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A Typological Classification for Assessing Farm Sustainability in the Italian Bovine Dairy Sector

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Abstract: Italy is among the most important countries in Europe for milk production. The new European policies encourage a transition towards sustainability and are leading European dairy farms to follow new trajectories to increase their economic efficiency, reduce their environmental impact, and ensure social sustainability. Few studies have attempted to classify dairy farms by analyzing the relationships between the structural profiles of farms and the social, environmental, and economic dimensions of sustainability. This work intends to pursue this aim through an exploratory analysis in the Italian production context. The cluster analysis technique made it possible to identify three types of dairy farms, which were characterized on the basis of indicators that represented the three dimensions of sustainability (environmental, social, and economic sustainability) and the emerging structural relationships based on the structural characteristics of the dairy farms. The classification made it possible to describe the state of the art of the Italian dairy sector in terms of sustainability and to understand how different types of farms can respond to the new European trajectories.

Keywords: sustainability; farm type; sustainable management; small-/medium-scale animal farms

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1. Introduction

Italy was the fifth European country in terms of the quantity of milk delivered in 2019 with a total of 1,208,647 thousand tons [1]. This amount was the main portion of the total milk production of farms, which reached 1,330,010,000 tons when domestic consumption, direct sale, and cattle feed were included [2].

Within the country, four regions produced almost 80% of the total milk in 2020: Lombardy, Emilia-Romagna, Veneto, and Piedmont. These areas produce larger quantities and have better efficiency compared to the others [3]. In 2018, the sector recorded a production value in the agricultural sector of approximately EUR 4.68 billion [4], while the turnover of the dairy industry was around EUR 16.63 billion [5]. These data show how the dairy industry is a fundamental asset for the national agri-food sector, representing 10% of the value of agricultural production and 12% of the dairy industry. In the last decade, the number of farms in the sector has decreased by about 17,000 units, reaching just over 26,000 in the first half of 2020 [6]. This trend originated in the disadvantageous position of small farms relative to capital-intensive investors [7], which made farmers susceptible to the "get-big-or-get-out" syndrome, leading to a process of concentration [8]. This situation, together with many factors, such as the environmental and social context in which farmers operate, have led to the development of larger farms over time; these represent the production base of the entire sector and have a greater concentration in the north of Italy [9].

In recent years, the rapid expansion of intensive farming systems has been analyzed, as they have caught the attention of researchers and experts, who have questioned the sustainability of these farming methods in terms of the negative effects on the environment and animal welfare that they produce [3,10,11]. These factors have generated higher social costs than those of private systems, with negative consequences for the whole society. This type of agriculture generates negative externalities due to its linear perspective [12,13], which follows the “take–make–dispose” principle of linear economics [14]. This is especially true in the animal farming sector due to the large number of inputs used to feed intensive farming systems, as well as their wastes [15]. Today, the possibility of having a greater social acceptability of these practices and the need to make the sector more efficient and more environmentally sustainable represent future challenges. This has been requested by the new European trajectories, such as the Farm-to-Fork Strategy [16]. In fact, the sector is now facing a transition towards sustainability, and although it is progressing slowly, more sustainable production methods have been developed in recent years [17–19].

The studies on farm sustainability are very heterogeneous, but they can be enclosed within some dominant strands of research. The first strand concerns studies that have attempted to explore the sustainability performance of livestock farming systems [20] and strategies for improving their resilience by looking at the self-sufficiency of their inputs [21,22]. In fact, it is widely recognized that increasing input self-sufficiency can be a strategy for improving the sustainability of agricultural systems because those are less dependent on the variability of the input market [23]. Although one of the suggested strategies was to reduce the inputs, other views suggest enhancing the waste outputs, too. Another strand, in fact, concerns studies that have designed the possibility of transitioning to a more sustainable system through a circular economy approach [24,25], which is intended to be a system-wide approach to economic development that is designed for the benefit of businesses, society, and the environment [26]. The transition to a circular economy can result in a minimization of the use of external inputs and in the reduction of waste and emissions into the environment through the recycling and valorization of agricultural waste [27], thus avoiding the exploitation animals but using them “for what they know how to do” [28].

Finally, the last strand concerns farm sustainability classification studies, of which there have been very few attempts in the bovine sector [28]. The need for an objective classification of dairy farms that covers all aspects of the production systems has been underlined by researchers [29,30]. In his classification study on the goat sector, Gelasakis et al. [31] provided a framework of factors that are representative of the types of farms from a structural point of view and of the level of intensity of a production system, thus laying the foundations for secondary evaluations in terms of farm sustainability performance. The importance of associating a sustainability assessment with the type of farm has already been recognized for other sectors in several countries [29,30,32–36].

The assessment of sustainability must be calibrated on a farm’s structural assets [30,32], which mainly include the area of the farm, the number of animals raised, the age and the education of the farmer, and the production methods (e.g., organic).

Lebacq et al. [37] provided a useful description of all three dimensions of sustainability: environmental, economic, and social. Environmental sustainability is described through the management of inputs, such as fertilizers and pesticides, and the use of resources. The consumption of water and the use of fertilizers and pesticides play a fundamental role in the environmental impact of agriculture and livestock [38–40]. The same authors described economic sustainability as the economic viability of agricultural systems, that is, their ability to be profitable in order to provide prosperity to the agricultural community. This can be described through profitability, self-sufficiency of inputs, diversification, and durability (family and employee labor costs). The inclusion of these concepts in the assessment of the economic sustainability of a farm is supported by the literature [22,41,42]. Social sustainability is defined at two levels: that of the farm and that of the society. At the farm level, it can be defined by the educational qualification, the working conditions, and the use of machinery [43]. On the social level, it is defined by multifunctionality (quality of rural areas, ecosystem services) and by extra-farm labor [44].

For the Italian context, there are no studies that have attempted to classify bovine dairy farms by assessing the relationships between the structural profile and the three dimensions of sustainability. Furthermore, while the environmental impact of bovine farming has been widely studied [3,45,46], the Italian literature lacks a characterization of farms that can also provide perspectives for improving farm management from an economic and social point of view.

This kind of classification studies in terms of sustainability-produced standardized procedures to better estimate input and output of livestock farming systems, evaluate changes and target information and policies to farmers [31,47].

Our study aims to address this gap. Furthermore, this study can be considered a novelty, as it can represent a preliminary strand with respect to studies that attempt to measure farms' performance in sustainability; only through a classification of bovine dairy farms that aggregates them according to homogeneous characteristics by calibrating the assessment of the sustainability of their structural assets will it be possible to proceed, in the second instance, to a more objective assessment of the social, environmental, and economic performance.

Indeed, to respond to this gap, this work carries out an exploratory analysis in order to identify a classification for Italian dairy farms by identifying emerging relations between the three dimensions of sustainability (environmental, social, and economic) and their structural profiles. This analysis is a novelty in that it cannot only allow us to understand how different types of farms might respond to the new European trajectories, but it also provides a general model that can be replicated across Europe, as the indicators and databases come from a European sample survey. To this end, an exploratory approach is used by applying multivariate statistical techniques. A principal component analysis was used to summarize the factors, and then a cluster analysis was run to gather the different livestock farms into homogeneous groups. This two-step approach is consistent with the statistical literature [48]. This analysis allows the creation of a typological grid that is representative of the aspects of structural polymorphism and sustainability [49,50] through a process of a posteriori interpretation [51].

The work is made up of four sections. First, the methodology and its theoretical basis are defined. The second part reports the descriptive analysis of the sample, followed by a description of the clusters obtained. Finally, a discussion and conclusions are provided based on the evidence from the analysis and the literature.

2. Materials and Methods

The empirical analysis was conducted on secondary data from the 2018 Farm Accountancy Data Network (FADN). The FADN was established in 1965 by the European Commission and is the official source of microeconomic data, as it is based on harmonized accounting standards. The Italian FADN (https://rica.crea.gov.it, accessed on 21 April 2021) sample consists of 11,000 annual farms, which are structured to represent the different production types, sizes, locations (e.g., region, altitude, etc.) that are present in the national territory. It allows a national average coverage of 95% of the utilized agricultural area (UAA), 97% of the value of standard production, 92% of the labor units (ULs), and 91% of the livestock units. For the present analysis, a filter was made to allow the isolation of farms in the dairy sector, thus leading to the extraction of 1216 farms.

The FADN consists of 25 tables that contain different types of information. In order to select useful indicators for the analysis, the indices were grouped according to their social, environmental, economic, and structural dimensions, as shown in the following graph (Figure 1). All of the following indicators were therefore selected in order to assess the farms' sustainability.

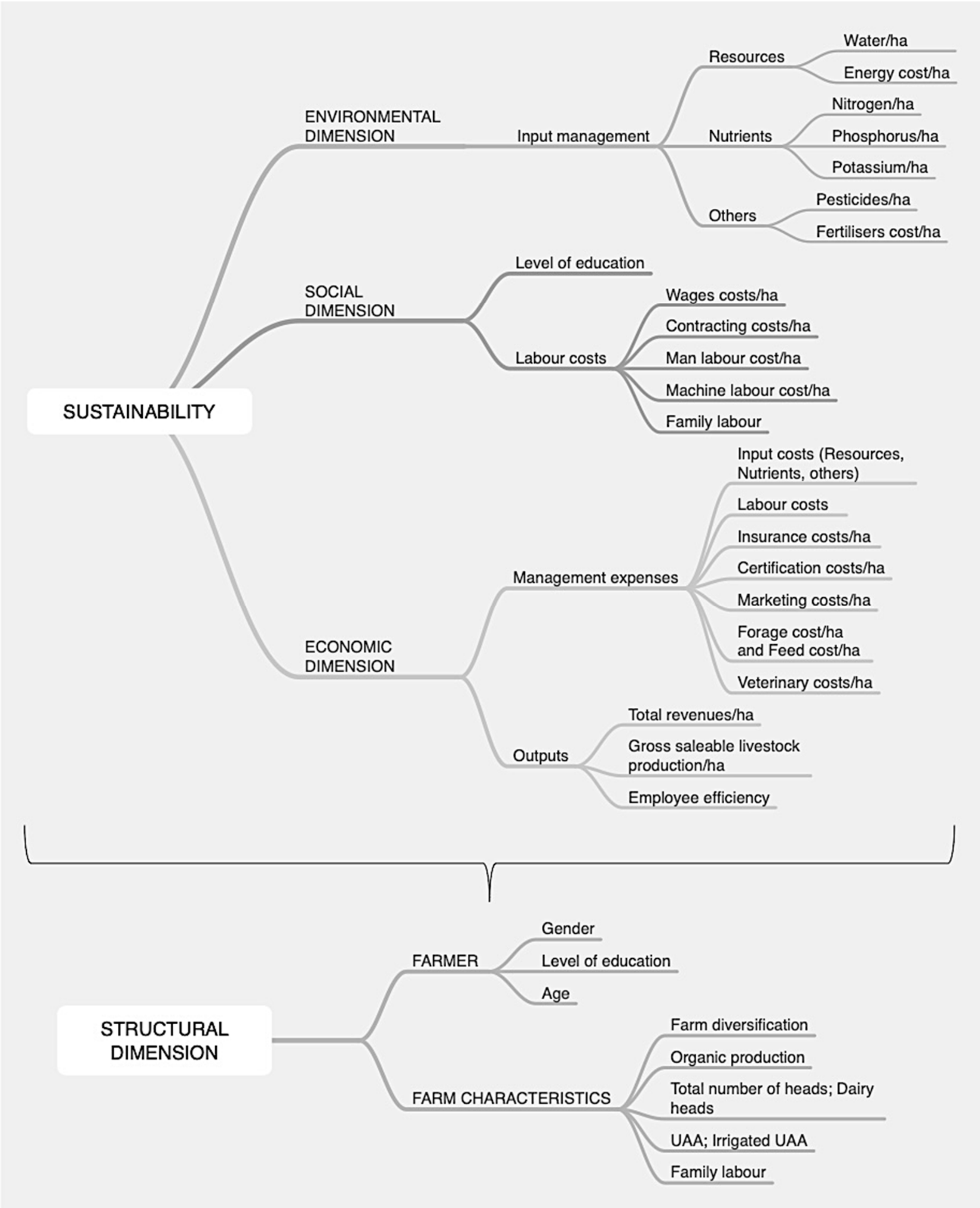

Figure 1. Authors' elaboration of the Italian FADN indicators.

In order to carry out this study, the selection of indicators was performed while considering the objective of the research and the targets of the farms examined. Furthermore, based on the available data, and the minimum representative sets of indicators were chosen for each dimension (Table 1). The literature confirms the need to contextualize the indicators of all three dimensions with respect to the reality of the production of dairy cows [37,52].

Table 1. Minimum representative sets of indicators for each dimension.

Sustainability			
Environmental dimension	Input management	Resources	Water/ha: volume of water distributed per hectare Energy cost/ha: costs incurred for the purchase of fuel, electricity and heating per hectare
		Nutrients	Nitrogen/ha: quantity of nitrogen distributed per hectare Phosphorus/ha: quantity of phosphorus distributed per hectare Potassium/ha: quantity of potassium distributed per hectare
		Others	Pesticides/ha: quantity distributed per hectare Fertilizer cost/ha: costs for fertilizers per hectare
Social dimension	Level of education		No title Primary school Secondary school Diploma Professional diploma Bachelor's degree Master's degree
	Labor costs		Wage costs/ha: expenses incurred for wages, social charges, and rent payable per hectare Contracting cost/ha: cost of agro-mechanical and technological services offered by external suppliers/ha Human labor cost/ha: cost of human labor per hectare Machine labor cost/ha: cost of machine labor per hectare Family labor: relationship between family UL and total UL
Economic dimension	Managerial expenses		Input costs, described in the previous section as "Resources, Nutrients, and others" Labor costs, described in the previous section as "Labor costs" Insurance costs/ha: insurance costs per hectare Certification costs/ha: costs for purchasing certifications per hectare Marketing costs/ha: marketing costs per hectare Forage costs/ha: expenses for the purchase of non-farm forage per hectare Feed costs/ha: expenses for the purchase of feed per hectare Veterinary costs/ha: costs of veterinary services and pharmaceutical costs per hectare
	Outputs		Total revenues/ha: total farm revenue Gross saleable livestock production/ha (Livestock GSP): revenues strictly related to the livestock activity Employee efficiency: relationship between added value and work unit
Structural Dimension			
Farmer	Gender		
	Level of education		No title, Primary school, Secondary school, Diploma, Professional diploma, Bachelor's degree, Master's Degree
	Age: age of the owner		
Farm characteristics			Farm diversification: presence or absence of other activities Organic production: presence or absence of organic production Dairy heads: number of heads in lactation Total number of heads UAA: in hectares Irrigated UAA: in hectares Family labor: relationship between family UL and total UL

The selected indicators were therefore the following:

The number of indicators identified was high, so in order to perform the analysis more efficiently, optimal scaling techniques were carried out to synthesize the information. The clustering process was articulated as follows:

- Given the highest number of continuous variables, a principal component analysis (PCA) was performed. PCA is a descriptive method that aims to summarize a data matrix in order to express its structure with a reduced number of dimensions. Thus, PCA is a method for identifying a particular transformation of the observed variables (a linear combination) and trying to explain a large part of the variance of the observed variables with a few components. In order to interpret the factorial weights more easily, it is possible to perform rotations of the factorial axes that maintain scale invariance by simplifying the structure of the weight system. The most commonly used solutions respect the orthogonality of the factors; in the present case, the Varimax rotation [53] was used, which is a useful method when there are several factors and a clear separation between the extracted factors is desired. Based on the rule of having an eigenvalue greater than 1 and on the interpretability of the data, the top 5 factors that explained 60% of the variance were chosen (Table 2).
- Subsequently, a cluster analysis was carried out with the aim of creating homogeneous groups of dairy farms based on the 5 previously extracted factors. Cluster analysis allows the generation of groups in which the points of the same group are more similar to each other than the points of the other clusters. Thus, the technique allows the formation of groups in which the internal inertia is minimal (within inertia), while the inertia between groups is maximal. The clustering technique used was the agglomerative hierarchical technique [54]. According to Ward's criterion, 10 successive iterations were performed.

Table 2. Results of the Varimax rotation.

Component	Total	% of Variance	Cumulative %
1	4.941	23.528	23.528
2	2.667	12.698	36.226
3	1.804	8.592	44.818
4	1.803	8.585	53.404
5	1.58	7.524	60.928

The data were processed through two types of software: SPSS version 26 and SPAD version 3.21.

With cluster analysis, it is possible to estimate the inputs and outputs of farms with different farming systems. Many studies in the literature (e.g., [52,55,56]) confirmed the methodological approach of this study. In particular, Micha et al. [52] calculated some performance indicators that were chosen to classify the dairy farms in Ireland, which permitted the identification of the farms that performed better or worse from the point of view of sustainability. In addition, by implementing a contextualization of the indicators for the Italian production context, the present study intends to find a classification of farms based on sustainability indicators and their socio-economic profiles in order to help in the understanding of how to act in order to improve the sustainability of the sector.

This process can lead to a standardization of the results, which is essential for providing policy guidelines for the improvement of these systems.

3. Results

Our sample consisted of 1211 farms, of which 95.5% were dairy farms and 4.5% were buffalo farms. The sample used, which included farms that were distributed throughout Italy, was representative of the Italian context and its distribution in the different areas (Figure 2).

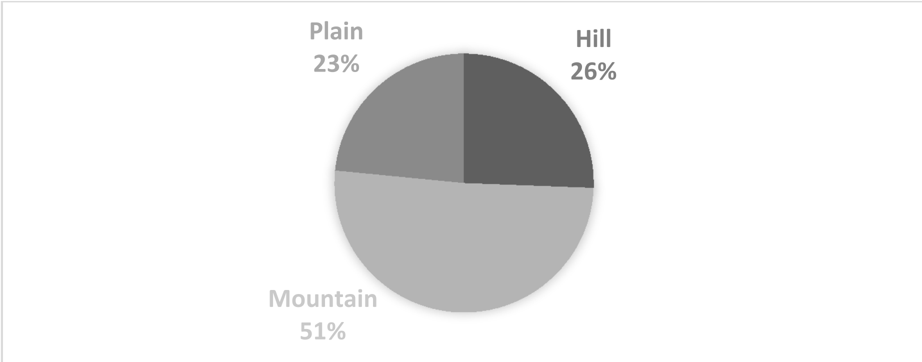

Figure 2. Distribution by altitude zone.

As already mentioned, dairy farming in Italy mainly developed in four regions (Lombardy, Emilia-Romagna, Veneto, and Piedmont); the following graph shows the distribution of the average number of animals of the analyzed farms on a provincial basis (Figure 3). As can be observed, the distribution was greater in the provinces of northern Italy, particularly in the area of the Po Valley.

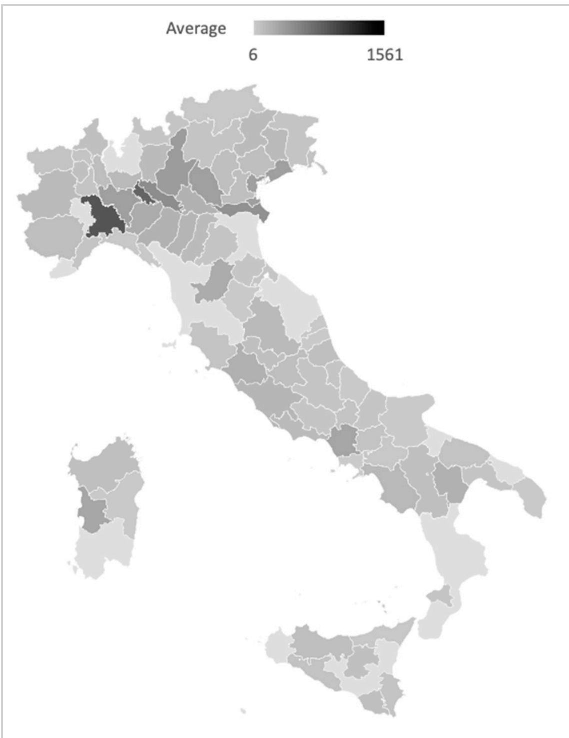

Figure 3. Distribution of the average number of animals per farm.

Table 3 shows the most important socio-demographic characteristics of the sample examined. In 82.66% of the cases, the farms were led by male entrepreneurs, while they were led by female ones in 17.34% of the cases. Furthermore, as shown in the following table, 13.29% of them were young farmers (under 40 years old). A total of 39.8% of the respondents attended secondary school, and 44.84% had a professional or high school diploma. Only 2.72% of the respondents had a university degree. In addition, 11.73% of the sample practiced organic production and 15.03% practiced activities complementary to livestock farming. Over 91.25% of the farms were family-run, while 8.75% had extra-family labor.

Table 3. Descriptive statistics.

Variable		Count	%
Gender	Female	210	17.34
	Male	1001	82.66
Young	No	1050	86.71
	Yes	161	13.29
Educational Level	No school	35	2.89
	Primary school	118	9.75
	Secondary school	482	39.80
	High school diploma	264	21.80
	Professional diploma	279	23.04
	Bachelor's degree	9	0.74
	Master's degree	24	1.98
Organic production	No	1069	88.27
	Yes	142	11.73
Diversification	No	1029	84.97
	Yes	182	15.03
Type of management	Other type	1	0.08
	With employees	13	1.08
	Subcontracting only	1	0.08
	Direct with extra-family prevalence	91	7.51
	Direct with predominantly family members	534	44.10
	Direct with family members only	571	47.15

Empirical Analysis

In order to characterize the farms involved in the study based on aspects of their structure and sustainability, a cluster analysis was carried out, and three typological groups were identified. The variables used for the analysis were both the structural variables of the sample and those that characterized the farms from the environmental, social, and economic points of view. The highlighted clusters (CLs) are shown in Figure 4.

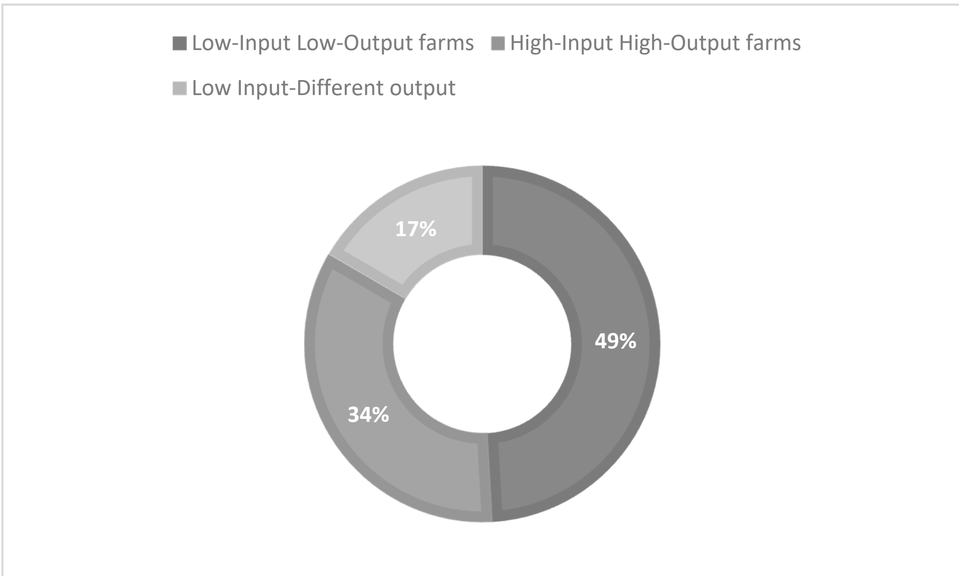

Figure 4. Distribution of the clusters.

- CLUSTER 1: Low-Input, Low-Output Farms that Are Attentive to the Environmental Dimension (49.1% of the Sample)

This CL was made up of the smallest farms in terms of consistency; they were characterized by an average of 79 total heads, of which 42 were in the lactation phase. As regards the overall size, however, the farms reported an average UAA of 52.8 hectares (of which 15% was irrigated). Compared to the others, in this cluster, the minimum values of the indicators of the environmental dimension were recorded. In fact, the lowest values were recorded for the use of "negative" inputs, such as non-renewable resources, fertilizers, nutrients, and pesticides. In support of this, 16% of the cluster's producers complied with the organic specifications. At the same time, this "low-input" profile was also associated with a "low-output" one. In fact, the indicators associated with the economic dimension tended to record the lowest values here, both among the cost items and for the total revenues (EUR 4626.6/ha), as well as in the added value per labor unit (EUR 38,638.7/ha). This last parameter highlighted the lowest economic efficiency per employee. For the social dimension, the lowest values were recorded for wages (EUR 337.88/ha), contracting (EUR 1.52/ha), human labor (EUR 777.27/ha), and machinery (EUR 239.93/ha). In the social dimension of this group, a higher amount of family labor was employed compared to in other groups (family work unit/total work unit equal to 0.88). This group also included the highest percentage of female leaders (20.3%). For the many aspects that were highlighted, these companies were distinguished from those of the other groups due to their greater attention to the environmental aspects.

- CLUSTER 2: High-Input, High-Output Farms that Are Attentive to the Economic Dimension (34.3% of the Sample)

This CL was made up of the largest farms, where, on average, there were 176 heads, of which 92 were in the lactating phase. However, the high number of animals was associated with an average UAA of only 45.99 hectares—the smallest among the groups—thus characterizing a production system with high inputs. A high degree of intensification of activities was also suggested by the high irrigated UAA and by the level of labor costs (mainly extra-family employees), which was the highest. The values of the environmental dimension, which represented the highest values per hectare among the clusters, confirmed that this was a type of farm that produced by using a high level of inputs. The high-cost values in the economic dimension were followed by the maximum values achieved for total revenues (EUR 10,952.88/ha), livestock GSP (EUR 7454.53/ha), and labor productivity. The latter, which was measured in added value per labor unit, was, on average, equal to EUR 60,639.96/ha. These then described the image of the farms based not only on the high inputs, but also on the economic sustainability. The maximum values were also reached for all indicators of the social dimension: wages (EUR 749.73/ha), contracting (EUR 22.09/ha), Human labor, and machine labor. The relationship between the latter two highlighted how this cluster was the one with the greatest use of machines compared to human labor. For the many aspects that were highlighted, these companies were distinguished from those of the other groups due to their greater attention to the economic aspects. Here, the cost per hectare found for insurance was the highest among the groups—to manage their business risk.

- CLUSTER 3: Low-Input, Different-Output Farms that Are Attentive to Social Sustainability (16.6% of the Sample)

This cluster was distinguished by an average of 115 animals that were reared, of which 52 were in the lactation phase. The average size of the farms belonging to this cluster was 82 hectares, which is the largest found among the groups, and this is where the greatest presence of organic production fell (16.5%). Furthermore, in this group, we found the highest percentage of tenants who had a degree (3%), confirmed by the fact that 18% of the cluster was made up of young entrepreneurs. This cluster showed the greatest attention to the social dimension among the clusters, as shown by the highest percentage of complementary activities that were added to the zootechnical activity (90.5%). In the economic dimension, the small amount spent on the purchase of non-farm fodder indicated that these were large farms practicing self-production. Here, the cost per hectare found for the certifications for enhancing the quality of the product was the highest among the groups. The indicators of the social dimension, such as human labor and machine labor, were found here to have the lowest values among the groups and, when compared to each other, highlighted a clear prevalence of the use of human work over machinery. These farms were therefore characterized by their greater attention to the social aspects, as they were more attentive to multifunctionality compared to those belonging to the other groups.

4. Discussion

Three different profiles emerged from the comparison among the clusters, which were distinguished according to the values achieved for the indicators used in the different dimensions to characterize the dairy farms: environmental, economic, social, and structural. In fact, on the basis of the structural characteristics detected within each cluster, different behavioral profiles were highlighted with respect to the farms' sustainability choices. The distribution by altitude zone was not significant in determining the clusters.

Although the region did not represent a net determinant of the entrepreneurs' behavior, most of the farms located in the areas of the four most important regions for the Italian bovine dairy sector fell within cluster 2.

CL1 represented small farms that stood out due to their performance in environmental sustainability compared to the others. In fact, they were characterized by the lowest level of input in the environmental dimension. This aligned well with the fact that this group included a high percentage of female leaders and of organic practices. The literature confirms the greater predisposition of women towards environmental issues and recognizes them as an active and essential part in environmental conservation [57]. In addition, CL1 highlighted the importance of family labor in the social dimension, which combined well with the high percentage of women in the cluster, as shown in the studies by Trauger [58] and Fairlie and Robb [59]. This group also recorded the lowest values in the economic dimension because, as the literature confirmed, it is precisely small companies that often demonstrate lower economic efficiency [60].

This group was clearly opposed by the CL2 farms, which directed their business choices toward the economic dimension. This was in line both with the medium–large structural assets of the farms and the fact that there was a high percentage of male leaders in the cluster [61]. In fact, these farms stood out not only by having the highest values in the economic dimension, but also by having the highest level of input in the environmental dimension. This showed a lack of attention to the environmental impacts of the practice of intensive farming, which was also indicated by the fact that the percentage of organic producers was almost zero. In fact, as reported in a study by Muller et al. [62], the organic method mandates a clear reduction of chemical inputs. The profile of this group also denoted a high degree of intensification of practices in the social dimension, with the highest costs for contracting and wages and the greatest value for the use of machines compared to human labor. The high values of these latter indicators agreed with the economic settings of the companies, as these also had the highest economic efficiency per employee.

CL3 was represented by farms that were very attentive to the social aspects. It was made up of farms with the largest farm size, which highlighted a production choice oriented towards multifunctionality from which the farmer obtained an important share of the company revenues. Here, there was a low livestock consistency, and a substantial percentage of organic livestock (16.5%) was found, which was in line with the findings highlighted by CL1. In fact, although these two clusters had similar consistencies and breeding methods, which were confirmed by the observed value of the livestock GSP, they differed in the values of their total revenues. This was due to both the diversification of the activities carried out in CL3 and the scarce quantity of investments of the farms in CL1 in activities that would allow them to enhance their farm products, such as certifications. In fact, the farms in CL3 sought different sources of income through complementary activities (90.5%), confirming that this group had the highest percentage of young people (18%). It is precisely the literature that confirms that young farmers may be more inclined to support a multifunctional approach on a farm [63]. Unlike in CL3, farms with a more limited surface area (CL1, CL2), regardless of the intensification of activities, were mainly oriented toward livestock production.

5. Conclusions

This work aimed to define the types of farms in the dairy cattle sector in order to provide a detailed picture of the Italian situation and, at the same time, to create a classification of homogeneous groups of farmers based on their structural profiles from the point of view of sustainability. This study provides a homogeneous and common basis on which it is possible to develop studies that measure the performance of farms in terms of sustainability through a more objective and comparable assessment of the social, environmental, and economic performance of farms. To obtain this result, multivariate statistical approaches were used, as these methods allowed a better exploration of the characteristics of management and the comparison of the profitability of the clusters that were obtained, as was already done in similar analyses [31,55].

Kelly et al. [64] highlighted the limitations of the FADN sample surveys, as they do not capture data from small farms that do not fall under the definition of "commercial", even though they receive subsidies as a result of the Common Agricultural Policies. Nevertheless, the FADN is the most reliable sample survey, as shown by the extensive literature [65–67]. If the sample base has limitations in its precise representation of the agricultural sectors, a further limitation of the study is the choice of indicators, which was based on a careful survey of the literature [52] and based on the characteristics of the sector, but it could be enriched with additional factors [31,32,55] and supplemented with indications that a primary survey could provide, such as a survey of farmers' perceptions and intentions [68].

Despite these limitations, the analysis carried out here allowed the set objectives to be reached and an identification of Italian farm types to be provided based on the emerging relations between the aspects of structure and sustainability. This classification potentially highlights the state of the art of the bovine dairy sector by classifying farms on the basis of sustainability indicators in order to understand how far the breeding strategies are from the European trajectories and how some types are already on the road to this sustainable transition.

Knowing how to combine the objectives of environmental sustainability with those of economic competitiveness will be important in complying with what is required by the European Commission through the Green Deal and related strategies (the Farm-to-Fork and Biodiversity strategies) [69,70].

Thus, this work is in the vein of research on policy support and is an attempt to animate discussions and future analyses to be replicated in other European countries so that a framework for sustainability can be provided. The different analyses could give hints to policymakers for making policies—such as the CAP or rural development policies—that are closer to the needs of different territorial realities.

Some farms have a high level of eco-compatibility; however, they should also be pushed to pay more attention to the economic dimension through a better use of socio-technical tools. Other farms are proving to be more attentive to the economic dimension, but need to improve their commitment to the environmental and social fields. The existence of the third group of farms demonstrates that a multifunctional management that includes sustainability in its three dimensions (environmental, social, and economic) is possible. The policy tools for supporting this sector will have to be defined in a different way to support the development of an articulated and complex sector.

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