



QUALITY OF LIFE AND HUMAN ISOLATION: THE CASE OF RURAL AREA OF PUGLIA

Francesco Contò*, Mariantonietta Fiore, Piermichele La Sala

University of Foggia, Department of Economic

Largo Papa Giovanni Paolo II, 71100, Foggia, Italy

e-mail: f.conto@unifg.it

* Corresponding author

Biographical Notes

Professor Francesco Contò is full professor at the Department of Economics, University of Foggia. Currently he teaches "Internationalization and competitiveness in the agro-food system". *Education and training:* Degree in Political Sciences, magna cum laude at the University of Bari (1976); degree in Economics and Business, magna cum laude at the University of Pescara (1990); University of National and World Economy of Sofia; European Parliament - Committee on Agriculture - Bruxelles (Belgium); General Commission for Scientific and Agricultural Research of Syrian Government (IAMB); DG VI Commission de l'Union Européenne - Bruxelles; Queen Elizabeth House (QEH) - Oxford (UK). *Miscellaneous:* Since 1977, he has held various scientific and professional positions inside and outside Academia and he has been responsible for many scientific projects research at national and international scale. He is author of over one hundred scientific international publications. He has held several positions of teaching and as a researcher at international, highly qualified, universities and research institutions. He is coordinator of the Ph.D. course on 'Economics and Environmental Law, Land and Landscape'. He is an ordinary member of several research Society in the Agricultural Economics field (EAAE, IAE, Ce.S.E.T. etc.). He has presented paper at about 100 scientific and academic conferences.

Mariantonietta Fiore has a Research Grant in Agricultural Economics at the University of Foggia. *Education and training:* Degree in Economics at University of Bari; MA in Economics and Finance at the University of Naples Federico II; PhD in "Economics and Technologies for the Sustainable Development"; PhD Courses of CIDE, Inter-University Centre of Econometrics, Bertinoro (Italy);

Methods Summer Program at the London School of Economics and Political Science. *Miscellaneous:* She won several research scholarships (University of Foggia, Province of Foggia etc.). She was research head in local Agencies and private companies for development projects. In 2011/2012 she held the position of Junior Expert of Ministry of Environment, Land and Sea. She took part in many international and national conferences as a presenter, chair and discussant; she was member of the Program Committee of the 73rd International Atlantic Economic Conference.

Piermichele La Sala graduated in Business Administration in 2004 at the Faculty of Economics, University of Calabria. Since 2007 he has participated in numerous research activities with the University of Basilicata in agro-food and rural districts and rural development. Since 2008 he is PhD student in food, environmental and forestry economics and engineering with specialization in economics and rural development planning at the Faculty of Agriculture, University of Basilicata, Economic Technical Department for management of agricultural and forestry land (DITEC). Since 2009, he is economic-technical manager of the Metapontum Agro-food District of Quality. Nowadays he has a research grant in Agricultural Economics at University of Foggia.

Abstract

The present research explores the socio-economic problems arising in a typical peripheral rural area - the Wide Area of Daunian Mountains (WADM)- in Southern Italy in order to analyse the concept of ‘well being’ through the analysis of the ‘quality of life’. For these purposes, we will develop an ‘Index of Human Isolation’ (UNDP, 1997), in order to take into account the multiple dimensions of isolation, that is a constant characteristic of rural areas, particularly the inter-generational, socio-structural, and geographical ones. This index will be employed to analyse the relationship between a set of variables representing the main economic, structural and social aspects of the area and the dynamics of the Value Added. The expected results are twofold; (a) the creation of VA should be decreasing at high levels of IHI; (b) the implementation of social-assistance network may actively contribute to the reduction of isolation.

JEL Classification: D63, D64, D60, Q10

Key-words: Quality of life, Peripheral Rural Area, Human Isolation, Well-being

Introduction

The serious socio-economic problems at both a distributional and qualitative level, the energy crisis, and the environmental emergencies have recently stimulated an international debate about the meaning of words such as ‘well being’ and ‘quality of life’ on the one hand, and about the inconsistency of merely quantitative indicators of economic growth (e.g. GDP), as proxies for the quality of life, on the other (Pressman and Summerfield, 2000). Furthermore, in the last two decades, both developing and industrialised countries have not faced any significant correlation between their GDP growth rate and their quality of life (Deneulin and Stewart, 2002; Lehtonen, 2004; Asheim, 2000; Roemer, 2006). For this reason, economic theories have moved from the analysis of the ‘objective well-being’ to the study of the so-called ‘subjective well-being’, by taking into account new concepts such as ‘happiness’ and ‘satisfaction’ (Easterlin, 2001; Veenhoven, 2000). In particular, in this theoretical framework, a new strand of literature known as ‘Economics and Happiness’ (Frey and Stutzer, 2006, Kahneman and Kruger, 2006, Di Tella and McCulloch, 2006; Bruni, 2004, Easterlin, 2001, 2002, 2003) has linked economics to the analysis of political institutions and happiness, by invoking Aristotle’s *eudaimonia*. However, as advocated by the so called ‘paradox of happiness’ (Easterlin, 1974), any additional income does not necessarily correspond to a greater prosperity and happiness (Galbraith, 1958, Easterlin, 1974, 2001, Scitovsky, 1976, Frank, 1999, Diener and Oishi, 2000, Myers 2000, Graham and Pettinato, 2002; Argyle, 2001; Nettle, 2005; Layard, 2005, Headey, 1993; Frey and Stutzer, 2002, Clark et al., 2005). In this context, several studies have then demonstrated the positive and significant effect on well-being of both the ‘relational goods’ (Brown, 2007; Becchetti and al., 2007, 2006; Gui, 2002) and the social capital (Sabatini, 2004; Healy, 2003): thanks to this ‘relational capital’ both new cognitive resources become available, such as information and trust, thus allowing the actors to achieve unattainable goals (Trigilia, 2001; Lippert and Spagnolo, 2006, Gintis and Khurana, 2007; Aoki, 2007; Dasgupta, 1999; Lin, 2001).

In this framework, our main purpose is to verify the volatility of the concept of well-being, taking into consideration the problems of a rural area (Wide Area of Daunian Mountains) and investigating the quality of life. The present paper is divided as follows: paragraph 2 describes the framework; paragraph 3, after having developed a Human Isolation Index (IIU), exposes the empirical analysis through the definition of the variables, the econometric model adopted and the results obtained. Finally, paragraph 4 draws the conclusions and proposes some policy indications.

The framework

The area of analysis is represented by thirty municipalities of the Wide Area of Daunian Mountains of the province of Foggia. The WADM, which is mainly mountainous and hilly, constitutes because of its altitude and geo-morphological conformation, a natural barrier; it features a road system and infrastructure absent, uneven or inefficient, and conversely the existence of different non-homogeneous and non-communicating socio-economic systems that led, in time, to a continuous process and increasing marginalization and peripheralization of the Area. The road network, in fact, does not allow easy and quick connections to both the provincial capital and instead is closer to major regional centres outside and between the different territorial systems internal to the area, given that travel times are quite high compared to distances to be covered. The social problems of the territory of the WADM are typical of an area of Southern Italy:

- *geographical isolation*, due to an uneven profile orographic and hydrological, high-risk areas and zoning 03/2003 which classified 1/3 of the municipalities with a high level of seismicity and the remaining 2/3 with an average level. The average distance between a municipality and a hospital, for example, is more or equal to the half-hour path;
- depopulation trend of smaller towns and more concentration in those that provide an level and quality average of basic services, this trend results in an overall low population density. In fact, almost half of the municipalities (14 of 30) do not exceed 30 inhabitants/sq.km and more than half (16 of 30) does not exceed 3,000 inhabitants;
- high and rising rates of aging and at the same low and decreasing birth rates also caused a massive emigration of young population and a simultaneous migration of older populations. This *status quo* is also aggravated by the data relative to the rate of disability that leads to productive economic grounds not lively, innovative and entrepreneurial as a result of the difficult workforce turnover.

The causes of the increasing level of isolation and internal disparities are even more evident from an examination of the economic and employment levels of the area that highlight the existence of a weak manufacturing base and essentially dependent on external transfers, and inappropriately to ensure absorption of even a small available labour force. The characteristics of local human capital, especially among the young and acculturated, are hardly compatible with the scarce job opportunities in the existing site and the possible start of a process of self-reliant development without prior upgrading of the local production system and human capital, especially one still in training, and without breaking a mindset that tends to favour the annuity in its various expressions rather than dynamism and entrepreneurial risk. The economic situation is indeed characterized by a

trend of increasing density and non-value added production and territorial production very low in absolute and relativity terms (IPRES, 2005-2009). From the environmental standpoint, it is to underline the widespread use of wind farms (installed in 18 municipalities of 30) and the presence of the mining sector. These activities that create a light and even profitable trend of economic growth seem to contrast with a marked enhancement of the development of the peculiar local environmental resources. Finally, important indicators of quality of life of a macroeconomic aggregate, in terms of dissemination and promotion of social networks, are the presence of museums, cinemas, gyms, sport and shopping, or even companies, consortia and cooperative services. In this case, facilities and recreational groups are numerically small: these problems result in a situation characterized by (i) a marginalization of particular morphological zones more geographical and social isolated because of an atavistic inefficient infrastructure of road and socio-economic networks and conversely (ii) the presence of even a few major service centres (functional centres) with a clear overlapping of functionality (in terms of principals, facilities and business services, health, cultural and recreational) in the two/three more centres in size next to municipalities heavily penalized for considerable distances from major centers.

The Index of Human Isolation (IHI)

The empirical analysis has been structured in two phases:

1. construction of Index of Human Isolation (IHI)
2. developing an econometric model in two steps.

The starting point for developing an Index of Human Isolation (IHI) was the UN report in 1997 which presented the two Human Poverty Indexes, HPI-1 and HPI-2 (Anand and Sen, 1997) that, compared to the HDI (Human Development Index - UNDP, 1990) which measures the average results obtained in a country in three basic dimensions of human development - life expectancy index, a decent standard of living (GDP) and literacy - measure deprivation in relation to, a growing part of the three dimensions considered, and other social exclusion.

The functional expressions of the two indexes are:

$$IPU - 1 = [1/3 (P_1^\alpha + P_2^\alpha + P_3^\alpha)]^{1/\alpha} \quad (1)$$

where

P_1 = Probability at birth of not surviving to 40 years (%)

P_2 = Rate of adult illiteracy

P_3 = Unweighted average of population without access to clean water and children underweight for age

$$IPU - 2 = [1/4 (P_1^\alpha + P_2^\alpha + P_3^\alpha + P_4^\alpha)]^{1/\alpha} \quad (2)$$

where:

P_1 = Probability at birth of not surviving to 60 years (%)

P_2 = Adults lacking functional ability to read and write

P_3 = Population below poverty line income (50% of median adjusted household disposable)

P_4 = Rate of long-term unemployment (lasting less than 12 months)

α is set or equal to 3 to give additional weight, but not predominant in those areas where deprivation is most acute¹. Anand and Sen (1997) make clear, however, that the deprivation is sensitive to the context and the socio-economic characteristics of the country for which the index has been developed. In this case, the Wide Area of Daunian Mountains derives its deprivation from ancestral geomorphological processes that led to marginalization and peripheralization. Therefore, given the lack of clear indicators and models of development, an index of human isolation was built that would reflect the statutory and regulatory problems of the area. The variables used for the construction of this index focuses attention on three dimensions of isolation: (i) intergenerational (ii) socio-structural and (iii) geographically. Regarding the first dimension, we used as a proxy the percentage of elderly (65+) of the total residents (ISTAT) which explains the higher concentration of the population over the higher age that is greater than the regional, national and EU average. The growing percentage of elderly people correlated with low and decreasing fertility indexes, the growing phenomenon of the exodus of youth and single-celled families produce an environment with scarce resources and opportunities and growth rates tending to zero.

For sociological structural isolation, we introduced a proxy for social welfare, the rate of disability of the population, i.e. the number of people perceived to be invalid and/or disabled - with a range that goes from 75% to 100% - compared to the population per thousand. For the construction of this proxy, we analyzed about 16,000 practices of the Medical Provincial Committee (admitted to the civil disability provision from) selected on the basis of disability employment of the applicant and, therefore, the need for economic assistance (through disability pension, monthly allowance of assistance), social and health care (continuous, 24-24h, and day, in residential and semi-residential facilities).

The framework that emerged from this analysis has highlighted quite a problematic situation, since the range of the rate of disability was found to vary from 20 ‰ to 88 ‰ and even higher. The widespread presence of a growing number of individuals considered disabled, related to the high percentage of elderly residents in total, results in a productive and a very weak and demographic

¹ If $\alpha = 1$, the IPU is the average of its size: if α is more great, more great will be the weight that is assigned to the dimension in which there is maximum deprivation.

structure with a very low incidence of active component and, conversely, highly dependent and in need of social and economic support. As regards the geographical isolation, we considered the unweighted average of two proxies: (i) percentage of daily trips out of the ordinary residence of the total population and (ii) rate of migration (net migration on average resident population) indicators that are symptomatic of the fragmented nature, of the centrifugal and marginal zone and ascribes to its increasingly negative net migration. For the calculation of α , we gave the same weight (i.e. 3) adopted for the construction of two indices of the UN - the HPI-1 and IPU-2 - in order to meet the basic philosophy that pervades the process.

Ultimately, the formula of Index of Human Isolation (IHI) is:

$$IHI = [1/3 (P_1^\alpha + P_2^\alpha + P_3^\alpha)]^{1/\alpha} \quad (3)$$

where:

P_1 = Percentage of population over 65

P_2 = Disability rates (per thousand)

P_3 = Unweighted average of the percentage of trips outside the town with the rate of migration

The three dimensions of IHI were not affected by collinearity and, anyway, structuring and processing of IHI is functional for the emergence of three dimensions of the phenomenon of isolation.

The variables

The econometric model used analyzes the relation between the dynamics of value added, suitably deflated, and a set of economic variables, structural and social in the period 2005/2009. Given that the level of analysis is local, the value added can be a good proxy of GDP per capita. The explanatory variables that represent and describe the flow of value added and profitability together with the geo-socio-economic isolation of the area considered were divided into two main groups:

1. economic and structural variables
2. social-environmental variables

The first group represents the attempt to consider all those variables that give cognizance of the structural-economic status quo of the area. The first two variables considered show the level of economic productivity of the area and represent a proxy variable capital and labor of the production function of the added value given the obvious difficulties of being able to get municipal data in particular those relating to tangible investment or as indicators of the stock of fixed capital. In fact, traditional sources of national statistics (ISTAT, STARNET, Chamber of Commerce, IPI, IPRES) does not return information and statistics at that level and type of analysis taking into consideration

the fragmented and unequally shared storage, such as in the Wide Area. The last variable, the social burden (CarSoc), gives an idea and highlights the high structural dependence of the population.

1. **DensPr** (percentage of local units on the of resident population);
2. **AddUL** (percentage workers employed per local units);
3. **CarSoc** (relationship between the size of the total young class (0-14 years) and the elderly (65 years and over) and the amount of potentially active middle-class individuals (15-64 years).

Moreover, the following factors were introduced: which more properly are the business aspects, the impact of energy consumption by sector in percentage terms of total and per capita water consumption (for which it was not possible to find sources of data that make a difference per the final destination). These regressors can explain the economic production structure being inserted into the equation as a functional impact on the total value by sector:

4. **EnInd** (in kW consumption for the industrial production of total consumption);
5. **EnAgr** (in kW consumption for agricultural production on the total consumption);
6. **Idr** (water consumption in cubic meters per capita).

As for the second set of explanatory variables, socio-environmental ones, a further division was made. The first sub-group, primarily based on the concept of emergency in terms of waste, risk, sustainable technologies (in terms of landscape and environmental) and consists of the following variables:

7. **MSW** (kg MSW - municipal solid waste - per capita);
8. **Accid** (percentage of the number of road accidents of vehicles on the vehicles park);
9. **Fire** (percentage of the number of forest fires on municipal land area);
10. **DRisk3_4**, hydrogeological risk dummy (1 if there are 3 or 4 risk areas, 0 otherwise);
11. **dSism** seismicity dummy (1 if the level of seismicity is High, 0 otherwise);
12. **dParEol** wind farms dummy (1 if there are wind farms; 0 otherwise).

In particular, the construction of the dummy dRisk3_4, was first analyzed and bounded mapping Basin Authority on Wide Area of Daunian Mountains, and then those common were identified (22 to 30, more than 70%) with high and very high risk classes, ie 3 and 4, according to the definition of classes of risk taken by the Plan Hydrogeological. In the second sub-group were included dummy variables that have had accessibility as a theme: (i) as a proper opportunity in terms of geography, distance from major health guidelines, commercial, recreational, cultural and (ii) as socializing in terms of personal well-being that comes from an environment conducive to cohesive and socialization, integration and altruism (Brown, 2007) and, therefore, to sympathies (Sen, 2000a). The accessibility to opportunities represents an important development dimension of the actual

level of quality of life achieved, the well-being of a community is embodied precisely in being able and having the opportunity effectively (the capability of Sen, 1997) to schedule their lives (Nussbaum, 2002) and their standard of living (Sen, 2000b). With this in mind, the following variables have been constructed and inserted:

13. **IHI** (described above);
14. **dAccess** accessibility dummy (1 if the time required to reach the major centers are less than 45 ', 0 otherwise);
15. **dPub** sports, cultural, recreational activities dummy (1 if there are theaters, clubs, pubs, sports facilities etc., 0 otherwise);
16. **dOdV** Voluntary Organizations dummy (1 if there are VO, 0 otherwise).

To support the decision to introduce this dummy variable is the literature (Salamon and Anheier, 1997, Roy and Ziemek 2000) that focuses on the positive and indisputable substantial increase in utility for both the beneficiaries and for associations those who participate in voluntary organizations (VO) and organize activities imbued with solidarity and generosity (Brown, 2007). Overall, it is expected that the variables included and built ad hoc are related positively to the Added Value variable except for IHI (Human Isolation Index), CarSoc (social burden), Dsism (seismicity dummy) and DRisk3_4 (hydrogeological risk dummy) and while for some variables (accidents and fires) the expected result may not be unique (if we consider that the GDP introduces a positive disutility - such as a fire - because they increase the economic activities related to them).

The econometric model

The relationship between the level of value added (VA) per capita of each municipality of Wide Area and predictor variables identified was developed in two steps: the first one studies the link between economic and structural variables and VA and in the second currency is the possible change of the coefficients and statistical significance of the prediction with the inclusion of the second set of macro variables identified, ie the social environment. The functional equations of the first and second steps are:

1. $VA = f(EcSt_{it})$ *first step*
2. $VA = f(EcSt_{it}, SAem_{it}, SAopp_{it})$ *second step*

where:

VA represents the dynamics of value added in 2005-2009;

ECST is the vector of variables that characterize the common economic and structural Area;

Saem represents the vector of variables that capture the socio-environmental concept of emergency;

SAopp represents the vector of variables that capture the socio-environmental concept of accessibility as an opportunity and social benefit.

first step

The equation of the first steps is presented in the following form:

$$\ln VA_{it} = \gamma_i + \beta_1(\text{CarSoc})_{it} + \beta_2(\text{DensProd})_{it} + \beta_3(\text{AddUL})_{it} + \beta_4(\text{EnInd})_{it} + \beta_5(\text{EnAgr})_{it} + \beta_6(\text{Idr})_{it} + \varepsilon_{it} \quad [01]$$

- $i = 1 \dots 30$ indicates the 30 municipalities of Area Wide of Daunian Mountains;
- $t = 2000 \dots 2004$;
- γ is the constant;
- β represents the estimated coefficients of the variables (social care, density production, number of employees for local units, impact of energy consumption in industry, impact of energy consumption in the agricultural sector, water consumption per capita);
- ε the error term.

second step

The goal of the second step is to verify how the model changes with the addition and the insertion of the second group of macro variables identified, that is, those social environment. The final equation of the second step is presented in the following functional form:

$$\ln VA_{it} = \gamma_i + \beta_1(\text{CarSoc})_{it} + \beta_2(\text{DensProd})_{it} + \beta_3(\text{AddUL})_{it} + \beta_4(\text{EnAgr})_{it} + \beta_5(\text{RSU})_{it} + \beta_6(\text{Accid})_{it} + \beta_7(\text{Fires})_{it} + \beta_8(\text{EnInd})_{it} + \beta_9(\text{Drisk3_4})_{it} + \beta_{10}(\text{Dsism})_{it} + \beta_{11}(\text{Daccess})_{it} + \beta_{12}(\text{Dpareol})_{it} + \beta_{13}(\text{IIU})_{it} + \beta_3(\text{Dpub})_{it} + \beta_4(\text{Dodv})_{it} + \varepsilon_{it} \quad [02]$$

Where:

- β , in particular, represents the estimated coefficients of all the variables (CarSoc, DensProd, AddUL, EnAgr, Idr, EnInd, MSW, Accidents, Fires, Drisk3_4, Dsism, Daccess, Dpareol IIU, Dpub, Dodv);

Results

The Table 1 summarizes the results of the first and second estimates of the model. The results show that in the first model, with the exception of the variable "water use" and "impact of energy consumption of the industrial sector" the sign and the significance of the variables coincide with what is expected at the theoretical level and contextually. In general, all variables are highly significant. Compared to the first step, the second model does not present heteroscedasticity and,

moreover, is well specified. The results show that, overall, the group of economic variables - DensProd and AddUL - still show a high statistical significance, highlighting, in particular, as imagined, an expected strong correlation between the number of employees per local units (AddUL) and the VA. Regarding the group of socio-environmental variables, the risk subgroup, the results are significant and in line with expected results; in particular the variable Fires would seem to adversely affect the VA of an effect perhaps due to crowding out and exacerbate the degree of isolation and, therefore, unattractiveness of the Wide Area of Daunian Mountains. The variable Accidents, significant at 10%, would result in an increase of 0.6% of the VA, this increase is attributable to clearly established negative effects inherent in the calculation of GDP, which includes negative disutility from products such as car accidents, divorce, crime, etc.. All these goods and services are 'consumable' (Pressman and Summerfield, 2000). The dummy Risk 3_4 (p-value = 0.001), however, would bring a incremental change in the flow of the VA of 9.3%. At first glance, this result would seem an anomaly: a more careful examination, however, does show that the strong correlation between growth in GDP and public expenditure, for all the work put in place for rehabilitation and improvement of areas with higher geological risk, is embodied in the Keynesian multiplier. As for the second subgroup of socio-environmental variables, focusing on the concept of accessibility, significance and value of the coefficient of the dummy variable Daccess reveals the connection between the flow of VA and the accessibility between municipalities. In fact, the more numerous are the municipalities with distances from service centers with less than 45', the greater are economic opportunities in terms of capital equipment, and intangible networks. Particular attention should be devoted to the Index of Human Isolation, purposely built for the case study under consideration, one may notice a significant negative relationship between the flow of VA and the IHI, thus confirming the hypothesis that, where there is a greater degree of isolation in geographic, economic and inter-generational terms, the flow of VA tends to decline as a percentage of a value equal to nearly 26%, as well the presence of a symptomatic population structure economically and socially heavy aggravated by geographical isolation, which in turn facilitates conversely a large and steady migration exodus. The dummy Dpub, in which we identify all municipalities with cinemas, theaters, recreational activities and so on, appears to have a high significance and a strong value of the coefficient. In addition to the immediate economic significance that we attribute to this correlation, it is more likely that a dissemination and distribution of activities, clubs and recreational facilities also affects social relations and an increasing of the VA. Finally, the dummy Dodv, inserted in order to focus on incremental changes in welfare that may result from a social life, cohesive and coherent with free bonds (Brown, 2007), is significant at the 10% limit.

Discussion

The Wide Area of Daunian Mountains shows a complex reality, a system in itself, not modeling, far from what we might expect in theory. In fact, not being popular (in terms of non-productive assets) is in particular a non-economic poverty, which is identified with the phenomena of isolation that cause the breakdown of civic ties and the social fabric. Anthropogenic desertification (in terms of population density and population of the total number of villages) is not at all a sustainable environmental framework. Ultimately, you are in a marginal atypical presence, characterized by a part of a landscape still untouched by modern urbanization, the other by hydro-geological and seismic instability and a large number of important wind-farms that for now do not seem to create economic returns for the native population, with poor and inefficient road networks, less densely populated areas with “aged” populations. In particular, the econometric results show that where there is a high IHI the creation of VA tends to decrease, conversely, symmetrically, in correspondence with increases in distance from the common “service centers” of less than 45', increasing economic opportunities, productive relationships and also in terms of capital equipment, and intangible networks. In fact, an analytical examination of the variables reveals the significance and correlation as well as strictly economic ones, Densprod and AddUl, especially all the explanatory socio-environmental dAccess, dIHI, dOdv who have had access as a common thread as an opportunity of personal achievement and a possibility of socialization, that is an important developmental dimension and the actual level of quality of life achieved. Several recent economic studies have shown, in contrast to possible expectations that older people are happier than younger people (Stroebe and Stroebe, 1987; Horley and Lavery, 1995; Oswald, 1997, Blanchflower and Oswald, 2000). A high index of old age (compared with a low birth rate, a small proportion of the working population and a high level of disability), so if one side leads to a demographic structure of the economically and socially heavy, the other can become a reservoir of well-being, knowledge and traditions through the activation of public-private network shared by the social partners, to support the training of the third sector, the elderly care and combat social exclusion by identifying innovative ways of employment of persons belonging to the groups even more vulnerable. Simultaneously, it is important the development the network based on telecommunications and assistance to reduce isolation in its various forms and to improve accessibility, exploiting and fully enhancing the many strengths of the area (ancient traditions and crafts, historical-tourism, a unique culture of food and wine). It should be at this point important to fix and identify possible future research in order to obtain results that further define the context and, consequently, any development models. In particular, with regard to the IHI, at a later stage of processing, it could be identified by the number of families per year and the average age of single-cell component only to

verify the actual level of social isolation for each municipality. It would be interesting to calculate on the one hand the surface of the risk3_4 areas, and to check how many guidelines (in km) fall into those areas on the total and the other an analysis of the present level of seismicity related to urbanization (not in accordance for most buildings). Finally, one might want to check after almost another five years (which may emerge in the fruits of any investment of royalties), if the relationship between the presence of wind farms and the value added has become significant, occurring with business surveys, number of local workers and implementation phases, and in related and ancillary services to large companies Spa design and installation. These paths were not developed at this stage because of objective difficulties and materials due to the uneven and fragmented nature that characterizes the local level in general archiving and computerization of small municipalities.

Bibliography

- Anand, S. and Sen, A. (1997). *Concepts of Human Development and Poverty: A Multidimensional Perspective, Human Development Report Office*, UNDP, New York.
- Aoki, M. (2007). “Three-Level Approach to the Rules of the Societal Game: Generic, Substantive and Operational”, paper presented at SASE's Presidential Choice Roundtable on institutional change, Copenhagen, June.
- Argyle, M. (2001), *The Psychology of Happiness*, Taylor&Francis, New York.
- Asheim, G. (2000), “Green National Accounting: Why and How?”, *Environment and Development Economics*, Vol. 5, No. 2, pp. 25-48.
- Becchetti, L., Londo Bedoya, D.A. and Trovato, G. (2006), “Income, Relational Goods and Happiness”, *Tor Vergata University Departmental Working Papers*, CEIS, 227.
- Becchetti, L., Perroni, A. and Rossetti, F. (2007), “Sociability and Happiness”, *Working Paper University of Bologna-AICCON* 44.
- Blanchflower, D.G. and Oswald, A.J. (2000), “Well-Being Over Time in Britain and the USA”, *NBER Working Paper*, 7487, pp. 1359-1386.
- Brickman, P. and Campbell, D.T. (1971), “Hedonic relativism and planning the good society”, in M.H. Apley (ed.), *Adaptation-level theory: A symposium*, Academic Press, New York.
- Bruni, L. (2004), *L'economia, la felicità e gli altri*, Città nuova, Roma.
- Bruni, L. (2007), *La ferita dell'altro. Economia e relazioni umane*, Il Margine, Trento.
- Clark, A.E., Etilé, F., Postel-Vinay, F., Senik, C. and Van der Straeten K. (2005), “Heterogeneity in reported well-being: Evidence from twelve European countries”, *Economic Journal*, 115, pp. 118-132.

- Dasgupta, P.S. (1999), "Economic progress and the idea of social capital", in P. Dasgupta and I. Serageldin (eds.), *Social Capital. A Multifaceted Perspective*, The World Bank, Washington.
- Deneulin, S. and Stewart, F. (2002), "Amartya Sen's contribution to development thinking", *Studies in Comparative International Development*, Vol. 37, No. 2, pp. 61-70.
- Di Tella, R. and McCulloch, R. (2006), "Some uses of happiness data in economics", *Journal of Economic Perspectives*, Vol. 20, No. 1.
- Diener, E. and Oishi, S. (2000), "Money and Happiness: Income and Subjective Well-Being across Nations", in E. Diener and E.M. Suh (eds.), *Culture and Subjective Well-Being*, MIT Press, Cambridge (Mass.).
- Easterlin, R.A. (1974), "Does Economic Growth Improve the Human Lot? Some empirical evidence", in P.A. Davis and M.K. Reader (eds), *Nation and Households in Economic Growth. Essays in Honor of Moses Abramowitz*, Academic Press, New York and London.
- Easterlin, R.A. (2001), "Income and Happiness: Towards a Unified Theory", *The Economic Journal*, 111, pp. 465-484.
- Easterlin, R.A. (2002), "Happiness in economics", *Economics*, The International Library of Critical Writings, Cheltenham.
- Easterlin, R.A. (2003), *Explaining Happiness*, Department of Economics, University of Southern California, Los Angeles.
- Frank, R.H. (1999), *Luxury Fever: Why Money Fails to Satisfy in an Era of Excess?*, Free Press, New York.
- Frey, B. and Stutzer, A. (2002), *Happiness in Economics: How the Economy and Institutions Affect Well-Being*, Princeton University Press, Princeton.
- Frey, B. and Stutzer, A. (2006), *Economia e felicità*, Il sole24ore, Milano.
- Galbraith, K. (1958), *The Affluent Society*, Penguin Books, Harmondsworth.
- Gintis, H. and Khurana, R. (2007), "Corporate Honesty and Business Education: A Behavioral Model", paper prepared at the *Workshop on Social Capital, Corporate Social Responsibility (CSR) and Sustainable Development*, Trento, July.
- Graham, C. and Pettinato, S. (2002), *Happiness and Hardship: Opportunity and Insecurity in New Market Economies*, The Brookings Institution Press, Washington, D.C.
- Gui, B. (2002), "Più che scambi incontri. La teoria economica alle prese con i fenomeni Relazionali", in P.L. Sacco and S. Zamagni (eds), *Complessità relazionale e comportamento economico. Materiali per un nuovo paradigma di razionalità*, Il Mulino, Bologna.
- Headey, B. (1993), "An Economic Model of Subjective Well-Being: Integrating Economic and Psychological Theories", *Social Indicators Research*, 28, pp.97-116.

- Healy, T. (2003), “Social capital: challenges for its measurement at international level” paper presented at the Workshop: Social Capital and Economic Development, Anniversary Conference on ‘Sustainable Ties in the Information Society’, Ireland, March.
- Horley, J. and Lavery, J.J. (1995), “Subjective well-being and age”, *Social Indicators Research*, 34, pp. 275–282.
- IPRES (2001), *La Puglia in cifre 2000*, Levante Editori, Bari.
- IPRES (2002). *La Puglia in cifre 2001*, Progedit, Bari.
- IPRES (2003). *La Puglia in cifre 2002*, Progedit, Bari.
- IPRES (2004). *La Puglia in cifre 2003*, Progedit, Bari
- IPRES (2005). *La Puglia in cifre 2004*, Progedit, Bari.
- Kahneman, D. and Krueger, A.B. (2006), “Developments in the Measurement of Subjective Well-Being”, *Journal of Economic Perspectives, American Economic Association*, Vol. 20, No. 1, pp. 3-24, Winter.
- Lane, R.E. (1998), *The Loss of Happiness in Market Economies*, Yale University Press, New Haven-London.
- Layard, R. (2005), *Happiness. Lessons from a New Science*, Allen Lane, London.
- Lehtonen, M. (2004), “The environmental–social interface of sustainable development: capabilities, social capital, institutions”, *Ecological Economics*, 49, pp. 199-214.
- Lin, N. (2001), *Social Capital: A Theory of Structure and Action*, Cambridge University Press, London and New York.
- Lippert, S. and Spagnolo, G. (2006), “Networks of Relations, Word-of-Mouth Communication, and Social Capital”, *SSE/EFI Working Paper in Economics and Finance*, 570.
- Myers, D.G. (2000), “The Funds, Friends, and Faith of Happy People”, *American Psychologist*, Vol. 55, No. 1, pp. 56-67.
- Nel, E. and Hill, T. (2008), “Marginalisation and demographic change in the semi-arid Karoo, South Africa”, *Journal of Arid Environments*, 72, pp. 2264–2274.
- Nettle, D. (2005), *Happiness: The Science Behind Your Smile*, Oxford University Press, Oxford.
- Nussbaum, M. (2002), *Giustizia sociale e dignità umana*, Il Mulino, Bologna.
- Oswald, A.J. (1997), “Happiness and economic performance”, *Economic Journal*, 107, pp. 1815-1831.
- Pressman, S. and Summerfield, G. (2000), “The Economic Contributions of Amartya Sen”, *Review of Political Economy*, Vol. 12, No. 1, pp. 89-113.
- Roemer, J.E. (2006), “Economic Development As Opportunity Equalization”, *Cowles foundation Discussion paper*, 1583, September.

- Roy, H. and Ziemek, S. (2000), "On the Economics of Volunteering", *Discussion Papers on Development Policy*, Zentrum für Entwicklungsforschung Center for Development Research, 31.
- Sabatini, F. (2004), "Che cosa è il Capitale Sociale?", *Dis/Uguaglianze, Trimestrale per l'analisi dei processi di sviluppo e sottosviluppo*, 3, pp. 41-55.
- Salamon, L.M. and Anheier, H.K. (1997), *Defining the Nonprofit Sector: A Cross-National Analysis*, New York Manchester University Press, New York.
- Scitowsky, T. (1976), *The Joyless Economy: An Enquiry into Human Satisfaction and Consumer Dissatisfaction*, Oxford University Press, New York.
- Sen, A.K. (1997), *Collective Choice and Social Welfare*, North-Holland, New York.
- Sen, A.K. (2000a), *La diseguaglianza*, Il Mulino, Bologna.
- Sen, A.K. (2000b), *Libertà è sviluppo. Perché non c'è crescita senza democrazia*, Arnoldo Mondadori, Milano.
- Stroebe, W. and Stroebe, M.S. (1987), *Bereavement and health: The psychological and physical consequences of partner loss*, Cambridge University Press, New York.
- Triglia, C. (2001), "Social Capital and Local Economic Development", *European Journal of Social Theory*, 4, pp. 427-442.
- UNDP (1990), *Human development Report 1990*, Oxford University Press, New York.
- UNDP (1997), *Human development Report 1997*, Oxford University Press, New York.
- Veenhoven, R. (2000), "Well-being in the welfare state, level not higher, distribution not more equitable", *Journal of Comparative Policy Analysis*, 2, pp. 91-125.

APPENDIX

Figure A1: Province of Foggia and Wide Area of Daunian Mountains



Source: http://www.areavasta.montidauni.it/jsps/28/Area_vasta/44/Il_Territorio.jsp

Table A1: Distances of the WADM municipalities from the major services centers

Municipalities	FOGGIA		LUCERA		SAN SEVERO		CAMPOBASSO	
	km	Min	Km	Min	km	min	Km	min
Accadia	68	60	89	78	107	88	136	116
Alberona	41	44	24	28	47	50	54	60
Anzano di Puglia	71	60	92	79	110	88	125	107
Ascoli Satriano	32	29	53	47	71	56	151	118
Biccari	40	42	23	26	43	45	80	78
Bovino	36	45	51	57	73	71	120	118
Candela	41	37	72	55	80	84	143	114
Carlantino	72	77	56	61	55	77	47	52
Casalnuovo Monte Rotaro	53	57	34	39	31	36	68	71
Casalvecchio di Puglia	49	51	29	33	27	31	64	66
Castelluccio dei Sauri	25	27	46	45	65	54	115	106
Castelluccio Valmaggiore	43	46	26	30	51	53	94	91
Castelnuovo della Daunia	48	51	28	33	30	35	63	65
Celenza Valfortore	66	69	50	53	69	71	38	40
Celle di San Vito	50	56	33	40	57	63	101	99
Deliceto	38	45	52	58	74	72	121	119
Faeto	51	58	35	42	59	64	79	86
Lucera	20	23	0	0	23	25	70	68
Monteleone di Puglia	78	69	74	80	117	96	132	116
Motta Montecorvino	39	39	22	23	41	41	53	54
Orsara di Puglia	45	52	33	39	81	79	101	100
Panni	47	55	61	67	83	81	120	124
Pietramontecorvino	40	40	20	22	35	41	61	63
Rocchetta Sant'Antonio	50	48	71	66	90	76	138	117
Roseto Valfortore	62	65	45	50	64	68	60	64
San Marco la Catola	60	59	44	45	62	62	36	37
Sant'Agata di Puglia	55	52	76	70	94	79	134	116
Troia	23	28	19	21	43	44	86	81
Volturara Appula	52	51	35	35	54	53	42	41
Volturino	41	41	25	26	43	43	54	54

Source: our processing on data available on: <http://www.viamichelin.it>

Table A2: Disability rates of the WADM municipalities population (2000-2004)

Municipalities	2000	2001	2002	2003	2004
Accadia	15,27	34,85	42,39	63,77	76,30
Alberona	21,53	38,87	61,12	87,04	101,40
Anzano di Puglia	12,01	23,36	29,78	40,95	51,20
Ascoli Satriano	5,97	12,40	17,62	28,09	34,82
Biccari	4,70	15,64	25,46	37,02	44,41
Bovino	14,98	29,40	39,96	58,23	69,37
Candela	9,23	16,32	23,67	34,18	42,00
Carlantino	9,59	20,91	36,38	52,16	65,25
Casalnuovo Monterotaro	10,41	23,64	40,56	58,30	68,80
Casalvecchio di Puglia	13,72	30,22	46,97	65,80	82,36
Castelluccio dei Sauri	9,72	17,96	26,28	36,37	38,85
Castelluccio Valmaggiore	11,45	24,61	34,20	44,92	48,51
Castelnuovo della Daunia	11,17	23,03	38,01	45,08	54,30
Celenza Valfortore	10,80	24,71	33,79	48,89	63,57
Celle di San Vito	12,71	48,39	64,52	85,11	90,91
Deliceto	12,82	26,97	36,73	53,07	59,40
Faeto	13,67	31,83	50,80	66,76	83,81
Lucera	5,16	11,41	19,09	27,95	34,34
Monteleone di Puglia	18,80	30,65	43,41	61,02	68,40
Motta Montecorvino	15,31	49,89	85,41	119,83	151,48
Orsara di Puglia	12,57	24,47	40,19	64,73	73,98
Panni	31,25	59,13	81,14	105,32	119,44
Pietramontecorvino	12,42	26,36	36,73	50,49	64,36
Rocchetta Sant'Antonio	15,83	30,96	41,28	55,77	68,57
Roseto Valfortore	10,60	27,44	36,79	51,87	60,92
San Marco la Catola	11,55	18,57	28,40	42,36	53,24
Sant'Agata di Puglia	15,11	34,54	50,96	74,27	87,70
Troia	8,16	18,33	26,67	36,65	43,57
Volturara Appula	21,85	48,66	82,19	133,10	154,98
Volturino	14,15	33,12	55,89	77,83	94,99

Source: our processing on data by Medical Provincial Committee of Province of Foggia

Table A3: IHI of WADM municipalities in decreasing order

Municipalities	2004	Municipalities	2004
Volturara Appula	1,08	Pietramontecorvino	0,49
Motta Montecorvino	1,06	Carlantino	0,49
Panni	0,85	Roseto Valfortore	0,47
Alberona	0,72	Celenza Valfortore	0,47
Volturino	0,68	Deliceto	0,46
Celle di San Vito	0,65	San Marco la Catola	0,43
Sant'Agata di Puglia	0,62	Castelluccio Valmaggiore	0,41
Faeto	0,61	Castelnuovo della Daunia	0,41
Casalvecchio di Puglia	0,60	Anzano di Puglia	0,40
Orsara di Puglia	0,55	Troia	0,38
Accadia	0,55	Biccari	0,38
Monteleone di Puglia	0,51	Castelluccio dei Sauri	0,35
Rocchetta Sant'Antonio	0,51	Candela	0,32
Bovino	0,51	Ascoli Satriano	0,31
Casalnuovo Monterotaro	0,50	Lucera	0,26

Source: our processing on data by ISTAT, IPRES and Medical Provincial Committee

Table A4: Descriptive statistics of the model variables

Variables	Obs	Media	Mediana	Standard deviation.	Pseudo Stand. dev.	Outliers		Skewness (pr)	Kurtosis (pr)
						mild	severe		
Lva	150	2.279	2.299	0.2561	0.1879	6 (low)		0.000	0.007
CarSoc	150	68.25	64.91	12.41	9.141	6 (high)	3 (high)	0.000	0.000
Densprod	150	155.22	155.5	33.85	35.67			0.128	0.965
AddUl	150								
IncEnAgr	150	12.09	7.972	11.97	9.331	1 (high)	5 (high)	0.000	0.000
RSU	100	262.2	270.2	72.63	66.52	1 (high)		0.239	0.767
Inc	150	1.758	0.83	3.074	1.92	3 (high)	4 (high)	0.000	0.000
Incen	150	0.237	.029	0.362	0.278	4 (high)	3 (high)	0.000	0.000
Drisk3_4	150	0.267	0	0.444	0.741				
Dsism	150	0.333	0	0.473	0.741				
Daccess	150	0.533	1	0.501	0.741				
Dpareol	150								
IU	150	0.396	0.346	0.153	0.117	4 (high)	3 (high)	0.000	0.000
Dpub	150	0.133	0	0.341	0				
Dodv	150	0.467	0	0.501	0.741				

Table A5: Results of the estimate, the first and second steps (dependent variable: ln VA)

<i>independent variables</i>	<i>First step</i>		<i>Second step – Pooled Estimation</i>									
	<i>Panel Pooled²</i>	<i>GLS Opz. het.</i>										
Costante	+1.183 (+0.113)	+1.237 (+0.079)	+1.090 (0.127)	+1.084 (0.127)	1.128 (0.128)	0.958 (0.126)	0.975 (0.124)	0.928 (0.123)	0.927 (0.124)	0.857 (0.123)	0.799 (0.120)	0.758 (0.122)
CarSoc	-0.002 ** (0.001)	-0.001 * (0.000)	-0.003 *** (0.001)	-0.003 *** (0.001)	-0.003 *** (0.001)	-0.003 *** (0.001)	-0.003 *** (0.001)	-0.001 *** (0.001)	-0.001 *** (0.001)	-0.001 *** (0.001)	-0.002 *** (0.001)	-0.003 *** (0.002)
Densprod	+0.005 *** (+0.000)	+0.005 *** (+0.000)	+0.005 *** (0.000)	+0.005 *** (0.000)	+0.005 *** (0.000)	+0.005 *** (0.000)	+0.006 *** (0.000)	+0.005 *** (0.000)	+0.005 *** (0.000)	+0.005 *** (0.000)	+0.005 *** (0.000)	+0.005 *** (0.000)
AddUI	+0.655 *** (+0.060)	+0.641 *** (+0.049)	+0.673 *** (0.083)	+0.678 *** (0.083)	+0.655 *** (0.083)	+0.719 *** (0.079)	+0.696 *** (0.078)	+0.707 *** (0.077)	+0.707 *** (0.080)	+0.686 *** (0.078)	+0.694 *** (0.075)	+0.763 *** (0.086)
EnAgr	+0.002 ** (+0.001)	+0.003 *** (+0.000)	+0.003 ** (0.001)	+0.002 ** (0.002)	+0.002 ** (0.001)	+0.002 ** (0.000)	+0.002 ** (0.000)	+0.001 * (0.001)	+0.002 * (0.001)	+0.001 *** (0.001)	-0.000 *** (0.001)	-0.000 *** (0.001)
RSU			+0.000 ** (0.000)	+0.000 *** (0.000)	+0.000 *** (0.000)	+0.000 ** (0.000)	+0.000 *** (0.000)	+0.000 ** (0.000)	+0.000 ** (0.000)	+0.000 ** (0.000)	+0.000 ** (0.000)	+0.000 *** (0.000)
Fire				+0.002 (0.004)	+0.001 (0.004)	+0.005 (0.004)	+0.005 (0.003)	+0.006 (0.003)	+0.006 (0.004)	+0.007 * (0.003)	+0.006 * (0.003)	+0.006 * (0.004)
Accident					-0.086 * (0.045)	-0.102 ** (0.426)	-0.853 *** (0.042)	-0.094 ** (0.041)	-0.095 ** (0.042)	-0.096 ** (0.040)	-0.104 * (0.040)	+0.105 *** (0.039)
Drisk3_4						+0.131 *** (0.033)	+0.162 *** (0.035)	+0.137 *** (0.036)	+0.137 *** (0.036)	+0.131 *** (0.035)	+0.101 *** (0.036)	+0.093 *** (0.036)
Dsism							-0.061 (0.027)	+0.008 (0.041)	+0.008 (0.042)	+0.006 (0.041)	-0.017 (0.041)	+0.024 (0.041)
Daccess								+0.092 ** (0.041)	+0.092 ** (0.041)	+0.094 ** (0.042)	+0.073 ** (0.041)	+0.067 * (0.041)
Dpareol									+0.000 (0.033)	+0.004 (0.032)	-0.005 (0.031)	+0.003 (0.031)
IIU										-0.285 ** (0.112)	-0.308 *** (0.108)	-0.258 ** (0.112)
Dpub											+0.126 *** (0.045)	+0.109 ** (0.046)
Dodv												+0.056*

² Regression with stepwise estimation pr. 0,1.

Francesco Contò, Mariantonietta Fiore, Piermichele La Sala – *Quality of life and human isolation: the case of rural area of Puglia*

												(0.034)
R ²	0.7082		0.7589	0.7600	0.7690	0.8029	0.8132	0.8229	0.8229	0.8351	0.8488	0.8534
Adjusted R ²	0.6988	0.6993	0.7461	0.7445	0.7514	0.7856	0.7945	0.8030	0.8008	0.8124	0.8260	0.8293
N. observations	150	150	150	150	150	150	150	150	150	150	150	150
N. groupes observed		30										

*** = lev. sign. 1%; ** = lev. sign. 5%; * = lev. sign. 10%; no asterisk = not significant