

## **A METHODOLOGICAL REVIEW OF MULTIFUNCTIONAL AGRICULTURE**

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### **ABSTRACT**

The purpose of the paper is to analyse the instruments for the assessment of the multiple functions of agriculture and classifying them into thematic areas.

Although there exists a lot of literature addressing the multifunctionality of agriculture from a theoretical or analytical point of view, fewer studies exist that analyse this topic from a methodological point of view, especially when assessment of different functions is addressed.

Reviewing the existing literature on the topic, this paper tries to give a first analytical framework and an overview of different evaluation methods. Based on the outputs of the analysis, the final section suggests possible directions for future researches.

*Keywords:* multifunctional agriculture; assessment instruments; non-market valuation

### **INTRODUCTION**

In this paper multifunctionality of agriculture is regarded as a concept combining the productive role of agriculture and its role in biodiversity conservation, landscape preservation and contribution to the socio-economic viability of rural areas. The socio-environmental role of agriculture as a major agent in sustaining rural economies and cultures is recognized and under this perspective we agree with Marsden (2003: 186) who underlines the task of multifunctional agriculture in contributing to the construction of a new agricultural sector that corresponds to the needs of the wider society. Going more in depth in the question of evaluation we look at multifunctional agriculture as a concept to understand and analyse the role of agriculture in society (Rossing et al., 2007).

There is a rich literature on multifunctional agriculture assessment with examples of evaluation studies that range in methods used and the scope of analysis undertaken. In this paper we attempt to give an overview of what can be found in literature with regard to instruments, methods and practices used for the assessment of the multiple functions of agriculture, classifying them from three different perspectives: what kind of tools are available by the side of consumer in order to evaluate farmer's supply; of which instruments farmers dispose to evaluate the demand of multifunctionality and to evaluate their own activity; and how institutions can assess farmer performances.

This review is not meant to be comprehensive or exhaustive, rather it wants to illustrate the diversity and scope of the different assessment methods available.

The paper is organised as follows. The starting point is a quick overview of viewpoint on multifunctional agriculture assessment. The second section describes the analytical framework developed to analyse and compare the various methods. Then discussion assesses the methods in terms of contribution to the analysis of multifunctional agriculture. It offers also some suggestions for the research agenda.

## PROBLEM FORMULATION

When we deal with valuation in multifunctionality of agriculture we are facing a wide issue which can be approached from different viewpoints, at different levels of aggregation, by using different instruments and aiming different objectives. The complexity of this theme is increased by substitution and complementarity relationships linking its components (Randall, 2007).

The reasons leading to carry out evaluations on multifunctional agriculture could be several. Some studies have been undertaken in order to develop a set of “green prices” to provide incentives for non-commodity production. Most commonly attempting to value the agriculture’s non-commodity outputs in totality, on a regional or even national scale. The result might be a single number that might be useful to encourage better appreciation of agriculture’s contribution to welfare (Randall, 2002). Some other evaluations have been carried out to find a way to internalise public goods and services into commodity network given the problem of market distortion. Furthermore some efforts have been done in order to evaluate the degree of multifunctionality of farming systems accepting its normative view.

Although there is a rich literature on multifunctional agriculture assessment some constraints exist mainly connected with the spatial and temporal relativity of this issue and with the specificity and applicability of the methods implemented and used. An aspect that deserves particular attention in this sense is related to way how this concept enters in the household strategy. Agriculture performs and has always performed multiple functions (Pampanini 2006) but sometimes farms provide benefits implicitly. The family farming model of Italian agriculture is a good example of such a consideration, since it has always played a key role in the social organisation of rural communities and particularly in taking care people with special needs without any explicit remuneration (Senni, 2005).

In this framework the present contribution aims to classify the literature in order to give a support to future researches that regard multifunctionality as an asset for regional development and seek to bridge the gap between demand for and supply of multifunctionality.

## METHODOLOGY

The system developed in order to assess existing methodologies in the context of evaluating the multiple functions of agriculture, consists of four steps.

**Table 1. Methodology**

PHASES	STEPS	MORE
Review	1: Collecting existing literature on valuation of multifunctional agriculture	SOURCES Peer-reviewed journals European research projects Websites of conference and research institutes

Identification	2 (input): Identification of methods and techniques described or used	
	3 (output): Sifting of methods and techniques found through a structured grid	GRID CRITERIA Type of tool Main objectives Data Phase of evaluation Function evaluated Aspect evaluated Type of methodology Spatial scale User groups Type of result
Evaluation	4: Discussion of results	Perspectives (Figure 1 below) Functions

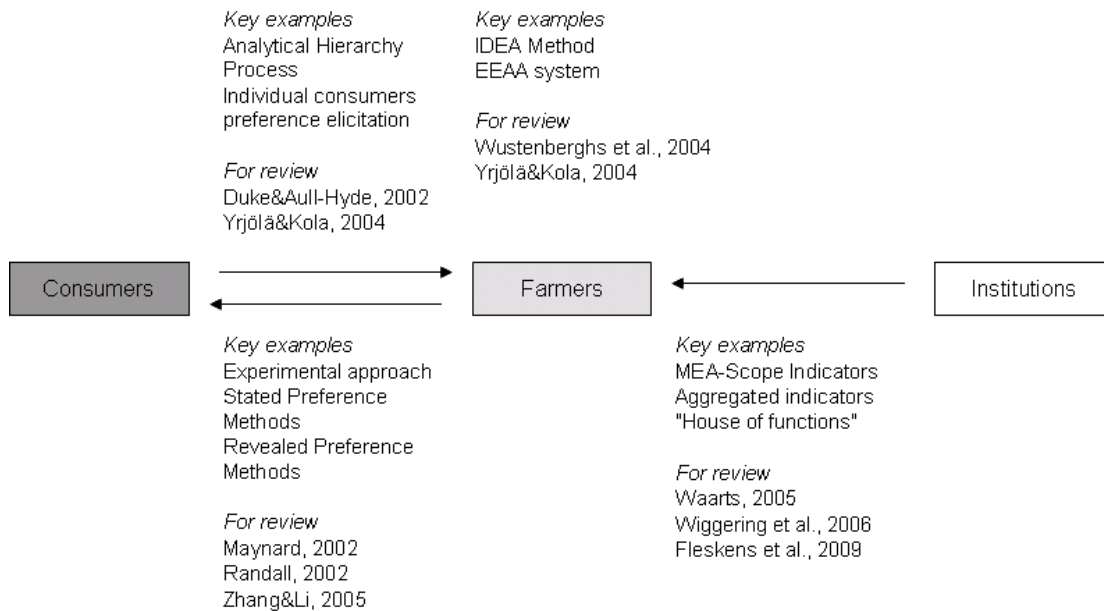
**Source: authors**

First, literature searching has been carried out combining reference chaining and hand searching. Sources of literature included peer-reviewed journals, European research projects in the field and websites of conferences and research institutes.

The next two steps constitute the identification phase. In the second step the literature is analysed in order to identify the methods or techniques described or used. The results of this step become the *inputs* of the third one (*output*) where the methods or techniques found run through a list of criteria identifying key elements. Ten criteria are distinguished. “Type of tool” refers to the assessing instruments: indicators, models, surveys. “Phase of evaluation” describes in which phase of the evaluation process we are, distinguishing among process, performance and impact evaluation. “Main objective” specifies the core aim of the method analysed. “Function valued” distinguishes among the all relevant functions of agriculture: productive, economic, ecological, social and cultural. “Type of methodology” specifies if it is demand or supply oriented and to which category of evaluation methodology belongs. “Aspect evaluated” indicates from which viewpoint the function are valuated: economic, environmental and social aspects. “Spatial scale” is given in terms of level of aggregation addressed: farm or a broader level. “User groups” indicates which users are involved in the study as subjects or objects of the evaluation: public institutions, farmers, citizens and consumers. “Type of result” reveals how the final outputs are presented.

Thus, an analytical framework arises allowing to compare the tools and support a comprehensive analysis. In the fourth step the result are discussed focussing on the following questions: (1) How consumer/citizen behaviour can be assessed? (2) How farmer behaviour can be assessed from the perspective of the consumers? (3) How farmer behaviour can be assessed from the perspective of the public institutions? (4) How farmers can evaluate their own performances?

**Figure 1. Overview of analysis along with representative assessing methods and key references for reviews**



**Source: authors**

The scheme above is provided to identify the subjects and the objects of the evaluation along with representative examples of assessing methods and key references for reviews. Three subjects are involved: consumer, farmer and institutions and four are the perspectives for the evaluations: consumer towards farmers and vice versa, institutions towards farmers and farmers' self-evaluation.

Classifying the literature by means of the scheme above a special attention is dedicated to the analysis of the different functions addressed.

**DISCUSSION OF SOURCES**

Analysing the selected literature we can distinguish between studies aim to compare different methods (Randall, 2002; Van Kleef et al., 2005; Zhang and Li, 2005; MultAgri project), and studies describing new specific methodologies. Some new methodologies are the result of combination of existing ones (Hall et al., 2004; Parra-López et al., 2008; Randall, 2002; MEA-Scope project) while some others are newly developed (Maynard et al., 2002; Wiggering et al., 2006; Fleskens et al., 2009).

The MultAgri project offers the widest review in the body of non-market valuation literature related to multifunctional agriculture, although the selective perspective of four European countries: France, Germany, the Netherlands and Portugal. The Journal on Agriculture, Ecosystems and Environment (120, 2007), dedicating a special issue to tools and methods that examine the multiple functions of agriculture, complements the main results of this study giving a more complete overview of the current state of the art of assessment methods in this field. An interesting methodological aspect emerged from this review is that most indicators of multifunctionality have been identified in research works as indicators of impacts, which are close to indicators of sustainability while very few indicators are related to activities. Developing such indicators could allow a better monitoring of the system.

Looking at selected literature from our four perspectives we can find some remarkable aspects: the studies related to the instruments available for policy makers to evaluate farmers performances as well as the tools to evaluate consumers' behaviours and needs are prevalent. Instead less developed are the instrument that consumers can use to evaluate farmers supply of multiple functions and the ones that farmers can use for self-evaluation.

To support policy decision making, both monitoring and evaluation methods have been developed in particular for the economic, environmental and landscape aspects. As an example Economic and Environmental Accounts for Agriculture presented by Wustenberghs et al. (2004) aim to provide policy-makers with a comprehensive assessment system of agriculture's multifunctionality, setting off economic data against social and environmental data.

Demand is mainly measured by examining individuals stated (expressed) preferences for non-commodity goods – Contingent Valuation Method – or revealed by examining individuals purchases of those market priced goods necessary to enjoy associated non-commodity goods (Travel Cost Methods, Hedonic Price Analysis). These measures generate evidence of willingness to pay (WTP) for benefits and willingness to accept (WTA) for costs required for welfare change measurement (Randall, 2002). But they are only able to isolate one effect on others. An interesting alternative to the more used stated and revealed valuation methods is suggested by Maynard et al. (2003). An experimental store was created to evaluate initial demand for local products. This methodology may likely be applied also to the evaluation of non-products from agriculture.

Recognizing the importance of a wider participation of consumers and citizens in designing a new agricultural sector corresponding to the needs of society, we note the scarcity of instruments they could use to assess farmers' performances. Furthermore from the consumers' point of view is increasing the demand of a better assessment of their own choices, especially when their behaviour is ethically driven. From this point of view there is an increasing demand for synthetic as well as complete indicators.

Of great importance are also the tools allowing farmers to assess their own activity but few examples exist in this sense. The IDEA (Indicateurs de Durabilité des Exploitations Agricoles or Farm Sustainability Indicators) method is an example of methodological interest in this perspective. This method is conceived as a self-assessment grid for farmers to evaluate the sustainability of their own farm, but also as an instrument to better establish a dialogue among farmers, institutions and local citizens.

From the point of view of the functions performed by agricultural activity, the studies related to the environmental and economic aspects dominate over social and cultural ones. This is mainly due to the fact that the two aspect are still dominating the multifunctional agriculture and that they are more easily evaluated.

In conclusion we can add that there is general consensus that where applied the definition of multifunctionality should be firmly area-based (Fleskens et al., 2009). Different stakeholders may value functions differently and the importance of functions varies across scales of analysis (Hein et al., 2006). In that respect a meta-evaluation should be organised trying to evaluate the general improvement provided by multifunctional agriculture at local level, also in order to better compare diverse situations.

## CONCLUSIONS

The concept itself of multifunctional agriculture is highly demanding with regards to multidimensional evaluation methods. It stimulated a lot of research around specific aspect related to multifunctional agriculture, but there is still a high expectation for more handle as well as exhaustive methods able to asses in a multidimensional way the concept and to cover the demand from different subject and in diverse perspectives. Up today environmental and economic aspect of multifunctional agriculture are mainly explored. It is due to the demand but also to the possibility to better and easily evaluate the results from these sides. On the other hand there is a large demand to better understand societal (health/care/educational) effects of multifunctional agriculture. As an example a better understanding and evaluation of health efficacy of agriculture is a first step to improve the use of agricultural resource for green care.

What emerges from literature is a large effort and a dynamic activity around the identification of diverse methods and tools. As usual there is also a wide field to explore regarding a better assessment of their suitability and transferability. During our analysis some grey zone emerged and they regard the organisation of more comprehensive methods, the organisation of instruments that can be more easily used by actors involved and that can better drive the evolution of multifunctional agriculture in the local system, the need to ensure area-based methods but also to have the opportunity to benchmark multifunctional agriculture at different territorial level.

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