













Chapter 36

Identifying the Determining Factors of the Adoption of Ecological Practices by Dairy Farms in Suceava County, Romania



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Abstract The present paper aims to identify the main factors for the adoption of ecological practices by dairy farmers from Dornelor Basin, Suceava county. In the last decade, this topic has received increased attention from the academic sector, in order to better understand the determining factors that can lead to a transition to ecological farming practices, as part of the efforts to protect biodiversity in agricultural landscapes. The main results highlight that the decision to adopt ecological farming practices is based on a mix of economic, social, institutional, and behavioural factors, closely related to farmers' self-identity, experience, motivation and social context in which they carry out their activity. Some studies indicate that the best method to support this transition to more sustainable practices is to influence farmers' motivation and behaviour, while other studies focus on a broader approach that calls for social, economic, technological, and institutional changes at the level of different actors (farmers, supply chain, natural resource management, etc.). In this context, the present study uses a large-scale survey implemented on 52 dairy cow farms in the Dornelor Basin, in order to analyse the main factors for the

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adoption of ecological practices. The questionnaire used for data collection specifically sought to find out farmers' opinions regarding different elements, of personal, institutional, and motivational nature. Data were processed using the SPSS software, standard statistical methods and non-parametric tests. The preliminary results indicate that in the case of dairy farms from the Dornelor Basin, the main factors that influence the decision to adopt ecological practices are related to individual motivation (mainly personal/family issues), social norms (e.g., their identification as farmers and belonging to the farming community), and certain economic and environmental benefits (such as high profitability and biodiversity improvement).

Keywords Ecological farming practices · Dairy farms

36.1 Introduction

In the recent decades, at the European level, an increase of concerns for the sustainability of farming systems has been noticed, both from the academic sector and from different European institutions with regulatory role in this field, starting from the need to identify new methods/technologies to limit the negative effects on the environment, mainly in terms of biodiversity and agricultural landscapes. From the perspective of European policies, the development of agro-environmental schemes was the most used tool in this field, which provided financial support to farmers who developed a specific environmental protection behaviour.

On the other hand, in the academic sector, efforts have been directed both to the identification of new farming methods/technologies and practices to ensure the protection of the environment, and to the evaluation of factors that determine the adoption of ecological practices by European farmers. In the latter case, the approach includes many aspects related both to farmers' personal domain (motivation, expectations, belonging to the farming community, etc.) and to the economic domain (benefits, constraints, influence of supply chain and buyers, etc.).

In this context, the aim of the study was to identify the factors that determine the adoption of ecological practices by dairy farmers in the Dornelor Basin, Suceava county, on the basis of a field survey conducted in this area.

The main working hypotheses are the following:

- Personal elements and social norms are important factors in the decision to adopt ecological farming practices.
- The economic benefits associated with the transition to ecological practices can support farmers' decision in the study area.

36.2 Literature Review

The ever-increasing pressure on the agri-food sector, to cope with the growing demand, at the European level, has recently brought to the core of debates the need to protect agricultural landscapes, as an essential condition for preserving biodiversity. The changes that have taken place at this level can increase the degradation of land resources and represent a threat to agro-diversity. An alternative solution to intensive farming is the shift to agro-ecological practices, which can contribute to maintaining and even improving biodiversity (Schoonhoven & Runhaar, 2018). The directions on which attention regarding the sustainability of different agricultural systems concentrates, namely, the advancements in environmentally friendly technologies/practices, can be approached by farmers and support improved productivity (Pretty, 2008). However, the need to better understand/identify the factors that explain the adoption of agro-ecological practices by farmers is equally important, both personal (behaviour, motivation), economic (benefits, constraints), as well as institutional and social factors.

In this context, the studies and research in this field can be grouped into several categories, depending on the nature of investigated factors, which can determine the adoption of practices/technologies based on ecological principles:

- Studies that focus on aspects related to motivation/behaviour/self-identity: an example in this sense is the report elaborated in LIFT HORIZON 2020 Project – “Low input farming and territories”, whose conceptual framework brings to the foreground a behavioural approach centred on attitudes, values, perception, and self-identity, associated to farmers (Hansson et al., 2019). At the same time, elements referring to the decision-making environment in which farmers operate (farm characteristics and farming activities, specific policies) are also considered, together with issues related to supply chain, institutional conditions and perception of consumers’ attitude and demand for organic products. Another study brings into focus the factors associated with farmers’ goal to adopt some agro-environmental financial aid free measures (van Dijk et al., 2016). Results highlight the importance of attitude, perception of social standards, and personal skills as significant factors related to farmers’ goal to adopt/apply agro-environmental measures, without these being supported by financial benefits. Overall, authors consider that farmer’s self-identity is the determining factor in this case. With regard to behavioural and motivational elements, de Snoo et al. (2013) embrace the idea that farmland conservation/protection represents a social change that should seek to influence the motivation and behaviour of individual farmers. For this purpose, the authors propose the involvement of several branches of social sciences (sociology, anthropology, economics, psychology) in the conservation/protection process, in order to achieve effective communication in terms of natural values, shaping of social norms and identity. Another approach is presented by Greiner et al. (2009) who, on the basis of a survey of 94 farmers, identified a clear correlation between motivation and attitude towards risk and

the adoption of best management practices, conservation practices aimed at reducing diffuse pollution from agricultural activities.

- Studies based on multidisciplinary approaches: for example, Pretty J., (2008), in a study on agriculture sustainability, advocates the need to develop new approaches that include biological and ecological processes in agri-food production, minimise the use of non-renewable resources, effectively use farmers' knowledge and skills and the collective ability of people to work together to solve common problems related to agricultural activities and natural resources. Duru et al. (2015) support agricultural systems based on biodiversity as a substitute for cost-effectiveness ones but highlight that such a transition might be difficult in certain areas where intensive farming is highly developed. Therefore, the authors consider that the adoption and development of biodiversity-based agriculture rests on actions that require changes at the level of different actors with various interests and opinions. Schoonhoven & Runhaar (2018) propose an integrated framework to explain farmers' decision to adopt agro-ecological practices, which includes both the conditions that promote adoption and the elements that support or hinder this process. The elements are grouped into four clusters from the economic, social, informational, and political fields. The results show that farmers' rationality is based on their personal perspective and context. The barriers perceived by farmers can represent a starting point for the identification of certain structural factors, which in turn can support the development of interventions such as increasing the perception and demand of agro-ecological products and agro-ecology integration in agricultural education/training.
- Studies addressing economic factors (benefits/barriers): in this sense, one example brings to attention the tendency of the academic environment to focus mainly on processes and less on results, expressing the benefits in such a manner that is not always relevant for farmers. This process creates a distance between researchers and farmers, at the level of perceived benefits of ecological intensification (Kleijn et al., 2019). According to the authors, these shortcomings could be overcome if the studies on ecological intensification addressed the relevant issues for farmers, like potential benefits and costs. Therefore, the probable cost of ecological intensification appears as an integrated component necessary to research activities. Another study, elaborated by Brown et al. (2019), who investigated the adoption of CAP measures strengthening biodiversity and ecosystem services by farmers, argues that, at the national level, the actions that are relevant to farmers are more likely to be chosen over those that support biodiversity. At the same time, at the farm level, farmers had the tendency to opt for actions that maximize yields, do not call for major management changes and involve fewer constraints on the long term.

These are a few examples of studies and research works that aimed to identify the determining factors of the adoption of environment-friendly practices by farmers that can contribute to reaching the objectives of biodiversity protection and improvement at the European level. In this context, the approach of the present study uses a mix of elements referring to farmers' behaviour and motivation, social norms,

information sources and the benefits and constraints associated to the adoption of ecological practices.

36.3 Methodology

The present study aims to identify the determinants of farmers' adoption or ecological farming practices, based on a field survey conducted on 52 dairy farms in the Dornelor Basin, Suceava county, Romania (Fig. 36.1).

The questionnaire on which the field survey was based was developed within the European Union's research project Horizon 2020 LIFT – *Low-input farming and territories*, being adapted to the specificity of each study area where it has been implemented, in Romania's case inclusively.¹

The questionnaire was intended to collect farmers' opinions regarding different elements, of personal, institutional, and motivational nature that influence the adoption of ecological practices in the study area. The collected data were centralised in a database created using the SPSS software. Data were processed, taking into consideration their nature, i.e., ordinal data (Likert scale – which falls into the category of ordinal measurement instruments, where the categories of answers “have a rank

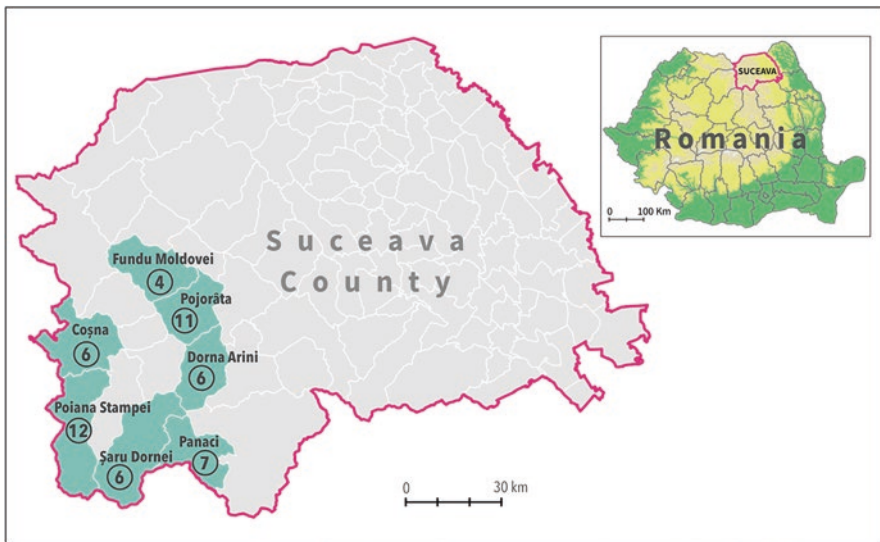


Fig. 36.1 Study area in Romania (number of questionnaires/communes). (Source: authors' processing based on the field survey data)

¹Tzouramani, I. et al. (2019). Deliverable D2.2 – LIFT Large-scale farmer survey questionnaire, 2019, available at: <https://www.lift-h2020.eu/deliverable-d2-2-lift-large-scale-farmer-survey-questionnaire>

order, but the intervals between them cannot be considered equal” (Jamieson, 2004), using specific methods such as frequencies/percentages, median, contingency tables).

36.4 Analysis/Results Interpretation

The section of the questionnaire dedicated to the determinants of the adoption of ecological practices by farmers included 18 questions, each of them containing several statements to be evaluated by participants, grouped into three categories, according to their nature: personal, institutional, and motivational. The first two questions, however, sought to assess the relationship and interaction between farmers and buyers with regard to farming practices, from farmers’ personal perspective (Fig. 36.2).

Participants’ answers with regard to their interaction with those to whom they sell their products reveal the existence of an information/debate process with reference to the environmental and social benefits, as well as a constant evaluation, by buyers, of the farming practices used. At the same time, farmers had rather a neutral opinion regarding both the possibility of buyers restricting their ability to practice a greener agriculture and the low interest of these in the farming practices used by farmers.

Referring to their personal relationships with the buyers of their products, farmers evaluate positively the aspects related to the existence of a partnership; however, in the case of trust/equity/long-term relationship, a neutral attitude of participants in this questionnaire can be noticed.

36.4.1 *Informal Institutional Conditions and Social Norms*

In this section, the questions addressed to farmers tried to find out their opinion regarding the information sources on farming practices, how other people see the use of ecological practices, perception of farmers in the area regarding the adoption of these practices, as well as aspects related to farmer’s self-identity, belonging to the farming community and the multiplier effect at its level.

The most important information sources of farmers are the family, other farmers, printed press/radio/TV as well as online sources (social platforms inclusively). At the same time, there is an obvious reticence of farmers with regard to the information disseminated by agricultural consultancy/extension bodies, by environmental advisors, as well as by representatives of input suppliers (Fig. 36.3).

At the same time, however, when it comes to association forms (cooperatives, farmer organizations, associations of farmland owners) and non-governmental organizations/certification bodies, these are not a main information source for farmers, the interactions with these being quite limited, most farmers not being affiliated to

Do you discuss your farming practices with the buyers of your products?						
	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Median *
I discuss the environmental and social benefits of my farming practices with those who buy my products	9.6%	7.7%	25.0%	30.8%	26.9%	4
My farming practices are regularly assessed against environmental and/or social farming practices standards by those who buy my products	9.6%	3.8%	26.9%	25.0%	34.6%	4
The requirements of those who buy my products restrict my ability to farm using more ecological farming practices	23.1%	11.5%	21.2%	30.8%	13.5%	3
The buyers of my products have little interest in the farming practices that I use	15.4%	9.6%	36.5%	23.1%	15.4%	3
How would you describe your relationship with the buyers of your products?						
Our relationship is truthful and frank	5.8%	5.8%	40.4%	9.6%	38.5%	3
Our relationship is fair and equal	25.0%	19.2%	25.0%	3.8%	26.9%	3
We have a long-term relationship	7.7%	5.8%	38.5%	13.5%	34.6%	3
We have a partnership	17.3%	7.7%	19.2%	21.2%	34.6%	4

Source: authors' processing of field survey data

Fig. 36.2 Interactions/relationship between farmers and buyers

*Likert scale, from 1 to 5, where 1, strongly disagree and 5, strongly agree

such organizations. The farmers who participated in this survey consider that in the study area, there is recognition of the importance of using ecological practices by those involved in farming activities, with obvious environmental benefits.

How often do you consult the following sources of information to get ideas for farming practices?						
	At least monthly	Several times per year	Once a year	Less than once a year	Never	Median
Family and friends	63.5%	25.0%	3.8%	1.9%	5.8%	1
Agricultural advisors	9.6%	11.5%	7.7%	19.2%	51.9%	5
Environmental advisors	3.8%	1.9%	21.2%	13.5%	59.6%	5
Supplier representatives	2.0%	3.9%	9.8%	7.8%	76.5%	5
Buyer representatives	5.8%	11.5%	23.1%	17.3%	42.3%	4
Open days. demonstration activities training	5.8%	15.4%	13.5%	13.5%	51.9%	5
Other farmers	21.2%	53.8%	13.5%	7.7%	3.8%	2
Press/Radio/TV	44.2%	28.8%	9.6%	3.8%	13.5%	2
Internet. including social media	40.4%	28.8%	1.9%	3.8%	25.0%	2

Fig. 36.3 Main information sources. (Source: authors’ processing of field survey data)
 *Likert scale, from 1 to 5, where 1, at least monthly and 5, never

Furthermore, more than 70% of respondents rather agree that this is a current practice of farmers in the area, by their adoption of at least one farming practice that is very similar to ecological ones.

Referring to aspects related to self-identity and belonging to the farming community in the area, participants strongly agree on the importance of their identification as farmers, as well as on the existence of a strong feeling of belonging to the farming community, which is also a very important factor for them (Fig. 36.4).

A similar agreement is manifested in: (1) personal projection, identification as ecological farmer, (2) assimilation of ecological farming, as an intrinsic part of respondents, (3) effects that overall changes have on personal life (at the level of farmers’ situation), (4) importance of understanding farm ecology as fundamental to agriculture.

As regards the multiplying effect at the level of farming community, most participants considered that the important factors in supporting the decision on farmers’ agricultural practices are the following: identification of a certain practice at the level of other farms in the area, large-scale use on similar farms and the innovating character of the practice.

To what extent do you agree with the following statement about farmers and farming?						
	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Median *
Being a farmer is an important reflection of who I am	5.8%	1.9%	23.1%	21.4%	48.1%	4
What happens to farmers as a whole will have an effect on what happens in my life	11.5%	1.9%	21.2%	23.1%	42.3%	4
I have a strong sense on belonging to the farming community	1.9%	1.9%	28.8%	26.9%	40.4%	4
I see myself as a farmer who prioritises the environment	-	-	17.3%	25.0%	57.7%	5
Understanding the ecology of the farm is what farming is about	3.8%	-	23.1%	25.0%	48.1%	4
Farming in a way that preserves the environment is part of who I am	5.8%	1.9%	15.4%	28.8%	48.1%	4

Fig. 36.4 Identity, community, ecology. (Source: authors' processing of field survey data)

*Likert scale, from 1 to 5, where 1, strongly disagree and 5, strongly agree

36.4.2 Individual Motivational Factors

In this section, the questions addressed to farmers tried to find farmers' opinions referring to their personal objectives, the relationship between the ecological practices and farm production, management style and farmers' change/adaptive capability.

Regardless of the category in which the objectives are found (agricultural activity, recognition by the community or personal/family aspects), these were considered important by participants (Fig. 36.5).

The objectives that stand out, by the significant share of (important and very important) answers, are those from the sphere of personal life, such as being fit and healthy, providing a satisfying lifestyle and helping (financially) the next generation. To a very large extent, farming in a way that improves the environment, enhancing land quality and producing high-quality products are also very important objectives for the farmers in the study area.

In general, the objectives that farmers consider easy to achieve at the farm level are related to their own farming experience and the farming experience in the

How important are the following objectives to you?						
	Not at all important	Unimportant	Neither important nor unimportant	Important	Very important	Median *
Producing high quality products	1.9%	-	9.6%	11.5%	76.9%	5
Being fit and healthy	1.9%	-	3.8%	5.8%	88.5%	5
Providing a satisfying lifestyle	1.9%	-	3.8%	25.0%	69.2%	5
Farming in a way that enhance the environment	2.0%	-	7.8%	27.5%	62.7%	5
Improving the condition of the land	1.9%	-	5.8%	23.1%	69.2%	5
Helping (financially) the next generation	1.9%	-	5.8%	15.4%	76.9%	5

Fig. 36.5 Personal and professional objectives. (Source: authors' processing of field survey data)
*Likert scale, from 1 to 5, where 1, not at all important and 5, very important

investigated area. These refer to the improvement of soil quality, use of alternatives to chemical farm inputs (fertilizers, pesticides, and herbicides) as well as the recycling of a greater amount of biomass. At the same time, the integration of different agro-ecosystems within the farming activities and maintaining or creating habitats for wild species seem to be rather achievable objectives in the study area.

From the perspective of professional training, the possibilities to have access to information and advisory services related to organic farming and the complexity level in terms of understanding and easy use of ecological practices, farmers largely agree on the possibility of developing this sector in the study area, in the next period. Most farmers consider that they are prepared to use ecological farming practices, have the ability to achieve their set goals, have access to advice and support for farming ecologically, that there are opportunities to shift to organic farming and, last but not least, that the farming practices that comply with ecological principles are easy to understand and use.

36.4.3 Benefits, Triggering Factors and Barriers

As regards the influence of adopting ecological farming practices on aspects referring to farm economy, environment and necessary labour resources, most participants consider that farm profitability and biodiversity would largely benefit from adopting these practices. However, the farmers who participated in the survey consider that the following would not be affected by an eventual transition to ecological practices: farm production, labour requirements for the farm, ability to meet current and future support payment requirements, ability to meet farming objectives, time spent working on the farm, soil fertility, farms's dependence on external inputs, intensity of seasonal peaks of work during the year, physical nature of work and mental workload.

The most important aspects for farmers who participated in the survey, in terms of changing the farming practices, are mainly grouped, on the basis of the cumulated value of answers "important" and "very important", into two categories: economic/meeting standards and environmental. In the category of economic aspects, the most important are the ability to meet product quality and safety standards, the market rewards, the availability of necessary skilled labour and the cost of adopting practices. As regards the environment, the most important for farmers are the ability to cope with climate change and to cope with pests and diseases. Besides these two categories, another aspect that met the majority of farmers' options is related to personal projection, namely, challenge and personal interest.

Farmers' experience with regard to the changes of farming practices adopted in the past highlights two important categories of aspects that have influenced this process: economic aspects and personal/family aspects. From the first category, in farmers' opinion, the most important factor considered was the changes in the prices of products, followed by the financial difficulties of farm, availability of skilled labour, changes in the regulations on farming activities, as well as access to new (domestic or export) markets. At the personal/family level, farm succession planning and farm inheritance represented important factors considered by farmers in supporting the decision to change the farming practices of the past.

36.5 Conclusions

At the level of the study area, behaviours compatible with the requirements of ecological agriculture are manifested, both from the perspective of farming activities and of the personal projection of farmers, through the use of practices that can be assimilated to ecological practices, and also through farmers' strong ties to the natural and social environment in which they operate. All these create a favourable framework to farming ecologically in the area in the next period.

The analysis reveals the existence of a mix of factors that can influence the adoption of ecological practices by dairy farms, among which the most important of

which refer (without creating a hierarchy) to aspects related to institutional conditions and social norms (expectations from the society, recognition of the importance of using ecological farming practices, farmer identity and sense of belonging to the farming community, multiplying effect at community level), individual/identity factors (from the sphere of personal life, related to health, ensuring a satisfactory standard of living and support for the next generation, and also the necessary knowledge and training to practice organic farming) and benefits/constraints (increased profitability, market rewards, cost of adoption). To sum up, the determining factors of the adoption of ecological practices by dairy farmers in the Dornelor Basin are clustered around elements from personal, economic, professional and social contexts.

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