QUALITATIVE ENHANCEMENTS IN AGRICULTURAL CROPS FOLLOWING EUROPEAN FUNDING

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RESEARCH ARTICLE

Abstract

The present study analyzes the impact of accessing European funds on a sample of 60 agricultural holdings in Romania, examining the transformations that occurred before and after the implementation of financing projects, based on a comprehensive questionnaire addressing crop quality, soil health, resource use, applied treatments, organic production, certifications, and perceptions related to consumer health and satisfaction.

The results highlight a profound shift in farm performance, reflected in a notable improvement in crop quality, described after financing through terms such as "very good," "much superior," "high," or "excellent," in contrast to the earlier situation marked by technological limitations, lack of mechanization, and structural soil issues.

Soil health improved from low levels—affected by the absence of natural fertilizers and the excessive use of chemicals—to high levels due to the application of organic fertilizers and the elimination of chemical treatments.

Funding stimulated the mechanization of agricultural holdings, evident in the increased diesel consumption and the introduction of high-performance machinery that enabled more efficient agricultural work. At the same time, investments led to the diversification of energy resources through the adoption of photovoltaic panels and the expansion of water resources through well drilling.

The transition toward organic farming represents one of the most significant developments: from a 98% absence of such practices before financing, farmers reached a level of organic farming adoption of approximately two-thirds following project implementation.

*These findings demonstrate the role of European funds in strengthening the sustainability, modernization, and competitiveness of Romanian agriculture, while also contributing to increased consumer satisfaction and the production of foods with a positive impact on heal*th.

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INTRODUCTION

Romanian agriculture is undergoing a rapid transformation driven largely by access to European funds, which have reshaped how farmers prepare soil, select crops, apply treatments and manage natural resources. Before these funds became available, most farmers relied on traditional methods, outdated machinery and often inadequate resource management — conditions that translated into lower crop quality, poor soil health and limited capacity to adopt organic practices.

Romanian agricultural products, as part of the European market, must meet EU quality standards. Several factors have contributed to declining productivity and lower product quality in Romania's agricultural sector, the most important being financial difficulties in purchasing inputs, fragmentation of cultivated land and a widespread lack of technological, managerial and marketing skills among many family holdings and small farms. These issues underpin the urgent need to reform agro-food quality standards. (Istudor et al., 2006)

Romania's agricultural potential has consistently been high, thanks to favourable geography, climate conditions and soil quality. Given this advantage, there is a clear need for agricultural policies focused on regional development. Public policies must capitalize on Romania's agricultural potential through coherent investment strategies and adaptation to environmental changes. (Strijek, 2025)

At both national and EU levels, public policy displays limited coherence. For example,

while genetically modified organisms are largely restricted in the EU to protect biodiversity, subsidy schemes are sometimes structured in ways that indirectly reduce biodiversity. Subsidies intended to support agriculture can create market distortions: they frequently benefit large producers disproportionately, leaving smallholders at a competitive disadvantage. (Năsulea et al., 2024)

Current agri-food policies and programs point to the need for a shift towards approaches that promote socially and ecologically sustainable food production. Quality labeling schemes have emerged as local or regional solutions for rural economies. Public institutions promote quality food products to support small-scale, sustainable agriculture. The motivation for focusing on quality schemes and promotional tools stems from the state of Romania's agri-food sector since late 2016, characterized by weak coherence in rural development program measures and a lack of market-oriented public policies, while European producers increasingly target new markets using indirect support mechanisms for farmers. To reposition Romania away from a vulnerable food-security profile, policymakers will need to adopt concrete sustainability measures. (Pădure, 2020)

Accelerating the structural adjustment of the agri-food sector remains a constant pressure on Romanian agriculture. This presents an unprecedented challenge for decision-makers over the coming years, who must continue and speed up the institutional preparations required for implementing the Common Agricultural Policy (CAP) and managing associated funds. Cost-benefit and impact assessments of CAP adoption can provide useful quantified guidance and a basis for choosing appropriate agricultural policy instruments in both the pre- and post-accession periods, while offering benchmarks for producers and consumers. (Giurcă, 2007)

It is also essential to analyse the direct and indirect effects of EU integration and CAP implementation on agricultural developments at both macroeconomic and microeconomic levels. Consideration must be given to post-accession economic trends, the market for agricultural goods, absorption of EU funds, technical-financial performance of farms, income dynamics and food consumption patterns. (Toma et al., 2010)

The empirical survey conducted for this article - based on 60 farmers who received EU agricultural grants - shows marked changes. Many respondents described the pre-funding quality of their crops as "good," but that assessment was relative, measured against low technological standards and clear financial limitations. Notably, 26% reported that a crop essentially "did not exist" or was only in an early stage, indicating that funding enabled the establishment of some farms, not merely their modernization.

Soil health before funding was seriously problematic: 10% explicitly described it as low, and many responses repeatedly mentioned the absence of organic fertilizers, widespread chemical use or even the practical absence of healthy topsoil (comments such as "the soil was not healthy because many chemicals were used" or "soil was poor due to lack of natural fertilizer" were common). This degradation reflects an intensive, quantity-oriented agriculture where ecosystem health was not a priority prior to funding.

Lack of mechanization and modern technical resources is also apparent from fuel-use data before grants: almost a quarter of farmers reported using no fuel at all, suggesting either the absence of agricultural machinery, reliance on manual labour, or extremely low levels of development. Those who did use fuel often operated old, inefficient equipment that limited ploughing depth, the quality of soil work and production efficiency. Water and energy access was precarious: farmers depended mainly on the public electricity grid (insufficient for modern agricultural needs) and on ad hoc wells or network supply not designed for sustainable irrigation. Organic production was virtually nonexistent before funding: 98% of respondents said they did not practice organic or mountain agriculture, either from lack of interest or lack of possibility; certified products were therefore absent, restricting access to specialty markets.

Within this broader context, EU funding functioned as a powerful catalyst — not only improving farm performance but also shifting production philosophies toward sustainability, quality and stewardship of natural resources. Across the dataset, farmers consistently reported that funding led to "much higher" crop quality, in some cases "excellent" soil health, substantial gains in energy autonomy and a clear move toward organic production. This study aims to examine these changes in detail, discuss each result, and provide a comprehensive picture of how European

financing contributes to the sustainable development of Romanian farms.

MATERIAL AND METHOD

The study's methodology is based on a questionnaire composed of both closed and open-ended questions, administered to 60 farmers who received European funding. The questionnaire evaluated the condition of the farms before and after accessing the funds, focusing on key components of agricultural activity: crop quality, soil health, fuel use, energy sources, access to water resources, the existence of organic production, certifications, the introduction of new varieties, the types of treatments applied before and after funding, the presence of soil and water analyses, and farmers' perceptions of how their products affect consumer health and satisfaction.

The research employed a descriptive and interpretative approach, oriented toward a before–after comparative analysis. Rather than constructing a complex statistical model, it examined the values reported by farmers, integrated their perspectives both qualitatively and quantitatively, and formulated interpretations that reflect their actual experiences. Open-ended responses were used to complement and clarify statistical data, providing a more nuanced understanding of the transformations observed.

The methodology allows for correlations between practices and resource use on the one hand, and farmers' perceptions of consumer health and product quality on the other. This offers a holistic view of the impact of European funds, extending the analysis beyond technical or quantitative aspects to include the cultural, technological and ecological changes generated by the financing.

RESULTS AND DISCUSSIONS

Crop quality before and after accessing European funds

Before receiving funding, crop quality varied widely, though most respondents described it as "good" (54%), which might initially suggest a favourable situation. However, a contextual analysis shows that this "good" quality was assessed relative to the limited resources of the farms, the absence of modern machinery and insufficient inputs. In reality, many answers reveal clear shortcomings: 26% stated that "there was no real crop," in the sense that no consolidated agricultural system existed; 6% reported average quality, while others used terms such as "weak," "acceptable," "decent," "it was good but not organic," or "the crop quality was lower because the machinery was old." These nuances highlight a significant discrepancy between farmers' perceptions and actual agricultural production standards.

After receiving funding, perceptions of crop quality change dramatically. Responses become overwhelmingly positive, with frequent mentions of "very good," "much superior," "high," "superior quality," "excellent," "the quality is much better," "the products are organic," and "quality increased considerably." A notable observation is the repeated idea that new machinery enables more efficient work, such as deeper ploughing, which results in better soil preparation and stronger crop development. Farmers also emphasize that the transition to organic cultivation significantly enhanced crop quality, fully aligning with the specialized literature on organic farming. The improvement in crop quality is one of the most evident effects of accessing European funds, and the consistency of the responses strongly supports this conclusion. (figures 1)

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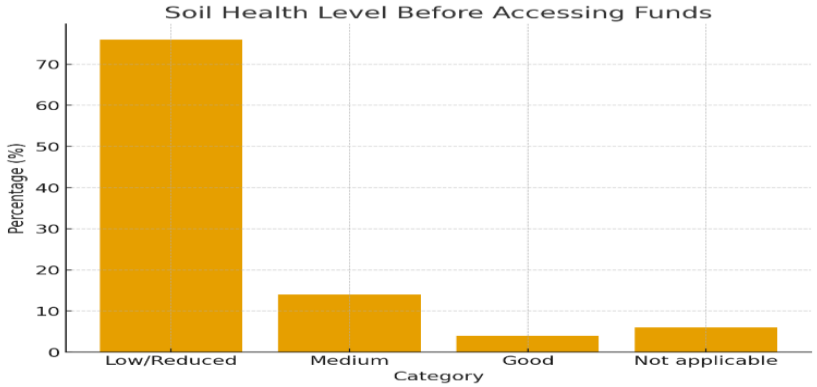
Figures 1 **Crop quality before and after accessing European funds**

Soil health before and after funding

The condition of soil health prior to accessing funds was deeply problematic. The responses overwhelmingly reveal severe deficiencies: poor soil (10%), low or reduced quality (6–8% nominally, but repeatedly

emphasized in many open-ended responses), the absence of organic fertilizers, intensive use of chemicals and even descriptions such as “nonexistent” or “the land was not worked.” Several farmers explicitly stated that their soil “was not healthy because many chemicals were used,” while others noted that soil health was compromised by the lack of natural fertilizers. The frequent recurrence of terms like “reduced,” “lack of natural fertilizer,” “weak,” “very low,” or “moderate to low” paints a clear picture of a degraded agricultural environment.

After receiving funding, the transformation is remarkable. Farmers describe their soil as “very good,” “good,” “perfectly healthy,” “100% healthy,” “high,” “medium to high,” or “significantly improved due to organic fertilizers.” A systematic approach to soil treatment becomes evident, involving manure, natural fertilizers and ecological practices that restore the biological structure of the soil. Many farmers emphasize that they no longer use chemical fertilizers, herbicides or pesticides, which directly explains the substantial improvement in soil health. Overall, the data indicate a clear shift from degraded soil to healthy soil, supporting the conclusion that European funds directly contribute to sustainable agricultural practices. (figures 2)



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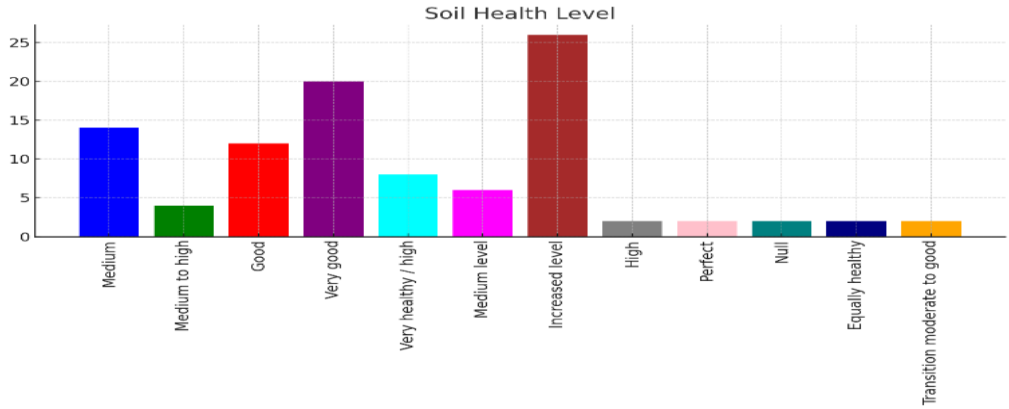

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Figures 2 **Soil health before and after funding**

Fuel use before and after accessing funds

Before receiving funding, fuel use reflects a low level of mechanization: a significant share of farmers reported that they “did not use fuels,” which essentially indicates the absence of machinery. At the same time, 70% reported using diesel, but this typically corresponded to limited fieldwork carried out with old or inefficient equipment. After accessing the funds, 94% of farmers use diesel, a clear sign of intensified mechanization necessary for efficient land exploitation. The appearance of combinations such as diesel + gasoline + oil or diesel + solar energy also points to a diversification of agricultural activities.

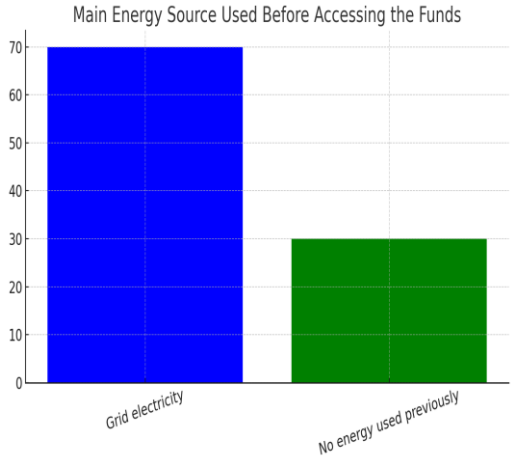
Energy sources before and after accessing funds

Before receiving funding, farmers relied almost entirely on the electricity grid. Many even stated that they “did not use energy” for agricultural activities. After the investments, the situation changes significantly:

photovoltaic panels become the primary energy source for a substantial share of farmers. The high frequency of responses mentioning photovoltaic energy—either alone or combined with grid electricity—shows a clear transition toward energy sustainability. (figures 3)

Water resources before and after funding

Before receiving financial support, water resources came mainly from the public network or simple wells. Many respondents stated that they "did not use water," which indicates a lack of irrigation altogether.



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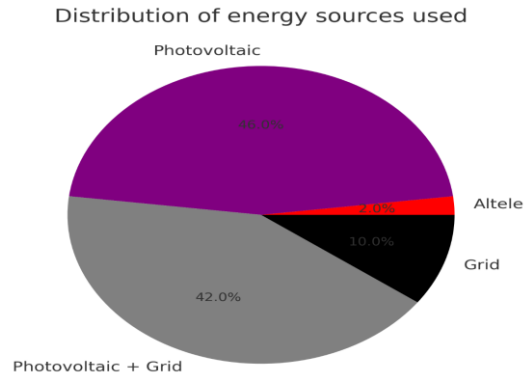

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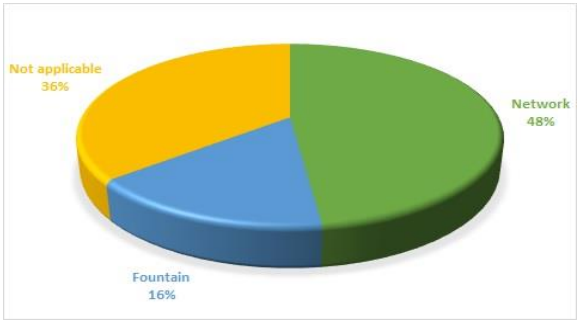
Figures 3 **Energy sources before and after accessing funds**

After purchasing the necessary equipment and infrastructure, farmers now rely on drilled wells or on combinations of drilled wells and the public network. The introduction of drilled wells represents a major improvement, enabling more efficient and reliable irrigation. (figures 4)



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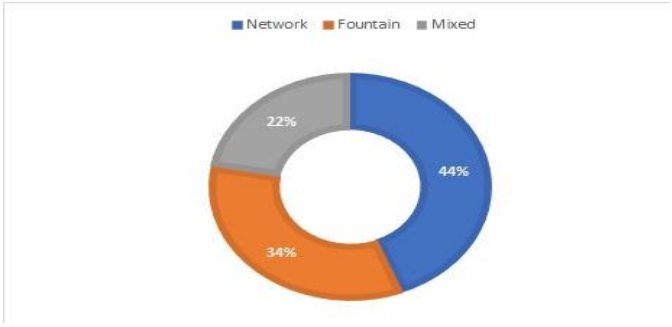

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Figures 4 **Water resources before and after funding**

Organic production and certifications

Before accessing the funds, the vast majority of beneficiaries did not engage in organic, ecological, or mountain production, either due to limited financial resources, lack of interest, or insufficient technical capacity. The data show that approximately 98% of respondents did not carry out such activities prior to funding. After project implementation, the situation changed significantly: around two-thirds of beneficiaries reported transitioning to organic production, either across the entire farm or only for specific crops. This shift demonstrates a direct impact of the funds on steering farmers toward more sustainable practices. At the same time, one-third of respondents continue to operate conventional systems, either due to operational constraints or insufficient resources for full conversion.

Before using the funds, almost all respondents (98%) did not hold any organic certifications, indicating a very low level of certification in their sector, restricted by limited resources, experience, or infrastructure. After the funds were implemented, the situation improved considerably, with about 32% of beneficiaries reporting that they hold at least one certified organic product or that their entire farm has become certified organic—evidence of the positive impact of financial support. However, the majority (68%) have still not completed the certification process, whether due to

administrative, logistical, or timing constraints, indicating that full transition requires more time. Overall, the data reveal that the funds created a clear opportunity for adopting organic certification, even if the process is gradual. Thus, there is a significant difference between the initial situation and the post-funding stage, highlighting the role of financial support in encouraging organic certification among farmers.

Introduction of new varieties

Most farmers did not introduce new varieties, but approximately 18% diversified their crops with green beans, peas, peppers, cucumbers, zucchini, pumpkins, tomatoes, watermelon, and sweet corn, reflecting an adaptation to market demand.

After accessing the funds, most respondents (around 62%) reported that they improved their existing production, either by increasing the quantity or by enhancing product quality, with outputs becoming healthier and more ecological. A small percentage, between 6% and 8%, made no improvements, suggesting financial or technical barriers. Detailed responses indicate that some farms diversified their cultivated varieties or adopted ecological practices, contributing to higher-quality products (2–4%). Thus, the funds clearly stimulated production improvements—both quantitative and qualitative—for most farmers. Overall, the data show a significant difference between the initial situation and the post-funding stage, demonstrating the role of funds in increasing agricultural performance.

A majority of respondents (approximately 70%, including "No," "no," and "I did not introduce new varieties") did not introduce new varieties in agriculture or livestock, indicating that crop diversification remained limited for many farms. In contrast, around 18% did introduce new varieties, with detailed responses citing green beans, peas, peppers, cucumbers, zucchini, pumpkins, sweet corn, watermelon, tomatoes, and cabbage. This reflects meaningful diversification in certain farms. The data suggest that the funds facilitated the introduction of new crops only for a subset of beneficiaries, while most retained their existing structure. The impact is more pronounced in farms that adopted high-value or ecologically oriented varieties. Thus, the introduction of new varieties was selective but significant for those who implemented changes.

Agricultural treatments before and after accessing funds

Before funding, chemical treatments predominated: herbicides, pesticides, nitrogen, and chemical fertilizers. After accessing the funds, many farmers shifted to organic treatments, particularly manure, while some abandoned chemical treatments entirely. Others combined traditional and ecological methods during the transition.

Before receiving funds, most respondents applied standard chemical treatments—including herbicides, insecticides, chemical fertilizers, nitrogen, pesticides, and foliar treatments—representing approximately 46% of responses. Another group (around 20%) stated that they did not apply any treatments or that treatments "were not needed," either due to the absence of crops or because they did not use chemicals. Individual responses listed foliar treatments, fertilizers, herbicides, insecticides, nitrogen, pesticides, chemical fertilizers, or combinations of these, illustrating the diversity of conventional practices used for crop protection and fertilization. Some respondents reported applying herbicides alone, nitrogen alone, or foliar treatments combined with herbicides and nitrogen, confirming that farmers used chemicals based on crop needs. At the same time, a considerable number of farms applied no treatments at all, indicating less intensive or more conservative operations. Overall, the initial situation reflects predominantly conventional agriculture, with a broad range of chemical treatments, but also a segment of farms without chemical interventions.

After using the funds, some farmers (approximately 20%, including "We do not use," "We no longer use," "I do not use," and similar responses) no longer apply any chemical treatments, maintaining ecological crops or aiming for full transition to organic farming. Another significant group (approximately 28%, including various mentions of "natural fertilizers" and "manure") applies organic fertilizers such as manure, in different forms and combinations. A smaller group (approximately 14%, including "chemical treatments, nitrogen, herbicides") continues to apply partial chemical treatments, combining nitrogen, herbicides, and sometimes manure. There are also responses indicating exclusive use of eco or bio treatments, such as

"eco and bio treatments" or "treatments permitted in eco agriculture" (around 6%). Some farmers combine manure with herbicides or pesticides, using both organic and chemical substances in reduced doses (about 4%). Treatments listed also include nitrogen alone, nitrogen with herbicides, or nitrogen combined with herbicides and pesticides, showing that fertilization and crop protection remain partially conventional in some farms (around 6%). Other responses describe ecological manure applications, foliar treatments, and natural fertilizers, reflecting a diverse set of adopted techniques. Some farms use only natural fertilizers without chemicals, while others combine chemical and organic fertilization methods for a gradual transition. Overall, the data indicate a mix of ecological practices, natural fertilizers, and controlled chemical treatments, demonstrating a progressive adaptation after accessing the funds. Thus, the funds enabled farmers to reduce chemical use and adopt more ecological practices while maintaining crop productivity and protection.

Correlation with consumer health and satisfaction

Farmers believe that organic products have a positive impact on health, and customers are generally very satisfied with product quality, with many reporting satisfaction levels of 100%.

Most respondents (approximately 28%, including "No" and "We cannot assess") believe they cannot directly correlate their products with clients' health outcomes, or they do not know how to evaluate this. In contrast, a significant share (around 44%, including "Very good," "Very good/very healthy if we have organic crops," "Very good," and "Excellent") believe that organic products have a strong positive impact on health, mainly due to the high quality of crops and raw materials. Another group (approximately 28%, including responses mentioning high-quality vegetables and seeds, as well as detailed comments about satisfied customers) emphasizes that organic products—including honey—contribute to consumer health, reduce disease risk, and provide beneficial vitamins and nutrients. Detailed responses highlight that the quality of raw materials and final products is correlated with consumer health and satisfaction. Numerous examples describe vegetables and organic products as "very healthy" or "superior quality," indicating a positive effect on customers. Overall, the data suggest a broad consensus that organic and high-quality products contribute to health and well-being, even if some respondents cannot quantify the effect. Thus, the funds and the shift toward organic production appear to have facilitated the creation of products that positively impact consumer health.

Most respondents (around 22%, including "No" and "We cannot assess") state that they cannot determine a clear correlation between their products and customer satisfaction, or they do not know how to evaluate it ("I don't know," "I cannot say"). However, a significant portion (around 42%, including "Very satisfied," "Very good," "100% satisfied," and "Very satisfied according to what they tell us") indicate that customers are very pleased with the products offered, emphasizing the positive impact of quality and price–quality ratio. Furthermore, responses mentioning "increased satisfaction level," "significantly increased satisfaction," or "high satisfaction level" (around 24%) show that the products contribute to higher customer satisfaction and farmer confidence, reflecting positive perceptions of ecological and high-quality products. Other detailed responses highlight that a diet rich in vegetables and organic products not only improves health but also enhances mood, energy, and overall well-being, confirming the link between food and general satisfaction. Examples referencing "loyal customers" or "good price–quality products" indicate that satisfaction is also influenced by consumer loyalty and perceived value. (figure 5)

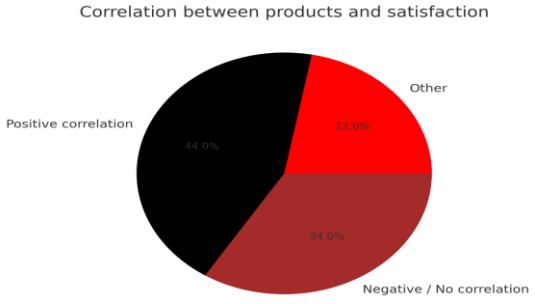

Figure 5 **Effective young farmers in North-West**

Overall, the data suggest a clear correlation between ecological/high-quality products and high customer satisfaction. Thus, the funds that facilitated organic production indirectly contributed to increased consumer satisfaction and strengthened producers' reputations.

CONCLUSIONS

The analysis of the data collected from the questionnaire applied to the 60 farmers clearly shows that accessing European funds has become a central driver of modernization in Romanian agriculture, profoundly influencing both the quality of production and the organization and functioning of farms. Before funding, most farms faced outdated infrastructure, lacked mechanization, and poorly managed natural resources, which directly affected crop quality and soil condition. Soil degradation, described in numerous responses with terms such as "poor," "low," or "depleted," resulted from a chemical-dependent agriculture lacking organic fertilization and a clear sustainability focus. After accessing European funds, a systematic and consistent improvement is observed, with farmers repeatedly reporting that their soil is "very healthy," "perfect," or "highly fertile," due to the abandonment of chemicals and the adoption of natural fertilizers. Crop quality has significantly improved, reflected in the frequent use of positive descriptors in responses and the recognition that modern machinery allows for more efficient work, supporting optimal plant development.

The funds have also been decisive in modernizing farm energy systems, with photovoltaic panels becoming widely adopted, as well as in establishing stable water supply systems through the expansion of drilled wells. At the same time, farm mechanization accelerated, evidenced by increased diesel consumption and the adoption of new technologies that enable better control over agricultural operations. The transition to organic farming is one of the most important effects of the funding, as farmers not only adopted ecological methods but also began to abandon chemical treatments, use natural fertilizers, and pursue certifications for their products, even though the process remains ongoing for many respondents. The importance of this transition is further highlighted by farmers' perceptions of the beneficial effects of their products on consumer health and satisfaction.

The study paints a picture of an agricultural sector in transformation, where European funding not only addresses past deficiencies but also creates the conditions for sustainable, high-performing, quality-oriented agriculture. The impact is observable at all levels—from soil and technologies to consumers and markets—demonstrating that agricultural investment is a fundamental pillar of rural development. The transformations recorded confirm that Romanian agriculture, supported by European funds, is increasingly aligned with Western standards, strengthening its capacity to produce healthy food, responsibly utilize natural resources, and meet the growing demands of contemporary consumers.

Overall, the study demonstrates that accessing European funds has generated essential, multidimensional transformations. Improvements in crop quality, soil health, access to resources, energy modernization, crop diversification, reduction of chemical treatments, and increased orientation toward organic farming are clear evidence of the positive impact of these funds. Farmers have adopted modern technologies, enhanced soil structure, and become active participants in sustainable agriculture. Increased consumer satisfaction and a shift toward organic products confirm the success of the implemented changes.

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