

4<sup>th</sup> meeting ▪ Rio de Janeiro, Brazil ▪ 9-11<sup>th</sup> November 2011

## **The Primary Sector and quality of life: evaluation methodologies for an efficient agricultural policy assessment**

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### **ABSTRACT**

The primary sector especially in developed countries has to play an even more multifunctional role for the production of positive externalities that increase the welfare of society. One of the main issues for the public decision-maker is to remedy market failures and to ensure sustainable development for the sector. In this framework, the general aim of the research is to define new methodologies, applicable at least on the national level, for the allocation of national and Community financial resources destined towards the sustainable development of rural areas.

Following a brief introduction on the concept of multifunctionality and on the economic theory that should guide the public intervention in the sector, this paper illustrates the results of a study on successful multifunctional enterprises in Italy in order to verify the possible existence of a model of multifunctional agriculture capable of offering a real alternative of development for many rural areas that, for various factors, can not prove competitive from the purely market viewpoint.

A first indispensable element to be able to proceed in this direction, however, is precisely the proper comprehension of the concept of quality of life and of its elementary components. In this context, the final part of the paper proposes a methodology to evaluate the quality of life in the rural municipalities of Tuscany, based on A. Sen's theory of capabilities.

**Keywords:** Multifunctionality of agriculture, rural development, quality of life

*“And everywhere I hear the same tune: Agriculture is the foundation of our rural economy.*

*Of course, we have to go beyond agriculture into rural development; we have to diversify agricultural and non-agricultural activities.*

*But we need to preserve agriculture as the fundamental social and economic fabric of our rural societies, including in those regions where farming is difficult.*

*On one hand, I see this reform as a chance to lay the ground for a new public contract between agriculture and society;*

- ✓ *a contract where we are called to provide food and to manage more than half of Europe's land;*
- ✓ *a contract that gives a renewed legitimacy and credibility to the CAP.”*

(Ciolos, 2011, p. 4)

## 1. Introduction

The primary sector especially in developed countries has to play an even more multifunctional role for the production of positive externalities that increase the welfare of society. “Food production is the number one objective of agriculture and for farmers. But it would be simplistic to limit the CAP to just that. The CAP also deals with helping farmers preserve our natural resources and maintain a countryside people want to live in. [...] European agriculture needs to sustain and reinforce its competitiveness on the basis of a productivity model that combines economic, environmental and social sustainability” (Ciolos 2011, pp. 3-4).

In this new perspective of the Common Agricultural Policy (CAP), it is no longer sufficient to assign planning tools to the sector and to the food chain on the local level. At the same time, numerous possibilities for interventions of a systemic nature to promote forms of integrated and sustainable rural development are finally opening up. This new approach to sustaining rural areas entails a territorial key of interpretation that grounds the role and major problems of agricultural activities in the overall local economic and social makeup, and does not limit interventions solely to the agricultural ambit or, at most, to that of the food chain. Moreover, introducing the principles of sustainable development into the analysis spotlights the limits of the market, along with the so-called “failures of the non market”, in the sense of the public administration’s inefficiency in managing the natural resources and, therefore, also the related activities such as agriculture. What proves increasingly more necessary is therefore a structure to analyse and plan public interventions capable of efficiently responding to these new objectives.

One of the main issues for the public decision-maker is to remedy market failures and ensure sustainable development for the sector. In this framework, the general aim of research is to define several methodological and operational tools to improve the effectiveness of the public intervention in agriculture. In particular, the analysis shall focus on the conditions necessary to promote a multifunctional agricultural development, precisely in the sense urged by the European Commissioner.

As Ciolos underlines, the primary sector contributes to the quality of life of the entire population with the production of both commodities and non-commodities (NCOs). However,

not all agricultures perform these functions in the same manner and with the same intensity. It is therefore necessary to define methodologies to evaluate the different contributions and, consequently, the different public interventions needed to pursue the social optimum. The first part of this paper specifically confronts these themes, introducing the concept of multifunctionality from the theoretical viewpoint, as well as from that of its concrete application in the CAP tools.

Based on this focus of multifunctional agriculture, the second part of the paper proposes the results of research conducted in Italy on a sample of farm enterprises characterised by their having achieved a model of rural development based on valorising the market and non-market functions performed by the farm enterprise. From the entirety of the case studies emerges a series of homogeneous characteristics on the level of enterprise and territory, which we feel represent what can be defined as prerequisites for a multifunctional agricultural development.

A first essential element for rural development is represented by the agricultural sector finding itself in a context that risks the progressive decline of these forms of activity and, at the same time, the abandonment of rural areas for urban areas. We feel that multifunctional agriculture can represent the winning model for the future in many rural areas and thus respond to the necessity to establish a new production balance for farm enterprises in a constantly expanding market, increasingly more characterised by the themes of international competition, the opening of markets, and their instability. Precisely for the nature of the “productions” it offers, though, this model requires a series of conditions that go beyond a farm’s production efficiency, and this is where the public intervention must be directed.

In this framework, a fundamental precondition to valorise agriculture in general and multifunctional agriculture in particular, appears to be the quality of life in rural areas. To render this concept more analytical and thus enable the preparation of concrete operational tools of intervention, the final part of the paper proposes a methodological approach to evaluate the quality of life based on A. Sen’s theory of capabilities, and its application in municipalities of Tuscany.

## **2. Theoretical framework of the concept of multifunctionality and the tools of agricultural policies employed for its application**

The most complete tool to support the formulation of policies in favour of the multifunctionality of agriculture is represented by the analytical framework developed by the Organisation for Economic Cooperation and Development (OECD), which supplies an effective definition of multifunctionality and identifies the criteria whereby strategies aimed at promoting agriculture’s non-market goods and services can be formulated to maximise social well-being (OECD 2001, OECD 2003, OECD 2005).

The point of departure of the work conducted by the OECD consists in assigning functions to agriculture which assume the character of public goods. For these functions, the market can not represent an adequate instrument to recognise social value and, consequently, guarantee that supplying these functions is sufficient to satisfy the demand expressed by society.

In this context, the essential elements for the development of public actions aimed at attaining the best solution from the social viewpoint require:

1. the analysis of the production relations between market (COs) and non-market goods and services;
2. the evaluation of the social benefits produced and not compensated, or compensated only in part, by the market<sup>1</sup>;
3. the creation of tools capable of correcting the market failures in relation to the offer of NCOs.

As far as the first point is concerned, it is essentially a question of understanding whether the social functions attributed to agriculture can be more efficiently realised independently of the farming activity. The concept of social efficiency concerns the possible economies of scope, in terms of production costs, as well as the possible overall valorisation of products which is achieved through the combined production of COs and NCOs, as in the case of the landscape function which makes it possible to increase the value of agricultural products through rural tourism and direct sale.

There is probably no single answer as to whether agriculture is the best subject to achieve the positive externalities it produces. On one hand, farming activities in many contexts, along with traditional agricultural productions, realise important externalities: landscape, regulation of water, occupation in rural areas, food safety, maintenance of social vitality and of local traditions, etc. On the other hand, these functions are carried out in a totally “random” manner as far as the social objectives are concerned, which is to say that there is no optimising or even satisfactory behaviour from the “social rational” viewpoint with respect to the allocation of resources among the different functions. There are certainly considerable differences as to the efficiency of carrying out each function analysed in the various territorial environments, and making an evaluation of the validity of the current management and the policy instruments to improve it therefore proves difficult.

The first critical element in this picture is posed by the evaluation of the externalities. Without a system of values, even not necessarily monetary, there is indeed no possibility to define a correct decisional process in order to allocate enterprise resources among the different production processes. This is therefore an essential point to solve so that the non-market social functions can take their proper place in the decision-making process of the farm entrepreneur or of the public agency competent in terms of agricultural policies.

Various methodologies can be utilised in this regard, to select from time to time as needed in function of the characteristics of the externalities concerned. They can be based on individual or group judgements (of experts, politicians, stakeholders), on revealed or stated preferences, and they can be of the direct or indirect type (see Navrud 2000 for a detailed review of the different methodologies). The use of these techniques, however, should be accompanied by the use of all the available information, so as to improve the cognitive picture as much as possible.

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<sup>1</sup> To simplify the exposition, the theme of negative externalities is not confronted, also in consideration of the CAP’s orientation of rendering this type of effect of agricultural productions increasingly more marginal.

If the market of COs guarantees the fulfilment of the demand of NCOs, no public intervention is necessary; if this is not the case, tools capable of correcting market failures must be defined.

The tools to utilise differ on the basis of the goods' characteristics. In particular, the solutions considered range from the creation of markets and volunteer contracts to systems of aid to production and price pegging.

When the necessity for public intervention through monetary incentives is established, the OECD approach suggests adopting targeted payments as the best option from the viewpoint of efficiency, equity and impact on the international market. The term "targeted", in this context, expresses a multi-dimensional concept that includes not only the territorial dimension, but also reference to specific desired NCOs. While in some situations, the objective can be identified relatively easily (as in the case of the maintenance of habitats), in others it can prove more difficult to define, as in the case of the landscape. In the latter cases, it will therefore be necessary to identify a factor or an activity that is a source of NCOs, and select the instrument that makes it possible to support the function, independently from the amount or intensity of the production of COs. The further the selected tool is from the production of NCOs (i.e. payments per hectare), the more necessary become educational initiatives, monitoring and regulations that assure that the NCOs are produced in the desired quantities, qualities and localisation (OECD, 2003).

With the 2005 report (OECD 2005) the conditions for public intervention are even further defined through the analysis of the so-called Non Governmental Approaches (NGAs). The NGAs embrace two modalities. One sees negotiations among private subjects for the offer of NCOs, and involves a payment by consumers/users (individuals or collective organisations) to farmers. The other concerns the voluntary offer, and without compensations, of NCOs.

The promotion of NGAs implies a series of actions to be undertaken by the public subject; as far as the creation of new markets is concerned, in particular, the measures range from establishing the right of property as an identifying factor of the person in charge of managing the resource in question, to actions of enforcement of private agreements, to the creation of instruments to indicate and guarantee the quality of the production processes associated to the production of NCOs. In the case of the voluntary offer, the role of the public subject is mainly expressed through technical and financial assistance.

Bearing in mind the results of these analyses, the OECD recommends that in the presence of market failures, governments should firstly verify the possibility of implementing non governmental options before undertaking direct interventions which can lead to market distortions with consequent inefficiencies in allocating resources.

In this theoretical frame of reference for the valorisation of agricultural multifunctionality, the conditions not strictly tied to income that can determine the continuation of the farming activities on the territory are left unconsidered, however. Indeed, in many cases, the forms of internalisation or, more generally, of compensation of the positive externalities, can contribute to the upkeep of agriculture. Alone, however, they are insufficient to promote real processes of rural development, especially as far as the continuation of new generations is concerned.

As we shall see more clearly further on, the existence of good transportation infrastructures, the presence of health and educational services, the quality of social and cultural interactions, are all elements found in all of the rural contexts where we find successful farming models.

In the case of European and, in particular, Italian agriculture, the conditions for public intervention to correct market failures frequently occur. In no context is it appropriate to confront the theme of agriculture, considering it as a single, homogeneous set, but considering the production of externalities, this assumption is even stronger. There are numerous different typologies of agriculture, each with its own specific social functions and with its own specific difficulties in performing its multifunctional role to the utmost. It is nevertheless a foregone conclusion that for many of these, the market in itself can not assure the achievement of the social optimum. It thus becomes very important to define the tools available to agricultural policies in order to take action to promote development.

A first point of departure consists of the tools currently contained in the European Agricultural Policy (PAC).

Unlike the concept of multifunctionality that emerged from the OECD documents, the one stated in the European Agricultural Model (EAM) makes no reference to any economic theory. Nevertheless, as of the 1992 Mc Sharry reform, multifunctionality assumed a growing importance in the official documents of the European Commission. As we can read in the preliminary papers of the Mid-term Review:

“The specific role of agriculture as a supplier of public goods must be acknowledged. This is the most important step in making public support to the process of liberalising commerce in agriculture compatible. In this context, a multifunctional role must be attributed to agriculture which in both developed and developing countries contributes to sustainable development, protection of the environment, the upkeep of vitality of rural areas, and the reduction of poverty” (European Community, 2000).

In the 2003 Fischler reform, however, these goals seem to have been forgotten or, in any event, perceived in a much narrower perspective than that of a full valorisation of the multifunctional nature of agriculture. The preoccupation that emerges is that of promoting an agriculture that does not have negative effects on the environment, rather than defending and stimulating an agriculture that performs its landscape, environmental and social functions, which are so important in many areas of the country.

This would appear to be the key of interpretation for the regulation of environmental compatibility and the failure to resort to forms of direct financing of the social functions (which would have been in part possible through a coherent application of art. 69). This approach is probably convincing for the many typologies of intensive agriculture and with a marked degree of competitiveness, but what can be said for the farms in the hills and mountains that offer environmental and social functions of greater value and, at the same time, find themselves faced with objective limits in terms of competitiveness?

The conclusion of the process described above is thus fulfilled with E.C. Reg. 1782/2003 where the concept of multifunctionality as a guiding element of the reform is replaced by that of sustainability and, consequently, the instruments to apply are now tied to monitoring

environmental compatibility rather than to targeted payments for the production of positive externalities.

Nevertheless, the context where multifunctionality could find an effective fulfilment is the development of the CAP into a Common Agricultural and Rural Policy for Europe (CARPE), and then into the regulation for rural development.

The regulation for support to rural development indeed provides for a series of actions potentially connected to promoting the multifunctionality of agriculture. With the document of February 20, 2006 which identifies the sectors of interest for the realisation of Community priorities, the Council explicitly assumes the multifunctional nature of agricultural activity as the key strategic position: “Strategic positions should reflect the multifunctional role that agricultural activity plays in terms of the wealth and diversity of landscapes, food products, and cultural and natural heritage” (European Union, D.C. 20/02/2006, 2006/144/EC).

So it is that in rural development, multifunctionality becomes the objective to potentially pursue transversally, that is to say by utilising all of the tools available in all four directions. In concrete applications, with the various Rural Development Plans (RDP), this objective in many cases proves to be neglected in favour of objectives on the competitiveness of farm structures and of the overall support to practises with a low environmental impact. In any event, the theoretical-methodological principles described prior seem to be unapplied.

The recent documents that reform the CAP relaunch the theme of multifunctionality also as a guide for the aid contemplated by the first pillar, but the modalities whereby the aid will be determined and, especially, the connection between these modalities and the value of the externalities generated still remain unclear. Another point yet to define is the strategic point on the agricultural models to invest in and, consequently, which tools it is more useful to concentrate on for them to gain ground.

As a contribution to these questions, the next paragraph summarises the results of a study on a representative sample of successful multifunctional enterprises in Italy.

### **3. Conditions for a multifunctional development of Italian agriculture**

In order to render the theoretical model of the competitive and multifunctional enterprise operative, this chapter proposes the experience of a research project that analysed the conditions that promote the valorisation of multifunctionality by means of a specific study conducted by directly interviewing fifty multifunctional and competitive farming enterprises. These were selected on the basis of the multifunctional characteristics of the enterprises, their vitality and their future perspectives. The selected enterprises thus represent success stories, interpreting this term in the sense of the enterprise’s capability to remain on the market under conditions of autonomy and generating externalities.

The analysis clearly points out that in various territorial contexts, even those considered “difficult” from the viewpoint of traditional production, multifunctional agriculture can represent a valid model for future rural development. This model, however, requires important and targeted public interventions for the total fulfilment of its potentials, precisely to guarantee, first of all, several preconditions on the level of both the enterprise and the territory.

Firstly, the enterprise characteristics that distinguish the farms of the sample were examined. The first thought emerges from the analysis of the farms' dimensions; we indeed note that the case studies have a medium-high agricultural surface area.

Yet another strong point that characterises all of the case studies is the high quality of products in response to the consumers' growing sensitivity towards origin, production process sustainability, and food safety. Quality is boosted with various commercial strategies, such as direct sale or product certification (i.e. DOP, DOCG, organic farm products).

Another decisive factor for enterprise success is diversification, which makes it possible to integrate farm income, favouring the economic stability of enterprises. More than 90% of the case studies diversified farm enterprise activity by adopting various solutions, such as transforming and packaging meat, milk or fruit (60%), educational activity (45%), rural tourism (45%), managing the territory (20%), producing energy (15%) or therapeutic activity (5%).

Finally, alongside high product quality and the diversification of enterprise activities, the strong points of the case studies analysed point out the marked professionalism of the managers, often associated with their young age.

As for the characteristics of the territory, a first consideration concerns the importance of its possessing landscape and cultural resources, and its reputation in terms of the quality of the products, which represent a competitive advantage for enterprises. It is indeed also by associating the images of the places and the territory that products can be valorised, internalising, in the market, the services that the farming enterprise produces in the ambit of protecting the environment, the landscape, and the local traditions.

Again on the territorial level, it must be emphasised how the quality of life is a fundamental condition. It is therefore important to attempt to understand its essential elements in order to intervene from the viewpoint of investments and public strategies. The study indeed evidences how all of the enterprises interviewed claim to enjoy a high quality of life, though the concept is not expressed in strictly analytical terms. It therefore appears crucial to understand the single elements that contribute to bringing the entrepreneurs to this opinion, which may vary even considerably from region to region and between peri-urban areas and outlying areas, in order to be able to intervene with specific instruments on the maintenance/improvement of these components in the rural areas where the public decision-maker considers it a priority to guarantee the maintenance of the primary activities. The strategic importance of the quality of life as the main prerequisite in guaranteeing forms of anthropic aggregation on the territory and increasing its image in the consumer's eyes thus informs the scientific world of the necessity to propose appropriate methodologies for an in-depth analysis of the analytical elements that constitute the quality of life. In this sense, the following approach, based on Sen's theoretical model of the economy of well-being, intends to confront this demand, proposing a case study to define the quality of life in a specific territorial context.

#### **4. The quality of life in rural areas**

At the basis of any attempted economic policy inspired by the principle of sustainable development lies the problem of formalising the very concept of quality of life or of "standard

of living”, and thus that of defining a “function of social well-being” as the foundation on which models for programming and managing should be decided. The search for “more objective indicators” to evaluate the standard of living has led to the establishment of the so-called “opulence” approach, on the basis of which the level of well-being can be evaluated in terms of possession of commodities (goods and services). Hence ensue the spreading of “real income” and GDP as indicators of economic well-being, and the stance of the various national statistics towards sampling magnitudes capable of quantifying the “goods” available in each Country and by different social categories. Opulence certainly constitutes a more objective measure of well-being than utility did, but the concept of well-being in the sense of “staying healthy” can be very far from that of possessing many goods.

In the search for what Sen terms a “common standard of well-being” (Sen, 1985), the approach that appears the most fertile – though certainly not resolute of all the problems connected with the search for an “objective” indicator of economic well-being adequate to orientate sustainable development policies – is the one that ties well-being not only to the possibility to purchase goods and services, but also the capability to live a long life, avoid avoidable diseases, find a decent occupation, live in a peaceful community free of crime.

A practical application of this theory on the macroeconomic level comes from the indexes formulated by the United Nations Development Programme (2011) (Human Development Index, Inequality-adjusted HDI, Gender Inequality Index and Multidimensional Poverty Index). These indexes have the merit of succeeding in offering a world panorama of the state of well-being, with its evaluation embracing the gross domestic product per capita, life expectancy at birth, adult literacy, school attendance, inequality among families and among genders, as essential aspects of an environment capable of enlarging individual choices and ensuring them a long, healthy and creative life. On the more analytical level of the individual rural territories, these indicators do not permit us to understand, however, the specific constitutive elements of well-being and thus, the real diversities between areas. Literature does not contain many studies on indicators of well-being on the micro level. A. Sen’s theory of capabilities seems to offer interesting cues for developing tools to evaluate well-being on the territorial level.

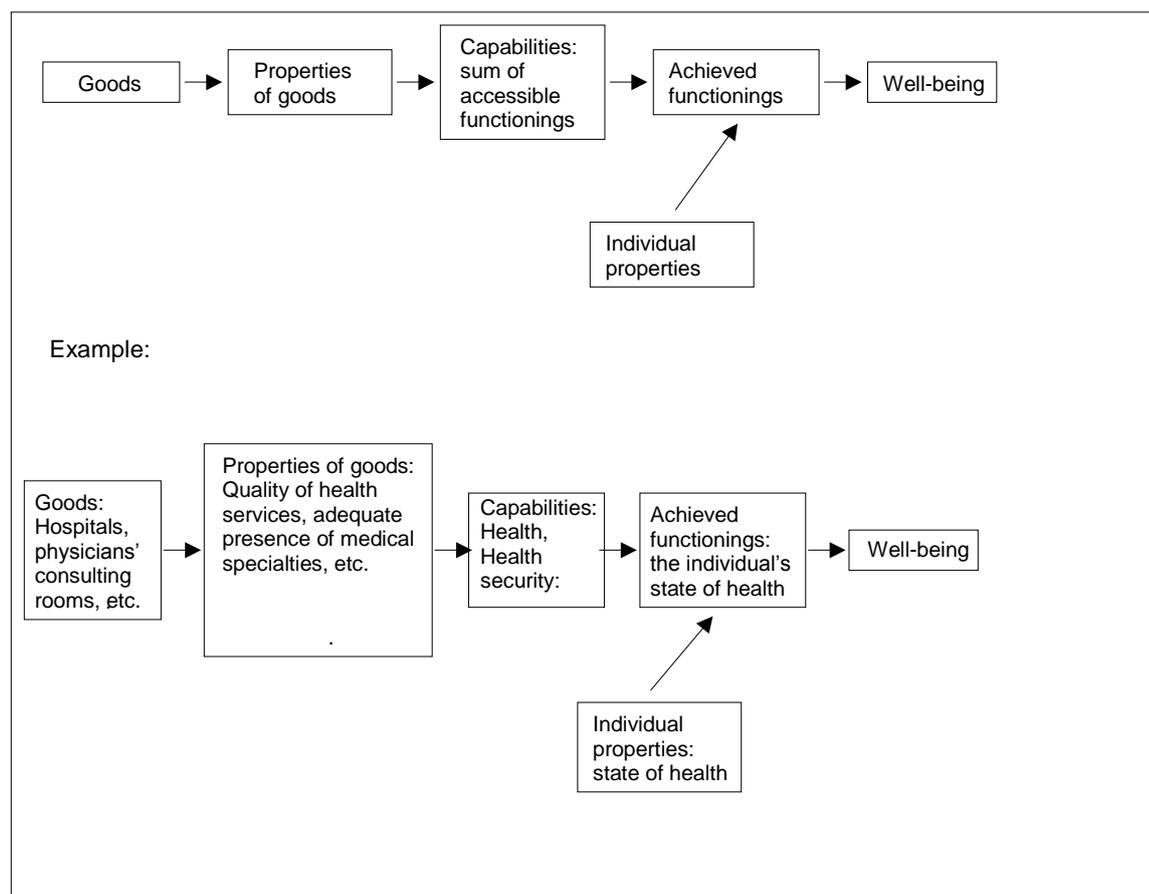
From the methodological viewpoint, Sen develops this theoretical approach, distinguishing two new economic categories formed by “functionings” and “capabilities”. The essential elements of Sen’s theory on well-being (Sen 1985) are formed by the concept of freedom of choice and by the consideration of individuals’ properties. In extremely concise terms, well-being proves to be determined by the *functionings* “activities” through which everyday life *can* assume concrete form, in function of the properties of each individual (ability, capability to translate “goods” into well-being), and by the characteristics of the resources available (suitability to being more or less used to satisfy needs)<sup>2</sup>

A possible schematization of Sen’s theory appears in Figure 1.

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<sup>2</sup> For a thorough handling of the theory of capabilities, see Sen (1985); for the application to agricultural and environmental economic problems, cfr. Bernetti-Casini (1995).

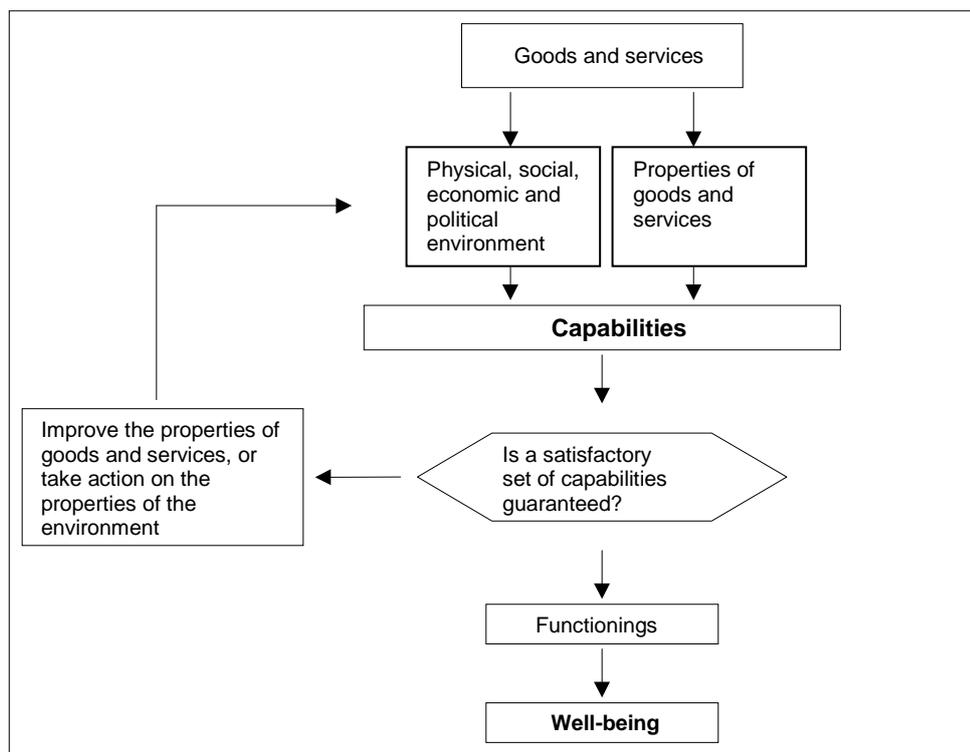
Figure 1. Schematization of the theory of capabilities (reformulated by Desai 1995)



The application of Sen's theory for specific evaluations of well-being presents numerous problems. Desai has advanced a very important proposal to implement a measurement of well-being on the basis of Sen's capabilities approach (1995). The most important points of this proposal are the importance of the socioeconomic and political environment in connoting the properties of both the commodities and the individual as pertains to his capability to employ these resources to carry on his life, and the definition of a minimum set of *capabilities* that the concept of well-being can be traced back to in any society. While the use of resources indeed depends on the physical-social-cultural-political context, it is very likely that we can define a set of capabilities where all of the different means of practically realising the functionings, and therefore human life, can be summarised.

Successively, to know if and which individuals possess a set of satisfactory capabilities, it is necessary to determine the individual's properties and the properties of goods, as well as the characteristics of the environment in which they live and thus exercise their possibility to select their functionings. The essence of the public decision-making process as pertains to well-being becomes the comparison between the resources required to satisfy minimum levels of identified *capabilities* and the resources necessary to define where and how to intervene. A diagram implementing the theory of functionings to problems in evaluating the ambit of public decision appears in Figure 2, resulting from an adaptation of the diagram originally proposed by Desai.

Figure 2. Diagram implementing the theory of capabilities to problems of evaluation in the ambit of public decision (Desai 1995).



As for the problem of identifying capacities in operation, Desai's interpretation of Sen leads to defining the following 4 propositions (Desai, 1995, p. 190)<sup>3</sup>

- a) the set of capabilities must be common to all of the individuals (and to all of the societies)
- b) these capabilities must be co-achievable (which is tantamount to a hypothesis of a total non-compensatory nature)
- c) the guaranteed capability level can be different for different societies
- d) a small number of capabilities can support a large number of functionings, but the number of functionings achieved is determined by the available resources; an increase in the quality of life can thus be measured by the largest set of current and possible functionings made possibly by the increase of public and private resources.

These four propositions presume a minimum set in the area of capabilities, which considers an unlimited number of functionings and permits the adoption of a relativistic position in the area of goods and resources.

In view of making the evaluation of the quality of life possible, even for realities that are "environmentally" very different from one another, Desai proposes the following capabilities that can universally be recognised as constitutive elements of well-being:

- a) capability of having a long and enjoyable life
- b) capability of assured (biological) reproduction
- c) capability of having good health

<sup>3</sup> The translation and the phrases in parentheses are by the authors.

- d) capability of having social interactions
- e) capability of having information, freedom of expression and of thought.

These can in turn be summarised in two categories

- I – Capability to have good health inasmuch as correlated to life expectancy and reproduction;
- II – Capability of having information, leisure, and social and cultural interaction.

With this approach, the problem thus shifts from the *capabilities* to their levels of minimum satisfaction for the societies considered and to the quantification/evaluation of the corresponding necessary supply of resources. Once the capabilities have been specified, it is necessary to identify the rules and practises for identifying the minimal quantity of goods and services that must be guaranteed, so as to ensure a satisfactory level of capability that permits individuals to implement the different functionings. What determines, however, the degree to which these capabilities must be satisfied? In other words, what determines the set of alternative functionings that these capabilities must cover? For Desai, this depends on the characteristics of the society in which one operates, and on the social problem confronted.

Bringing the theoretical analysis to the level of the municipalities of Tuscany, the problem is no longer so much that of defining minimum thresholds in Desai's sense so that there be a *standard of living*, but instead of evaluating the different level of satisfaction of these *capabilities*. This problem can be broken down into the following analysis phases: defining the functionings that determine each capability, the same for all of the municipalities insofar as homogeneous from the viewpoint of the physical-social-cultural-political context; defining the indicators for these functionings based on the supply of the available resources.

Applying the theoretical picture we have illustrated to evaluate well-being on the territorial level means overcoming numerous practical problems. The first of these is certainly that of the availability of adequate statistical data: official statistics are almost exclusively aimed at collecting information on the current availability of goods and/or their consumption, and not on their potential uses and therefore on the *capabilities* of individuals. This implies considerable problems in application, connected to the difficulty of transforming information on commodities into terms of real or potential *functionings*. On the territorial level, for example, the availability of social services for a certain group of individuals, and thus their *capabilities* in terms of education, health service, etc., certainly depends on the existence of corresponding structures, but this existence must necessarily be mediated by the concept of distance, so that the real characteristics of usability of the service can emerge and thus obtain a real indicator of *capability*.

Another peculiar property of the territorial ambit is geographic localisation based on precise administrative ambits and thus ambits of operation (municipalities, provinces, regions, etc.). Given the purpose of information to guide the political action with respect to the properties and the accessibility of the public good (and therefore to the functioning's realisation), the entirety of the states of well-being that must be compared and evaluated must coincide with the administrative ambits on the territory, with inevitable problems of "mediating" the data available for all of the individuals residing there.

Again on a territorial level and based on the social, economic and cultural conditions present, it will be necessary to define an ideal minimum level of accessibility to the functionings

which makes it possible to achieve a satisfactory state of well-being even for the weakest strata of the population, and serves as a guide to political action.

Finally, to improve the quality of the information supplied, the various functionings can be hierarchized into *essential* for the achievement of a minimum level of well-being (cfr. Chiappero Martinetti 1995 and Desai 1995) and *accessory*, mostly referred to cultural and leisure satisfaction, personal tranquillity and interpersonal relations (cfr. Sen, 1985, Bernetti and Casini, 1995). While the methodological solution adopted identifies a universally valid minimum set of capabilities without distinguishing the importance of each of these, the entirety of the functionings that determines the satisfaction of each capability can embrace functionings of different relative importance.

With this premise, a possible methodological diagram for the application of Sen's theory to the territorial ambit could be the following.

1. Identification and hierarchization of functionings into:

- Level I. *Essential functionings (and related commodities)*, for which the attainment of a minimum level of satisfaction is fundamental (nutrition, health, etc.);
- Level II. *Accessory functionings (and related commodities)* which contribute to attaining high levels of well-being, only subordinate to the attainment of satisfactory levels of the essential functionings.

2. Identification of the *properties* of the single territorial ambits that most influence the achievement of the functionings.

3. Construction of a battery of indicators capable of representing the achievement of functionings with respect to the territorial *properties*.

4. Identification of a method to evaluate the sets of capabilities for each territorial-administrative ambit of reference.

#### 4.1 Sets of functionings

In view of obtaining an evaluation of the well-being of the municipalities of Tuscany in the previously specified sense, it was considered advisable to identify subcategories or, more precisely, sets of *functionings* for each of the two previously defined *capabilities*, which would enable summarising all of the possible *functionings* into several aggregates logically and operatively referable to the information on the available resources. 9 sets of important *functionings* were thus identified (Table 1).

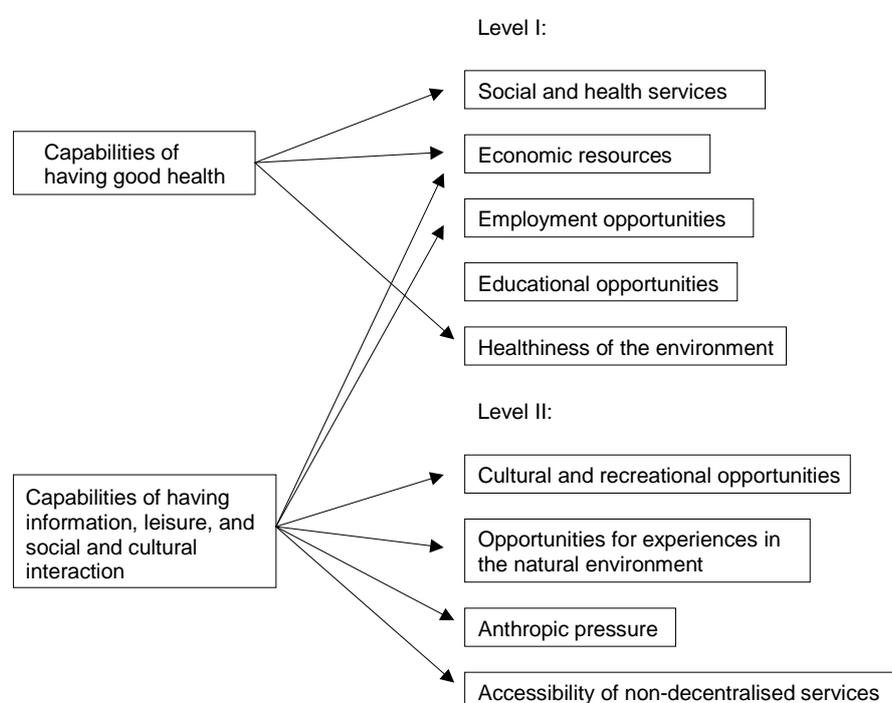
Table 1: *Functionings identified for the region of Tuscany*

<b>Level I:</b>	<b>Level II:</b>
Social and health services	Cultural and recreational opportunities
Education	Opportunities for experiences in the natural environment
Healthiness of the environment	Functionings inversely correlated to anthropic pressure
Economic resources	Other functionings determined by non-decentralised services
Employment opportunities	

These are not all of the sets that could be considered to evaluate well-being, but only those that on the examined level of territorial analysis proved important to point out the well-being differentials. For example, the set we could define as “social security”, which concerns the possibility to perform activities without incurring in risks tied to crime, is certainly essential for an absolute evaluation of well-being. On the level of the municipalities of Tuscany, however, it did not appear to be a sufficiently selective discriminating indicator to evaluate relative well-being, which instead represents the specific objective of our analysis. Paragraphs 1.3.1 and the following will provide detailed descriptions of single sets of functionings, with an analysis of the specific components considered and of the exact connotations attributed to each of these.

The classes considered are connected to Desai’s two fundamental capabilities as illustrated in Figure 3.

Figure 3. Capabilities and functions according to the proposed scheme



For each of the sets of functionings considered, we then evaluated the degree of satisfaction by means of analysing the available resources. These resources were determined starting from the *commodities*: goods and services necessary for the realisation of the various functionings, to then consider the different levels of resource usability through the determination of the so-called properties. A schematization of the work conducted appears in Table 2.

Table 2. Construction schema of the sets of functionings

(1)	(2)	(3)	(4)		(5)
<b>Sets <math>k</math> of Functionings of level I (<math>1=1</math>)</b>	<b>Commodities <math>x_i</math></b>	<b>Properties</b>	<b>extension usability</b>	<b>of area of</b>	<b>area consistence function <math>A(.)</math></b>
Social and health services	workers of the health	$C^k(x^k, d_i)$	10	30	max value

	services L.U.				
Economic resources	available income of resident population in '93	$C^k(x_i)$			
Employment opportunities	unemployment rate in '90	$C^k(x_i)$			
Education opportunities	no. L.U. for secondary education	$C^k(x^k, d_i)$	10	30	additive
Healthiness of the environment	workers in industrial activities expressed in Population Equivalent (P.E.) and residents per square kilometre surface area	$C^k(x^k, d_i)$	0		max value

of level II (1=2)					
Cultural and recreational opportunities	no. L.U. for production and distribution of <b>cinema and video</b> ( $r^1$ )	$C^k(x^k, d_i)$	5	20	Additive
	no. L.U. <i>libraries, archives, museums, etc.</i> ( $r^2$ )	$C^k(x^k, d_i)$	5	20	Additive
	no. L.U. <i>Sports activities</i> ( $r^3$ )	$C^k(x^k, d_i)$	5	10	Additive
Recreational opportunities "in the open air"	no. areas of environmental importance	$C^k(x^k, d_i)$		20	additive
Anthropic pressure	sq. km. per inhabitant	$C^k(x_i)$			
Accessibility of non-decentralised services	distance from municipalities with resident population > 50,000	$C^k(x_i)$			
Accessibility of the territory	road typologies present	$C^k(x_i)$			

Finally, it is advisable to note that the sets considered and, especially, the indicators of the resources and their properties, certainly do not lay claim at representing a comprehensive set of elements useful for defining the conditions of local well-being. They are instead an exemplification of the methodology adopted: other and more numerous elements, even with a greater detail than that of the municipality, could certainly lead to a more precise description of the different conditions of local well-being in Tuscany. We feel, however, that the aspects considered are capable of supplying interesting information on the quality of life in the municipalities of Tuscany, and that therefore, in and of themselves, they can constitute a sufficient element of reflection for a closer analysis of rural development.

## 4.2 Commodities, properties and indicators of functionings

Having defined the *area of evaluation*, the next step consists of quantifying the various *objects of value* selected and then in possibly defining an appropriate *system of values*. In this paper, this final phase was not carried out by defining a veritable function of social well-being of a deterministic type, but instead by employing a methodology based on membership functions of a fuzzy type. We thereby do not achieve an attribution of value, but instead, a quantification of the degree of truth of certain judgements such as: the level of available resources guarantees (does not guarantee) a good level of *capabilities* satisfaction; municipality  $x$  has (does not have) a level of well-being higher than municipality  $y$ .

As far as the quantification of goods and services is concerned, in the specific case considered, it was necessary to confront the usual problems of the inadequacy of statistical information with respect to the Sen formulation of well-being. The solutions adopted must therefore be interpreted as the best compromises between theoretically necessary information and available data. The fundamental simplification adopted was that of using statistical indicators available on the municipality level and representative of the *commodities* necessary for their realisation (Tab. 2, col. 2), as *proxies* of the sets of *functionings* selected. So it is, for example, that the *functionings* tied to the health service have been quantified by means of the number of workers employed in these services on the territory, while for education, reference is made to the number of Local Units. From the theoretical viewpoint, the use of indicators of the *potential functionings* aggregated on the municipality level entails the impossibility to refer to the different individual functions which translate the *commodities* into *functionings*. Though keeping the analysis on the territorial level, it would have been necessary to be able to at least distinguish different social groups in relation to their different functions, distinguishing, for example, the population on the basis of social class, cultural level, age, etc. Indeed, the real availability of a *functioning* depends not only on the existence of certain goods and services, but also on the individual properties of the potential users: for some *functionings*, the most immediate example of the poor and the elderly are likely to have translation functions which differ from those of the rich and the young. Unfortunately, however, the unavailability of data on the municipality level capable of defining the different social groups for each *functioning* (categories with higher levels of health service per level of income, etc.) has made it necessary to operate referencing the so-called average individual, with all of the inevitable distortions that this implies. In the attempt to attenuate the distortional effects of this solution, especially in terms of objectivity, the construction phases and their “evaluation” in the sense specified earlier have referenced the weakest strata of the population, thus considering the level of satisfaction of the resources from their perspective.

In the case that the  $k$ -*mo* set of *functionings* related to the resident population in a certain municipality can be traced back exclusively to  $x^k$  *commodities* found in the same  $i$ -*mo* municipality (for example, the per capita available income), the quantification of the *capabilities* and, before them, of the properties derives directly from the physical dimension of the *commodities* sampled in each administrative unit:

$$C^k(x_i^k) = x_i$$

For some sets of *functionings*, it was instead necessary to consider not only the *commodities* present in the municipality considered, but also those available in other municipalities within a certain distance, as in the case of the *functionings* related to the social

services and environmental healthiness. The analysis is thus extended to a *basin of usability*, that is to say to the set of  $j$ - $mi$  municipalities, near the  $i$ - $mo$  municipality, whose commodities, like those of the same  $i$ - $mo$  municipality, impact on the functionings of the resident population in the  $i$ - $mo$  municipality. Therefore, the set of *commodities* available for the inhabitants of the  $i$ - $mo$  municipality will ensue from the aggregation of all of the related *commodities* present in the basin of usability.

In order to define the *potential functionings* of the residents in municipality  $i$ - $mo$  who depend on the *commodities* present in the other municipalities  $j$ , however, it is necessary to consider the different degree of usability of the *commodities* in function of their distance. In other words, it is necessary to define a function of the *properties*, in the Sen sense, of the *commodities*<sup>4</sup>, so as to reckon the different role that a resource has in relation to its possibility to be translated into real *functionings*. In the case in point, the function that translates the *commodities* into *properties*  $C(.)$  has been formalised as follows:

$$C^k(\mathbf{x}^k, \mathbf{d}_i) = A[c^k(\mathbf{x}^k, \mathbf{d}_i)]$$

where  $\mathbf{x}$  is the vector of the *commodities* present in the  $n$  municipalities related to the  $k$ - $mo$  set of functionings;  $\mathbf{d}$  is the vector of the distances of all the municipalities  $j$  from the municipality  $i$ - $mo$ ;  $c^k(.)$  is the function that translates the *commodities* present in the municipalities  $j$  in terms of usability for the inhabitants of the municipality  $i$ - $mo$ ;  $A(.)$  is the aggregation function that makes it possible to quantify the *properties* of the *commodities* available to the population of the municipality  $i$ - $mo$  to achieve a given set of *functionings*.

The definition of the *basins of usability* unfolded in two distinct phases.

The first phase consists in determining the road distances between the municipalities of Tuscany. As this data is not available, we proceeded to estimate them, first of all calculating the Euclidean distances on the basis of the geographic coordinates of each municipality's administrative headquarters deduced from the Geographic Information System. These distances were then approximated to the road distances, considering coefficients  $\alpha_i$  of conversion. These coefficients which differ for plain, hill and mountain areas were determined through a regression between known road distances and Euclidean distances, for three samples of municipalities situated on the plain, in the hills and in the mountains, for a total of 200 observations<sup>5</sup>.

The second phase for defining the *basins of usability* consists in identifying the set of municipalities with a value  $d_i$  lower than a certain threshold  $d_{mas}$ , considered as the maximum distance within which the service can be enjoyed.

For each service considered, it is therefore possible to define a *municipality dimension*,  $x_i$ , represented by the entirety of the L.U.s or of their related workers, existing in the municipality  $i$ - $mo$ . According to Sen's theory of *well-being*, it is necessary to distinguish the

<sup>4</sup> According to Sen's theory of *well-being*, it is necessary to distinguish *commodities* (goods and services) from their *properties*, that is to say from the "various desirable properties of the commodities in question" (Sen 1985, p. 9), inasmuch as it is precisely these properties that determine the potential functionings associable to the various *commodities*.

<sup>5</sup> The regressions carried out proved to be extremely significant, and always presented an  $R^2$  higher than 95%.

*commodities* (goods and services) from their *properties*, that is to say from the “*various desirable properties of the commodities in question*” (Sen 1985, p. 9), inasmuch as it is precisely these properties that determine the potential functionings that can be associated to the various *commodities*. In this sense, the municipality dimensions of the service have been converted into terms of *properties*, considering the different degree of usability possessed by service structures located at different distances from the municipality *i*-mo of reference. The function  $c(x_i, d_{ij})$  thus identifies the properties of the service present in the municipality *j*-mo, available for the inhabitants of the municipality *i*-mo. This function will therefore be equal to  $x_i$  if the distance between the municipality *i*-mo ( $i=1, \dots, 287$ ) and the municipality *j*-mo ( $j=1, \dots, 287$ ) where the service,  $d_{ij}$  is situated, is less than  $d_{min}$ , equal to zero for the services situated outside of the basin of usability ( $d_{ij} > d_{max}$ ), and assumes values between 1 and 0 for the intermediate cases:

$$c(x_i, d_{ij}) = \begin{cases} x_i & \text{se } d_i \leq d_{min} \\ x_i \cdot \left[ 1 - \left( \frac{d_i - d_{min}}{d_{max} - d_{min}} \right) \right] & \text{se } d_{min} < d_i < d_{max} \\ 0 & \text{se } d_i \geq d_{max} \end{cases}$$

With this function we therefore consider the resident population of municipality *i*-mo as having a full usability of the *commodities* of municipality *j*-mo,  $x_j^k$ , if the distance between the two municipalities,  $d_{ij}$ , is lower than or equal to a threshold distance  $d_{min}^k$ , considered by no means capable of compromising the realisation of the set *k* of *functionings*. On the contrary, for  $d_{ij} > d_{max}^k$  the *commodities* present in the municipality *j*-mo prove to be totally unusable by the residents of the municipality *i*-mo. For intermediate values of  $d_{ij}$ , the quantification of the properties of the *commodities* is correct in accordance with a linear function, where the entity of the *commodities* is reduced in a manner directly proportional to the distance. Therefore, the threshold  $d_{max}^k$  identifies a *basin of usability*, that is to say a set of municipalities, *j*, with *commodities* capable of impacting on the level of *capabilities* related to the population of the municipality *i*-mo.

The entity of the *properties* available for the municipality *i*-mo is finally given by the aggregation function,  $A^k$ , of the individual  $c^k(x_j^k, d_{ij})$  selected for the set of *functionings* *k*-mo. More exactly, we felt it necessary to adopt two different forms of aggregation. The additive function

$$C^k(\mathbf{x}^k, \mathbf{d}_i) = \sum_{j=1}^{n=287} c^k(x_j^k, d_{ij}) \quad (i = 1, \dots, 287)$$

was employed in the case when the potential *functionings* available to the population depend directly on the overall entity of the *commodities*, corrected in function of the distances, present in a certain basin of usability (i.e. the sets of *functionings* related to education, recreational and cultural activities).

The function of maximum value,

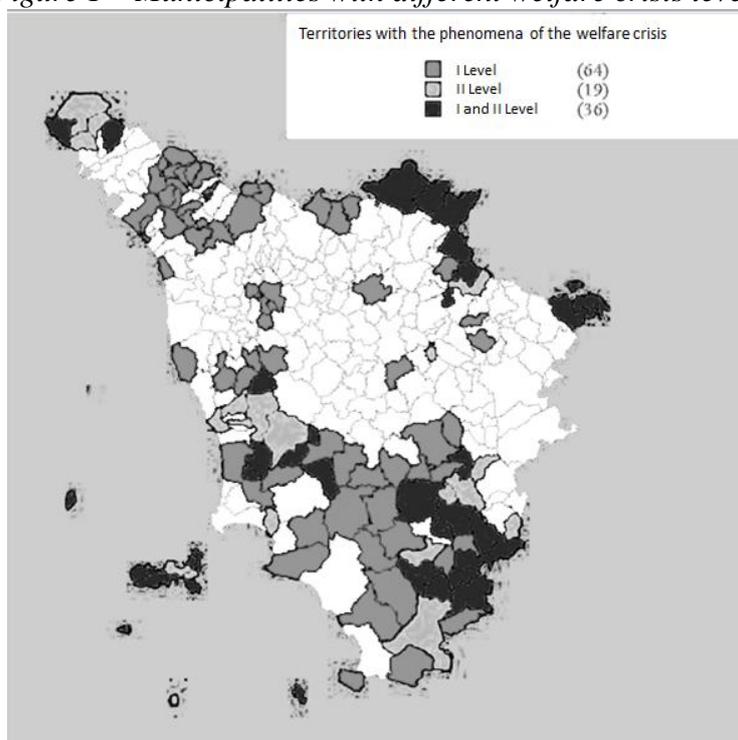
$$C^k(\mathbf{x}^k, \mathbf{d}_i) = \text{Max}[c^k(x_j^k, d_{ij})] \quad (i, j = 1, \dots, 287)$$

was instead employed when the practicability of the *functionings* is determined by the maximum value of the *properties* present in a certain basin of usability: for example, for the possibility to receive adequate treatment, the presence in the basin of usability of a hospital structure of large dimensions is preponderant for identifying the potential functionings.

The final passage from *properties* to *potential functionings* or *capabilities* occurred using a function capable of identifying, with respect to the context of Tuscany, the presence of *capabilities* fully satisfactory, unsatisfactory or of an intermediate level, in relation to the availability of *commodities*.

The overall results of the evaluation appear in Figure 1 which points out the municipalities with unsatisfactory levels of well-being, distinguished for insufficiency of functionings of the first or second level or of both.

Figure 1 – Municipalities with different welfare crisis levels



Accepting this methodology of evaluation in the rural areas identified, the policies of rural development should, first of all, aim at removing/attenuating the components that determine these conditions of a low quality of life.

## 5. Conclusions

In many areas of the European Union, and in Italy in particular, for many decades now the agricultural sector has witnessed a progressive contraction in terms of surface area as well as of workers, and this despite very important policies of support. Today, the social function of agriculture has profoundly changed compared to the functions it had at the beginning of the CAP, but it continues to remain fundamental for the well-being of society.

The new approach of CAP reform intends to promote an increasingly more competitive agriculture that is also sustainable and multifunctional, capable also of providing the production of the public goods that society requires.

Following a brief introduction on the concept of multifunctionality and on the economic theory that should guide the public intervention in the sector, this paper illustrates the results of a study on successful multifunctional enterprises in Italy in order to verify the possible existence of a model of multifunctional agriculture capable of offering a real alternative of development for many rural areas that, for various factors, can not prove competitive from the purely market viewpoint.

The analysis of the case studies has pointed out that the key factor of success, but also of the continuation of activities, consists in the quality of life. This also explains the reasons for the inefficiency of the past tools of support for rural development in many areas, and introduces the theme of the most appropriate tools of intervention to adopt also in the second CAP pillar, that of the provisions for rural development.

A first indispensable element to be able to proceed in this direction, however, is precisely the proper comprehension of the concept of quality of life and of its elementary components.

The final part of the paper proposes a methodology to evaluate the quality of life in the rural municipalities of Tuscany, based on A. Sen's theory of capabilities.

The results obtained appear convincing and, in any event, make it possible to identify a series of fundamental components that are unavoidable in order to guarantee adequate conditions of well-being, and thus can be the object of verification and improvement, employing adequate instruments of public policy, which are not necessarily only agricultural.

Defining the objectives of the primary sector in the EU for the near future, along with the agricultural models to target, are fundamental passages to properly structure the next CAP. In this picture, multifunctional agriculture can play an important role. Likewise, the quality of life in rural areas must represent the substratum that must be guaranteed, so that the other tools for rural development can express the maximum potentials.

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