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THE ECONOMIC IMPACT OF THE AGRICULTURAL INPUT SUPPLY CHAIN ON SMALL-SCALE FARMING IN SERBIA

EKONOMSKI UTICAJ LANCA SNABDEVANJA POLJOPRIVREDNIH INPUTA NA MALA POLJOPRIVREDNA GAZDINSTVA U SRBIJI

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Abstract

The article analyses the economic impact of different input supply chains on small family farms in Serbia. The authors chose a rarely analysed topic of relations between agricultural producers and suppliers. The analysis aims to identify the inputs necessary for the production process of small farms and their availability on the Serbian market. The aim is to increase the potential of small farms to select suppliers that either do not have established supply chains or sufficient budgets. To assess the supply of small farms, we used different MCDM methods, which allowed us to discover the supply chain's best choices. A database of 550 surveyed small farms was used, and various criteria and alternatives related to input supply chains available to small farms were defined. The results show that the input suppliers are the most dominant form of supply. It was observed that yields per hectare depend on the price, quality, and availability of inputs, which can ensure the economic stability of small farms. Identifying these effects can be useful because it can provide support to small family farms in Serbia to improve business operations.

Sažetak

U radu se analizira ekonomski uticaj različitih lanaca snabdevanja na mala porodična gazdinstva u Srbiji. Autori su odabrali retko analiziranu temu odnosa poljoprivrednih proizvođača i dobavljača. Cilj analize je da se identifikuju inputi neophodni za proizvodni proces malih gazdinstava i njihova dostupnost na tržištu Srbije. Cilj je da se poveća potencijal za mala gazdinstva da izaberu dobavljače koji ili nemaju uspostavljene lance snabdevanja ili dovoljno budžeta. Da bismo procenili snabdevanje malih farmi, koristili smo različite MCDM metode, što nam je omogućilo da otkrijemo najbolje izbore u lancu snabdevanja. Korišćena je baza podataka od 550 anketiranih malih gazdinstava i definisani su različiti kriterijumi i alternative u vezi sa lancima snabdevanja i inputima dostupnim na malim gazdinstvima. Rezultati pokazuju da su dobavljači najdominantniji oblik snabdevanja. Uočeno je da prinosi po hektaru zavise od cene, kvaliteta i dostupnosti inputa, koji mogu obezbediti ekonomsku stabilnost malih gazdinstava. Identifikovanje ovih efekata može biti korisno, jer može pružiti podršku malim porodičnim gazdinstvima u Srbiji u cilju unapređenja poslovanja.

Keywords: *agro-inputs supply, MCDM methods, small farms, Serbia*

Ključne reči: *snabdevanje inputima iz poljoprivrede, MCDM metode, mala gazdinstva, Srbija*

Introduction

Farmers and traders in Serbia have been facing numerous problems with distribution channels and supply chains for decades. The lack of cooperation and mutual accusations, due to the gradual exclusion of the state from market rules and selectively granted subsidies and strong external competition, affected small farms the most. The Serbian government adopted a Draft law in 2021 that regulates the rules in the field of trade in agricultural products. Agricultural policy is implemented through the Law on Agriculture and Rural Development and the Law on Incentives in Agriculture and Rural Development, which do not allow the regulation of the market of agricultural products nor the introduction of new market regulation mechanisms. Such an environment does not serve further agricultural development. Simultaneously, the market mechanisms applied in Serbia still deviate from the current measures of the EU common market. Therefore, it is crucial to establish a single legal framework in domestic legislation, similar to that existing in the EU. By setting the conditions for activating the requirements and measures of market regulation, the legislative and institutional framework will be developed. The framework is necessary for the implementation of EU mechanisms and refers to the organization of the common market of agricultural products.

The Serbian market of small farmers is characterized by many customers and high demand but low added value (due to the weak position in a supply chain), high transaction costs, and an unregulated market. Investing in input supply for farmers is too risky due to the sale of agricultural products on the illegal market. Furthermore, small farms are reluctant to finance and provide technical support for optimizing the use of input since they are unsure of the sale of final products, late payment, or quality. Farmers are often forced to work through local traders to ensure a regular supply, sometimes by obtaining the inputs at a higher price.

Sustainable growth and progress of registered small farms in Serbia should be equated with the availability and accessibility of inputs, as well as their good quality. Improving the productivity of small farms implies improved access of small farms to inputs - seeds, fertilizers, and agrochemicals. This further increases farmers' income [1], [2], [3]. Some economies, such as the Netherlands and the United Kingdom, have reached some solutions to improve the availability and accessibility of inputs. They have developed market-based criteria for supplying inputs to several less developed economies through several approaches: one of the approaches is the focus on the agro-dealers who are driven by profit, the second is the approach with a focus on the very important person who must be a chain leader and who leads the value chain, and one of the approaches is the local traders' approach with a lot of buyers and market which is not regulated. We have implemented similar approaches in the socio-economic analysis of small farms in Serbia. They are based on the experience of small farm owners and the features of the input market in Serbia and are presented in the survey of the research project entitled "The role of small farms in the sustainable development of the agri-food sector in the countries of Central and Eastern Europe". In this research, we did not analyse the features of the market, because we focused on analysing the availability of input to small farmers and their position in the market.

We begin the discussion with a brief review of the literature on the availability of agricultural input supply to small-scale farms in Serbia. The second part focuses on the decision-making tools which are very important for further improvement of the supply interaction of input with explanation about the different purposes and opportunities of MCDM techniques for a better analysis of this paper. The last part of the paper is focused on the results of the research related to small farms in Serbia.

Input supply for small-scale farms

Agricultural food supply chains are complex systems of the agri-food sector. Input supply to small farms, i.e. small-scale producers of agricultural products, is a part of a large network of supply channels. Traditionally, supply channels can be defined as a network of suppliers,

production plants, distribution centres from which raw materials are supplied, afterwards converted into finished goods, and delivered to final users [4]. To put it differently, the purpose of this network is the efficient integration of every participant from suppliers to stores with a purpose of quality distribution of inputs, with a precycle time, place and quantities and the costs throughout the system can be lowered. Sales channel management also includes the activities related to planning, coordination and material movement control, parts and products from suppliers; inventory management of procured parts; appropriate product storage, as well as transport to buyers [5]. From the point of view of decision-making levels (strategic, tactical, and operational), input supply management indicates that these decision-making levels of all scales optimize input supply performance [4]. The roles in the agri-food supply chain typically involve the sectors responsible for the production of raw materials (farmers), the processing and conversion of raw materials into products, and, finally, the distribution and delivery of final products to end users [6].

Unlike numerous supply chain surveys [7], [8], [9], a small number of research papers have analysed the area of selecting input suppliers (raw materials in agricultural production). [10] outlines that the choice of raw material suppliers is a complex issue that refers to multiple criteria in an unclear environment. The techniques used to overcome this problem are integrated MCDM methods that we will use in the analysis of raw material supply. Small-scale farms in Serbia have been facing similar problems, because they do not have their own suppliers or sufficient budget, so it is difficult to find optimal suppliers of raw materials over several consecutive years.

Market supply is based on market elements: supply and demand. Small-scale farms are active participants in the market as clients with needs and interests. The inputs used for agricultural production are organic seeds and fertilizers, chemical fertilizers, herbicides, insecticides and animal nutrition and animal health products. The emphasis of our analysis is on the first phase of the agricultural value chain – input supply to agricultural holdings, and in this way connects:

- The owners of small registered farms and/or agricultural producers.
- Input suppliers, with or without any formal agreement.
- Regular suppliers, on preferential terms.

Access to the inputs should be supported by the state or a local community, so that even the poorest farmers, especially in the most remote and underdeveloped areas, can have enough high-quality and diverse inputs for their production. One of the proposals could be to develop a network of smaller distributors or dealers who would operate closer to the production areas.

The main problem for the small farms in Serbia is the lack of financial resources and unfavourable conditions to access banking products. Another significant shortcoming of Serbian small-scale farms is the lack of appropriate skills and knowledge in the application of certain inputs in the production process. This leads to poor performance, low productivity, low farm income, and low demand for inputs in a group of small-scale farms.

In the following parts of the paper, we are going to present input supply to agricultural holdings by using different MCDM methods to present the best choice for small farms. The best choice will contribute to reducing the cost of raw materials and increasing the income of small farms, as well as finding adequate suppliers within a pre-planned budget for high-quality raw materials according to the planned production.

Indicatively, the MCMD methods include the hierarchical structure of the problem (AHP and Fuzzy AHP), the technique for ranking preferences more similar to the perfect solution (TOPSIS), the method of the distance of the alternative from the ideal solution (Fuzzy TOPSIS), the technique of the best criterion to other ones, and the other criterion with the worst one – Best-Worst Method (BWM). The Fuzzy AHP method overcomes the ambiguity and uncertainty of criteria, while the TOPSIS method enables evaluating alternatives for selection and ranking of raw material suppliers. Within the AHP and Fuzzy AHP methods, there will be four criteria and four alternative solutions of input suppliers for the calculation of normalized relative

weights of unclear values for all criteria and alternatives to each criterion. Using the TOPSIS method, the ranking of all competing alternatives and a relative proximity to the ideal solution have been defined to obtain a suitable input supplier. Through Fuzzy TOPSIS, a consistent ranking of alternatives has been established. Lately, one of the newest and most effective MCDM methods for weighting factors and decision criteria – BWM – has been applied.

Research methodology
Dataset

This study analysed small family farms in Serbia because of their role and importance in the agricultural sector and sustainable development. We surveyed 500 farms in all regions from June to September 2019. The data collection process was conducted through direct interviews. Agricultural advisors conducted interviews with farmers. The questionnaires covered four areas: general farm characteristics, economic and social sustainability, environmental sustainability, and market linkages. The pilot studies covered several farms, and then conducted the final form of the questionnaire. 527 small agricultural farms were analysed (up to 15 ha of utilized agricultural area and EUR 15 thousand per year of total production and family farms, where the share of own work of family members is at least 75% of the invested work of farm members).

Multi-criteria decision-making (MCDM) techniques

In this study, we used several MCDM techniques to validate the obtained results: WSM = SAW, DEA, AHP, TOPSIS, Fuzzy AHP, Fuzzy TOPSIS, EDAS, VIKOR, BWM, and Entropy). We opted for the most current in multi-criteria analysis for supply chains: AHP, TOPSIS, Fuzzy AHP, Fuzzy TOPSIS, and BWM. Below, in paragraphs, we have provided a brief overview of the application of each of these methods.

Numerous MCDM methods have been applied, developed, and implemented for decades in many areas [11], [12]. All of these methods combine the performance of the alternatives through a number of criteria (contradictory, qualitative, quantitative), and, ultimately, come up with the solution that requires consensus [13]. Paul et al [9] present in detail the application of the MCDM methods through numerous analyses and research over a long period of time. It is similar to Louis et al (2018). Some methods have proved very useful in the supply chains' decision-making process, simultaneously providing the basis for our analysis of the input supply in the agro-economy. The goal of MCDM is to help decision makers choose the alternatives that match their preferences, not to give them the best decision. The knowledge of MCDM methods and proper understanding of the perspectives of decision-making itself are key to efficient and effective business decision-making.

We based our analysis on a number of criteria relating to input suppliers for small farms agricultural production. Starting from examining various studies from a number of sources [14], [15], [16], [17], [18], we began the analysis with ten criteria (input price, delivery time, payment methods, input quality, sophistication of a supplier, a wide range of raw materials, the elasticity of a demand, advertising, the Internet, and other methods). Our idea was to include as many criteria as possible to find the best alternatives (lowest cost of production, higher income, supply of inputs, diversified supply chains, etc.) for farmers. Based on the calculated weights (the first phase of the research) of the above-mentioned criteria, we selected the four highest ranked ones and included them in the further course of the analysis. As for the choice of alternatives, we were guided by the experience of the aforesaid research papers for individual economies. Venkatesh and Nithyashree [14] examined agricultural input markets and the use of inputs in India; Kenea et al. [15] investigated the efficiency of the credit system - timely and sufficient amount of delivering credit to farmers engaged on crop production and establishing efficient extension service in the study area was mandatory; Mutambara [17] recommended that all input supply chain interventions be transferred to poor

farmers; Sheldon [18] analysed the advent of online retailing which holds out the possibility of gaining new insights into the impact of multiproduct strategies by retailers and the interaction with consumer search and small farmers (the survey). After considering everything (regular suppliers, with and without signed contract, dealers, production chains, sales chains, regional centres, redeemers, agricultural cooperatives), we selected four most common alternatives for delivering agricultural inputs: farmers self-supplied products, random input suppliers without any formal agreement, regular suppliers without a previously signed contract, and regular suppliers with previously signed contracts covering preferential terms. In this phase and the next one, we included experienced experts to evaluate the decision on the selection of input suppliers.

Experts (decision makers) make choices based on experience and intuition. The approach is mainly subjective. Principally, the decisions are made based on decision-making according to multiple criteria (MCDM). In this way, subjective thinking tends to be reduced, and objective influence in decision-making increases. Numerous MCDM methods allow ranking and selecting one or more alternatives from a defined alternative's group. According to Shiur & Shih [19], these methods provide decision makers or experts with an effectual framework for comparison based on the multiple criteria assessment. The experts included in our analysis of input suppliers have extensive experience in the field of science (agriculture) and agribusiness (Table 1).

Table 1. Experts' Profile

	Gender	Age	Education level	Experience	Sector/Institution
Expert 1	Male	47	Bachelors	> 20 YRS	Economy (Chamber of Commerce)
Expert 2	Female	39	Master	> 12 YRS	Research (University)
Expert 3	Male	63	PhD	> 30 YRS	Education (University)
Expert 4	Female	55	Bachelors	> 25 YRS	Economy (Chamber of Commerce)
Expert 5	Male	38	PhD	> 15 YRS	Education (University)

This section presents previous studies on the application of different MCDM methods. According to many authors, the numerous and diverse applications of AHP prove that AHP is a credible decision-making tool. AHP can manage complex decisions in almost any field – finance [20], project risk management [21], supply chain risk management [11], energy sector [13], as well as in researching incomplete data [22]. The AHP and TOPSIS methods were applied in a potential supplier selection [23], a wireless network selection [24], renewable energy sources [25], etc. Mardani et al [12] show a broad usage of AHP for over two decades. Also, the Fuzzy AHP [26], [27] and Fuzzy TOPSIS methods in numerous spheres is widespread. Thus, for example, Chaising and Temdee [10] show how to increase selection potential for small and medium-sized enterprises that do not have their suppliers and the budget for selecting appropriate suppliers of raw materials.

The study of Sharififar et al. [28] discusses sustainable agricultural production by land evaluation based on multiple criteria approach (AHP). Demiril et al. [29] used Fuzzy AHP to evaluate alternate land cover policies under various confidence levels. Rezaei-Moghaddam and Karami [30] used AHP for a multiple criteria evaluation of sustainable agricultural development models. Peyman et al. [31] combined the fuzzy TOPSIS ranking technique with the AHP method to address the limitations of traditional FMEA analysis. Mangla et al. [32] used FTA analysis and the AHP method to incorporate qualitative and quantitative information into a green supply chain group decision-making process for risk analysis in an uncertain environment.

Analytic Hierarchy Process (AHP)

AHP is a subjective MCDM method that uses Saaty's [33] nine-point scale to analyse qualitative criteria that generate alternative priorities (via a relative importance scale). The AHP hierarchical structure is designed so that decision makers can represent complex problems in a simple form. According to Lee et al. [34], it facilitates the evaluation of numerous factors (quantitative and qualitative), even in the case of multiple conflicting criteria.

The AHP methods are used for structuring a problem and analysing the connection between the facts and the factors that affect the problem. Regarding input supply, the problem structure triggers discussions about the competing priorities of input supply actions and the relationship with input supply objectives. The hierarchical structure accurately presents the alternatives and criteria for evaluating alternatives (Phase 1: goal - criterion - alternatives; Phase 2: assigning weights; Phase 3: linking criteria to alternatives). At the same time, it shows that decision-makers need to compromise when choosing one criterion over another. The consistency index notes the inconsistency of the decision maker's assessment in paired comparison. However, AHP can detect inconsistencies outside individual decisions. In the problem of input supply, priority vectors received from each decision maker are compared [35], [36]. The AHP method makes it easier for decision-makers to agree on critical factors that affect problem-solving. The concept of decision-making is realized through five types, according to Md. Sum [20]: (1) a set of alternatives selection, (2) definition of priorities, (3) resources allocation, (4) business processes comparison, and (5) all factors synthesis.

Fuzzy Analytic Hierarchy Process (FAHP)

Although the AHP method is one of the most widely used MCDM methods, its disadvantage is that, in practice, decision makers are often faced with an uncertain environment for paired comparisons. This is why Fuzzy AHP is far more adequate [37]. There are numerous papers presenting different Fuzzy AHP methods [38], [39], [26]. All of them represent a systematic approach to the alternative problem of choosing because decision makers believe it is more reliable to make interval-based decisions than decisions with a fixed value. In other words, decision makers are sometimes unable to accurately evaluate preferences due to the unclear nature of the comparison process [39].

Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS)

This method was developed by Hwang and Yoon [40], who investigated how close an optimal alternative is to the ideal solution and how far it is from the corresponding negative optimal solution. Similar to the AHP method, criteria and alternatives are defined in the beginning, and afterwards, a normalized decision matrix is created. In defining the TOPSIS method, the solutions (positive and negative) are set hypothetically and derived from the structure of the method and the distance from each alternative is measured through so-called Euclidean distances [13]. In this case, the distance of the proposed alternative is calculated separately from the ideal solution. The best solution to the problem is determined after ranking the alternatives with the maximum value. The integration of the structure of the method contributes to the further upgrading of the TOPSIS method. The advantage of the TOPSIS method is due to a relatively simple and easy-to-understand calculation process with an unlimited number of criteria and attributes.

Fuzzy Technique for Order of Preference by Similarity to Ideal Solution (F-TOPSIS)

The Fuzzy TOPSIS is also present in some areas, as confirmed by many papers, even those that relate specifically to supply chains [41], [42]. This method has proven to be a sustainable approach to solving the problem of choosing alternatives since it represents a hierarchical approach to making a more rational decision. This technique is implemented through four steps (creating a normalized matrix, determining the weight of the metric, defining positive and negative outcomes, determining the distance of alternatives, evaluating alternatives, ranking). The application of Fuzzy TOPSIS generates a consistent ranking of alternatives, even when their number changes. To put it differently, this method provides a more flexible method regarding changing the number of evaluated alternatives.

Best-Worst Method (BWM)

The increasing application of BWM methods within MCDM [43], [44], [45] enabled us to use this method to solve the problem of input supply to small farms. The new BWM method has a relative weight of decision criteria with a smaller scope of calculations and less paired comparisons, with a low inconsistency rate of paired comparisons [44]. The application of this method is realized through several steps - after decision makers determine the best and the worst criteria, the procedure of controlling the advantage of the best and the worst criterion over other criteria is conducted, and, finally, the best criteria are ranked. While the AHP method provides a ranking of indicators, criteria, and sub-criteria of decision making (by paired comparison and expert analysis) from the most important one to the least important one, the BWM method determines the best indicators and criteria by a decision maker, measuring the comparisons between each of the two criteria.

Simulation result

Investing in agricultural development is particularly important in small farms, due to their large presence and their role in the development of agriculture and rural areas [46]. The entire analysis of raw material suppliers to small farms in Serbia was conducted using the aforementioned MCDM methods. Table 2 presents the weights for each of the five MCDM methods and their ranks.

Table 2. Calculated Alternatives by MCDM methods

Methods/	AHP		Fuzzy AHP		TOPSIS		Fuzzy TOPSIS		BWM	
Alternative	Weights	Rank	Weights	Rank	Weights	Rank	Weights	Rank	Weights	Rank
A1	0.097	4	0.104	4	0.267	4	0.353	4	0.101	4
A2	0.478	1	0.488	1	0.520	1	0.759	1	0.493	1
A3	0.271	2	0.287	2	0.496	2	0.563	2	0.290	2
A4	0.154	3	0.121	3	0.400	3	0.422	3	0.116	3

Source: Authors' calculations

Note for agricultural inputs channels: A1 – most of the products come from our farm, A2 – most from a variety of suppliers without any formal agreements, A3 – most from regular suppliers, but without previously signed contracts, A4 – most from regular suppliers on preferential terms and/or under previously signed contracts.

Table 2 shows that an input supplier without formal agreements has the highest weight value, i.e., ranked the highest compared to all suppliers. Therefore, an input supplier without formal agreements (A2) is the best alternative for selecting a suitable supplier for small farmers in Serbia, which may be surprising given the results of other studies. For example, Bellemare and Novak [47] claim that contract farming is perceived as a key tool for improving social welfare, upgrading technology, and increasing farm productivity. It also helps overcome production constraints such as finance, insurance, and lack of technical and managerial capacity. [48] Besides, contract farming is a crucial component for risk management and overcoming market failures [49].

Meanwhile, the research results on agricultural input supply channels available to small farms in Serbia showed that input suppliers without any formal agreements have a dominant position for farmers. This is broadly justified by uncertain support from the state, unclear steps in the adjusting EU process to agricultural policy, and a high degree of uncertainty in the input market, i.e., agricultural raw materials. Thus, input delivery by suppliers without formal agreements is significantly present in small farms in Serbia. The reason is simple: farmers do not want to be tied to individual suppliers due to great uncertainty in the market. Farmers experience some inconveniences due to delays in the delivery of inputs or the inability to

procure them, jeopardizing their production. In such circumstances, farmers lose confidence in potential regular suppliers and are forced to rely on sporadically and irregularly available input providers, without any formal agreements, but with goods currently available.

Self-supplied products (such as seeds or organic manure) are always available to small farmers, however, their supply and use have declined dramatically in recent years. The main cause of such a trend is the wide offer of imported pesticides and fertilizers. However, due to the absence of phytosanitary control at customs, the quality of these inputs declined, which resulted in a significant deterioration in the base of indigenous varieties, so the yield and the yield per hectare dropped dramatically [50].

Considering the importance of fertilizer as an input in agricultural production, the analysis of the economic geography of fertilizers follows McArthur & McCord's [16] findings on how "supplier access" to intermediate goods matters for trade and per capita income.

Interestingly, inputs (chemical fertilizers and pesticides) and farm size have indicated a mixed relationship in India. In other words, as farm size increases, input use decreases. [14].

A research report [15] found that half of the Ethiopian farmers surveyed reported that fertilizer arrived after planting, 32 percent said the bags were too light, 25 percent complained of poor quality, and nearly 40 percent said their planting was delayed due to fertilizer problems.

In a study from Zimbabwe [17], which focused mainly on the input supply chain due to access to agricultural inputs, especially fertilizers, most farmers considered fertilizers to be unavailable. This is in line with the FAO finding [2] that although one kilogram of nitrogen fertilizer yields 10 to 15 kg of grain, it is unaffordable for most African farmers because it costs them 2 to 4 times the average price on the world market.

Conclusion and recommendations

This paper discusses the possible applications of different methods in multi-criteria decision-making on the farmers' choice of agricultural inputs supply chain. The complexity of the problem of input supply chains and agricultural production requires a decision-making tool that can include both the principles of input supply and several conflicting factors that affect the problem. The research shows how different MCDM methods can structure the problem of making decisions about available inputs. We have demonstrated that AHP, Fuzzy AHP, TOPSIS, Fuzzy TOPSIS, and BWM are decision-making tools that can improve small-scale farms' decision-making in input supply analysis. The results show that the most preferable, from the economic point of view, input supply chain refers to suppliers without any formal agreements, followed by regular input suppliers, but without any previously signed contracts. On the other hand, the least dominant are self-supplied products and regular suppliers with preferential prices and/or previously signed contracts.

The analysis results indicate that the most adequate multi-criteria methodology has been successfully selected. We considered several methods to analyse the problem and the interrelationships between the criteria and alternatives. We believe that the MCDM methods can help decision makers to consider and implement valid decisions along with satisfactory compromises when considering alternatives for risk assessment and uncertainty to simplify negotiations and keep a record of more successful decision-making.

Regarding agricultural policy in Serbia, state support is crucial so that even the poorest farmers in the most remote and underdeveloped areas have sufficient quality and diverse inputs for their production. One of the suggestions could be to develop a network of smaller distributors or dealers who would operate closer to the agricultural producers. It is necessary to ensure the continuity of their economic activity in a sector and to reduce the risk of bankruptcy, for example, by developing insurance guarantee instruments and low-interest loans for small and medium-sized enterprises. The farmer will then have security of supply in the long term and will be more inclined to enter into long-term cooperation with the supplier. An additional and

important factor is the education of farmers. Building and strengthening the capacity of small farms necessarily implies providing the appropriate skills and knowledge in the application of certain inputs, which will improve performance and productivity, increase revenues, and change the elasticity of demand for a variety of inputs. For a smallholder farmer, good business cooperation with the first in the supply chain, with the input supplier or small trader, is of utmost importance. Dealer networks and supplier associations must be well organized and educated to be able to analyse the real needs of farmers and have adequate capacity to offer technical support, sales options (vouchers, small loans, discounts, etc.), business skills, and legislative and administrative support. This will enable the development of long-term relationships more easily through a strong market presence and regular cooperation between input suppliers and farmers.

This approach can help donors and agricultural policymakers to increase the importance of farm support programs in the future, providing necessary inputs. Moreover, encouraging the association of farm owners, similar to agricultural cooperatives, is a crucial issue from the perspective of achieving economies of scale in the supply of inputs to small farms.

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