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A multi-criteria analysis for evaluating environmental performance of poultry farms in Umbria Region, according to European Legislation

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Abstract

Since the 1960s, the International policies for sustainable development and a growing awareness of society regarding environmental issues have stimulated and led also the livestock production sector to adopt frequently more sustainable practices (Horrihan et al. 2002).

After a long legislative process, on 24 September 1996, the Integrated Pollution and Prevention Directive was introduced in Europe – IPPC, which provides obligation to release an environmental authorization for the activities identified by the same legislation (UE, 1996). The IPPC is a necessary procedure to evaluate the environmental compatibility of the production activities that could determine significant environmental problems, such as polluting emissions in atmosphere, water and soil, or in relation to the waste management and natural resources consumption. The most important innovations introduced by this authorization are a significant simplification of the authorization process for companies, and the Best Available Techniques – BAT (EU, 2017). The adoption of these techniques by the poultry farms and the prescriptions by the competent entities is guided by the BAT REFERENCE Document – BREF, issued by the European Union with all the useful information regarding the BAT. In this framework, the objective of this work is to assess a group of poultry farms subjected to IPPC, taking as case study a number of farms located in the Umbrian region. The main purpose is to identify the most efficient alternative in the environmental field and the necessary improvements, in order to evaluate the level of sustainability of the farms, also in relation to the prescriptions of BREF.

The ranking of sustainability has been obtained by means of Electre II evaluation method (Roy, 1991 and 1996; Roy and Bertier, 1971), which is part of non-monetary valuation methods, particularly the multi-criteria analysis field. Multi-criteria analysis (Multi Criteria Decision Aiding - MCDA, see Roy, 1996; Zeleny, 1982) is able to support the decision maker to make a choice; it means to consider the problem from different points of view, to compare the consequences of each action, and finally decide which is the best direction (Boggia and

Cortina, 2008). The Electre method establishes a dominance relationship for each pair of alternatives considered in the multi-criteria problem analyzed, using both an index of concordance and discordance (Castellini et al., 2012).

The obtained results show that all the farms subject to IPPC examined are mostly sustainable from an environmental point of view, with some companies more virtuous than others, and in most cases respect the limits defined by the European Union for certain parameters. In particular, two farms on seven resulted to be the most efficient, especially for what concerns water and energy consumption. In any case, further improvements are necessary, and companies operating in this sector must be encouraged towards continuous innovation and efficiency, in order to improve their environmental sustainability.

Keywords : Sustainability, MCDA, IPPC, Environmental performance

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