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## **SUSTAINABILITY AND PROFITABILITY OF COMMERCIAL RABBITRIES IN TIZI-OUZOU, ALGERIA**

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### **ABSTRACT**

Using the IDEA method, we evaluated sustainability of 15 modern rabbit farms in Tizi-Ouzou (Algeria). The score of the agro-ecological scale is the lowest for the 15 farms. By cons, this score is higher for two farms that have diversified farming practices. The score of the socio-territorial scale is average for the 13 farms because of the better life of its breeders, and the free time that they have. However, this score is low (limiting factor) for two farms. This because of the overload encountered at work, and also the lack of time for holidays and family entertainment. The economic scale score is highest for all farms. This is explained by a very good profitability of these farms. In terms of three scales (Agro-ecological, socio-territorial and economic) farms do not seem to be sustainable, because of the poor scores of the agro-ecological scale for the 13 farms and socio-territorial for the two farms. On the other hand, rabbit farms are profitable. Indeed, the first concern of farmers is to produce quantitatively

**Keys words:** rabbit farms, sustainability, IDEA method, Tizi-Ouzou

### **INTRODUCTION**

In Algeria, meat production is mainly based on cattle and sheep farming. These production systems are still unable to meet the protein needs of people. Moreover, Algeria is still dependent on the world market (CNIS, 2017). In order to reduce this dependence, the livestock sector has initiated several livestock development programs including rabbit breeding.

Currently, the modern and rational rabbit breeding is developing increasingly both in number and size of farms. By its performances around 35 rabbits/female/year (Mouhous et al, 2019), and the possibility of developing local alternative resources (Kadi, 2012; Guermah, 2016; Harouz-Cherifi, 2018, Djellal, 2018), the rabbit farming could help create a sustainable solution to meet the protein needs of people.

In this sense, the objective of this study is to evaluate the sustainability and profitability of rabbit farms but in the context of respect for the environment.

### **MATERIALS AND METHODS**

#### **Survey party**

After a global survey that involved more than 60 commercial rabbit farms, according to availability of farmers to cooperate, fifteen farms were randomly chosen. The survey was conducted from May 2013 to July 2013. The questionnaire used was structured in three sections (social, technical and economic). A pre-survey was conducted with three breeders to test the questionnaire.

### Analytical methods

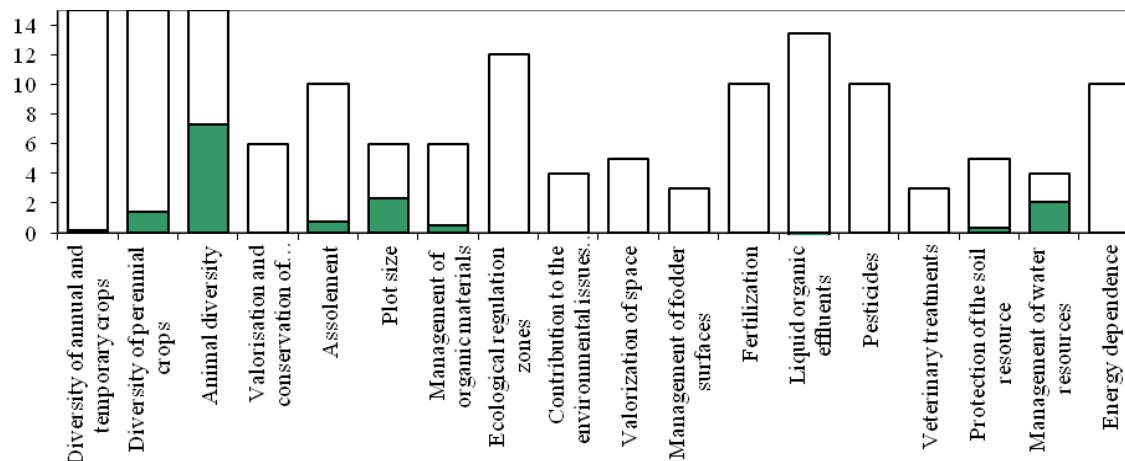
To enable a diagnosis of the sustainability of rabbit farms, we used the IDEA method (Agricultural Sustainability Indicators) described by Vilain (2003). It is structured and grouped into three sustainability scales (agro-ecological, socio-territorial, economic). Each scale is evaluated by a variety of indicators for which scores are assigned.

## RESULTS AND DISCUSSION

According to local conditions, for the purposes of the evaluation method of sustainability rabbit farms, we considered 31 of 41 indicators. The other 10 remaining indicators are deleted either due to lack of data or because they are not applicable in the study area. The analysis of the sustainability of commercial rabbitries was done on three scales: agro-ecological, socio-territorial and economic.

### Analysis of the agro-ecological scale

The agro-ecological scale comprises three components: the diversity of productions, the organization of space and agricultural practices. Agro-ecological sustainability (Figure 1) is penalized by the zero or very low scores attributed to some indicators such as "Action for natural patrimony", "Ecological regulation zone" and "soil protection". But also by the lack of specifications through which the breeder undertakes to respect and protect the natural heritage.

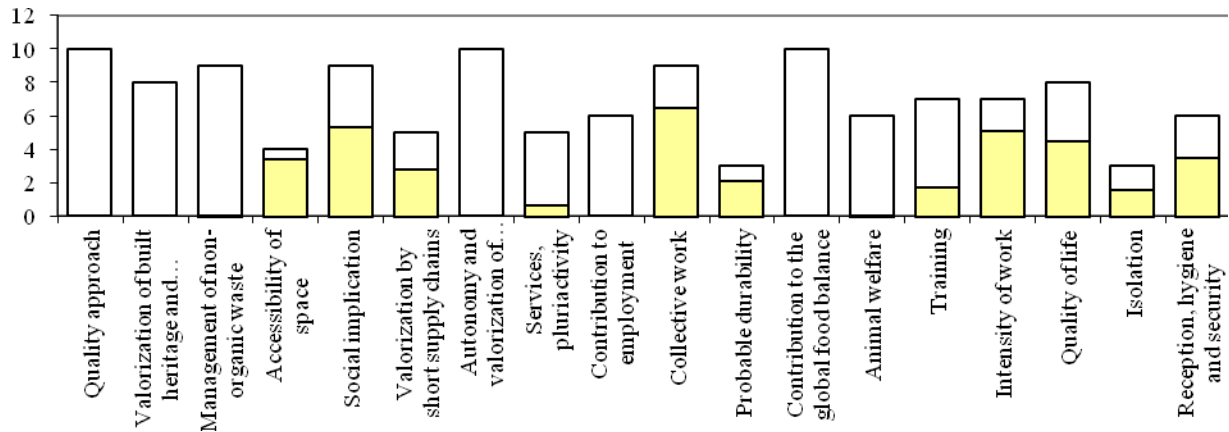


**Figure 1.** Agro-ecological sustainability. Value on the farm and maximum possible

The scores of the agro-ecological scale vary between -3 and 7.3. The highest score was obtained by the component diversity of production (8.85) and the lowest by the agricultural practice component. This is due to the rating "-3" assigned for the indicator "organic and liquid effluents". The results obtained by the agro-ecological scale are also influenced by the lack of surface used for crops. As well as the scarcity of perennial crops. The figure 1 shows that no component has reached half the maximum possible score.

### Analysis of the socio-territorial scale

The socio-territorial scale comprises three components with 16 indicators targeting human and local development, product quality, employment and service, ethics and human development. The socio-territorial scale presents average scores, with an average of 49 points. These scores range from 5.68 to 31.61 points (Figure 2). The proposed criteria for assessing animal welfare are insufficient. They do not reflect sufficient conditions for development of the animal and it remains the hot topic. The rating is "- 3", based on the assessment of housing conditions and the behavior of the animal in the cage.

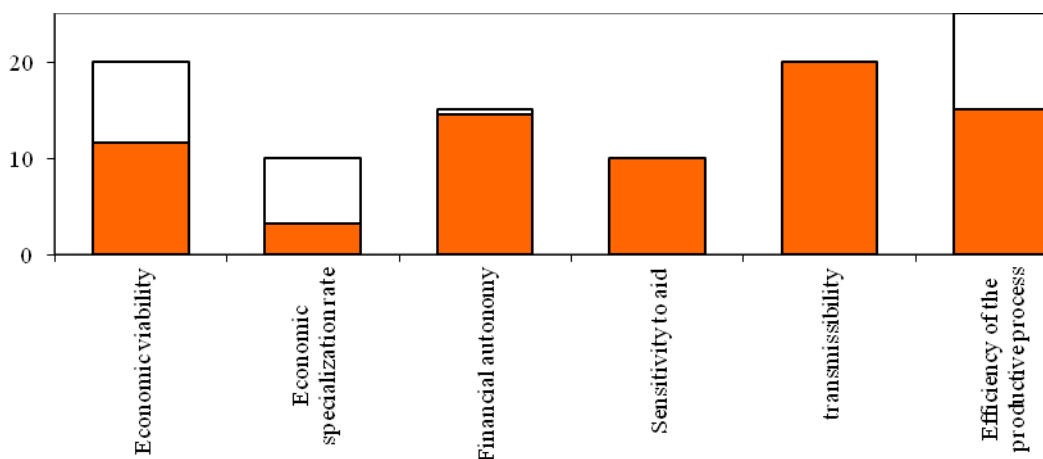


**Figure 2.** Socio-territorial sustainability. Value on the farm and maximum possible

The lowest score is obtained for the quality component of products and territories (5.68) because of lack of quality approach (labels) and the scarcity of traceability process. The highest score is obtained in ethics and human development (31.61). All aspects related to the quality of the products, the various services rendered to the territory are not taken into account by breeders who favor the profitability aspect rather than the citizenship aspect.

### Analysis of the economic scale

The economic scale addresses livestock producers' practices and strategies from the economic point of view through the components: sustainability, independence, transferability and efficiency. The economic scale records the best sustainability scores (Figure 3). More than 10 farms scored more than 60 points. It appears that even with this system of above-ground breeding which uses more inputs (purchase of concentrated feeds, fodder ...), a best score of 74/100 was obtained for the parameter "transmissibility and sensitivity to aid". This is judged positively by the IDEA method and the score awarded is 20 points since the transmissibility is less than  $60 * k \text{ Euro} / \text{UTH}$  (Vilain, 2003). The lowest score is recorded for the economic specialization rate of 3.2 / 10, because of the practice of a single agricultural activity is rabbit breeding. Farmers use few inputs and prioritize their own resources, which in the long run guarantees their sustainability. In the surveyed farms, the difference (product - input) / product is important and between 50% and 60%. This result allowed assigning a score of 15/25 according to Vilain (2003).



**Figure 3.** Economic sustainability Value on the farm and maximum possible

Finally, the analysis of global sustainability shows that the limiting factor for the sustainability of these farms is the agro-ecological scale with a very low score of 8.39 / 100 (Figure 4), while in French farms, Fortun-Lamothe et al (2012) reported a score of 43. Our result is largely due to the failure of agricultural practices and also to poor waste management. Whereas, farms report interesting

sustainability according to the socio-territorial and economic criteria for which scores are more than 75 points. The rabbit farms are very profitable, some farms vary between 1 and 2 times the guaranteed minimum wage / month. Almost the same result was achieved in French farms, 1 to 1.5 times the guaranteed minimum wage according to Fortun-Lamothe (2007).

Figure 5 shows that the components of the agro-ecological scale are the weakest, especially the agricultural component. Followed by the components of the socio-territorial scale that have somewhat high scores, especially the ethical component and human development. The best scores are held by the components of the economic scale, in particular the transmissibility component and the independence component, which hold maximum scores. In contrast, the sustainability of Tunisian rabbit farms is limited by the economic scale, while the agro-ecological scale presents interesting scores (Ben Larbi et al, 2017).

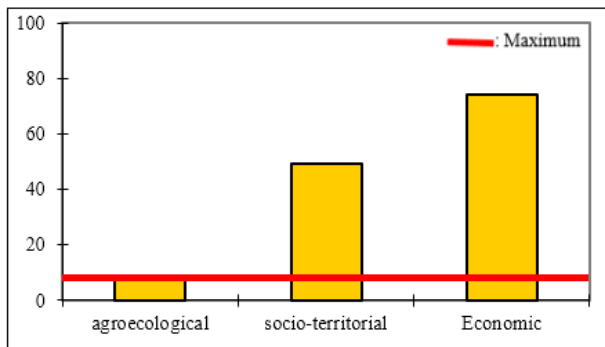


Figure 4. Sustainability of rabbits farms



Figure 5. Components of farm sustainability

## CONCLUSION

In the Algerian context, the study has shown that some indicators of the IDEA method are not applicable. The IDEA method has shown that breeders have poor performance in protecting the environment. The high profitability of rabbit farms reinforces the socio-territorial and economic scales. The agricultural sustainability inevitably passes by the taking into account of the triptych (environment-social-economy), in particular by the improvement of the agricultural practices.

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