knowledge, increasing the risk of misinformation [5].

Implementing an agricultural extension system in Romania has the potential to transform key areas of agriculture, agribusiness, and the trade of agricultural products [8]. By delivering expert guidance on modern farming techniques, crop protection, and sustainable agricultural practices, an extension service could help farmers boost productivity, enhance soil health, and improve crop resilience [14]. In agribusiness, access to specialized advice on supply chain optimization, marketing strategies, and the development of value-added products would enable farmers to better position their goods in both local and international markets [7]. Moreover, the extension service could facilitate smoother and more efficient agricultural trade by providing farmers and traders with essential information on product quality standards, certification processes, and compliance with market regulations [17]. This would not only elevate the competitiveness of Romanian agricultural products globally but also foster education and innovation and economic growth across the entire agricultural sector [19]. Through the integration of technical knowledge, market insights, and sustainable practices, an agricultural extension system could serve as a vital catalyst for the long-term development and modernization of Romania's agriculture and agribusiness landscape [20].

One of the few functional consultancy options currently available to Romanian farmers is private, fee-based consultancy, primarily focused on helping farmers develop projects for accessing European Union funding [4, 12]. These services, while helpful for navigating complex funding applications, do not address the broader needs of agricultural knowledge, management practices, or sustainability, which a comprehensive extension system could provide [10].

This paper examines the role of these Facebook groups in the context of the urgent need for the implementation of a national agricultural extension system. As Romanian farmers seek quick and effective solutions, Facebook groups have become a vital space for idea exchange [15]. However, these platforms remain limited in their capacity to replace an organized and systematic extension structure[13]. While these platforms provide some value, they cannot address the long-term challenges facing consultancy in the Romanian agricultural sector [23].

This paper explores the benefits and limitations of this phenomenon and argues for the necessity of implementing a formal agricultural extension system based on successful models from other countries, particularly the American system [25].

MATERIALS AND METHODS

The methodology of this study aimed to offer a comprehensive yet preliminary overview of the informal consultancy phenomenon within Romanian agriculture through Facebook groups [30], particularly in the absence of a formal agricultural extension system. The research explores how these digital communities bridge the knowledge gap by systematically analyzing posts and interactions from January 2023 to May 2024, a period chosen to capture a complete agricultural cycle, including key stages such as planting, fertilization, pest control, harvesting, and land preparation.

The data were examined using a mixed-methods approach, including:

•**Descriptive statistics** to quantify participation levels, post frequency, and engagement rates (comments, likes).

•**Content analysis** to qualitatively explore themes from user discussions, identifying key topics and recurring issues.

•**SWOT analysis** to evaluate the strengths, weaknesses, opportunities, and threats of using Facebook groups for informal agricultural consultancy.

This approach provides an initial understanding of informal agricultural knowledge exchange in Romania while highlighting the need for a formal extension system to mitigate the risks and limitations of relying solely on informal networks.

Data Collection and Survey Design

To ensure a robust sample, 20 Facebook groups with the largest membership and highest activity levels were selected for analysis. These groups were chosen based on several criteria:

•Membership of over 1,000 individuals to ensure relevance and representativeness.

•A focus on agricultural topics, including crop production, livestock management, machinery, and input markets.

•A broad geographical representation to capture discussions from diverse agricultural regions of Romania.

To systematically collect and analyze the data from the identified Facebook groups, a structured questionnaire was developed using Google Forms. The questionnaire served as the primary tool for filtering relevant data and extracting insights from the interactions within the groups. A total of 37 questions were included in the survey, focusing on various aspects of group dynamics, user engagement, and the nature of the discussions using the following key questions:

1.Group Age: Aimed to assess how long the group had been active, with older groups often having more established and trustworthy communities.

2.Number of Members: Tracked to assess the group's activity level and the potential reach of shared information, recognizing that larger groups may face challenges with information quality.

3.Main Domain of the Group: Identified each group's primary focus (e.g., general agriculture, machinery sales), helping to categorize the types of discussions and analyze their relevance.

4.Average Age of Members: Evaluated to understand the level of experience and engagement, with younger members possibly using the groups more for learning and older members contributing expert knowledge.

5.Geographical Distribution of Posts: Examined to determine whether certain regions were more active, helping to identify if the groups attract members equally from across Romania.

6.Daily Number of Posts: Measured the average daily activity, with more posts indicating higher engagement and knowledge exchange.

7.Number of Responses: Tracked to determine how interactive the group is and whether members are receiving adequate feedback on their queries.

8.Full-Time and Part-Time Farmers: This split helped assess the expertise level within each group, differentiating between professional and hobbyist farmers.

9.Percentage of Advertisements: Recorded to understand the balance between commercial content and consultancy, with a higher percentage indicating more trade-focused interactions.

10.Types of Questions: Categorized by topics such as machinery, crop protection, and fertilization, to highlight the areas most relevant to Romanian farmers.

11.Relevance of Questions: Evaluated to ensure the productivity of discussions and whether they addressed real agricultural challenges.

12.Objective Quality of Responses: Assessed the quality of responses based on their accuracy, completeness, and relevance.

13.Perception of Response Quality: Gathered feedback from question askers to measure how helpful they found the responses, indicating the group's overall effectiveness.

In the analysis of the pertinence of questions, as well as the correctness, completeness, and incorrectness or irony of responses, a scale of 10% increments was employed. This approach was adopted to address the inherent subjectivity in evaluating qualitative data such as user-generated content. By utilizing this gradation, the study aimed to more clearly distinguish between different levels of question and response quality. The use of a broader scale allowed for more discernible variations, facilitating a clearer understanding of the trends and discrepancies across the analyzed Facebook groups.

Analysis of group members' perception of answer quality and receptivity of initiators

The authors assessed the quality of answers and the receptivity of group initiators using a 1 to 10 rating scale. This evaluation was based on key metrics, including the number of replies, the depth of answers, follow-up questions, and overall engagement through likes and reactions.

The methodology included:

1.Counting Replies: Posts with more replies indicated higher engagement, reflecting both receptivity and the value of the original question.

2.Depth and Validity: Responses were rated based on their detail and accuracy, with more informative answers receiving higher quality ratings.

3.Follow-up Engagement: The number of follow-up replies and additional questions were analyzed, with active, layered discussions seen as a positive group dynamic.

4.Reactions and Likes: Higher engagement, as shown by likes or reactions, indicated greater perceived value within the community.

5.Receptivity of Initiators: The level of interaction from the original poster, such as responding with further questions or acknowledgments, was key in assessing their engagement, with low interaction resulting in lower scores.

Study limitations and future studies

While this study provides useful insights into the role of Facebook groups as informal agricultural consultancy platforms, several limitations must be considered:

1.Temporal Constraints: The analysis was limited to posts from January 2023 to May 2024. Although this period captures a full agricultural cycle, it may not reflect long-term trends or historical shifts in the use of digital platforms for agricultural advice.

2.Scope of Study: This research offers a broad overview rather than an in-depth analysis of specific groups or discussions. Further research should focus on detailed case studies of individual groups to better understand information dynamics and the quality of advice exchanged.

3.Quality of Information: The unverified nature of the advice shared is a key limitation. As the study did not assess users' qualifications or verify the accuracy of advice, future research should evaluate the reliability of the information provided, comparing it with professional standards.

4.Sample Bias: Focusing on large, active groups may have excluded smaller, niche communities with unique advice. Future research should explore these specialized groups to see if different trends or issues arise.

5.Reliance on Self-Reported Data: Information such as geographical origin and users' professional backgrounds (full-time or part-time farmers) was based on self-reported data, which may not always be accurate [21]. Future studies should employ a more structured data collection approach.

Methodological Approach for Future Studies.

This study offers a preliminary exploration, with further in-depth research needed. Future studies should include case studies of specific groups, focusing on user demographics, engagement, and long-term trends in the advice exchanged.

By integrating qualitative and quantitative methods, future research can provide a deeper understanding of how these platforms function as informal agricultural advisory networks [18].

RESULTS AND DISCUSSIONS

This section presents a comprehensive analysis of the informal agricultural consultancy occurring in Romanian Facebook groups. By examining group dynamics, user engagement, common discussion topics, and the quality of shared information, the study highlights both the advantages and risks associated with relying on these platforms.

Table 1 provides a clear snapshot of the size, year of establishment, and average daily posts of 20 different Facebook groups focused on agriculture in Romania.

The following are detailed observations on the group dynamics and how they reflect broader trends in agricultural consultancy via social media.

•High Membership and Activity Levels in Large Groups:

The largest groups, such as *Tractoare și Utilaje Agricole de Vânzare* (Tractors and Agricultural Equipment for Sale, 148,800 members) and *Agricole* (Agricultural, 105,600 members), exhibit the highest activity levels, with over 30 posts per day. The large membership sizes of these groups suggest that there is a strong demand for machinery-related information and a marketplace for agricultural equipment. Farmers actively engage in these groups to buy, sell, and trade equipment, a critical component of farm operations in Romania. The high post volume indicates that the machinery and equipment trade is a vital part of the farming community's daily operations, and Facebook groups are the go-to platforms for farmers seeking affordable and second-hand machinery.

•Niche Groups with Lower Membership but Focused Engagement:

Smaller, more specialized groups such as *Boli și Dăunători în Agricultura României* (Diseases and Pests in Romanian Agriculture, 12,000 members) and *NO-TILL România* (6,900 members) maintain lower membership numbers but display strong engagement levels within their specific agricultural niches. These groups appeal to farmers looking for specialized advice on pest management, disease control, and sustainable farming practices. The smaller size allows for more targeted discussions and often more personalized advice, which is crucial for farmers dealing with specific technical challenges in crop protection or those exploring no-till farming techniques.

Table 1. Facebook groups overview

Facebook group name	Established in	Members number	Average posts per day
Tractoare și Utilaje Agricole de Vânzare (Tractors and Agricultural Equipment for Sale)	2015	148,800	30+
Agricole (Agricultural)	2018	105,600	30+
Vânzări Tractoare și Utilaje Agricole (Tractors and Agricultural Equipment Sales)	2010	105000	10-15
Comerț cu Cereale, Utilaje și Produse Agricole (Trade with Grains, Equipment, and Agricultural Products)	2017	58,300	30+
Agricultura Românească (Romanian Agriculture)	2010	52,400	30+
Agricultura (Agriculture)	2019	29,500	5-10
Agricultura României (Poze &Videoclipuri) (Romanian Agriculture: Photos & Videos)	2011	29,300	30+
AgronetGrup (Agronet Group)	2015	24,400	30+
Ingineri Agronomi (Agricultural Engineers)	2014	23,700	30+
Agro TV	2020	18,600	15-20
Agricole de Vânzare (Agricultural for Sale)	2014	16,900	30+
AgroRomânia (Agro Romania)	2014	12,100	10-15
Boli și Dăunători în Agricultura României (Diseases and Pests in Romanian Agriculture)	2016	12,000	5-10
NO-TILL România (NO-TILL Romania)	2021	6,900	1-5
AgroSubvenții (Agro Subsidies)	2021	6,600	5-10
Agricultura România (Agriculture Romania)	2013	5,700	5-10
Bursa Transport Cereale (Grain Transport Exchange)	2020	1,400	1-5

Source: Own processing based on public data obtained from Facebook platform.

•Older Groups with Larger Memberships:

Groups that were established earlier, such as *Agricultura Românească* (Romanian

Agriculture, 2010) and *Vânzări Tractoare și Utilaje Agricole* (Tractors and Agricultural Equipment Sales, 2010), tend to have larger memberships and higher activity levels compared to newer groups. This reflects the fact that older groups have had more time to establish trust and build a community. Over time, these groups have become recognized platforms where farmers can seek advice and engage with peers. The longevity of these groups also implies a steady growth in their reputation, making them trusted sources for both newcomers and experienced farmers. The higher activity levels in older groups suggest that more experienced farmers frequently participate, contributing to the reliability and continuity of the advice provided.

•Correlation Between Membership Size and Activity:

There is a general correlation between membership size and activity levels. For example, groups like *Agricole* and *Tractoare și Utilaje Agricole de Vânzare*, both of which have over 100,000 members, demonstrate consistently high post frequencies, often exceeding 30 posts per day. This suggests that as groups grow larger, the diversity of the membership base increases, leading to more frequent interactions and a wider range of topics being discussed. It also points to the importance of critical mass in social media communities: once a group reaches a certain size, it becomes self-sustaining in terms of activity and engagement.

•The Importance of Focus in Group Activity:

Groups like *Boli și Dăunători în Agricultura României* and *NO-TILL România*—though smaller in size—demonstrate that focused topics can also drive engagement. These groups have a smaller but more engaged user base because their members share a common interest in highly specialized agricultural issues. The specificity of these groups makes them attractive to farmers who are looking for expert-level discussions on topics such as pest control or sustainable farming techniques. The niche appeal of these groups likely results in higher-quality interactions, as the discussions are driven by farmers seeking targeted advice rather than general information.

•The Role of Newer Groups:

While older groups like *Agricultura Românească* dominate in terms of size and activity, newer groups such as *AgroSubvenții* (Agro Subsidies, 2021) and *NO-TILL România* (2021) have also quickly attracted sizable memberships and demonstrate active engagement, despite being relatively new. This points to the fact that newer groups can grow rapidly if they tap into emerging trends or unmet needs within the agricultural community. For instance, *NO-TILL România* has seen strong interest in conservation agriculture, a topic gaining traction in recent years due to concerns about soil health and sustainable farming practices.

•Group Size as an Indicator of Group Maturity:

The relationship between the year of establishment and group size reveals that older, more established groups tend to have larger memberships. For example, groups like *Agricultura Românească* (52,400 members) and *Vânzări Tractoare și Utilaje Agricole* (105,000 members) were founded in 2010, giving them ample time to accumulate a substantial number of members. In contrast, newer groups such as *AgroSubvenții* (2021) or *NO-TILL România* (2021) are still in the growth phase, although they already exhibit notable activity and participation rates. The maturity of a group often correlates with increased trust and engagement among members, further solidifying the group's role as a reliable source of information.

•Increased Activity in Equipment-Oriented Groups:

Groups with a strong focus on machinery and equipment, such as *Tractoare și Utilaje Agricole de Vânzare* and *Agricole*, stand out in terms of both membership size and post frequency. The consistent high activity in these groups underscores the critical role that machinery and agricultural equipment play in Romanian farming. For many farmers, purchasing affordable, reliable equipment is essential for improving farm productivity, and these groups provide a vital marketplace for the exchange of second-hand machinery. Furthermore, the peer-to-peer nature of these transactions helps farmers avoid intermediary

costs, making the groups a preferred platform for equipment trade.

•Diverse Range of Activity Levels:

While some groups consistently maintain high levels of activity (e.g., *Tractoare și Utilaje Agricole de Vânzare* and *Agricole*), others such as *Bursa Transport Cereale* (Grain Transport Exchange) have fewer daily posts. This suggests that group activity is closely tied to the specific needs of the members. For example, groups focused on machinery and equipment sales tend to have high-frequency posts due to the transactional nature of the group, whereas groups centered around consultation or knowledge exchange (e.g., *Ingineri Agronomi*) might see fewer, but more in-depth discussions.

Users' profile and professional focus

A significant number of full-time farmers dominate many of the groups, indicating their practical and professional focus.

1.Full-time farmers as primary contributors:

Groups like *Agricultura Românească* (80% full-time farmers) and *Comerț cu Cereale, Utilajeși Produse Agricole* (70%) primarily serve those who rely on agriculture for their livelihood. The high proportion of full-time farmers suggests these platforms play a key role in managing farm operations, providing practical advice and facilitating the trade of essential agricultural equipment. Their participation leads to more in-depth discussions, especially concerning machinery, inputs, and crop management.

2.Engagement from part-time farmers and other occupations:

In groups like *Agricultura* (40% full-time farmers, 40% users from other occupations), a broader participant base includes part-time farmers and individuals with different professions. These users seek agricultural advice for small-scale or hobby farming, contributing to more diverse, though possibly less specialized, discussions. In groups like *Bursa Transport Cereale* (60% users from other fields), the platform caters to individuals involved in ancillary industries such as logistics and supply chains, enriching conversations with their expertise in transportation, trade, and operational challenges.

3.Part-time farmers and agricultural Enthusiasts:

Groups like *AgroRomânia* (65% full-time, 20% part-time farmers) reflect a balance between professional engagement and amateur interest. Part-time farmers often participate for supplementary income or personal improvement, contributing to discussions on best practices for small-scale farming or balancing agriculture with other careers.

4.The role of other occupations: the high percentage of users from non-agricultural sectors in groups like *Bursa Transport Cereale* emphasizes the interconnectedness of agriculture with industries like logistics and machinery repairs. These participants add valuable insights into operational aspects of farming, ensuring discussions cover broader topics such as transportation, machinery maintenance, and market access, alongside crop production.

Discussions focus and user engagement levels vary significantly depending on the group's focus, whether general farming, specialized areas, or commercial activities.

General agricultural discussions: Groups like Ingineri Agronomi (50% of posts), Agricultura (60%), and Agricultura România (55%) focus on broad farming topics, including crop rotation, soil health, and equipment maintenance. These discussions reflect a community-driven approach, catering to farmers of varying expertise who share practical advice and experiences.

Specialized groups for targeted advice: Groups such as Boli și Dăunători în Agricultura României (80% focused on plant protection) and NO-TILL România (90% focused on no-till farming) cater to those seeking specialized advice. The technical discussions often involve expert insights on pest management, disease control, and sustainable farming practices, offering highly relevant and practical solutions.

Commercial activities and marketplace engagement: Groups like Tractoare și Utilaje Agricole de Vânzare (90% machinery sales) and Comerț cu Cereale, Utilaje și Produse Agricole (85% sales-related posts) serve as virtual marketplaces for agricultural equipment. Farmers use these groups for peer-

to-peer transactions, with less emphasis on knowledge exchange and more on facilitating trade.

Quality of questions and discussions

As presented in Table 2, 67.6% of the questions posed are relevant, targeting specific farming challenges like crop protection and machinery maintenance. Groups like Ingineri Agronomi and Agricultura Românească show 80-90% well-formed, actionable questions, while groups like Agro TV and Comerț cu Cereale have a 50-50 mix of pertinent and non-pertinent questions, reflecting a wider range of participant expertise.

Non-pertinent questions, accounting for **32.4%**, usually reflect a lack of specific agricultural knowledge or experience from the poster. These posts are often repetitive, unspecific, or focused on topics that have been discussed previously, which may dilute the quality of the overall discussion.

Response quality and engagement

The responses quality within the groups is similarly varied, reflecting the decentralized and informal nature of the consultancy process. As presented in Table 2 and Figure 1, the analysis highlights four key categories of responses: detailed and correct answers, correct but incomplete answers, ironic responses, and incorrect answers.

Table 2. Quality of responses and discussions engagement

Facebook group name	Pertinent Questions	Incoherent Questions	Detailed Correct Answers	Incomplete Correct Answers	Ironic Answers	Wrong Answers
Ingineri Agronomi	80%	20%	40%	30%	20%	10%
Agricultura	70%	30%	30%	40%	20%	10%
Agricultura in Romania	90%	10%	50%	20%	10%	20%
Agro TV	50%	50%	30%	20%	30%	20%
Boli si Daunatori in Agricultura Romaniei	60%	40%	50%	30%	0%	20%
Tractoare si Utilaje Agricole de Vanzare	60%	40%	50%	30%	10%	10%
Agro Romania	70%	30%	60%	20%	10%	10%
Bursa Transport Cereale	80%	20%	40%	40%	10%	10%
Comert cu Cereale, Utilaje si Produse Agricole	50%	50%	30%	20%	20%	30%
Agricole	60%	40%	20%	30%	10%	40%
Agricultura Romaneasca	90%	10%	60%	20%	10%	10%
Agricole de vanzare	70%	30%	70%	10%	10%	10%
AgroSubventii	40%	60%	30%	20%	10%	40%
NO-TILL ROMANIA	80%	20%	40%	30%	30%	0%
Agronetgrup	50%	50%	70%	20%	0%	10%
Agricultura Romaniei (Poze&Videoclipuri)	60%	40%	60%	20%	10%	10%
Vanzari Tractoare si Utilaje Agricole Romania	90%	10%	70%	10%	10%	10%
Average	67.6%	32.35%	47.0%	24.1%	12.9%	15.8%

Source: Own processing based on public data obtained from Facebook platform.

1.Detailed and correct answers:

Approximately 44.7% of the responses are categorized as detailed and accurate, indicating that a large portion of the group members possess practical expertise in agriculture. These responses often come from experienced

farmers, agronomists, or other professionals who have both the knowledge and willingness to provide helpful, thorough advice. Groups like *NO-TILL România* and *AgriculturaRomânească* excel in this category, where a majority of responses offer detailed explanations and guidance.

This high percentage of detailed responses reflects the role these groups play in fostering a sense of community, where members actively seek to help each other improve their farming practices.

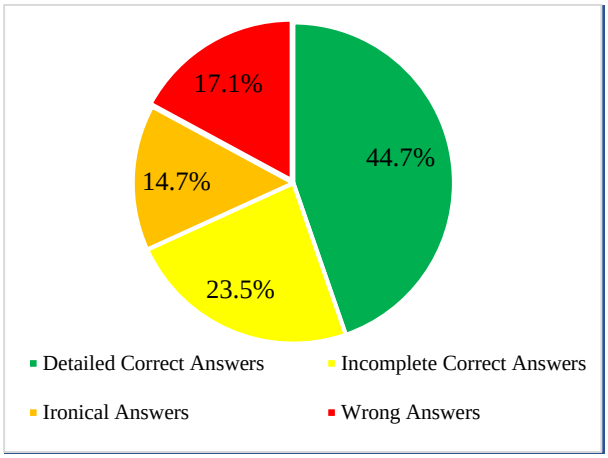

Fig. 1. Responses' quality
Source: own calculations.

2.Correct but incomplete answers:

•23.5% of the responses fall into this category. These answers, while technically correct, are often incomplete or too vague to provide full clarity on a problem. This often happens when the responder offers a brief solution but lacks the time or interest to elaborate on it.

•Groups such as *Ingineri Agronomi* and *AgroRomânia* showcase this type of engagement, where responses tend to address the question in part but leave the poster needing to conduct additional research or ask follow-up questions.

3.Ironic Responses:

14.7% of the responses are ironic or sarcastic in nature. While this is a relatively small percentage, it can still impact the quality of discourse within a group. These types of responses often occur in groups like *Agro TV* or *Comerț cu Cereale, UtilajeșiProduse Agricole*, where there is a broader mix of users, and questions can sometimes be seen as overly simplistic or redundant.

This kind of interaction may discourage new or less experienced members from participating, as they may feel belittled or dismissed.

4.Incorrect answers:

Alarmingly, 17.1% of the responses are incorrect, posing potential risks for those who follow them. This is particularly concerning in groups where members are making important decisions about crops, machinery purchases, or pest management.

The presence of incorrect answers suggests the need for a more structured or moderated approach to the information being shared. Without a verification mechanism, such as expert oversight or moderation, the prevalence of misinformation can cause harm, especially in critical areas like crop protection or the use of pesticides [6, 27].

Posting and engagement frequency

Another important dimension of the analysis is the engagement frequency, which varies significantly between groups. Some groups have upwards of **30 posts per day**, as seen in *Ingineri Agronomi*, *Tractoare și Utilaje Agricole de Vânzare*, and *Agricultura Românească*. The high posting frequency suggests that these groups are a central hub for daily consultations and interactions among farmers.

However, groups like *Bursa Transport Cereale* or *NO-TILL România* experience fewer posts (typically fewer than five per day), yet maintain a high engagement level through detailed and expert-led discussions. The lower volume of posts in these specialized groups does not reflect lower engagement but rather a focus on quality over quantity. Farmers may post less frequently but rely on these groups for in-depth advice and solutions to complex farming issues.

Member perception and responses satisfaction

Based on the data collected, Figure 2 presents scores on a scale of 1 to 10 for both the perceived quality of responses and the receptivity of the group initiators across various Facebook groups. These scores reflect an average assessment of interactions in each group.

The analysis revealed several key findings:

1.High scores for quality and receptivity:

Groups like *Vânzări Tractoare și Utilaje Agricole* (Sales of Tractors and Agricultural Equipment) and *NO-TILL România* (focused on conservation agriculture) consistently scored high for both the quality of responses (8–9) and the receptivity of the initiators (8). These groups tend to foster high-quality interactions because of their focused nature. Discussions revolve around technical subjects like machinery sales or sustainable farming practices, where members are more likely to provide detailed and accurate advice. The high receptivity scores suggest that group members value and actively engage with these high-quality discussions.

2.Moderate scores for quality and receptivity: Several groups, such as *Agricultura* and *Bursa Transport Cereale* (Grain Transport Exchange), show moderate engagement and quality. These groups have a mix of transactional and informational posts, which explains the variation in scores. While members are generally receptive to replies, there is less depth in discussions compared to more specialized groups. In these groups, engagement tends to drop off after initial responses, with fewer follow-up questions or comments. The quality of responses often reflects this pattern, as replies tend to be shorter and more functional rather than detailed.

3.Lower scores for quality and receptivity: Groups like *Agro TV* and *Agricole de Vânzare* (Agricultural Products for Sale) score low for both response quality and receptivity. These groups are more focused on advertisements and sales, which could explain the lower interaction quality. Most discussions here center on buying and selling equipment or products, where the primary goal is to complete a transaction rather than engage in deep agricultural discussions. As a result, the quality of replies is often minimal, and initiators rarely follow up once the transaction is complete.

4.Impact of group focus on interaction quality: The focus of a group significantly impacts the quality of interactions. For example, *NO-TILL România* scored highly in both categories due to its niche focus on conservation agriculture, which attracts a smaller but more knowledgeable audience. In contrast, groups like *Agro TV*, which feature a mix of advertisements and occasional discussions, have lower scores because the engagement is less about exchanging knowledge and more about transactional efficiency.

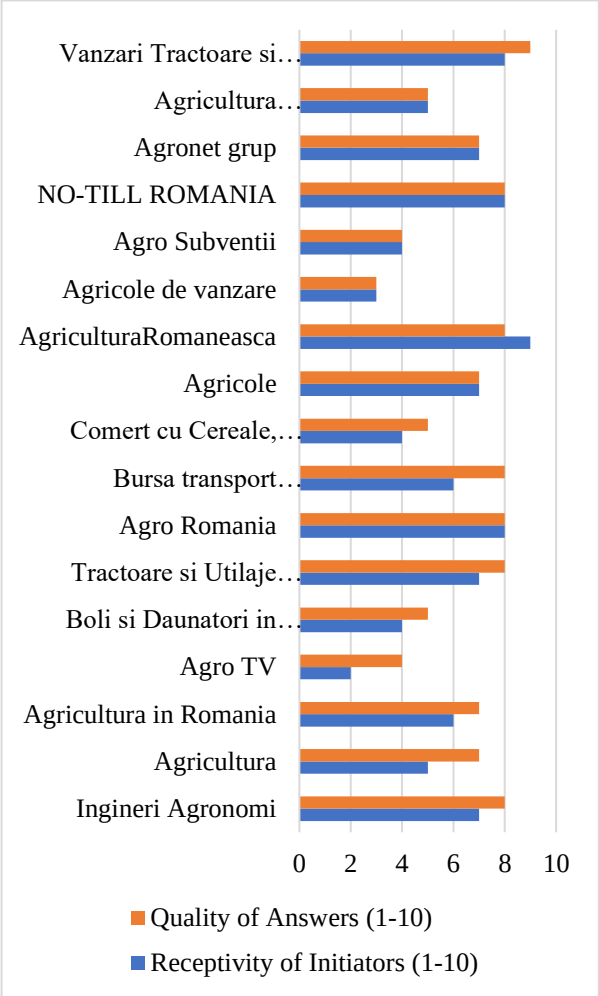

Fig. 2. Members' perception and satisfaction with responses
Source: own calculations

5.Variability in receptivity: The level of receptivity among group initiators varied widely across groups. In high-scoring groups like *Agricultura Românească* (Romanian Agriculture) and *AgroRomânia*, initiators were highly engaged, often asking follow-up questions and expressing appreciation for the answers. This level of engagement fosters a collaborative environment where discussions can develop into more nuanced conversations. Conversely, in lower-scoring groups, initiators often did not engage with replies beyond the initial question, leading to less dynamic interactions.

6.Overall trends: The analysis indicates that groups with a clear, focused purpose and an audience seeking specific information, such as *NO-TILL România* or *Ingineri Agronomi*, tend to foster higher-quality discussions and more engaged initiators. On the other hand, groups with a broad or commercial focus, such as *Agricole de Vânzare* or *Agro TV*, are more transactional, resulting in lower-quality interactions and less initiator engagement.

The data also sheds light on how members perceive the quality of the responses they receive. In groups such as *Vânzări Tractoare și Utilaje Agricole* and *Agricultura Românească*, members generally express high satisfaction with the responses, rating them between 8 and 9 out of 10. This positive feedback likely stems from the detailed and correct answers prevalent in these groups, where the user base consists primarily of experienced farmers or professionals with considerable agricultural knowledge.

Conversely, in groups like *Agro TV* or *Agricole de Vânzare*, member satisfaction is lower, averaging 3 to 5 out of 10, due to the higher percentage of incorrect or sarcastic responses. This disparity in user satisfaction highlights the varied nature of these groups and emphasizes the importance of targeted group dynamics for high-quality interaction.

SWOT analysis of informal agricultural consultancy in Romanian Facebook groups and its potential alignment with a formal extension system

Strengths:

1.Accessibility and Flexibility:

•Romanian Facebook groups provide accessible platforms for farmers to connect and share knowledge. This informal consultancy offers flexibility that allows farmers to ask questions and share experiences from any location. Compared to formal extension services, the ease of access through social media facilitates rapid exchanges of information.

•Similar to the American Extension System, which connects farmers with local agents for tailored advice, Romanian groups allow immediate feedback and create networks of farmers who offer insights based on real-world experience. However, unlike the structured U.S. extension, the informal nature of these platforms means that participation is voluntary and the advice unregulated.

2.Peer-to-Peer Knowledge Sharing:

•Informal Facebook groups in Romania encourage peer-to-peer knowledge sharing, allowing members to offer advice on common agricultural challenges, from machinery purchases to crop protection. The benefit here is that farmers can receive firsthand, practical advice from others who have faced similar problems, making the knowledge applicable and grounded in real-world experiences.

•While the U.S. extension model supports peer learning, it is usually guided by agricultural experts and extension agents, ensuring that information is backed by scientific research. The informal system in Romania lacks this formal oversight but is highly adaptable, as it is driven by the immediate needs of the farmers.

3.Community Support and Engagement:

•Facebook groups provide a sense of community among farmers, especially in rural areas where formal consultancy may not be available. They facilitate the exchange of moral and professional support, similar to how the American extension system builds strong farmer networks through field days and workshops.

•The informal discussions allow for a relaxed, open exchange of ideas, which can foster engagement among farmers who might not typically participate in formal systems. This dynamic interaction is beneficial for those in remote areas, as it provides an alternative source of consultancy.

4.Specialization in Niche Areas:

•Some Facebook groups focus on specific agricultural challenges, such as pest control (*Boli și Dăunători în Agricultura României*) or sustainable farming practices (*NO-TILL România*). These specialized groups allow for targeted discussions that attract farmers seeking expert advice in those particular areas [2].

•While the American extension system offers specialized advice through formal channels, these Romanian groups provide a platform where farmers can discuss niche topics in a

more informal, accessible way, allowing for practical and immediate solutions.

Weaknesses:

1.Lack of Scientific Rigor and Verification:

•A significant weakness of the informal consultancy provided by Romanian Facebook groups is the lack of scientific oversight. In the U.S. extension model, advice is provided by trained professionals backed by university research, ensuring the information is accurate and up-to-date. Romanian groups, by contrast, rely on anecdotal knowledge, which may be outdated, inaccurate, or harmful if applied incorrectly.

•This absence of a formal extension system means there is no mechanism to validate the information being shared, which could lead to poor decision-making or inefficient farming practices. While the platform is useful for quick exchanges, the lack of verified, research-backed data is a major drawback.

2.Inconsistent Quality of Information:

•The quality of information in Romanian Facebook groups is inconsistent, varying from highly informed advice to less reliable suggestions. Unlike the U.S. system, where extension agents ensure that all farmers receive high-quality, standardized information, Romanian farmers must sift through diverse opinions, often with no clear consensus.

•For example, discussions in groups like *Agro TV* and *Agricole de Vânzare* tend to focus more on transactions and less on agronomic advice, leading to gaps in practical, evidence-based knowledge. The informal nature means that some discussions are not as helpful or reliable as those provided through structured, formal channels like the U.S. extension service.

3.No Formal Training for Contributors:

•While U.S. extension agents undergo formal training and continuous education to provide scientifically validated advice, Romanian Facebook group members are not formally trained, and their advice is based on personal experiences. This can lead to the dissemination of incomplete or incorrect information, especially on technical issues like pest control, crop management, or machinery repair.

•The absence of easy access to trained agricultural consultants means that many Romanian farmers may be missing out on the latest innovations and best practices in agriculture, something that the American model of extension successfully addresses by regularly updating farmers through training and outreach programs.

4.Fragmentation and Lack of Coordination:

•In the U.S. system, extension services are coordinated through universities, local offices, and government programs, providing a unified approach to agricultural consultancy. Romanian Facebook groups, on the other hand, are fragmented, with no overarching structure or coordination between groups. This fragmentation can result in a lack of comprehensive support for larger agricultural challenges, such as climate change adaptation, market integration, or technological advancements [9, 24].

•Without a formal extension service, Romanian farmers are left to rely on piecemeal advice from a variety of uncoordinated sources, making it difficult to address systemic agricultural issues on a national scale.

Opportunities:

1.Adapting Aspects of the U.S. Model:

•Romania could benefit from integrating elements of the U.S. extension system into its informal consultancy. Facebook groups could serve as a starting point for a more formal agricultural extension program, where trained agricultural experts offer regular, evidence-based advice within these online communities [13].

•This hybrid approach would allow Romania to maintain the flexibility of informal groups while incorporating the scientific rigor and structure of the U.S. extension model. For example, university-led webinars or Q&A sessions within Facebook groups could provide more reliable information to farmers [11].

2. Incorporating Digital Tools:

•As seen in the U.S., where extension services increasingly use digital tools, Romania could introduce more structured, technology-driven solutions. For instance, AI-powered chatbots could be integrated into Facebook groups to answer frequently asked questions or provide basic advice, supplementing the informal peer-to-peer exchanges with validated information.

•Virtual consultations with agricultural experts could also be offered as part of a formal

extension service, ensuring that farmers receive accurate and timely advice tailored to their specific needs.

3.Developing a Formalized Agricultural Extension System:

•Drawing from the U.S. example, Romania could develop a formal agricultural extension system that complements the existing informal Facebook groups. Such a system would provide farmers with access to trained extension agents who can offer personalized advice based on research. This would not only improve the quality of information but also help farmers understand and address broader very important challenges, such as climate adaptation, market expansion, and farm modernization [16].

•A formal extension service, modeled after the U.S. system but adapted to local needs, would bridge the gap between informal knowledge exchanges and the need for research-based, scientifically valid solutions.

4.Enhancing Farmer Education:

•Romania could also use these platforms to enhance farmer education by offering online courses, webinars, and training sessions on best agricultural practices. This would allow Facebook groups to evolve into more structured educational platforms, offering real-time learning opportunities for farmers.

•By partnering with universities and research institutes, these groups could provide more formal educational resources to help farmers stay updated with modern farming techniques.

Threats:

1.Over-Reliance on Informal Consultancy:

•A major threat is the over-reliance on informal consultancy, which may limit the development of a formal, structured agricultural extension system in Romania. If farmers continue to rely solely on Facebook groups for advice, they may miss out on scientifically validated solutions and the benefits of formal training.

•Unlike the U.S. model, which integrates both formal education and peer-to-peer learning, Romanian farmers may become too dependent on informal advice, which could hinder agricultural progress and innovation in the long term.

2.Misinformation and Lack of Moderation:

•The lack of moderation in Facebook groups means that misinformation can spread quickly, leading to poor agricultural decisions. Without trained professionals to verify the accuracy of the information shared, farmers are at risk of adopting ineffective or even harmful practices.

•The American extension system mitigates this risk through trained agents who ensure that all advice given is evidence-based and accurate. The lack of such safeguards in Romanian Facebook groups represents a significant threat to the long-term success of agricultural consultancy [29].

3.Absence of Government Support:

•Without government investment in a formal extension system, Romania risks perpetuating a fragmented and uncoordinated approach to agricultural consultancy. The U.S. system is heavily supported by both federal and state governments, ensuring nationwide access to agricultural services [28].

• In Romania, the lack of a coordinated policy to develop agricultural consultancy could result in ongoing reliance on informal networks, which may not be sustainable in the face of future agricultural challenges.

4.Challenges in Scaling a Formal System:

•Implementing a formal agricultural extension system in Romania similar to the U.S. model would require significant resources and infrastructure development. Scaling this type of system may prove difficult without the necessary government support and financial investment.

•The risk is that informal Facebook groups may remain the primary source of consultancy for many farmers, leaving the agricultural sector vulnerable to misinformation and underdeveloped practices.

CONCLUSIONS

The study reveals the significant role that informal agricultural consultancy via Facebook groups plays in Romania, particularly in light of the absence of a formal agricultural extension system. With limited access to structured agricultural support, Romanian farmers have increasingly turned to online platforms, such as Facebook, for information sharing and peer-to-peer advice.

These groups provide a dynamic space where farmers address pressing issues like machinery maintenance, pest control, and the adoption of sustainable farming practices, all in real-time.

While the accessibility and community-driven approach of these platforms are clear benefits, the study identifies significant drawbacks. Chief among these is the inconsistent quality and accuracy of the information shared, often influenced by a lack of expert oversight and professional moderation. This can lead to misinformation or ineffective practices being adopted. Furthermore, the digital divide limits participation, as many farmers in rural or remote areas may lack reliable internet access or digital literacy, which reduces the inclusivity and reach of these online communities.

There are promising opportunities, particularly in integrating these informal networks with a formal agricultural extension system, similar to the American model. A hybrid approach could leverage the grassroots knowledge-sharing dynamics of Facebook groups while providing reliable, expert-backed guidance and structured educational resources. Sustainable practices, like no-till farming, which are increasingly gaining traction, could also benefit from this dual system of informal and formal consultancy.

However, the risks associated with misinformation, reliance on social media platforms, and the continued absence of a comprehensive extension service remain substantial. Without regulatory oversight or expert intervention, harmful agricultural practices could spread unchecked, leading to negative impacts on crop yields, soil health, and overall farm sustainability. The study also emphasizes the growing dependency on platforms like Facebook, which are subject to policy changes that could further disrupt these informal advisory channels.

In conclusion, while Facebook groups serve an essential role in filling the gap left by Romania's lack of a formal extension system, they are insufficient as a stand-alone solution. A robust, well-funded formal extension system, drawing on successful international models and supplemented by digital tools and community engagement, is crucial for advancing Romanian agriculture and supporting rural development. This study provides a foundational analysis of the current state of informal consultancy in Romania's agricultural sector, but more in-depth research is necessary to develop a comprehensive framework that combines both informal and formal agricultural extension services for maximum effectiveness.

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