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## Conference Paper

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# THE FUTURE OF THE ECOLOGICAL FARM: TEN OPINIONS AND EVALUATIONS. RESULTS OF APPLYING DELPHI METHOD

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## Abstract

*If we can decipher the content of opinions and evaluations of those involved in ecological agriculture then we could know the subjective fundamentals/resorts of the modernization and ecological development's process at the level of the rural communities. The study mainly aims at identifying the opinions on the ecological farm's evolutions, and, as general objectives: knowing the projections regarding employment in ecological farm, employment in agriculture's support services, determining the way in which the consequences of using ecological practices on the supply chain and impact on rural communities are perceived. The scientific approach on the ecological subjectivity has turned to a structured communication method, Delphi, in three stages. The study was implemented in a rural area defined by concerns and ecological agricultural activities – Dornelor Basin, Suceava county and it has identified the content, persistence, flexibility and statements' meaning (positive/negative) of opinions regarding the future of the ecological farms.*

**Keywords:** ecological farm, opinion, evaluation, Delphi method.

**JEL classification:** Q01, Q57

## INTRODUCTION

Analyzing the opinions and evaluations of actors involved in ecological agriculture can decipher the subjective mechanisms of the functioning of a productive system that support the return to nature by using some environmentally friendly methods and techniques. The necessity of such a scientific approach focused on the subjectivity of those involved in ecological agriculture is determined by the responses to the social request, to produce and offer healthy goods/products while respecting the conditions imposed by environmental protection and knowledge of specific behaviors of those involved in this type of agricultural activity. The timeliness of the subjective ecology's studies is endorsed by the necessity of understanding and supporting the farms that use environmentally friendly practices, by elaborating and implementing adequate measures for both their modernization and ecological development. The theoretical defining of the functioning and structuring mechanisms specific to ecological farm is incomplete if aside economic factors the ones of sociological and psychological nature would not be added (Dessart F.,J., 2019). In order to formulate a scientific response to the holistic approach necessity, *“In the social sciences, there have been numerous studies on reasons for farmers to convert to organic farming (e.g, Fairweather, 1999; Padel, 2008) and for consumers to purchase organic foods”(e.g., Brand, 2006; Holt, 2006). “(Darnhofer, I., et all, 2010:68). In this way, the relevance of the sociological and psychological factors is emphasized: “Several non-economic factors were found to play an important role in farmers' decision to actually convert or to plan to convert to organic farming.... The farmers' attitudes to the environment strongly influenced the probability of (potential) conversion and environmental concerns were widely present as motives for organic farming. These findings confirm that adoption of organic farming is not only a question of economic prospects, but also involves lifestyle choices or other ideals.” (Koesling, M et all, 2008:93). The dynamic of the profound*

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transformation of agriculture’s ecosystem induced by farmers that use ecological practices (Kressmann G., 2021) requires knowledge of both local context’s characteristics and of those specific to actors involved in ecological production (Gravel A., 2016). Researches on subjective ecology are generated by social psychology’s fundamentals, by social representations that constitute the foundations of opinions, attitudes and by behaviors based on attitudes. In this psychological chain, the opinion has its own importance because it represents the consequence of an interindividual process (Stoerzel J., 1978). As a recognition of understanding the importance of subjective factors, the European environmental policies and support measures demanded by the development of ecological agriculture have included behavioral factors into official documents, in the associated impact evaluation: “*To achieve better results in delivering environmental and public goods, the CAP likely needs to be based not only on regulations and financial incentives (as it is now), but also on incentives leveraging the non-financial, behavioural factors that have a bearing on farmers’ uptake of more sustainable practice*” (Dessart, F., J., et al 2019).

## MATERIALS AND METHODS

**Study Area - Dornelor Basin** is located in the south-west part of Suceava county and it includes 12 territorial administrative units (Vatra Dornei, Dorna Candreni, Poiana Stampei, Coșna, Iacobeni, Ciocănești, Cârlibaba, Dorna Arini, Panaci, Șaru Dornei, Crucea și Broșteni) covering a total area of 221,517 ha, out of which 51,590 ha of agricultural area (23.3%) and 169,927 ha of nonagricultural area.



**Figure 1. Map of Dornelor Basin, Suceava county**

Source: own processing based on <https://harti.wansait.com/2011/suceava-ro-administrative-map-harta-administrativa/>

The pastures and hays from Dornelor Basin cover 96% of the agricultural area, aspect that confer a mixt character to local agriculture, based, mainly, on raising dairy animals (cows, sheeps, goats).

**The method used** was Delphi, following these stages: the first, was getting acquainted with the method and supplying information regarding the characteristics of ecological and conventional farms from the area; in this first stage, Delphi questionnaires for round I were sent to the 10 experts; in the second stage, a report containing the anonymized responses of expert was drafted and sent along with

the questions from Delphi round II; a second report was drafted and sent along with the Delphi round III. The questionnaires were applied on-line, also with face-to-face support.

**Participants-** as regards the gender structure, 70% of the respondents were women and 30% men. Most participants had more than 10 years of experience, working in research, public administration, extension, agricultural activities, food processing, retail and NGO sector.

**Table 1. Participants' Characteristics- Demographical and occupational - Suceava county, Romania**

		Rounds		
		1	2	3
Gender	Male	7	7	6
	Female	3	3	3
	Other			
	Prefer not to say			
Work Experience	< 5 years			
	5 - 10 years	2	2	2
	10 – 20 years	3	3	2
	> 20 years	5	5	5
Area of experience <sup>a</sup>	Researcher	2	2	2
	Civil servant	2	2	2
	Extension officer (both public or private)	3	3	3
	Farmer	1	1	1
	Representative of farmers organisation			
	Food chain– input supplier			
	Food chain– food processor	1	1	1
	Food chain– wholesaler or retailer	2	2	2
	Land agent			
	Non-governmental organisation	1	1	
Other; please specify: / _____ /				

Source: adaptation after Wentholt, Rowe, König, Marvin, & Frewer (2009). Note: a – participants were allowed to choose multiple areas of experience to reflect their expertise.

**Data Processing and Analysis** – based on the fact that the questionnaire contained different types of questions, the analysis focused on both quantitative and qualitative aspects. Quantifying the existing correlations between variables was based on Kendall's W coefficient, as exemplified in Cafiso, Di Graziano, & Pappalardo (2013). The null hypothesis is that participants have independent opinions from one another. Rejecting this null does not mean that participants agree but that at least two of the participants agree with one another. Kendall's W will take a value of 0 for no agreement and 1 if all experts perfectly agree with each other such that:  $0 \leq W \leq 1$ .

Kendall's W can be calculated by the following formula:

$$W = \frac{12 * S}{m^2 * (n^3 - n) * m * \sum_{j=1}^m T_j}$$

where: S- sum of squared coefficients for n, number of objects,  $R_i$  - is the sum of ranks of each object, i, across all, m number of experts,  $\bar{R}$  is the mean rank value for each object across all the experts,  $T_j$  allows for a correction in the case of a rank being tied where  $t_i$  is the number of ranks that are tied across object i, and  $g_j$  is number of different objects that have ties. For the present study, the Kendall's W has been calculated with the help of SPSS software, based on the experts' opinions collected in the case study area.

## RESULTS AND DISSCUSION

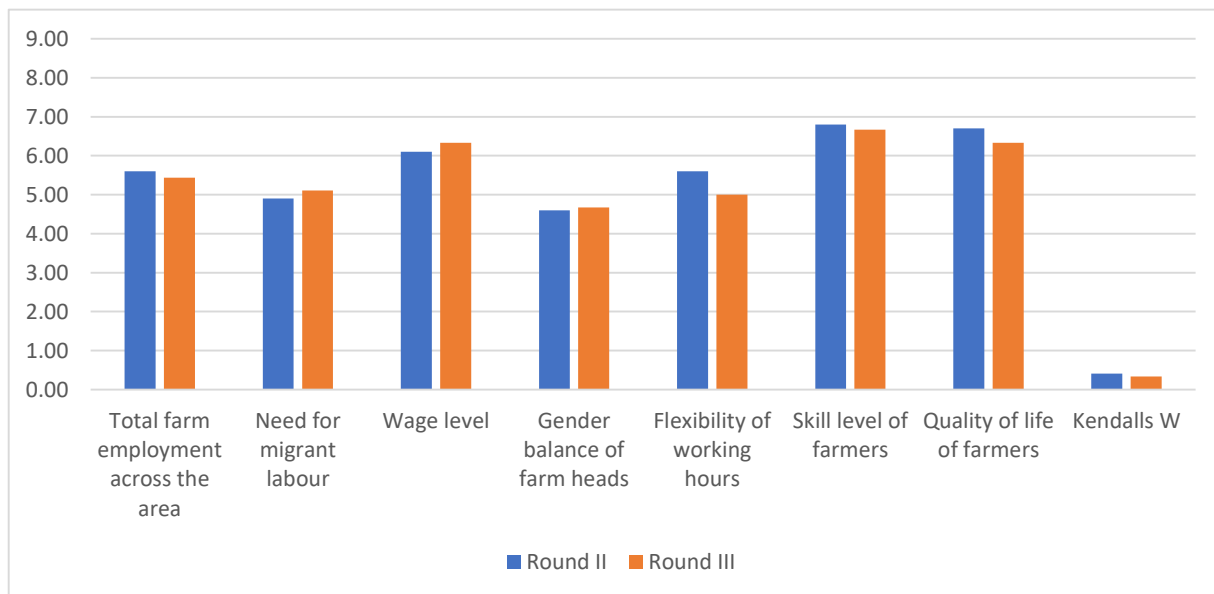
The study of opinions and evaluations regarding the dynamic of different components/aspects of ecological agriculture/ecological farms revealed their consistency and special intensity and directions' likeness (positive/negative).

### Opinions and evaluations regarding the effects of ecological agriculture's development on employment

The analysis of the effects induced by ecological agriculture's development on employment was performed by evaluating the following aspects: *total farm employment across the area, need for migrant labor, wage level, gender balance of farm heads (% women and men), flexibility of working hours, skill level of farmers, quality of life of farmers*. The opinions and, implicitly, evaluations on *skill level of farmers, quality of life of farmers and wage level* were the most pronounced following the coherent social representations that participants had; the average value of responses (over 6 during the entire exercise, on a 1 to 9 scale) highlights the participants' interest on these aspects and enunciation of coherent, consistent opinions. The restructuring of opinions regarding some aspects is not significant, but indicates the "subjective propensity" that participants had to slightly refine/adjust their opinion.

The direction of opinion regarding the *quality of life of farmers* registered the highest negative adjustment between the second and third round of Delphi (-0.37, at the level of the average values of responses). *The skill level of farmers*, the best evaluated aspect (with an average value of 6.8 in the second round of Delphi exercise) was reevaluated, the general opinion registering a negative adjustment (6.67 – the average value on round III). The consolidation of an opinion, the one regarding the *wage level* (an increase of 0.23 between the two rounds) is part of the positive evolution process, of pronounced affirming an opinion, that can generate strongly favorable attitudes for adopting/supporting environmentally friendly practices. The process of reconstructing the opinion is clearly visible in case of *need for migrant labor* aspect: from a clearly formulated opinion, without being a strong one (less than 5 points in round II), to a crystalized one (with 5.11 point in round III).

**Figure 2. Opinions' dynamic on evaluating employment's effects - What would be the impact on the following?**



*Source: own calculations based on experts' opinions*

*Note: 1 represents a large decrease and 9 a large increase. For Kendall's W, the value ranges from 0-1, where 1 represent a total agreement and 0 total disagreement.*

The opinion regarding the *gender balance of farm heads* does not have an important relevance in the structure of those referring to employment's effects; though, it is noticeable the slight positive change, following the knowledge of all participants' evaluations.

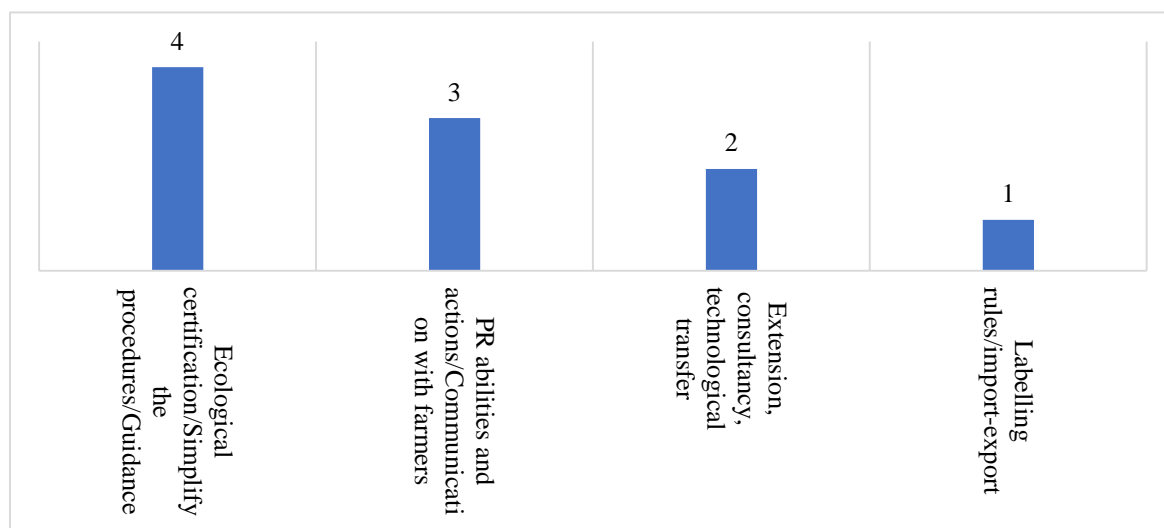
In the final evaluations' hierarchy, the most important are those regarding the *skill level of farmers, wage level and quality of life of farmers*. The in-depth analysis of evaluations regarding employment's effects, induced by the use of ecological practices, has identified the complexity of opinions' construction: for example, the opinion on the necessity of development/skills upgrade has a significant pathway: it appears as an enunciated opinion, without having profoundness, consistency: *"Registering in the ecological agriculture system automatically presumes the attunement of adequate skills"* (participant in round II Delphi), then, following, a structural process carried out based on key elements (such as knowledge, information) – *"The need for skills of labor force would increase, more information being needed"* or *"Ecological certification of the farm's activity entails some superior knowledge, in the sense of understanding and applying the strict measures imposed by legislation"* (participant in round II Delphi).

Opinions regarding employment's effects at the level of support services/industries for agriculture

The opinion regarding the potential effects of adopting an ecological agricultural system, in the case study area, on the dynamics of advisory services has been analyzed in a bidimensional way; the opinion on the envisaged future of advisory services, from a quantitative perspective, registered a high level of homogeneity; all participants considered that is necessary to increase the number of advisory centers: *"the advisory service is required to grow directly proportional with the number of farms and, especially, with their size, the problems that can appear (financial etc.) being different based on their size level"* (participant in round II Delphi).

The opinions have an ample content when it comes to the qualitative development of these services. Projecting the additional skills needed by the agricultural consultants was accomplished on multiple plans/domains: *"...I believe that from the additional skills needed by the consultants, the ecological agriculture requires: technical knowledge adequate to ecological livestock farming, specific juridical problems, feasibility studies, marketing, management and training"* (participant in round II Delphi).

**Figure 3. The hierarchy of additional skills- based on experts' opinion**

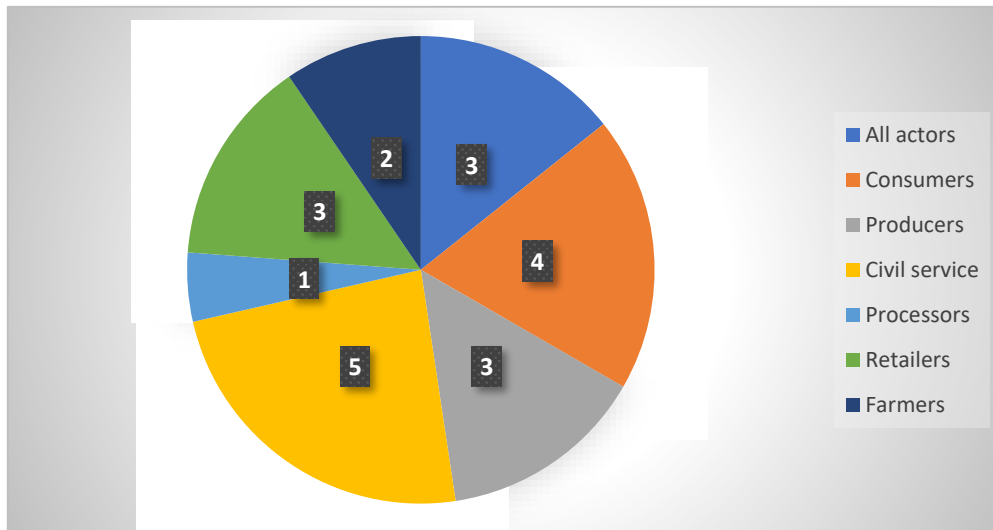


Source: own calculations based on experts' opinions

Extending the study to opinions regarding the skills of actors involved in the food chain allowed the analysis and identification of subjective positionings, coherently stated, with various intensities; the stated opinion is focused on the necessity to change/modify the skills of all involved

actors: “All actors in the food chain have to acquire skills specific to the ecological system, both producers, as well as processor and retailers” (participant in round II Delphi).

**Figure4. Opinions regarding the need to change the skills**

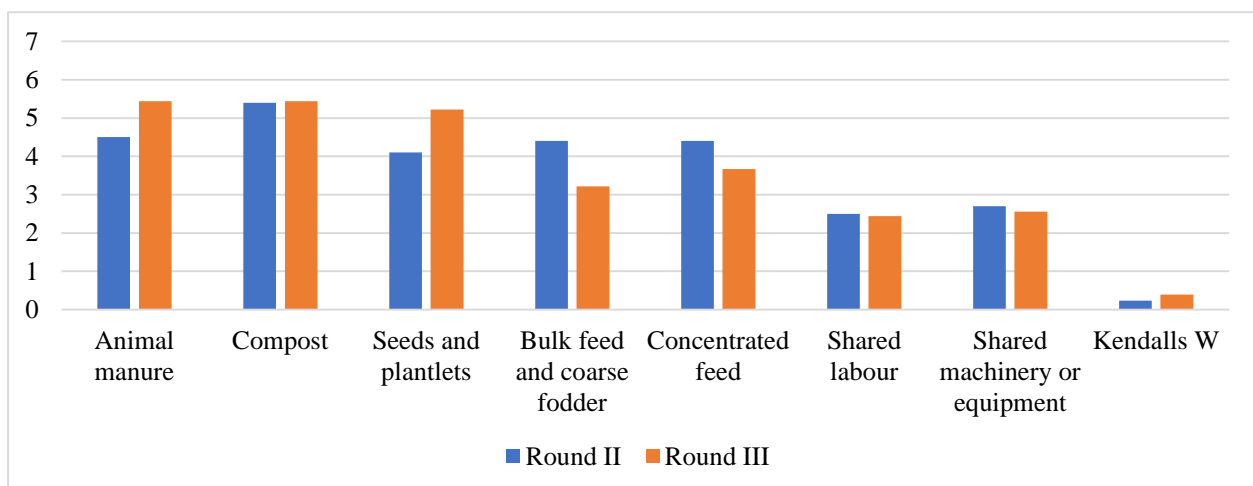


Source: own calculations based on experts' opinions

### Opinions regarding supply chain effects

Participants' opinion regarding the effects on the supply chain concentrates on the beneficial/positive impact on the trade between farms (inputs), that could lead to: an increase commercial trade, a closer collaboration between farms, a positive dynamic of labor force. In this way, the participants consider that the premises for the development of agricultural activities and reaching higher economic benefits are ensured: “There would be a positive impact, as it would **increase trade between farms**; as only the use of ecologically certified products is accepted, there would be more in-kind exchanges between ecological farms to equilibrate their input-output balance”(participant in Delphi Round II); “Adopting the ecological farming system automatically leads to an increase in trade with agricultural inputs between farm” (participant in Delphi Round II);

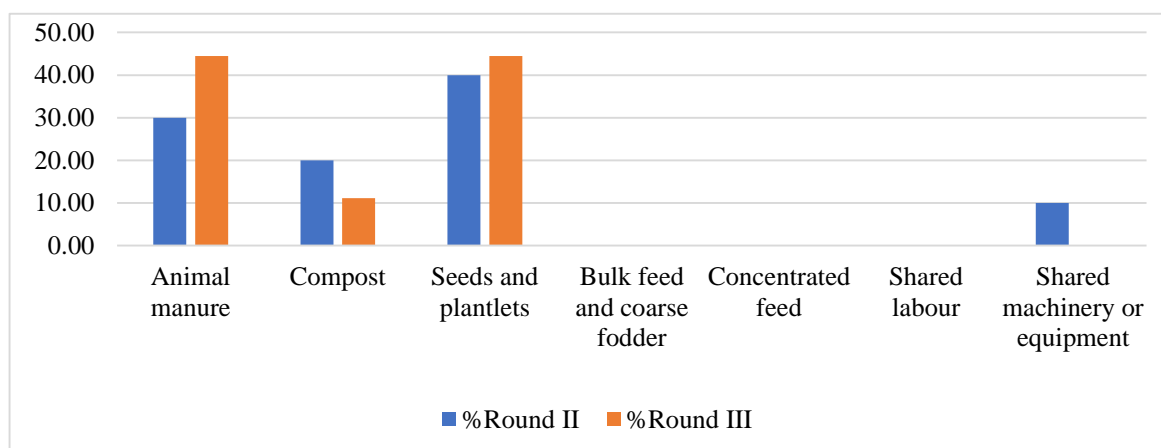
**Figure 5. Opinions' dynamic on which input will have the biggest change in trade levels between farms**



Source: own calculations based on experts' opinions

Note: 1 being having least change and 7 having most change. For Kendall's W, the value ranges from 0-1, where 1 represent a total agreement and 0 total disagreement.

**Figure 6. Share of respondents who have chosen this input as the one that will have the biggest change in trade levels between farms**



*Source: own calculations based on experts' opinions*

This scenario of the development of the trade in inputs between farms, supported by most respondents, would determine, in their opinion, a change in the trade with organic fertilizers (compost and animal manure) in the first place, as well as in the trade with inputs for animal feeding (bulk feed and coarse fodder, concentrated feed). The stated opinions have traverse: a) an evident consolidation process (in case of animal manure, seeds and plantlets and compost); b) an intensity's reduction process (shared labor, shared machinery or equipment); c) a de-structuring process (bulk feed and coarse feed, concentrated feed). At the same time, there was an evident process of increasing agreement between experts regarding the inputs that will have the biggest change in trade levels, the Kendall's W coefficient rising from 0.231 in round II to 0.389 in round III of Delphi exercise.

## CONCLUSIONS

Knowing the subjective dimensions allows, on one side, the use of mechanisms that can facilitate/multiply the adoption of ecological practices, ecological development based on own patterns, on the social farmers' universe, and on the other side it represents a social guarantee of the efficient implementation of ecological policy's measures and ecological modernization programs.

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