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Local sustainable development and well-being/quality of life. An application of the capability approach at regional level

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Abstract

This paper has a twofold aim: the former is to focus on the concept of well-being/quality of life and its relationships with local sustainable development and the latter is to apply the capability approach at regional level. More specifically, one wants to analyse if sustainable development at a local level serves to better understand both the formation of well-being and/or quality of life. The instrument which will allow us to verify the operational value of the capability approach is the building of a multidimensional synthetic index of sustainability. This index will consists of aggregating a set of variables of different nature – from the socio-economic to the environmental ones. It may be considered an alternative to the conventional indices, which are normally founded on GDP, and will be applied to the Italian regions. After having standardised each variable so to make them homogeneous, the methodology proposed, which will allow us to gather and compare the Italian regions according to the higher or lower level of quality of life, is the Wroclaw's Economic School taxonomic method. The results obtained may represent an information tool for targeting and zoning sustainable development measures which aim at improving well-being/quality of life at a local level.

1. Introduction

The topic of this paper is to examine the relationships between local sustainable development and well-being/quality of life, i.e. to verify if sustainable development at a local level helps to better understand the formation of well-being. This issue will be addressed both at theoretical and operational levels through the building of a multidimensional synthetic index.

In order to evaluate these relationships at a local level, it is important to insert them into a wider view. Therefore, some preliminary considerations may be useful in order to understand what we intend to carry out.

In a first place, we should point out that we are dealing with a multidimensional conception of individual and social well-being. More specifically, with reference to social well-being, the measure of the level of well-being of a community and the implementation of the policies aimed to increase it depend on the judgments of value which characterize the shape of this function, i.e. the map of the rights on which the examined society is founded. As regards as individual well-being, it is determined by the satisfaction of a multiplicity of needs which is not always linked to the availability of economic resources. In other words, economists have today a greater consciousness that the relationship between well-being and productive capacities is not as direct and positive as it was considered before. At the same time, it was recently shown that the availability and intensity of resources does not paradoxically guarantee high levels of human development (Bulte, Damania and Deacon, 2005).

Secondly, when one addresses any kind of political economy issue inspired to sustainable development principle, one has to formalize the concept itself of quality of life or standard of living, which implies that of the definition of "*function of social well-being*" as a decision making foundation of the planning's operative models. Broadly speaking, well-being is used to indicate quality of life not only with reference to well-being of the single individual, who is the first keeper of feelings and perceptions, but also, and especially, with regard to the social one (Dasgupta, 2001).

In a third place, in order to specify the nature of the relationship between local development and well-being, a view of sustainable development, which is wider than the mere environmental protection, has to be taken into account. Development is sustainable, in the acceptation used here, when it includes quality of life, equity among generations and social and ethical dimensions of human well-being. Furthermore, sustainable development may be conceived as a relevant component of human development in the sense of a higher level of environmental well-being which translates itself, jointly to other factors, into a higher level of quality of life.

The paper is divided into six sections. The first section presents a critical review of the main theories of well-being, starting from the utilitarian/welfarist and opulence theories to the basic needs approach. The second one explains the framework of the capability approach with all its main categories of *functionings*, *capabilities* and *freedom* and the conception of well-being in Sen's view. The third section focuses on the definitions of local sustainable development and, more specifically, on the relationships between local

sustainable development and well-being/quality of life. The fourth section deals with the principles of how to build the empirical index (main problems, aggregating of different units, etc…). Furthermore, it presents the data, (i.e., the variables, the regions and the years taken into consideration) and it ends up with the formula of the new multidimensional synthetic index. The fifth one shows the results obtained from the methodology used. In order to improve the implementation of sustainable development at local level, the conclusions outline some policy implications on the grounds of the results achieved.

2. A critical review of the main theories of well-being preceding the capability approach

2.1. The utilitarian/welfarist and the opulence approaches

In order to fully comprehend the concept of well-being and to critically examine the relationship between local sustainable development and well-being, we cannot avoid referring briefly to the evolution of the concept of well-being. This concept is the logic assumption on which the capability approach is based. Therefore, the discussion presented in this section aims at critically explaining the theories of well-being which have preceded the capability approach. Analysing these theories is an useful operation because, as we will see, the concept of well-being assumes all another significance in comparison, to the utilitarian approach.

We should however note that, if on the one hand, ideas about well-being are taken into account in discussions concerning "the good life" and "the good society", which are external concepts to the traditional economic science which aims instead at maximizing social well-being through the efficient resources use, on the other hand, economists did not focus very much on the idea of well-being itself. For example, Pigou prefers stressing on economic welfare, since the concept of well-being is a very broad concept characterized by a money measure both of satisfactions and dissatisfactions (Dodds, 1997, p. 97). Also recent literature discusses factors which have an impact on social well-being, but without much investigating the concepts underlying this term. Theories of well-being do not exclusively relate to economics science, but range from political philosophy to psychology. However, to the aims of this work, we will focus our attention only on the currents of thought which are more linked to economic science.

The first approach to well-being is the classical utilitarian theory or Welfare Economics proposed by Bentham and Pigou who identify well-being, or better to say welfare,[1] with the level of utility[2]. This can be considered, according to one of the different acceptations, i.e. satisfaction, happiness, objective to maximize in the functions of choice. From this perspective, welfare which is considered as a "state of mind" is synonymous with happiness (ibidem). Those emphasising well-being as a state of mind generally use survey techniques to deduce people's assessment of their happiness or life satisfaction. One of the economists who draw on surveys techniques is Scitovsky. But it is interesting to note how his argument contradicts the common utilitarian assumption which let identify welfare with happiness[3]. Scitovsky, pointing out the difference between pleasure and comfort, discusses the relationship between income and happiness. If the experience of pleasure is related to a change in one's level comfort, he asks himself if an increase of income does imply an enhancement of happiness. An increase in the level of income seems, according to the traditional belief, to enhance the level of happiness of the human beings. However, while data on income are available, happiness cannot be measured, even if data exist on how people rate their own happiness. According to Scitovsky, some surveys showed that the majority of people are satisfied with a rising income. In a long period of rising incomes the same surveys have shown that people are no longer satisfied. Therefore, he suggests that these situations give rise to the paradox of development: economic and technological advances allow a comfortable life where human beings are able to enjoy comforts, but at the same time they make pleasure, and so happiness, more difficult to obtain (Scitovsky, 1976, pp. 133-140).

We have to note that, although the previous Scitovsky's considerations on the concept of well-being could be a digression on the topic of utilitarianism, we have thought that it was opportune to refer to them as welfare not being identified with happiness, could constitute a premise of the capability approach. Since our aim is to analyse not only individual but also social well-being, we cannot avoid referring to the individual and social welfare according to the welfarist theory.

[1] Welfare and well-being are two different concepts and a definition of both terms is here useful. We refer to welfare as the value that a person attributes to his/her conditions (goods and services which belong to a person, his/her personal relationships etc...) in a determined social situation. Furthermore, welfare is often considered synonymous with utility. Well-being is a concept wider than welfare because it includes non-welfare characteristics of the social situations (such as the rights that a person enjoys, the importance of human rights in the collective life, etc…). It is clear that these characteristics should be taken into account when measuring social well-being. However, it should be observed that since the concept of social well-being implies a procedure of aggregation, human rights may not be easily counted. (Dasgupta, 2001). Given that the utilitarian theory accepts the former acceptation of the term, welfare will be preferably used when dealing with this theory although the term well-being or welfare is often used indistinctly , while, as it is well-known, the capability approach accepts the latter meaning.

[2] We use indistinctly both terms in this context (except when we talk about merit goods) even if welfare does not always coincide with utility. As for these cases, see (Ng, 1983, pp.7-10).

Above all, it should be stated that in utilitarian theory maximizing the total happiness of all human beings implies that resources and opportunities should be directed to those who derive the most pleasure from them. In other words, "total happiness is likely to be maximized by a roughly equal distribution of resources within a community" (Dodds, 1997, p. 98).

With regards to social welfare, welfare economics allows to state whether social welfare in one economic situation is higher or lower than in another. This statement does not diverge from Mishan's one according to which "theoretical welfare economics is […] that branch of study which endeavors to formulate propositions by which we may rank, on the scale of better or worse, alternative economic situations open to society" (Mishan, 1960, p. 13).

In order to better understand both the concepts of individual and social welfares, some formal equations are, on this purpose, appropriate. Following Ng (1983), two definitions are taken here into consideration. The first is an individualistic Bergson's social welfare function (SWF) according to which social welfare can be defined as a vector of individual welfares:

$$W^i = f(W^1, W^2, \ldots, W^I) \qquad (1)$$

where W^i is the welfare of the individual i and I is the relevant number of individuals. In this context, if individual welfare may be considered as an individual's happiness, one may ask how the individual's (net) happiness is measured. This difficulty can be overcome if we assume that an individual is the best judge of his welfare and that he maximizes his own welfare (in the sense that whenever he prefers x to y he is assumed to be happier at x than at y). Accordingly, his utility function becomes an ordinal indicator of his welfare.

The second interpretation defines social welfare as a vector of individual (ordinal) utilities. The equation is the following: $W = f(U^1, U^2, \ldots U^I)$, where U^1 is a utility function representing the ordinal preference of individual i. According to this equation, if we define "social welfare as a vector of individual welfares or (utilities), we say that social welfare increases if and only if W^i (or U^i) increases for some i and decreases for no i" (Ng, 1983, p. 3). In other words, the increase in welfare for some individuals and the decrease for some other have an effect which cannot be easily calculated in terms of quantity and sign on the change in social welfare.

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[3] On this purpose, we can refer to the theory proposed by Hirsh (1977) who introduces us to the matter of the positional goods and Mishan's argument on the doubts of measuring the welfare of a society with the per capita income, which himself defines "an economic delusion" (Mishan,

The vector concept of social welfare does not distance itself much from the concept of a Paretian SWF. The Pareto criterion says that social welfare increases if some individuals are better off without any individual being made worse off. Consequently, increase in some of W^i (or U^i) and decrease in no W^i (or U^i) is a sufficient but not necessary condition for an increase in social welfare. The Paretian condition is as follows :

$$\delta f/\delta W^i > 0 \text{ for all i} \quad (2) \text{ (ibidem, p. 2)}$$

This condition makes the equation (*I*) Paretian. The impossibility of making interpersonal comparison of welfare or utility makes the vector concept of social welfare of limited interest.

According to Bentham, social welfare or "happiness of society" can be defined as the total aggregation of the happiness of each individual in society. The equation is as follows:

$$W = W^1 + W^2 + \ldots + W^I = \sum_{i=I}^{I} W^i \quad (3)$$

where W is the total welfare given by the welfare of each individual W^i (Little, 1958).

This equation presents the advantage in comparison with the previous ones, that social welfare can be comparable if some W^i increase and some decrease. However, it does not solve the problem of interpersonal comparison of welfare or utility. In fact, since these different types of individual's welfare have to be summed, the utility functions have to be comparable. In order to aggregate individual welfare we need to measure and compare them.

This examination of the formal equations of social and individual welfares allows us to more easily address some of the main criticisms to the utilitarian theory.

According to Bernetti and Casini (1995, p. 5), a first problem to tackle when dealing with the utilitarian theory is the multiplicity of meanings attributed to the term utility and especially their scarce inter-changeability with reference to the specific issue which has to be analysed. But even overcoming this aspect, the limits imposed by the subjectivist intrinsic nature of the solutions proposed in terms of happiness still remain. Furthermore, if, on the one hand, well-being has been defined as a state of mind, on the other hand, this identification has been criticised under a philosophical level. The main philosophical criticism to this theory is that it neglects many aspects of well-being which are not related to the ones of mental state, such as the case of the government which acts according to justice rather than happiness. Therefore, happiness does

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1993, p. 76).

not depend on government but on the responsibility of the citizens. This points out that the utilitarian approach has limited applications to many practical policy issues. For this reason, a descriptive approach to well-being according to which well-being is considered as "a state of the world" is often adopted (Dodds, 1997, pp. 98-99).

A further criticism is that positive and negative sources (such as a beautiful landscape, pollution or crime) are not taken into account in the traditional welfare economics, which instead considers only the set consumable of goods and services (Pressman and Summerfield, 2000).

The search of "more objective indicators" for the evaluation of well-being/quality of life has led to the approach of "opulence". This approach, although being similar to the utilitarian theory, represents a step ahead in comparison with it since opulence surely constitutes a more objective measure than utility. According to the "opulence theory", the level of well-being is assessable in terms possession of goods and services (real income and GDP, as measures of economic well-being, start to spread from it). However, also this theory has its limits. In particular, the opulence approach has been criticized since the concept of well-being, being different, as mentioned above, from welfare, does not only include possessing goods but also other aspects such as, freedom, environmental quality, social opportunities etc…(Bernetti and Casini, 1995, pp. 5-6). These aspects which go beyond possessing goods, will be deeply analysed in the paragraph 3 when dealing with the conception of well-being according to the capability approach.

2.2. The basic needs approach

Before examining the conception of well-being[4] according to the capability approach, we think it is appropriate focussing on the "basic needs approach" (BNA) because unlike the utilitarian and opulence theories, Sen's view about development originates from it. The intellectual foundation of this approach goes back to the Rawls theory of justice[5] (1971). According to Rawls, assuming that there is a multiplicity of conceptions of the good, there can be only a partial agreement on the nature of the good life and society although this implies an overlapping consensus on the means through which these conceptions should be achieved. It follows that the universal access to certain key social institutions deriving from the overlapping

[4] We have referred to the main theories of well-being since their analysis was useful for the aims of this work. However, we cannot neglect just mentioning the satisfaction of preferences approach whose discussion is sent back to Dodds (1997, pp. 99-101).
[5] It should be noted that Rawls does not really identify the BNA with the theory of justice. Rather he argues that social well-being can be maximised through the adoption of processes and institutions (Dodds, 1997, p. 102).

consensus will involve, among the satisfaction of a hierarchic set of needs, the presence of some, such as the basic needs, which are common to all and therefore more important than others. But if, on the one hand, different individuals rank in a different way higher order needs, social well-being may be reduced owing to a strict equality of outcomes, on the other hand. In order to solve this tension, Rawls suggests the "maximin principle" as that principle which approves departures from equality if and only if the well-being of the least well-off in a society is improved by them. (ibidem).

Referring more specifically to the BNA, we can point out that the aim of this approach was to provide a minimum standard to the poorest groups of population. The idea of development underlying this theory had to be linked to a strategy of guaranteeing the basic needs. Individual well-being is therefore evaluated in terms of "*full life state*" (Stewart, 1985, 1989). While, its components, which are identified in the basic needs list (such as health, education, nutrition etc..), are called "indicators of complete life".

In the end of the 70's this theory has been reformulated by Streeten (1979, 1981) and Hicks and Streeten (1979). The last tried to fight poverty through transferring goods and services not only in income, but also and especially in the educational fields and health service. In the 1980's, Sen aimed to develop and expand the BNA (Pressman & Summerfield, 2000).

The BNA contains basically three innovative points. The first one is linked to the fact that it shifts the attention from the economic indicators (GDP or PNL) referred to a whole community to the single individual condition: the aim is to escape that behind these values deep inequalities are kept hidden. The second innovation promoted by the BNA is that, while the theories of growth put in a subaltern position the satisfaction of the basic needs of individuals, economic growth is favoured through the satisfaction of human needs. Furthermore, the policy implemented in order to fight poverty is planned more in terms of goods and services than in terms of income.

It should be noted that also this approach presents some limitations. The main ones regard the same definition of basic needs and the difficulty to set the boundaries between needs and wants. More specifically, if on the one hand, minimum requirements for physical survival can be easily identified, on the other hand, it is more difficult to quantify psychological and social needs. Consequently, the BNA does not provide a guide to the evaluation of well-being in countries with medium - high level of income where the basic needs are guaranteed. (Dodds, 1997, pp. 101-102).

3. The conception of well-being according to the capability approach

In order to reach a "common standard of well-being" (Sen, 1985a), the most productive theory, even if not resolving of all problems linked with a search of a more objective indicator of well-being, is the capability approach or the approach of "freedoms". The capability approach may be considered an alternative theory to the utilitarian approach owing to the fact that human well-being has been moved out of the domain of utility and brought into the domain of the life of human beings. Furthermore, this theory differentiates itself from the utilitarian and the opulence approaches as it implies not only the possession of goods but also, and especially, other elements, such as freedom, equality of social opportunities, safeguard of human rights, environmental quality, etc…

The essential elements of this theory regard the concept of freedom of choice and of the individual characteristics. Individual well-being is evaluated on the basis of two analytical categories: *functionings* and *capabilities*. Functionings are defined as "an achievement of a person: what he or she manages to do or to be" (Sen, 1985a, p. 10). Capabilities are the "freedoms" which every individual has to choose the functionings independently also on their achievements[6]. Functionings and capabilities represent the constitutive elements of well-being (Sen 1985a). An element characterising the capability approach is, therefore, freedom. This conception, which focuses on human freedoms, is an alternative to the traditional views of development. "Development can be seen [...] as a process of expanding the real freedoms that people enjoy" (Sen, 1999, p. 3).

In a multidimensional view of development freedom plays a key role. Basically, this concept of development as freedom follows three important lines of thinking. First of all, "development must be (a) consistent with the demands of social justice, (b) consistent with the demands of human freedom, and (c) concerned with human beings as ends rather than means and with *human* well-being" (Qizilbash, 1996, p. 1209). We should note that one of the relevant factors which mark the separation from the traditional ethical

[6] The achievement represents a corollary in Sen's view as well-being is not directly adequate to the achievements but it is a function of the capabilities. This is even more valid if we consider that freedom of choice is essential as a component of the quality of life (Bazzani, Di Pasquale, Viaggi, Zanni, 2001). Some examples may be useful on this purpose. In a Western country the existence of more opportunities than in a less developed country constitute an indicator of a higher standard of living independently on the implementation of these opportunities by some individuals. Or the availability of natural resources represents an improvement of well-being even if without its effective use (value of existence) (Bernetti and Casini, 1995, pp. 6-7).

theories (utilitarianism or opulence-oriented view[7] and Rawls's theory of justice) is given by freedom. It is directly connected with the quality of life and it assumes a precise content, namely the capability to choose and attain achievements. The differences to the traditional concept of *welfare* and to the *welfarist* theory are evident. The capability to choose and attain achievements is closely linked to the level of *well-being* reached by individuals for the essential reason that individual freedom is a component of *well-being*. The welfarist theory is inadequate in dealing with freedom for two reasons. "First, freedom is concerned with what one *can* do, and not just with what one does do. Second, freedom is concerned with what one can *do*, and not just with what utility that doing leads to" (Sen, 1984, p. 318). Furthermore, while the welfarist theory refers to the situation in which a person achieves a given level of satisfaction of personal desires or preferences, or a determined level of happiness, the level of well-being depends on the individual capability to achieve his/her own aims.

It may seem, from what has been mentioned so far, that Sen focuses more on individual well-being rather than the social one. A deeper interpretation of Sen's well-being shows that the well-being of a person is connected to social well-being and that individual freedom implies social freedom. Sen has afterwards elaborated a new approach to the analysis and measurement of well-being. Well-being, unlike welfare, is a general situation and does not refer to particular acts or events. With reference to "being well", the notion of well-being includes not only material goods, but also values and moral sentiments.

Determining the levels of personal well-being is based on two principal components of the concept of capability: the set of available goods and its set of utilization functions. But when these components are known, how to proceed to their aggregation in order to reach a common standard of well-being? There are considerable difficulties in the evaluation of set of a person's capabilities and Sen is aware of this (Sen, 1985a, p. 51-71). In order to obtain an arrangement of the situations of social well-being, an approach of equity referred to well-being and not to resources could be applied to an index of capabilities instead of an index of utility. For these reasons, the capability approach can be considered not only from the individual's point of view, but also from the social one. It may be considered a first step towards a theory of justice different, as already mentioned before, from the utilitarian approach. This implies that, if the capability

[7] Basically, one limit of the opulence view is that it does not take into account the real opportunities individuals have. In fact, as this approach focuses only on incomes at the aggregative and individual level, it neglects "the plurality of influences that differentiate the real opportunities of people, and implicitly assumes away the variations - related to personal characteristics as well as the social and physical environment - in the possibility of converting the means of income into the ends of good and liveable lives which people have reason to value"(Anand, and Sen, 2000, p. 2031).

approach may go beyond the traditional approaches, it will be necessary to settle up with the problem of evaluating the set of capabilities.

In order to address the problem of evaluating well-being, we can represent a) the person's state of well-being as a vector of functionings from which a person selects some on the basis of the kind of life he/she chooses; the person's capability is instead the set of feasible vectors[8], b) the evaluation of well-being as a function of the capability set of the chosen combination of functionings, considered jointly as two "objects of value"[9], in order not only to formalise the evaluative approach but also to point out the role played by the individual choices. Well-being is therefore represented alternatively either through the level of achievement of relevant functionings or through the set of functionings which can be potentially implemented.

In analytical terms, if f_i is a vector of functionings and Q_i are the capabilities - which depend on the amount of income and the available goods and services (indicated with x_i) as well as on two variables that influence the conversion of individual resources into well-being, represented by a vector of personal characteristics[10] θ_i and by a vector E_i of environmental indicators - the equation of well-being for the individual i, (WB_i) is as follows (Chiappero Martinetti, 1996, p. 39):

$$WB_i = g_i [f_i; Q_i \mid Q_i = h_i (x_i, \theta_i, E_i)] \qquad (4)$$

From this equation, by preferring those components useful to our object of study, it is clear that, the environmental component is included in the quality of life hence in the conception of well-being. It is also relevant to observe that when we refer to the environmental component, we generally link it to the widely discussed and controversial concept of sustainable development[11]. The link between well-being and

[8]Person's capability set has to be interpreted in the sense of person's opportunities to achieve well-being or, using Berlin's terminology, *positive freedom* (Berlin, 1969). This analytical category is incorporated into the notion of well-being, for the simple reason that freedom allows one to achieve well-being. This general idea brings Sen to call the above mentioned incorporation *well-being freedom* (Sen, 1985b).

[9]Objects of value can be identified with a characterization, among the possible functionings, of the *relevant* functionings. These represent the level of well-being satisfactorily. Therefore, in the concept of sustainable development, the *relevant* functionings could constitute the value-objects which satisfy the principles of environmental sustainability, economic efficiency and intergenerational equity.

[10] About the characteristics of the goods it is obligatory to refer to Lancaster (1979). He was the first one to theoretically discuss that utility does not derive from goods but from their characteristics. In terms of Sen's approach, the well-being of a person requires the specification of his capabilities, that is, the functions used which he is able to exercise with a basket of goods. Therefore, a set of function of utilization is associated to each person, everyone of whom specifies a pattern of possible uses of the characteristics of the possessed goods. It follows that the well-being of a person may be explained as the evaluation of the function of utilization adopted corresponding to a given vector of the characteristics of goods. With reference to environmental quality, this is definable if we identify the constitutive characteristics of it. For example, if we take into consideration pollution and degradation, its characteristics are given by better features of the environmental quality of the area in terms of sustainability of the resources (i.e. soil, air and water), while as regards as biodiversity, its characteristics are made up of biological diversity as characteristic of the ecosystems.

[11] Sustainable development is considered in this work according to a broader concept than environmental protection because it includes quality of life, intra and inter-generational equity, social and ethical dimensions of human well-being. The concept of sustainable development is so based on the human development approach, i.e. on that approach which, having an "ethical" dimension (Qizilbash 1996, p. 1209) seeks to put people back at the centre of development.

sustainable development is then straightforward[12] in the sense that a higher level of sustainable development means a higher level of well-being, thus of quality of life[13]. We can deduce that as environmental well-being is a component of quality of life, its improvement may imply a higher level of freedom. Furthermore, the environmental component does not only have the same weight as the social and the economic ones, but is also included in the quality of life through a process of identification of the relationships between the components of natural capital and the quality of life itself. In this sense, the analytical categories of *functionings* and *capabilities* have an instrumental role. In particular, they are used in the evaluation of social well-being according to a methodological process which associates the concept of well-being with different environmental conditions.

The discussion on the relationship between sustainable development and well-being which was above explained, constitutes an introductory note to the next paragraph which will deeply analyse if sustainable development at a local level serves to better understand the formation of quality of life. This wide view of the issue in question can be considered a necessary operation in order to comprehend the local dimension of sustainable development.

4. A discussion on the relationships between local sustainable development and well-being/quality of life.

In this work, the empirical analysis of the relationships between sustainable development at local level and different levels of quality of life has been verified taking into consideration the regional dimension. Local development can be examined at different territorial levels, starting from the single municipality to a homogeneous group of municipalities (such as industrial districts) or to provincial and, lastly, regional levels. In order to point out the differences in local development and quality of life, the reference to the regional

[12] The link between sustainable development and well-being comes from the fact that both of them are considered forward-looking concepts. But, if it is clear, on the one hand, that sustainable development is a forward-looking concept for guaranteeing the needs of present and future generations, it is not as clear, on the other hand, why well-being can be considered a forward looking concept too. The distinction between welfare and well-being may be of some help. While the former is a snap-shot in time concept since it produces only temporary benefits (such as the increase in material wealth which can create only temporary happiness and satisfaction), the latter is a forward-looking concept. The explanation lies in the fact that, when we deal with well-being, we usually think about a lasting development, which should increase the standard of living of present and future generations. To increase well-being means, for example, the possibility to raise the educational level especially in developing countries, to get a more equitable income distribution, to promote human and political rights, to ensure a better environmental quality, etc. All these economic policy actions, differently from the ones deriving from welfare, should last over time and for this reason they are similar to those contained in the sustainable development concept. It is therefore understandable the link between both terms.

[13] It is useful to note that well-being is identified with quality of life according to a conception of human development which we have accepted. This means a desire of improving the quality of life which translates itself into a higher level of well-being. For example, in a developing country, the possibility to raise the educational level, a more equitable income distribution, the promotion of human and political rights and a better environmental quality are all aspects which surely contribute to the improvement of the quality of life. The link between human well-being and quality of life becomes therefore evident.

dimension was a compulsory choice basically for two reasons: a) unavailability of meaningful data, given our object of study, referred to territories which have smaller dimensions than regions; b) an analysis at local level finds its justification if it is supported by a direct research concerning the territory, object of study.

Although local development is often cited as an option within the wider context of regional policy, the concept remains vague and lends itself to different interpretations[14]. According to Coffey and Polèse, local development "refers to a particular form of regional development in which endogenous or local factors play a principal role; thus the term "locally based" development is equally appropriate"(1985, p. 86). Its distinctive element is constituted of the capacity of the local institutional authorities to cooperate in order to start and conduct shared paths of development which mobilize local resources and competences. Following the analytical framework proposed by Olate (2003, p. 18), local level constitutes an integration of three approaches: capabilities at the individual level, social capital at the group and community levels, and institution both at community and local levels, recognizing that connections with global level are essential.

Furthermore, when we discuss about the concept of local development we cannot avoid referring to the term *milieu*. This concept which was suggested from Castells M., wants to indicate the specific common relationships that the individuals who belong to specific local territorial systems, have with a certain local environment, i.e. the *milieu*. Or, as Passet (1994) suggests, the point of contact between the human resource and the territory takes place exactly in the space conceived as "*milieu de vie*" or "*habitat*" according to Karl Polanyi's definition.

Beyond these definitions, two distinct approaches on the concept of local development seem to be interesting. We will only give some generalities because, for the aims of this work, we should basically analyze the relationship between well-being and local sustainable development. Also these approaches emphasize the definition of the term local development and its similarities and differences with regional development. More specifically, in the first approach, called "development of localities" the term «local» indicates any action, event or process which regards an individual territory, i.e. a locality. According to this

[14] The literature usually examines local development but we have added the term *sustainable* in the sense that this kind of development either if it is conceived on a global scale, either on a local one, has to be sustainable i.e. capable to maintain "the important environmental functions into the indefinite future" (Ekins and Simon, 2001, p.5). This means that, in order not to cross certain environmental thresh-holds, it is necessary to fix limits to the anthropogenic impacts on the environment. We also should note that when we talk about local sustainable development , we usually refer to territorial sustainability (Segre, A., 2003). Furthermore, when we refer to sustainable development, we do not only consider environmental sustainability but also social, political and human one. In other words, there is an interrelation among the socio-economic, political and environmental variables. The sustainability problems go further than the environment since, in order to safeguard the welfare possibilities of future generations, there is a need for flexible economic and social system able to resist to the shocks. We are dealing with the so called "multidimensional human development" paradigm which gathers a multiplicity of interacting aspects.

approach, local development becomes a synonymous with regional development, although the former refers to a territory which has a limited dimension. It follows that local development implies the self-development of small regions, i.e. the development of localities. (Coffey and Polèse, 1984, pp. 1-2). With reference to the distinction between a "locality", i.e. local development and regional development, it should be pointed out that the difference is basically "reduced to a difference of degree, according to the size of the area in question, and does not necessarily reflect a difference in the nature of the process. In addition, the territorial limits of that which is "local" (in relation to that which is "regional") will likely vary from author to author and from one country to another" (ibidem). Therefore, the framework of local development so defined is based on the development of micro-regions.

In the second approach, called "development based on local factors", "the term "local" can also indicate an event, action or process, the impetus for which is found principally within the region in question, as opposed to being provided from external areas" (ibidem). According to this acceptation, the adjective "local" can be interpreted as "endogenous" or "native". This view of "local" needs the elaboration of a model which can be applied both to macro-regions and micro-regions. Such concept of local development considered as "native" or "endogenous" may be applied in order to build the multidimensional index. In fact, once we will select the variables, we will not take into consideration a number of different variables which are essential for an absolute evaluation of well-being, but those variables which at the territorial/local level result to be relevant for pointing out the differentials in well-being (Casini, 2000, p. 12).

This reference on the definitions and approaches of local development, allows us to specify the relationship local sustainable development/ well-being.

In a first place, when we deal with the concept of sustainable development, we immediately refer to environmental sustainability and thus to natural capital. For this reason, it may be interesting to see how natural capital contributes to the quality of life of a region. As mentioned above, natural capital contributes to human well-being as a life support system that provides a supply of resources, as a waste receptor and as a provider of amenities and amusement. In order to guarantee natural capital conservation, resources stocks should be kept constant over time. In other words, the stock of renewable resources should not decline over time and depletion of exhaustible resources should be replaced by increases in renewable resources or man-

made capital (assuming substitutability[15]). However, these contributions although have stressed on the idea that natural capital is an important component of human well-being, they do not specify the relationships between the different types of natural capital according to its function in creating environmental services and improvements in the quality of life (Collados and Duane, 1999, p. 446).

From a regional point of view, extraction of resources and pollution going beyond the regeneration capacity of the natural resources impair the ability of natural capital to produce environmental resources. Therefore, we can point out that the contribution of natural capital to the quality of life of a region takes place in two subsidiary ways: 1) by supplying environmental services that cannot be imported; 2) by providing the natural resources that through a production process, become precious to human beings. Through environmental services, natural capital can regenerate itself and the environmental systems which are produced from ecosystems and other components of the regional natural capital, supply life-support life - support functions necessary for natural capital reproduction. The destruction of this natural capital alters the improvement of a quality of life of a region leading to a non-sustainable path of development (ibidem, p. 449).

From what has been mentioned above, we can extrapolate how it is important not to impair natural capital since it surely contributes to the improvement of a quality of life of a region.

This matter seems closely linked to the key issue of this section, i.e. the relationship between local sustainable development and well-being. In other words, we want to verify if sustainable development at a local level serves to better understand both the formation of well-being and/or quality of life. Such matter will be addressed not only at a theoretical level but also at the operational one.

Focusing on the theoretical side, we should address this critical issue starting from an introductory remark. We should be aware of the fact that since the needs of the persons change by time and are different from a place to another, the first step to take is to understand the distinct characteristics (in the Lancaster's sense, i.e. that needs derive from their characteristics) of the people who live in different areas. Owing to

[15] This substitution implies what has been defined as "weak sustainability" or anthropocentric perspective as opposed to the non-anthropocentric perspective or "strong sustainability". According to the anthropocentric view, which dominates the paradigm of sustainable development, a sustainable society, sustainable food production, and sustainable economic development, are related with human well-being. (Shearman, 1990, p. 5). If there is concern about the impact of human activity on environment, this has to be interpreted in the sense that "the environmental impact represents a potential threat to future human viability and therefore involves a question of the moral responsibility of people with respect to other people"(ibidem).

this, the observation of the different dimensions of well-being[16] assumes a more precise meaning and allows more correct evaluations: for example, not necessarily a same level of consumption expresses the same pleasure, such as the presence of the same services expresses an analogous satisfaction, if the people who carry out consumption and use the services are different. But states of dissatisfaction can be created due to the different satisfied needs. In order to improve the existing situation, it is relevant to know not only the level of well-being but also how it forms in its different dimensions pointing out on the one hand, the links among the different dimensions and the difficulties which have some dimensions of well-being to be implemented, on the other hand.

What mentioned above lets us introduce more specifically into the local dimension issue. i.e. one asks himself/herself if it can help to comprehend and solve, in a more circumstantial way, the problems above outlined. Furthermore, the obvious consideration that not only well-being but also its distribution can be analyzed, has in this way overcome. The presence of strong imbalances among people who live close does create both problems of equity and affects the mechanism itself through which the needs are shaped and the degree of satisfaction perceived.

Generally speaking, the critical point is if the level and the process of well-being can be better understood through the local dimension. The reference to the local dimension allows to consider the similarities and the homogeneities which come along in virtue of territorial mobility. In fact, since, at a local level, peculiarities of residential preferences, of life styles, etc. have a better chance to take place only on limited territories, it may be possible to verify the different ways through which the constitutive elements of well-being interact. More specifically, the local dimension of well-being justifies itself and becomes relevant for some reasons. Firstly, the needs are better satisfied in a local dimension as the persons prefer the places in which they are settled. In a second place, a local level is better preferred to a global one because the lifestyles and the needs depend on the relationships with the others who live in the same environment. In other words, we can state that the analysis of well-being assumes a relevant meaning mainly for two reasons: 1) the needs of population and the capacity of satisfying them form themselves at the local dimension; 2) knowing how

[16] We should remark that well-being, being a multidimensional phenomenon, does not only depend on goods and services bought for consumption but also on health, on the quality of the environment, on the safety of daily life, on the facility of finding a job etc… It arises from the equilibrium more or less satisfying between the needs and the capacity to satisfy them. This means that there can be a high level equilibrium where at high needs correspond high capacities and low level equilibrium but equally satisfying where low capacities are combined with more modest needs. For these reasons, it is important to know, beyond the levels of well-being achieved, what are the needs which are expression of the values of the different local communities and how they are satisfied. Therefore, if this process is known, two advantages can derive from it: 1) the possibility of verifying the

well-being forms in local places is important in order to delineate policies which aim to control and improve it (Casini Benvenuti and Sciclone, 2003, pp. 17-20).

Furthermore, it has been verified (Theys, 2002) that the integration of the social[17], economic and environmental dimensions which are the most shared ones (or considered) in a multidimensional view of sustainable development, works best at the local level. In fact, on the one hand, local territories are the levels where the interrelations between the different dimensions are most explicit, where participation and dialogue are most feasible and where the issues of socially sustainable development become concrete. On the other hand, an intervention at territorial level has more chances to be more efficacious than at global level since the responsibilities are easier to establish, the actions easier to control and the interdependences among the actors can be handier to be taken into consideration. Broadly speaking, the local dimension seems to be the only one able to guarantee that minimum of transverseness which is at the heart of the so called concept of "lasting development". Therefore, local development constitutes the basis of a lasting development.

At the core of sustainability debate, there should be an attempt to build bridges between the local and the global, the sectoral and the spatial. The macro-level analyses should include more issues of "environmental inequalities", instead of dealing with equity issues only in terms of revenue or access to development. This means that, while the environmental-social interface is easier to implement at the local level, the challenge is to find ways of putting phenomena at a local level into a wider context and to identify the roles of actors and institutions at different levels.

Another reasoning is that local level should function not only as a motor having the unique capacity of integrating the various sustainability concerns, but also its action should be guided through developing a flexible framework of common principles. While, the national level should basically have the role to identify environmental, socially or economically unsustainable situations (Theys, 2002).

In the last instance, on the grounds of the previous elements of discussion regarding the relationship between local sustainable development and well-being/quality of life, we should consider that in a process of

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sustainability over time since the equilibrium which is achieved today may not be achieved tomorrow; 2) the possibility of controlling the achieved level of well-being so that it can be kept and improved over time (Casini Benvenuti and Sciclone, 2003, pp. 20-21).

[17] Besides an environmental sustainable development, there is also a social sustainable development, i.e. that development which safeguards a set of rules and social values. Ballet, Dubois, Mahieu have efficaciously defined socially sustainable development as a development that "guarantees for both present and future generations an improvement of the capabilities of well-being (social, economic or environmental) for all, through the aspiration of equity on the one hand-as intra - generational distribution of these capabilities – and their transmission across generations on the other hand" (2003, p. 6) . As for the literature on social sustainability, see also (Coleman, 1988; Ohkawa and Kohama, 1989; Deneulin and Stewart, 2001). With reference to the relationship between the economic, environmental and social dimensions, Becker et al., (1997) and Hart (1998-1999), describe it as a hierarchy of dependence: the economy is part of and depends on the society which itself exists within the environment and is dependent on it.

implementation of sustainable development at a local level, both private and public choices, aiming for example, at safeguarding the environmental heritage of a specific region and increasing the extent of protected areas, have a growing importance. The safeguard of protected areas represents one of the highest manifestations of sustainable development. For example, nature parks have the twofold role of preserving and letting present and future generation "publicly enjoy" owing to its contribution in terms of open spaces, landscape, hydro-geological safety, maintenance of a natural biological set-up. Of course, it deals with a sustainable development aiming at "producing" public goods which improve common well-being and quality of life.

All this being stated and bearing always in mind the theoretical framework of the capability approach, actions of environmental policy at a regional level, have to be taken into account as instruments of *territorial governance*, that is, as "government" of a management of human organisation. This is even more valid at a local level, if one considers that the safeguard of a territory means "feeling in his/her environment". Therefore, the implementation of environmental policies has to promote the building or rebuilding not only of natural *habitat*, but also of human *habitat*, more specifically of *milieu*, as representation of a more balanced relationship between economic growth and environmental quality.

5. Applying the capability approach at regional level

From the beginning of this work, we have pointed out the necessity to consider well-being as a multidimensional phenomenon which does not identify itself with the simple GDP. There is usually a positive relationship between well-being and economic growth but this is not a cause-effect relationship mainly for two reasons: a) well-being, in several cases, is not connected with phenomena linked to the production process, b) economic growth is *per se* a poor indicator of well-being. Furthermore, the effects of economic growth are contradictory: on the one hand, it contributes to increase income, on the other hand, it could generate negative effects, such as, pollution and stress. Therefore, we can state that there is not a mechanic relationship between economic growth and the improvement in the quality of life[18]. This issue is,

Furthermore, with regards only to the environmental-social interface, i.e. on the relationship between environmental and social spheres, see (Lehtonen, 2004, p. 207).

[18] On this purpose, it should be noted, with explicit reference to the environmental needs, that the challenge is to bring back, a more balanced relationship between environmental quality and economic growth among the components of quality of life and well-being. This relationship can be positive, as the so called "inverted Kuznets curves" have demonstrated at least for some pollutants, or it turns out in a trade-off (Arrow, 1995; Grossman, 1995; Rothman and De Bruyn, 1998).

however, object of discussion. Although some authors consider that "per capita GDP still acts as a fairly good *proxy* for most aspects of development" (Ray, 1998, p. 29), not all the regions which have the highest income, show the highest longevity, a lower rate of mortality, the highest levels of education, the lowest levels of criminality or of social cohesion (Casini Benvenuti and Sciclone, 2003, p. 14).

What above mentioned points out that National Accounting (which GDP and GNP derive from) is a misleading indicator[19] of well-being/quality of life. It can be rather considered as a good index of welfare. It "does not serve as a unilateral guarantee of success in "human development"(Ray, 1998 p. 29). For these reasons, other indices have been created with the idea of reformulating some alternative approaches to the traditional methodology of GDP calculation in order to include some elements of sustainability. Examples are given by *Greening GNP, NNP, Genuine Savings approach* and the *Index of Sustainable Economic Welfare* (*ISEW*). Also these measures, although they are better measures of well-being and sustainability, present some weaknesses[20].

Furthermore, an index which centre more on human development than on economic growth and is closer to a multidimensional conception of well-being is constituted of the *Human Development Index* (*HDI*). Also this index has some limitations, one of which is that two components are missing from its calculation: human freedom and environmental quality (Atkinson et al, 1997, p. 141). In particular, it does not take into account any environmental component[21].

If the previous indices which are more solid and reliable than GDP still present some limitations, we cannot state the same for other indices of sustainable development, such as the augmented Green Net National Product (GNNP) and the interest on augmented Genuine Savings (GS) which have been proposed in a recent work of Pezzey-Hanley-Turner-Tinch (2005). Also the combination of strong and weak sustainability indicators suggested by (Rennings and Wiggering, 1997) and the *ecological footprint* (Wackernagel and Rees, 1996) may be a way for improving measures of sustainability.

This brief critical overview on the alternative indices to GDP let us introduce into the building of a new multidimensional index. The aim of building this index which will be calculated for each Italian region

[19] For a detailed analysis of the weaknesses and criticisms to GDP indicator, which for synthesis reasons we cannot focus on, see, (Anderson, 1991; Beckermann, 1995; Mishan, 1993).

[20] As for greening GDP and GNP, see (Hanley et al. 1997; Hanley 2000); regarding the Genuine Savings, see (Pearce, Markandya and Barbier, 1989 pp. 45-47) and with reference to the Index of Sustainable Economic Welfare (ISEW), see (Daly 1989; Stockammer et al, 1997, p. 22; Hamilton 1999, p. 14).

using the taxonomic methodology, is to compare and gather the same Italian regions, object of our case study, according to the lower and higher level of quality of life. It can be considered an alternative to the conventional ones above mentioned, because it will be built considering the multidimensional feature of well-being which reveals itself through the composite nature of the indicators selected. This index, as we will see, tries to catch all the different dimensions of well-being/quality of life from the socio-economic to the environmental ones, including of course the sustainability aspects.

The first step is to resort to a list[22] of some meaningful variables, particularly suitable to an analysis of well-being at local level, in our case study at the Italian regions. Using the framework adopted by Robeyns (2002, p. 12), these are as follows: consumption, variables of structural dynamics, income distribution, education, civil participation, politic participation, aesthetic and cultural values, variables of environmental quality. These variables, which, according to Sen's terminology, correspond to functionings[23], are identified in two different sets, i.e. functionings of first level, the so called *essential* functionings, and functionings of second level, the so defined *accessorial* functionings. In the former set[24], education, income distribution, the variables of structural dynamics, civil and political participation are included; while, aesthetic and cultural values and the variables of environmental quality belong to the latter set[25]. Consumption, instead, does not constitute a functioning since it is a monetary variable and therefore only an instrument to achieve well-being.

The second step consists in exploring the possibility of how to measure the phenomenon under examination, that is the possibility of transforming these variables in indicators and, later, aggregating them.

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[21] However, it should be noted that a further adjustment, introducing the per capita total material input, has been proposed in order to obtain an environmentally sustainable HDI (Hinterberger et all., 1999).

[22] A list of variables to which will correspond a series of indicators, is particularly useful when one wants to aim at the completeness of information rather than a search for an univocal tendency.

[23] These variables, except for consumption, represent functionings since they indicate what the individual may be able to do or to be with the resources and capability he has. In other words, functionings are the achievements an individual can pursue. Having enough equi-distributed income, being educated, being employed, having political and civil rights, improving the environmental quality through a separate collection of urban waste or being able to institute protected areas for the protection of environment are all examples of functionings because they represent the achievements of a person. Furthermore, it should be noted that the set of functionings changes when the conditions of technology and of social progress change. The access to more evolved forms of consumption is a clear example of this. Functionings which emerge in a more advanced phase of a society, concern for example, the mobility on the territory, safety and therefore, a life sheltered from the most widespread forms of criminality, the appropriate use of free time, the integration and social cohesion etc….(Casini Benvenuti and Sciclone, 2003, p. 12).

[24] Variables such as income distribution, education, employment, civil and political participation can be defined as *essential* functionings because the achievement of a minimum level of satisfaction is fundamental.

[25] Variables, such as aesthetic and cultural value and variables of environmental quality are considered as *accessorial* in the sense that they contribute to the achievement of high levels of well-being, only subordinately to the achievement of satisfying levels of the *essential* functionings. Furthermore, it should be pointed out that the distinction between *essential* and *accessorial* functionings is only theoretical.

Taking our cue from Tsui (2002) who examines the axiomatic foundation of multidimensional poverty indices and from the axiomatic approach (Peragine, 2001) that gives an idea about the aggregation problem, we can proceed with building up this index which we will call Sen's index of sustainability.

By attributing each of the above mentioned variables to each region, we assume that there is a function *f* which makes Sen's sustainable development (S_{sd}) depend on *consumption* (C), on *essential functionings* [V_{sd} (variables of structural dynamics), Em (employment) I (income distribution) E (education), C_p (civil participation), P_p (political participation)] and on *accessorial* functionings [A_{cv} (aesthetic and cultural values), V_{eq} (variables of environmental quality)]:

$$S_{sd} = f\left(C, V_{sd}, E_m, I, E, C_p, P_p, A_{cv}, V_{eq}\right) \qquad (5)$$

In order to transform these variables to indicators so that they can be object of measurement, we have to identify the data required to measure each functioning[26], although due sometimes to unavailability of statistical data, as in this context, *proxies*[27] may be of help. Then, the equation (1.5) becomes the following:

$$S_{sd} = f\left[I(C), I(V_{sd}), I(Em.), I(I), I(E)I(C_p), I(P_p), I(A_{CV}), I(V_{eq})\right] \qquad (6)^{28}$$

Where the indicator chosen (I) for the variable consumption is the share of consumption[29] set for education, recreation and culture on the total household consumption[30], the indicators chosen for the variables of structural dynamics are respectively the firms net birthrate[31] and the capacity of exports[32] i.e. the

[26] We have considered only functionings because, in relation to the empirical side, they are the only indirectly observable in comparison with capabilities.

[27] Proxies have not been used in the case of consumption and of variables of structural dynamics.

[28] We assume that *f* is a monotonic increasing function. This means that the synthetic index will raise if, *ceteris paribus*, one of the variables increases. Therefore, an increase in consumption, education, employment, will let the index increase; while the increase in regional poverty, for example, will let the index fall. For this reason, it is necessary to change the direction of the above mentioned negative indicators in order to have the whole set of positive increasing indicators and therefore obtain a monotonic increasing synthetic index of well-being and/or quality of life. Tab. I presents both positive and negative indicators. Negative indicators, such as, the index of regional poverty and the number of violent crimes per 10.000 inhabitants have become positive through the complement respect to the unity of reference. In particular, 100 has been subtracted to each observed value in order to obtain positive values. Tab. 2 takes into account this further calculation.

[29] The choice of having selected consumption may seem in contradiction with Sen's ideas because it is well known that consumption together with income are considered by Sen as instruments to achieve well-being. For this reason, one may think that these components should be excluded *a priori*. Instead, consumption has to be taken into consideration, since, according to Sen, raising consumption is important, especially in poor countries, but, for a broader goal of development that is to enhance the capability of all human beings to obtain those things that they most value. At the same time, enhancing this variable does not ensure that the goals of better health, education and life expectancy are fulfilled. Furthermore, it should be noted that selecting consumption is not in line with the concept of sustainable development since it is a common assumption in this field of literature that higher consumption is no longer sustainable. Even the introduction of an inter-temporal preference rate does not represent by itself a sufficient condition in order to guarantee a path of sustainable consumption. However, despite this, consumption, which constitute the basis for a process of development and is considered a *determinant* or input of well-being (Dasgupta, 1993), has been taken into account together with other variables, since, it is a necessary, although not sufficient condition to comprehend a process of sustainable human development (Schischka, 2002, pp.7-8). As for the reasons of having selected consumption instead of income, see (Coudouel, Hentshel and Wodon, 2001)

[30] With reference to this data see (Istat, 2005, Conti regionali).

[31] We have chosen this *proxy* in order to represent one the variables of structural dynamics because it is a peculiar characteristic of the economic Italian structure. In fact, the Italian economic reality, particularly the North East is mainly constituted of an always increasing number of small-medium firms. We should not forget that we have chosen these indicators instead of others because they express at best the implementation of a local sustainable development.

[32] The capacity of export represents another meaningful *proxy* for the variables of structural dynamics because it is a sign of the economic performance of the Italian regions.

export value on GDP, for employment, the rate of employed people aged 15-64 as a share of the total population of the same age group, the index of regional poverty[33] has been used for income distribution, for education, the labour force with at least advanced educational qualification, with reference to the civil participation, two *proxies* have been used, respectively, the rate of legality and social cohesion[34] and the rate of capacity of development of social services[35], with reference to the political participation, the number of the electors on the number of elected[36], with regards to aesthetic and cultural values, we have used the percentage of protected areas[37], while, two *proxies* have been taken into consideration in order to represent the variables of environmental quality, respectively, the energy produced by renewable sources[38] and the index of separate collection of solid urban waste[39]. Therefore, the functionings considered are in total twelve.

At this point, the question which immediately arises is why these indicators have been chosen instead of others. First of all, because they, unlike the conventional indices and other empirical applications, are the most representative of the socio-economic and environmental Italian society. In other words, as it was previously pointed out, since the aim of this work is an evaluation of a relative well-being, i.e. of well-being at a local level, we did not select the sets of variables which can considered for an overall evaluation of well-being, but only those which, at the territorial level, are proved to be relevant for pointing out the differentials in the level of well-being.

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[33] We refer to a definition of relative poverty according to which the families, whose monthly consumption is equal or lower than the average per capita consumption in the country, are considered poor.

[34] This proxy has been chosen because it represents a constitutive element and one among the most important of the well-being of a community. The social cohesion measures the aptitude of a community to collaborate and to assume cooperative behaviours. It reinforces the spirit of attachment and of respect also and especially local to the public rules, favours the reforms and it constitutes an unavoidable element for economic development. Furthermore, as much as a society is cohering, as more the individual, generational and exclusive conflicts find a point of equilibrium about a shared solution (Casini Benvenuti and Sciclone, 2003, p. 329). With specific reference to the data, violent crimes per 10.000 inhabitants, which go from the small robbery to the bombs attacks, have been considered (Istat, Indicatori regionali di sviluppo, 2005)

[35] We have chosen this *proxy* because we think that the capacity of development of social services is one peculiar aspect of the civil participation in the Italian regions. In particular, we have referred to the rate of the persons who are 14th years old or more (who have participated to voluntary service meetings, to ecological associations, for civil rights, for peace or who have carried out free activities for voluntary service associations) on the total population of the same age group (ibidem).

[36] One requirement in order to reach a sustainable human development is to ensure citizens voting rights. According to Ackerman (1980), it is fundamental, besides guaranteeing the access to determined services or goods, to allow everybody to be able to express his/her point of view through efficacious political channels (electoral systems). This recalls indeed the relevance of the local dimension through which the electoral system becomes able to adequately transmit the preferences of the citizens. Furthermore, the capability of implementing functionings depends on the level through which the economic-social and political environment of a community allows the individuals to identify the needs and to satisfy them. It is strictly linked to the way through which life of persons is ruled by the institutions; more specifically, to the guarantee attributed to the individual preferences, through the recognition of political freedoms. For all these reasons, the political and civil participation of the individuals who compose a community is quite relevant and has been therefore taken into account (Casini Benvenuti and Sciclone, 2003, p. 19).

[37] The percentage of protected areas is an indirect *proxy* in order to represent aesthetic and cultural values. We have referred to it not only because it is the easiest data to be available, but also because a high percentage of protected areas means a bigger incidence of landscape, hydro-geological safety, maintenance of a natural biological set-up, spaces for cultural and recreational activities.

[38] In particular, the data refers to the GWh of energy produced by renewable sources on GWh total net production. The renewable sources considered as renewable are the hydroelectric, the Aeolian, photovoltaic, geo-thermoelectric and biomass (Istat, Indicatori regionali di sviluppo, 2005).

[39] The data refer to solid urban rubbish object of separate collection on the total urban solid waste (ibidem).

Secondly, this selection has taken into account the approach of the indicators proposed by Dasgupta[40] (1999) and applied to the measurement of well-being in a multidimensional space. This approach, although being less refined under the theoretical profile, aims at reaching a wide dimension of economic and social welfare, able to capture its complexity and to provide a support to the evaluation process of policy making. In other words, the multidimensionality is the main feature of this approach, as only aggregating variables of different nature, meaning and different unity in one index of "quality of life" (Dasgupta and Weale, 1992), the complexity of well-being can be approximated[41].

At the same time, the selection has been made considering, at a global level, the ongoing European debate on the social indicators of national performance, since this debate represents a remarkable point of view able to address the action of the European Union. More specifically, we are referring to the *Indicators for Social inclusion in the European Union*[42] (Atkinson et al, 2001) prepared for the Belgium government with the aim of defining a guide for building a set of social indicators which can be used to control and evaluate the situations of the member countries and their responses to the social policy of the European Union.

The difference between the variables selected in the report and those chosen in this work is that while, in the former they have to measure only the current aspects of the well-being itself and not its sustainability, in the latter, one wants to measure not the current aspects of well-being but the sustainability of the well-being itself[43].

In order to carry on the analysis, we have to address the aggregation problem. The methodology adopted, in order to aggregate and weigh these functionings is the taxonomic method proposed by the Wroclaw's Economic school (Hellewig, 1975). This methodology can be applied not only in all those cases in which a determination of a complex and synthetic measure of indicators is useful, but also and especially in comparative analyses, such as the territorial unities. The synthesis of the elementary indicators will be

[40] According to Dasgupta (1999), the set of indicators has to be minimum so that to find an equilibrium between completeness and heaviness; furthermore it has to be selected in order to avoid overlapping. For this reason, indicators with high correlation, such as for example, income and consumption, have to be avoided.

[41] We should point out that the conception of well-being addressed in this work is inspired to the distinction proposed by Dasgupta (1993, 1999) between *constitutive* elements (health, state of the environment etc..) and *determinants* of well-being (income, infrastructures, etc…). It follows that quality of life can be conceived as the final result of a productive process in which the *determinants* of well-being represent the *inputs* and the constitutive elements represent the *outputs*.

[42] We need a special mention of social inclusion because we are referring to the areas on which the social indicators are verified, i.e.: economic dimension, (income, its distribution and poverty) unemployment, regional differences, education, health and social participation.

[43] It is useful to note that one the weaknesses of Sen's approach is the difficulty of converting income into functionings, i.e. the information difficulty. It concerns the availability of necessary data able to analyse well-being in the functioning space, which is higher than the requirements of

carried out by calculating an index of distance of each territorial unity from a *unit* considered *ideal*. In Tab. 3 we express, in a simplified way, each variable in symbols such as x_1^i, x_2^i, x_3^i, etc. Therefore, x_1^i stands respectively for consumption for the region i, x_2^i for both the variables of structural dynamics, x_3^i for employment and so on… It follows that the equation (6) becomes:

$$S_{isd} = f(x_1^i, x_2^i, x_3^i, x_4^i, x_5^i, x_6^i, x_7^i, x_8^i, x_9^i, x_{10}^i, x_{11}^i, x_{12}^i) \quad (7)$$

Where S_{isd} which substitutes S_{sd} in the equation (6), stands for Sen's index of sustainable development for the region i since the index is calculated for each Italian region.

At this point, the standardization is a necessary operation in order to make these variables, which are expressed in different account units, homogeneous. Therefore, the variables z_1^i z_2^i z_3^i etc., which are standardised variables referring to the region i, substitute the original ones (Tab. 4)[44].

The equation 7. becomes the following:

$$S_{isd} = f(z_1^i, z_2^i, z_3^i, z_4^i, z_5^i, z_6^i, z_7^i, z_8^i\, z_9^i, z_{10}^i, z_{11}^i, z_{12}^i) \quad (8)$$

After having standardised each variable, the calculation of the synthetic index takes place through the aggregation of the distances among the effective values of the elementary indicators and those of the territorial unit (i.e. the region) considered *ideal*.

For each elementary indicator, the *ideal value* will be the highest of the values assumed by the different unities considered: a vector of ideal values which identifies itself with the *ideal unit* not necessarily coinciding with a real territorial unit, will be built. A vector of ideal values of the indicators obviously standardised (i.e. the highest values of each series of the elementary indicators made all positive and standardised) will be obtained:

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the utilitarian analysis. In fact, none of the utilitarian applications uses data specifically gathered in order to measure functionings and this may imply distortions in the results achieved.

[44] All the variables from z_1^i to z_{10}^i are obtained using this formula $z_{ij} = \frac{x_{ij} - \bar{x}_{0j}}{\sigma_j}$, where z_{ij} refers to the standardisation of the indicator j for the region i; x_{ij} is the variable taken into account which refers to the indicator i and j, $\bar{x}_{oj}$ is the arithmetic mean for the j indicator and σ_j is the averaged squared deviation for the indicator j.

$$Z_0' = (z_{01}, Z_{02,\ldots,} z_{0m}) \qquad (9)$$

Where z_{01} is the standardized ideal indicator for consumption, Z_{02} is the standardized ideal indicator for the variables of structural dynamics and so on.

At this point, each territorial unit will be compared with the ideal one. The comparison takes place through the calculation of the Euclidean distance between each territorial unit and the ideal one[45]. In formal terms, the distance of the i unit from the ideal one, i.e. D_{i0} (which is defined by the Hellewig's model of development), will be given by :

$$D_{i0} = \sqrt{\sum_{j=i}^{m} \left(z_{ij} - z_{0j}\right)^2} \qquad (10)$$

Where Z_{ij} refers to the standardisation of the indicator j for the region i, while z_{0j} refers to the standardised ideal indicator j for the region i. When D_{i0} is bigger, the distance of the i territorial unit from the ideal one is bigger.

Supposed that the arithmetic mean of the distances of each single unit as to the ideal one is given by:

$$\bar{D}_0 = (1/n)\sum_{i=1}^{n} D_{i0} \quad (11)$$

(where n is the number of variables or the number of the statistical units considered and D_0 represents the averaged ideal distance) and supposed that the averaged squared deviation for the region i (σ_0) is as follows:

$$\sigma_0 = \sqrt{(1/n)\sum_{i=1}^{n}\left(D_{i0} - \bar{D}_0\right)^2} \qquad (12)$$

and D_0, which is the ideal distance, is given by the following equation:

$$D_0 = \bar{D}_0 + 2\sigma_0 \qquad (13)$$

the synthetic index for the region i defined by Hellewig' s measurement of development, in our case Sens's index of sustainable development for the region i is given by the following formula:

$$S_{isd} = D_{i0}/D_0 \qquad (14)$$

[45] Each standardised value coming from the subtraction to each ideal value will be aggregated. Therefore, the aggregation process corresponds to the calculation of the Euclidean distances of each region from the ideal one, D_{i0}.

where $S_{isd}d_i$ stands for Sen's synthetic index of sustainability. D_{i0} is the the distance of the i-unit from the ideal one and D_0 is given by the formula (13)[46].

The synthetic index $S_{isd}d_i$ will have value 0 when the distance between a given territorial unit and the ideal one is null, while, the superior limit is not defined but it is closer to 1. Therefore, the level of development of a territorial unit will be the more higher the more the unit considered will be closer to the ideal one, i.e. as much as the synthetic index $S_{isd}d_i$ will be closer to 0.

In other words, from the application of this methodology, it emerges that the level of quality of life is higher in those regions in which the taxonomic index is lower (see Tab. 5). Furthermore, the weighting issue can be solved indirectly attributing a higher weight to the region which has the highest value of each single variable, i.e. the *ideal region*. According to this way, the distances of each single value from the value of the ideal region can be considered a measure of weighting of each variable.[47]

6. Discussion about the results

As it was previously pointed out, the methodology adopted by us allows to gather and compare the Italian regions according to the higher or lower level of quality of life. This means that, the regions which have been able to follow a sustainable development path from the economic, social and environmental point of view, report a high level of quality of life. Instead, the regions which have not been able to follow a sustainable development path, have a low level of quality of life. More specifically, according to the methodology proposed, if the taxonomic index is lower (which means that the distance between the standardised value attributed to a region and that attributed to the ideal one is smaller), the level of quality of life is higher. We can thus classify the Italian regions in five different groups[48]. It is useful to point out that the results achieved confirm more or less the current trend which sees a clear contraposition between the bloc of the Central-Northern regions characterised by a higher level of sustainable development and that of Southern regions with a lower one. The group A which has the highest level of sustainability and thus of

[46] $\bar{D}_0$, σ_0, D_0 are calculated in Tab. 6.

[47] It should be noted that a disadavantage of a weighting criterion is the introduction of a further subjective component which may influence the final results.

[48] The typological groups of the Italian regions are shown in. Fig.1. They are gathered according to a decreasing ranking from the region which has the lowest taxonomic index d_i to the one which has the highest one.

quality of life among all the groups is constituted of three regions: Veneto, Trentino Alto Adige and Tuscany, the former and the latter respectively with the values of 0,57 and the third with 0,58 (see, Tab. 5). It seems that at a local level, these regions, which belong to the so called "third Italy" or Northern-Eastern-Centre ("*NEC* model"), have reached a high level of quality of life and thus a high level of sustainable development in the three dimensions considered by us. This is shown by the fact that most of the standardised values are above the mean (Tab. 4). In particular, with reference to Trentino Alto Adige, one may note that the three standardised values referred to the environmental functionings are all above the mean. The regions of Lombardy, Abruzzo, Umbria, Emilia Romagna, Piedmont, Marches and Friuli Venezia Giulia are gathered into the group B. These regions, have followed a model of development, which although able to produce economic growth, has neglected other dimensions of well-being. For example, regions such as Friuli Venezia Giulia, Emilia Romagna, Marches and Umbria, whose socio-economic values are mostly above the mean, register some consistent negative values concerning the environmental variables[49]. This confutes the common assumption that environmental well-being is a consequence of a high level of development.

Valle D'Aosta, Latium and Basilicata constitute the group C with intermediate values respectively of 0,75, 0,74 and 0,79. One may point out the effort achieved from the Basilicata region whose progress has been made in these last years. It has the highest value equal to 0,79 (Tab. 5) among the Italian Southern regions which are gathered in the fifth group except for Sardinia and Molise which belong to the fourth group. The relatively good position of Basilicata in comparison with the other Southern regions may be explained thanks to a local policy which has basically aimed to the enhancement of the local resources and competences. With reference to the region of Latium, its standardised environmental indicators are all negative.

Liguria, Sardinia and Molise belong to the group D with the values respectively of 0,80, 0,86 and 0,88. This group represents some not well defined socio-economic and environmental positions: the region of Liguria and partly Sardinia owing to the accentuated process of deindustrialisation and Molise whose the

[49] On this purpose, we should point out that the indicators which we have taken into account, give us only an idea of the relative environmental well-being of a given region. In fact, we do not know what the situation would have been if we had considered other environmental variables. Consequently, a certain kind of analysis and explanation of facts, which might appear risky, is justified on the grounds of the variables taken into consideration.

relatively low value reflects its geographical position placed between the Southern delay and the Northern push.

The group E is constituted of the regions which have the lowest level of sustainability and thus of quality of life, i.e. Apulia (with a value equal to 0,89) Calabria (with 0,92), Campania (with 0,94) and Sicily with a value equal to 0,98). It is not surprising their very low level of quality of life since these regions are those whose the standardised values referring to the rate of legality and social cohesion are under the mean. This obviously produces direct negative effects on quality of life. In particular, it should be noted that the region of Campania has the highest standardised value under the mean, (equal to – 3,726) among the others gathered in the same group. Furthermore, the values referred to the three environmental functionings are mostly under the mean (see Tab. 4), in particular the region of Campania owing to the problem of waste not yet adequately solved.

6. Concluding remarks

The analysis which was carried out in this paper has pointed out that since well-being is strongly determined by the actions of daily life, the territorial dimensions seem to be the ideal unities also for the analysis of well-being. Therefore, the choice of the territorial dimension has derived from the fact the equilibrium between the needs expressed and the capacities effected could be better implemented in a restricted ambit, such as the local one.

It is also useful to remark that the categories of *freedom*, *functionings* and *capabilities* have allowed to identify the relationships between the components of natural capital and quality of life. In this sense, the analytical categories of functioning*s* and capabilities have had an instrumental role. More specifically, they have been used to evaluate social well-being according to a methodological approach which associates the concept of well-being with different economic, environmental and social conditions. On the grounds of this wider view, the environmental problem has been conceived in a new light, which includes quality of life, the intra and inter-generational equity, and the ethical aspects of human well-being.

From the operational point of view, the aim was to apply the capability approach, being one of the most adequate theories of well being to address human sustainable development. The taxonomic methodology adopted has allowed us to compare and gather the Italian regions according to the higher or lower level of quality of life.

The results have shown on the one hand that the common assumption according to which environmental well-being is lower in those regions where the socio-economic conditions are unstable (see the cases of Apulia and Campania where the values regarding the rate of legality and social cohesion are negative) is revealed itself correct even if this assumption cannot be always argued. In fact, the examples shown by the regions of Lombardy, Emilia Romagna, Friuli Venezia Giulia, Marches and Umbria point out that probably, although it is generally recognised that sustainable development may follow human development, the case of a lower development at an environmental level depends on the extent to which environmental issues are considered important in political choices. For this reason, such results could provide some useful information tool for targeting and zoning sustainable development measures at a local level.

In order to improve quality of life at local level, still a lot has yet to be done at regional level so that environmental problems enter the civic conscience. In other words, the local governments have to be able to implement more sustainable policies and thus be more careful to environment notwithstanding the well-known economic implications. According to the approach discussed in this work, environment has to be conceived in a wider sense than the mere ecological one, i.e. not only the safeguard of the territory, the landscape and of the artistic and cultural patrimony but also of the social environment and of civil life. Only policy is able to let jointly proceed economic well-being with the social, cultural and environmental one. Particularly, one of the possible solutions is to take into account the capacity of "response" of the public opinion about the environment. The implementation of policy actions at local level could consists in the willingness to pay eco-taxes, to bear the expenses for the conservation of the nature and for the research, or to respect economic and fiscal instruments of regulation. Furthermore, it should be noted that the nature of projects of sustainable development has to be planned at local level and not established by a super-ordinate organ of government; this means a participation at a local level of the different institutions which gravitate on that territorial ambit.

In the last instance, the analysis which was carried out in this paper has increased in importance local sustainable development since it results that the regional institutions are the first points of reference able to introject in their policies the principles of sustainability so that sustainable development which is still a *definition* becomes the aim of a new form of "governance", i.e. of *territorial governance*.

Tab. 1 - Averaged data of the essential and accessorial functionings in the period 2000-2003

Regions	% of expenses for education, recreation and culture on the total household consump.	Employment rate	Firms net birth-rate	Export cap. Val. export on GDP perc.	*Index of reg.poverty	Education	Numb.of violent crimes per 10.000 inhabitants	Index of cap.of develop. of soc.service	**Rate of polit.particip	***Protect. areas hect.per 100 inhabit.	Energy prod.by renew. sources	Index of separate collect. of solid urban rubbish
Piedmont	9,6	62,2	1,4	28,4	7,6	20,2	15	11,2	84,2	4	46,6	24,7
Valle D'Aosta	6,8	66,1	1,2	11,4	8,3	20,5	9,1	14,1	80,5	34,2	10	20,4
Lombardy	8,7	63	1,8	30,2	4,3	21	12,3	13,6	86,5	0,8	32,7	37,5
Trent. Alto A.	7,7	66,3	1,6	16,8	10,7	17	8,2	25,1	84,5	30,2	95,2	28,2
Veneto	9	63,1	2,1	34,7	4,1	19,3	9,2	16,5	84,7	2,1	12,7	38,6
Friuli-Ven.Giulia	8,3	61,8	1,2	30,1	9,2	22,3	10,3	13,5	77,9	4,6	19,2	24,1
Liguria	8,3	58,3	1,2	9,9	6,4	22	11	9,8	81,9	1,6	1,8	14,4
Emilia Romagna	9,7	67,8	1,7	28,7	4,9	21,5	12,6	14	88,8	2,2	9,5	26,4
Tuscany	8,8	61,6	2	25,4	5,6	21,5	10,8	15,6	86,3	4,6	27,5	26,4
Umbria	8,3	59,1	1,8	13,8	8,2	24,2	6,6	9,8	85,3	7,8	34	15,4
Marches	9,3	62,3	2	26,5	5,4	21,6	8,5	9,6	83,9	6,1	14,3	13,9
Latium	7,9	54,6	2,8	8,7	8,4	26,8	14,6	6,8	81,8	4,3	3,2	5,9
Abruzzo	8	55,4	2,5	23	16,2	24,4	8,4	6,9	77,2	24,4	38	10,3
Molise	7,3	51,4	2,7	9,8	23,8	23	5,6	7,4	69	2	17,9	3,3
Campania	7,8	41,5	3	9,3	23,2	20,8	29	5,8	76,2	5,8	45,1	7,2
Apulia	7,7	44,8	2,9	10	22	19,7	12	7,3	78,4	3,2	1,8	7,7
Basilicata	8,3	45,6	2	15,4	24,7	21,1	7,3	8,1	75	21	20,5	5,2
Calabria	7,6	41,7	3,6	1,1	28,2	22,1	10,8	6	70,6	9,4	10,4	6,3
Sicily	6,9	41,6	2,7	7	24,9	20	12,9	5,7	71,1	5,6	3,1	4,4
Sardinia	7,4	46,5	3,2	8,3	17	20,2	12,1	9,6	77,6	5,8	4,1	2,9

* This index has been calculated only for the years 2002-2003
**The only data available refer to the political elections which took place in 2001.
*** The values refer only to the year 2002
Our elaboration on data Istat, 2005. Indicatori regionali di sviluppo e Conti Regionali

Tab. 2. Matrix of the positive elementary indicators

Regions	% of expenses for education, recreation and culture on the total household consump.	Employment rate	Firms net birth-rate	Export cap. Val. export on GDP perc.	Index of economic comfort	Education	Rate of legality and soc. cohesion	Index of cap.of devel. of soc.services	Rate of polit.particip	***Protect. areas hect.per 100 inhabit.	Energy prod.by renew. sources	Index of separate collect. of solid urban rubbish
Piedmont	9,6	62,2	1,4	28,4	92,4	20,2	85	11,2	84,2	4	46,6	24,7
Valle D'Aosta	6,8	66,1	1,2	11,4	91,7	20,5	90,9	14,1	80,5	34,2	10	20,4
Lombardy	8,7	63	1,8	30,2	95,7	21	87,7	13,6	86,5	0,8	32,7	37,5
Trent. Alto A.	7,7	66,3	1,6	16,8	89,3	17	91,8	25,1	84,5	30,2	95,2	28,2
Veneto	9	63,1	2,1	34,7	95,9	19,3	90,8	16,5	84,7	2,1	12,7	38,6
Friuli-Ven.Giulia	8,3	61,8	1,2	30,1	90,8	22,3	89,7	13,5	77,9	4,6	19,2	24,1
Liguria	8,3	58,3	1,2	9,9	93,6	22	89	9,8	81,9	1,6	1,8	14,4
Emilia Romagna	9,7	67,8	1,7	28,7	95,1	21,5	87,4	14	88,8	2,2	9,5	26,4
Tuscany	8,8	61,6	2	25,4	94,4	21,5	89,2	15,6	86,3	4,6	27,5	26,4
Umbria	8,3	59,1	1,8	13,8	91,8	24,2	93,4	9,8	85,3	7,8	34	15,4
Marches	9,3	62,3	2	26,5	94,6	21,6	91,5	9,6	83,9	6,1	14,3	13,9
Latium	7,9	54,6	2,8	8,7	91,6	26,8	85,4	6,8	81,8	4,3	3,2	5,9
Abruzzo	8	55,4	2,5	23	83,8	24,4	91,6	6,9	77,2	24,4	38	10,3
Molise	7,3	51,4	2,7	9,8	76,2	23	94,4	7,4	69	2	17,9	3,3
Campania	7,8	41,5	3	9,3	76,8	20,8	71	5,8	76,2	5,8	45,1	7,2
Apulia	7,7	44,8	2,9	10	78	19,7	88	7,3	78,4	3,2	1,8	7,7
Basilicata	8,3	45,6	2	15,4	75,3	21,1	92,7	8,1	75	21	20,5	5,2
Calabria	7,6	41,7	3,6	1,1	71,8	22,1	89,2	6	70,6	9,4	10,4	6,3
Sicily	6,9	41,6	2,7	7	75,1	20	87,1	5,7	71,1	5,6	3,1	4,4
Sardinia	7,4	46,5	3,2	8,3	83	20,2	87,9	9,6	77,6	5,8	4,1	2,9

Tab.3. Arithmetic mean and standard deviation for each of the elementary indicators

Regions	X_1^i	X_2^i	X_3^i	X_4^i	X_5^i	X_6^i	X_7^i	X_8^i	X_9^i	X_{10}^i	X_{11}^i	X_{12}^i
Piedmont	9,6	62,2	1,4	28,4	92,4	20,2	85	11,2	84,2	4	46,6	24,7
Valle D'Aosta	6,8	66,1	1,2	11,4	91,7	20,5	90,9	14,1	80,5	34,2	10	20,4
Lombardy	8,7	63	1,8	30,2	95,7	21	87,7	13,6	86,5	0,8	32,7	37,5
Trent. Alto A.	7,7	66,3	1,6	16,8	89,3	17	91,8	25,1	84,5	30,2	95,2	28,2
Veneto	9	63,1	2,1	34,7	95,9	19,3	90,8	16,5	84,7	2,1	12,7	38,6
Friuli-Ven.Giulia	8,3	61,8	1,2	30,1	90,8	22,3	89,7	13,5	77,9	4,6	19,2	24,1
Liguria	8,3	58,3	1,2	9,9	93,6	22	89	9,8	81,9	1,6	1,8	14,4
Emilia Romagna	9,7	67,8	1,7	28,7	95,1	21,5	87,4	14	88,8	2,2	9,5	26,4
Tuscany	8,8	61,6	2	25,4	94,4	21,5	89,2	15,6	86,3	4,6	27,5	26,4
Umbria	8,3	59,1	1,8	13,8	91,8	24,2	93,4	9,8	85,3	7,8	34	15,4
Marches	9,3	62,3	2	26,5	94,6	21,6	91,5	9,6	83,9	6,1	14,3	13,9
Latium	7,9	54,6	2,8	8,7	91,6	26,8	85,4	6,8	81,8	4,3	3,2	5,9
Abruzzo	8	55,4	2,5	23	83,8	24,4	91,6	6,9	77,2	24,4	38	10,3
Molise	7,3	51,4	2,7	9,8	76,2	23	94,4	7,4	69	2	17,9	3,3
Campania	7,8	41,5	3	9,3	76,8	20,8	71	5,8	76,2	5,8	45,1	7,2
Apulia	7,7	44,8	2,9	10	78	19,7	88	7,3	78,4	3,2	1,8	7,7
Basilicata	8,3	45,6	2	15,4	75,3	21,1	92,7	8,1	75	21	20,5	5,2
Calabria	7,6	41,7	3,6	1,1	71,8	22,1	89,2	6	70,6	9,4	10,4	6,3
Sicily	6,9	41,6	2,7	7	75,1	20	87,1	5,7	71,1	5,6	3,1	4,4
Sardinia	7,4	46,5	3,2	8,3	83	20,2	87,9	9,6	77,6	5,8	4,1	2,9
$\bar{X}_{0j}$	8,2	55,7	2,2	17,4	86,8	21,5	88,7	10,8	80,1	9	22,4	16,2
σ_j	0,8	8,87	0,7	9,67	8,15	2,04	4,75	4,68	5,56	9,73	21,8	11,1

Our elaboration $\bar{X}_{oj}$ = arithmetic mean for the indicator j σ_j =averaged squared deviation for the indicator j

Tab. 5 - Calculation of D_{i0} and d_i

Regions	Distances D_{i0}	d_i
Piedmont	7,1413	0,66
Valle D'Aosta	8,174	0,75
Lombardy	6,7079	0,62
Trent. Alto A.	6,2352	0,57
Veneto	6,163	0,57
Friuli-Ven.Giulia	7,4063	0,68
Liguria	8,7197	0,8
Emilia Romagna	7,0608	0,65
Tuscany	6,3547	0,58
Umbria	6,9231	0,64
Marches	7,2316	0,66
Latium	8,0601	0,74
Abruzzo	6,9439	0,64
Molise	9,5209	0,88
Campania	10,2166	0,94
Apulia	9,6689	0,89
Basilicata	8,6141	0,79
Calabria	10,0177	0,92
Sicily	10,6833	0,98
Sardinia	9,3816	0,86

Tab. 6. Calculation of $\bar{D}_0$, σ_0 and D_0

$\bar{D}_0$	8,061235
σ_0	1,40977
D_0	10,88083

Tab. 4. Matrix of the standardized elementary redirected indicators.

Regions	Z_1^i	Z_2^i	Z_3^i	Z_4^i	Z_5^i	Z_6^i	Z_7^i	Z_8^i	Z_9^i	Z_{10}^i	Z_{11}^i	Z_{12}^i
Piedmont	1,75	0,733	-1,143	1,138	0,687	-0,64	-0,779	0,085	0,737	-0,514	1,110	0,766
Valle D'Aosta	-1,75	1,172	-1,429	-0,620	0,601	-0,490	0,463	0,705	0,072	2,590	-0,569	0,378
Lombardy	0,625	0,823	-0,571	1,324	1,09	-0,245	-0,211	0,598	1,151	-0,843	0,472	1,919
Trent. Alto A.	-0,625	1,195	-0,857	-0,062	0,307	-2,206	0,653	3,056	0,791	2,179	3,339	1,081
Veneto	1	0,834	-0,143	1,789	1,117	-1,078	0,442	1,218	0,827	-0,709	-0,445	2,018
Friuli-Ven.Giulia	0,125	0,688	-1,429	1,313	0,491	0,392	0,211	0,577	-0,396	-0,452	-0,147	0,712
Liguria	0,125	0,293	-1,429	-0,776	0,834	0,245	0,063	-0,214	0,324	-0,761	-0,945	-0,162
Emilia Romagna	1,875	1,364	-0,714	1,169	1,018	***-0,011***	-0,274	0,684	1,565	-0,699	-0,592	0,919
Tuscany	0,75	0,665	-0,286	0,827	0,933	**-0,011**	0,105	1,026	1,115	-0,452	0,234	0,919
Umbria	0,125	0,383	-0,571	-0,372	0,613	1,324	0,989	-0,214	0,935	-0,123	0,532	-0,072
Marches	1,375	0,744	-0,286	0,941	0,957	0,049	0,589	-0,256	0,683	-0,298	-0,372	-0,207
Latium	-0,375	-0,124	0,857	-0,900	0,589	2,60	-0,695	-0,85	0,306	-0,483	-0,881	-0,928
Abruzzo	-0,25	-0,034	0,429	0,579	-0,368	1,422	0,611	-0,833	-0,522	1,583	0,716	-0,532
Molise	-1,125	-0,485	0,714	-0,786	-1,301	0,735	1,2	-0,726	-1,996	-0,72	-0,206	-1,162
Campania	-0,5	-1,601	1,143	-0,827	-1,227	-0,343	-3,726	-1,068	-0,701	-0,329	1,041	-0,811
Abulia	-0,625	-1,229	1	-0,765	-1,080	-0,882	-0,147	-0,748	-0,306	-0,596	-0,945	-0,766
Basilicata	0,125	-1,139	-0,286	-0,207	-1,411	-0,196	0,842	-0,577	-0,917	1,233	-0,087	-0,991
Calabria	-0,75	-1,578	2	-1,686	-1,840	0,294	0,105	-1,026	-1,709	0,041	-0,550	-0,892
Sicily	-1,625	-1,590	0,714	-1,075	-1,436	-0,735	-0,337	-1,090	-1,619	-0,349	-0,885	-1,063
Sardinia	-1	-1,037	1,429	-0,941	-0,466	-0,637	-0,168	-0,256	-0,450	-0,329	-0,839	-1,198
Ideal region	1,875	1,364	2	1,789	1,117	2,6	1,2	3,056	1,565	2,59	3,339	2,018
-0,011	is obtained showing a two- digit approximation on Tab.3											

Fig. 1. Typological groups of the Italian regions

Group A

Veneto, Trentino A. Adige,Tuscany

Group B

Lombardy, Abruzzo, Umbria Emilia R., Piedmont, Marches

Group C

Valle D'Aosta, Latium, Basilicata

Group D

Liguria, Sardinia, Molise

Group E

Apulia, Calabria, Campania, Sicily

References

Ackerman, B., 1980. Social Justice in the Liberal State. Yale University Press, New Haven.

Anand, S., Sen, A.K., 2000. Human Development and Economic Sustainability. World Development, 12 (28), 2029-2049.

Anderson, V., 1991. Alternative Economic Indicators. Routdledge, London.

Arrow, K., et al., 1995. Economic Growth, Carrying Capacity, and the Environment. Science, 268 (28), 520-521.

Atkinson, G., Dubourg R., Hamilton K., Munasinghe M., Pearce D., Young C., 1997. Measuring Sustainable Development. Edward Elgar.

Atkinson, A. B., - Cantillon, B., - Marlier, B., and Nolan B., 2001. Indicators for Social Inclusion in the European Union, Report presented at Conference on Indicators for Social Inclusion: Making Common EU Objectives Work. Antwerp, 14-15 September.

Ballet, J., Dubois, J.L., Mahieu, F.R., 2003. Le développement socialment durable: un moyen d'intégrer capacités et durabilité. Paper presented at the Third Conference on the Capability Approach, University of Pavia, 6-9 September, 2003.

Bazzani, G., Di Pasquale, S., Viaggi, D., Zanni, G., 2001. Evaluation of the Quality of Life as a Support to the management of interventions for rural development. 73rd Seminar of the European Association of Agricultural Economists: "Policy Experiences with Rural development in a Diversified Europe" Ancona (Italy), 28-30 June 2001.

Becker, E., et al., 1997. Sustainability: A Cross Disciplinary Concept for Social Transformations. Most Policy Papers 6. Paris: UNESCO. Internet web site http://www/unesco org/most/discuss html.

Beckermann, W., 1995. Small is Stupid. Duckworth.

Berlin, I., 1969. Four Essays on Liberty. Oxford University Press, Oxford.

Bernetti, J., Casini, L., 1995. Ambiente e benessere: un approccio secondo la teoria delle scelte sociali di Sen. Rivista di Economia Agraria (1).

Bulte E. H., Damania, R., and Deacon, R. T., 2005. Resource Intensity, Institutions, and Development. World Development, 33 (7), pp. 1029-1044.

Casini, L., 2000. Nuove prospettive per uno Sviluppo Sostenibile del territorio. Studio Editoriale Fiorentino.

Casini Benvenuti S., Sciclone N., (eds. by) 2003. Benessere e condizioni di vita in Toscana. Franco Angeli, Milano.

Chiappero Martinetti, E., 1996. Standard of Living Evaluation Based on Sen's Approach: Some Methodological Suggestions. Politeia. 12 (43/44), 37-53.

Coffey, W., Polèse, M., 1984. The concept of Local Development: A Stages model of Endogenous regional Growth in P.W.J. Batey (edit. by). Papers of the Regional Science Association, vol. (55).

Coffey, W., Polèse, M., 1985. Local development: Conceptual Bases and Policy Implications. Regional Studies, Vol (19.2), pp. 85-93.

Coleman, J.S., 1988. Social Capital in the Creation of Human Capital. Knowledge and Social Capital. E. Lasser (ed.). University of Chicago Press. Chicago.

Collados C., Duane, T.P., 1999. Natural capital and quality of life : a model for evaluating the sustainability of alternative regional development paths. Ecological Economics, 30, pp. 441-460.

Coudouel, A., Hentschel, J., Wodon, Q., April 2001. Well-being Measurement and Analysis. http://www.poverty.worldbank.org/files/5467_chap 1.pdf.

Daly, H. E., 1989. Towards a Measure of Sustainable Social Net National Product in Ahnad, Y.J., El Serafy, S., Land., E., Lutz.

Daly, H. E., 1996. Beyond Growth. The Economics of Sustainable Development. Beacon Press, Oxford.

Dasgupta, P., 1993. An enquiry into well-being and destitution. Clarendon Press, Oxford.

Dasgupta, P., 1999. Valuation and Evaluation: Measuring the Quality of Life and Evaluation Policy. London School of Economics and Political Sciences.

Dasgupta, P., 2001. Human Well-being and the Natural Environment. Oxford University Press, Oxford.

Deneulin, S., Stewart, F., 2001. A Capability Approach for Individuals Living Together. Von Hugel Institute Conference. http://www.st-edmunds.com.ac/uk/vhi/sen/papers/deneulin.pdf.

Dodds, S., 1997. Towards a 'science of sustainability': Improving the way ecological economics understands human well-being. Ecological Economics 23, 95-111.

Ekins, P., Simon, S., 2001. Estimating sustainability gaps: methods and preliminary applications for the UK and the Netherlands. Ecological Economics, 37, 5-22.

Grossman, G. M., 1995. Pollution and Growth: What do we know? in Goldin, J and Winters, L.A. (ed. by), The Economics of Sustainable Development. Cambridge: Cambridge University Press. 19-46.

Hamilton, K., 1999. Measuring Well-Being: Responses to Some Criticisms of the Index of Sustainable Economic Welfare. Seminar to the Department of Geography and Environment, London School of Economics and Political Science.

Hanley, N., Shogren, J.F., White, B., 1997. Environmental Economics in Theory and Practice. T J Press, LTD.

Hanley, N., 2000. Macroeconomics Measures of Sustainability. Journal of Economic Surveys, 14 (1), 1-30.

Hart, M., 1998-99. What Is Sustainability Anyway? Internet web site http:// www. Subject matters.com/ indicators/sustainability/index html.

Hellewig, T.Z., 1975. Méthode de selection d'un ensemble compact de variables in UNESCO, «Les indicateurs sociaux: problémes de definition and de sélection», in «Rapport et Documents de Sciences Sociales», 30.

Hicks, N., Streeten, P., 1979. Indicators of Development: The Search for a Basic Needs Yardstick. World Development. 7, 568-580.

Hinterberger, F., et al., 1999. Sustainable Human Development Index. A Suggestion for Greening the UN Indicator of Social and Economic Welfare. Wuppertal Institute, Wuppertal, Düsseldorf, Germany.

Hirsh, F., 1977. Social Limits to Growth. Routledge & Kegan Paul, London.

Istat, 2005. Indicatori regionali di sviluppo.

Istat, 2005. Conti regionali.

Lancaster, K., 1979. Variety, Equity and Efficiency. Blakwell, Oxford.

Lehtonen M., 2004. The environmental – social interface of sustainable development: capabilities, social capital, institutions. Ecological Economics 49, pp. 199-214.

Little, I.M.D., 1958. A Critique of Welfare Economics. Oxford University Press, New York.

Mishan, E.J., 1960. Welfare Economics: An Assessment. North Holland.

Mishan, E. J., 1993. The Costs of Economic Growth. Weidenfeld & Nicolson, London.

Ng, Y-K., 1983. Welfare Economics. Introduction and Development of Basic Concepts. MacMillan, London.

Ohkawa, K., Kohama, H., 1989. Lectures on Developing Economies. University of Tokyo Press: Tokyo.

Olate, R., 2003. Local Institutions, Social Capital and Capabilities. Challenges for Development and Social Intervention in Latin America. Draft Paper Presented at the Professor Douglass North PhD Seminar, Center for New Institutional Social Sciences, Washington University in St. Louis, 29 October. Web site: http:/cniss.wustl.edu/workshoppapers/olatepaper.pdf.

Passet, R., 1994. L'Amenagement du Territoire dans une perspective de Developpment durable. Revue d'Economie Régionale et Urbaine, n. 4.

Pearce, D.W., - Markandya, A., and Barbier, E.B., 1989. Blueprint for a Green Economy. Earthscan London.

Peragine, V., 2001. Defining Sustainability. Department of Economics, University of Bari.

Pezzey, J.,C.V., Hanley, N., Turner D., Tinch, D., 2005. Comparing Augmented Sustainability Measures for Scotland: is there a mismatch? forthcoming in Ecological Economics.

Pressman, S., Summerfield, G., 2000. The Economic Contributions of Amartya Sen. Review of Political Economy, 12, (1), 90-113.

Qizilbash, M., 1996. Ethical development. World Development. 24, (7), 1209-1221.

Rawls, 1971., 1971. A Theory of Justice. Harvard University Press, New York.

Ray, D., 1998. Development Economics. Princeton University Press, Princeton.

Rennings K., Wiggering H., 1997. Steps towards indicators of sustainable development: Linking economic and ecological concepts. Ecological Economics, 20, 25-36.

Robeyns, I., 2002. Sen's Capability Approach and Gender Inequality. Conference Proceedings: "Promoting Women's Capabilities: examining Nussbaum's Capabilities Approach". 9-10 September (2002). Von Hugel Institute St Edmund's College, Cambridge. http://www.ct-edmunds.cam.ac.uk/vhi/sen/program1.shtml.

Rothman, D.S., and De Bruyn, S.M., 1998. Probing into the Environmental Kuznets Curve Hypothesis. Ecological Economics, (25), 143-145.

Schischka, J., 2002. The Capabilities Approach as a Metric for Economic Development: An Application in Nepal. Conference Proceedings: "Promoting Women's Capabilities: examining Nussbaum's Capabilities Approach" 9-10 September 2002. Von Hugel Institute St Edmund's College Cambridge. http://www.ct-edmunds.cam.ac.uk/vhi/sen/program1.shtml.

Scitovsky, T., 1976. The Joyless Economy. Oxford University Press, New York.

Sen, A. K., 1984. Resources, Values and Development. Basil Blackwell, Oxford.

Sen, A. K., 1985(a) Commodities and Capabilities. Amsterdam: Elsevier and reprinted (1999). Oxford University Press, New Delhi.

Sen, A. K., 1985(b). The moral Standing of the Market, in E:F: Paul, F.D. Miller, Jr. & J.Paul (Eds.,). Ethics and Economics. Basil Blackwell, 1-19, Oxford.

Sen, A.K., 1999. Development as Freedom. Oxford University Press, Oxford.

Segre, A., 2003. The local Territorial Systems and their environmental sustainability. Paper to be presented at the Regional Science Association. International Conference, Pisa-Italy, 12th-15th April 2003.

Shearman, R., 1990. The Meaning and Ethics of Sustainability. Environmental Management, 14(1), pp. 1-8.

Stewart, F., 1985. Planning to meet Basic Needs. London, McMillan.

Stewart, F.,1989. Basic Needs Strategies, Human Rights, and the Right to Development. Human Rights Quarterly, 11(3), pp. 347-374.

Stockammer, E., et al., 1997. The Index of Sustainable Economic Welfare (ISEW) as an Alternative to GDP in Measuring Economic Welfare. The Results of the Austrian (revised) ISEW Calculation 1955-1992. Ecological Economics, 21 (1), 19-34.

Streeten, P., 1979. Basic Needs: Premises and Promises. Journal of Policy Modelling. http://www.complexsystems.org/publications/pdf/basic_needs.pdf.

Streeten, P., 1981. First Things First. Oxford University Press, New York.

Theys, P. J., 2002. L'approche territoriale du "developpement durable", condition d'une prise en compte de sa dimension social. Website: http://www.revue-ddt.org/dossier001/D001_A05.htm

Tsui, K – Y., 2002. Multidimensional poverty indices. Social Choice and Welfare, 19 (1), 69-93.

Wackernagel, M., Rees, W., 1996. Our Ecological Footprint. Reducing Human Impact on the Earth. New Society Publishers, Gabriola Island, Canada.