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*AGRO-ENERGY PRODUCTION AS A DRIVING FORCE IN THE SOCIO-ECOLOGICAL
TRANSITION OF RURAL ENVIRONMENTS: A SIGNIFICANT CASE STUDY WITHIN THE ALTA
MURGIA NATIONAL PARK*

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Summary: This paper explores the possibility of considering the productive environment of a South-European rural region, the *Alta Murgia* National Park in the Italian region of Apulia, as the socio-economic framework for a new culture of territorial development, ingenerated by the local diffusion of dedicated biomass crops. We intend to draw particular attention to the processes involved in the implementation of the green energy and energy efficiency policies, at the territorial and regional levels, and their material and immaterial (social perception) impacts on the local rural landscape.

Résumé: Cette étude se propose d'analyser le contexte socio-économique du territoire rural du Parc National de l'*Alta Murgia*, au sein de la région italienne de Pouilles, à l'aune des changements induits par la diffusion des cultures dédiées à la production de biomasses et biocarburants et de la conséquente expérimentation d'une nouvelle *culture* du développement territorial. Cette hypothèse sera explorée à partir d'une réflexion sur l'application des principes de durabilité et d'efficacité énergétique au sein des cycles productifs propres aux entreprises agricoles et zootechniques locales, ainsi que sur leur retombées physiques et liées aux représentations sociales du paysage rural.

Keywords: rural landscape, agro-energy, energy policy, energetic sustainability, territorial governance, European Landscape Convention

Mots clés: paysage rural, agro-énergies, politiques énergétiques, durabilité énergétique, gouvernance territoriale, Convention Européenne du Paysage

Agro-energy production as a driving force in the socio-ecological transition of rural environments: a significant case study within the *Alta Murgia* National Park

1. INTRODUCTION. LANDSCAPE AS A FORUM FOR MULTIPLE ACTORS

This study proposes to explore a fundamental hypothesis about the possibility of viewing the productive environment of a traditional rural region in Southern Europe as the socio-economic framework for a new culture of territorial development, driven by the intensification of new forms of debate and private/public exchanges centered on green energy issues.

We intend to place particular emphasis on the processes involved in the implementation of landscape and energy policies at the territorial and local level and the implications within these processes of the adoption of sustainable development principles. From our scientific perspective, these dynamics may be evaluated in terms of their potential to renew territorial governance procedures, by virtue of the adoption of the “landscape approach” (Prieur, Durosseau, 2006) in the construction of a new participative process, specifically ideated for green energy policies.

In the light of these preliminary considerations, this study will be aimed at analysing the catalyzing effect of the development of an emerging socio-political viewpoint, which explores the possibility of seeing the landscape as a “forum” or a “stage” (van der Horst, 2010), to construct a discussion between multiple actors about the role of green energies within societies, and, more generally, about the way to consider the relationship between energy production and consumption and the context in which the societies themselves live. In our hypothesis, this catalyzing effect forms the foundation for the emergence of a new *territorial production* process (Beaurain, 2003) and plays a central role in structuring new forms of governance which, in turn, may potentially establish different kinds of cooperative projects between local entrepreneurs, institutional stakeholders and groups of involved citizens.

In order to make this emerging forum function as a new catalyst for *territorial production*, a renewed *sense* of energy, being a central issue of the climate change agenda for national and regional European governments, must be developed. If we start to consider the close relationship it has with the radical changes engendered in landscape structures and perceptions based on a different energy management policy, we're confronted by an initial

stream of development for deeper reflections on the bilateral relationship between energy and landscape issues. On one hand, landscape may represent a new critical *observatory* from which to approach a more balanced consideration of the past and present use of energy in different societies (van der Horst, 2010), and, on the other hand, energy may be considered as an important “driver” for landscape, concerning three main aspects: “energy production”, “energy consumption” and “embodied energy” (Selman, 2010). An initial important topic for discussion in this landscape forum would be to distinguish between “explicit” and “implicit” energy streams which permeate everyday living. These might include transportation networks, electric power and heating facilities in the first case, and energy footprints of products and production and consumption habits in the second case. Subsequently, this distinction may introduce a wider acknowledgment of the way in which the historical “dialectical relation” between contemporary societies and energy is spatially reflected into the landscape (Ghosn, 2010).

In this paper, we will mainly argue the fundamental role that energy drivers play in shaping the productive landscape of a specific rural South-European region, the *Alta Murgia* in the Italian region of Apulia, considering both the material (physical changes in landscape structures) and immaterial (landscape perception) implications of the close bilateral relationship between landscape and energy drivers.

2. AGRO-ENERGIES AND RURAL ENVIRONMENTS FROM THE POINT OF VIEW OF TERRITORIAL INTELLIGENCE

As the particular socio-economic environment that we intend to explore in this paper, through the lens of the multiple *energy drivers* in action in the landscape, is the productive context of a rural South European region, our analysis will be focussed on energy crop production, which has become increasingly widespread in the last decade for both small and large agricultural enterprises.

Our interest in this aspect is due to critical consideration of the cause-effect relationship between the economic crisis, which has been affecting the agricultural sectors of certain South European regions for last decades (Hervieu, Thibault, 2009), and the consequent diffusion of this new form of non-food production. In fact, since *Agenda 2000* and the reform of the *Common*

Agricultural Policy in 1999, this interpretation of the multi-functional paradigm in agriculture production along with the intensification of new measures to promote rural development, the second Pillar of CAP (Hervieu, 2002), have produced an important debate and notable public mobilisation.

The possibility of creating a new perspective for economic and social development in the South-European regions affected by negative economic trends has been viewed in this emerging political framework as producing a renewed social interest in the energy aspects which are inherent to sustainable development of rural societies (Organisation for Economic Co-operation and Development, 2001). By virtue of its comprehensive approach to the socio-economic and environmental issues of sustainability, the development of an agro-energetic strategy for the evolution of rural territories is closely connected to the testing of new scientific tools for the implementation at the local level of the multi-disciplinary “set of knowledge” representing territorial intelligence (Girardot, 2008).

As highlighted by the analysis of the local case study presented in this paper, the design of new scientific tools, and, even more importantly, of a new method to approach the scientific knowledge of this new territorial dynamic, which today affects an increasing amount of productive areas within the rural South-European regions, is aimed at testing the possibility of synergistically taking into account the different environmental, economic and socio-cultural aspects that are affected by the diffusion of green energy projects.

In the light of these varied implications, the “energetic shift” of productive lands needs to be evaluated and understood in the context of a more complex territorial evolution, which creates, on one hand, a need for national and regional governments to react with a long-term strategy to the energy crisis affecting contemporary societies, and, on the other hand, considers the financial implications of the loss of the social and economic value of agricultural and livestock activities in traditional rural regions.

The main scientific hypothesis analysed in this paper therefore focuses on demonstrating how a wider acknowledgment of the place and role of renewable energy projects within rural South-European landscapes may contribute to transforming this emerging issue in territorial planning into an important opportunity to improve the currently widespread scientific tools used to deal with sustainable development of productive lands. Consequently, green energy projects may become, in turn, a potential new *social platform* for the implementation of direct interactions between local public and private players, helping to move in the direction of a more participative and balanced model of sustainable territorial development.

Specifically, we intend to explore the hypothesis stated in the title of this paper, examining agro-energy production as a driving force for the *socio-ecological transition* (Fischer-Kowalski, Haberl, 2007) of contemporary rural societies. Hence, we intend to analyse the impacts of these projects at a wider scale, both geographically and problematically, than the one generally considered by policymakers and land-use planners when analysing their effectiveness. The final purpose of this new way of considering the potential of green energy projects within the territorial framework in which they are located is to highlight, first, the catalyzing effect that they create in terms of transforming contemporary rural landscapes, and second, the possibility to view the management of these projects as a *laboratory* for experimenting with a new integrated approach to sustainability.

3. THE ALTA MURGIA RURAL REGION AS A SIGNIFICANT CASE STUDY

Through the evaluation of a site-specific example in the Italian region of Apulia, we intend to analyse the emergence and diffusion stages of green energy plants in contemporary rural South-European contexts and their relationship with the socio-economic development of the area in which they’re integrated. Our analysis will place particular focus on the consequences of national and regional sustainable development policies regarding energy efficiency and renewable energy regulation on the productive cycle of the agricultural and livestock firms located in the area of *Alta Murgia* National Park. This is the first Italian Rural Park, established in 2004 in the hinterland of the Mediterranean city of Bari, on a pre-existing Natura 2000 Site, Site of Community Importance and Special Protection Area “Murgia Alta” (SCI/SPA).

As in the specific framework outlined by this case study we examine an important dimension of territorial management, the *landscape* (Ormaux, 2008), and in particular, as *Alta Murgia* is part of a system of protected areas (Italian National Parks), special attention must be paid to the different *top-down* and *bottom-up* approaches that may be adopted by the local stakeholders in order to create the process for establishment green energy projects. If we evaluate different ways of contributing to the territorial production of agricultural environments by considering the application of these antithetical approaches, we can develop a first reflection about the territorial governance processes leading to landscape policies, at various local and national levels, as well as to energy policies.

In fact, the participation procedures, which should precede and legitimise the establishment of new policies, as generally emphasized by the *Aarhus Convention* (1998) and more specifically evoked in the *European Landscape Convention* (2000) in

order “to establish and implement landscape policies aimed at landscape protection, management and planning”, represent an important political common ground from which the sharing of a *bottom-up* approach to both landscape and energy policies could commence.

It is specifically in this sense that we intend to approach our critical analysis of the process which has led to the establishment of various policy levels, dealing with management of green energy as well as concerning the evaluation and authorisation of projects within the protected area of *Alta Murgia* National Park.

As already noted in the introduction, the partial conversion of agricultural production into agro-energy crops, as well as the increasing production of biomass and biogas for green energy production by the livestock industry, have emerged in the last few years as two major activities potentially able to introduce a new positive economic trend for rural South-European regions. When not part of a system of protected areas, the partial conversion of agricultural and livestock production into non-food energy crops has, over the last decade, been promoted by local institutions and widely adopted by local entrepreneurs in order to diversify and stabilize their production. In some cases, for example in the French natural region of Beauce, the bio-energy solution has represented a successful model for new economic development of agricultural and livestock sectors, creating a new shared political foundation on which local public and private stakeholders were able to build an effective perspective to lead the future of farming towards a new evolutionary process. In other cases, such as in the protected territory of *Alta Murgia* National Park, the establishment process for green energy projects has been characterised by a more difficult bureaucratic process and less acceptance of the radical changes to the landscape structure and production by local residents, leading to strong reactions from local political actors (Ente Parco Nazionale dell’Alta Murgia, *Documento sul P.E.A.R. Puglia*, 27/06/2006).

While traditionally featuring intensive cereal production and livestock farming, since the institution of the protected area, the socio-economic environment of the *Alta Murgia* has faced a new stage of development, carried out by local governments in concert with the local residents, seeking “to support economic vitality and to promote a renewed model of sustainable territorial management of the National Park, in continuity with the local rural traditions” (*Proposta di Piano e di Regolamento del Parco Nazionale dell’Alta Murgia. Relazione generale*, 31/05/2010). While in the initial policy stages the spread of green energy projects within the context of the protected areas was seen as a key factor for sustainable

development of the *Alta Murgia* agricultural area (Viesti, 2008), an important political shift has occurred since the *National Guidelines for the authorisation of renewable energy installations*, drafted by the Italian Ministry for Economic Development and Regional Guidelines went into effect in September of 2010, combined with the subsequent ratification of the *Regional Guidelines for Apulia*, in December of 2011. The simultaneous tightening of National Park regulations regarding the spread of green energy in the rural landscape has in fact generated radical changes in the local political strategy for energy sustainability, in an attempt to go beyond massive production of renewable energy mainly aimed at achieving the required percentage of green energy, at both the national and regional level (*European Burden-Sharing Agreement*, 1998). Through the introduction of a more strictly regulated authorisation process for the installation of renewable energy power plants, which actually prohibits the installation of large-scale energy power plants within agricultural lands and ensures appropriate integration of these structures into the landscape, the local administrators, both at the regional and protected area level, have taken important new steps towards achieving a more balanced and landscape-sensitive approach to green energy policy. The current state of political green energy strategy seems clearly focussed on taking into account not only ecological damage and land use conflicts in agricultural contexts affected by large-scale energy projects, but also on considering related landscape esthetical issues.

Moreover, since the National Park Action Plan came into force in May of 2010, two main pilot projects have been established by the government to involve local agricultural and livestock entrepreneurs in a new territorial dynamic. The first pilot project, “Re-launching Sustainable Animal Husbandry”, supports the “re-establishment” of the basic *multifunctional* condition of agricultural and livestock enterprises (Chrispeels, 2003) through a more transversal integration between traditional local techniques and knowhow, which are seen as a potential model for sustainable resource management, and new forms of energy production. The second one, “the 21st Century *Alta Murgia* Farm”, has the goal of increasing the visibility and touristic appeal of sustainable rural enterprises, which focus their economic activities in the direction of actualising the image of agriculture and livestock farming, thanks to the construction of a diversified green energy mix (*Proposta di Piano e di Regolamento del Parco Nazionale dell’Alta Murgia. Relazione generale*, 31/05/2010).

Both these experimental projects, which in the wider territorial context have an additional goal of integrating the traditional farms of the *Alta Murgia*

into the organisation of a new regional district for the production of renewable energy and the achievement of energy efficiency criteria (*La Nuova Energia. Distretto Produttivo delle Energie Rinnovabili e dell'Efficienza Energetica della Regione Puglia*, 2009), undoubtedly represent an important step towards thwarting the economic crisis and decreasing the social isolation of the "identitarian" rural activities in the *Alta Murgia* area (Magnaghi, 2000).

In fact, the foundation of the regional district "*La Nuova Energia*" is closely connected to the history of agro-energy development in the *Alta Murgia* area. This district was created in 2009 by three local partners: one of those, working with the local and regional business associations (Confapi Bari and Confindustria Puglia), is the Agricultural Cooperative *Coop. Agricola Silvium - Giovanni XXIII*. Launched in 2006/2007, this cooperative project had the goal of introducing a set of activities in the territory of a large number of municipalities within *Alta Murgia* National Park and of the nearby townships of the Basilicata Region, in order to experiment with the spread of agro-energy production, "through the detection of a series of economically, socially and ecologically virtuous tracks" (Tucci, 2009). First conceived as an inter-regional district, working with the cooperation of the Faculty of Agricultural Sciences at the University of Bari (Department DSPV), the *Distretto Agrienergetico Appulo-Lucano* has constructed a local network of agricultural enterprises involved in the energy crop production process, and has worked to implement educational programs specifically designed to provide local entrepreneurs with scientific and technical support. Thanks to the involvement of the local socio-economic actors in the process of establishing this agro-energy production network, public and private project leaders have created a successful experimentation model, fully adapted to the local socio-economic and geographic features of the agricultural area in question. The criteria of "energetic and environmental sustainability" for the species chosen for dedicated biomass crops (rapeseed and crambe for biodiesel, starch- and sugar-based plants for bio-ethanol, wheat straw and corn stalks for biogas), combined with the "income perspective" for the agriculture entrepreneurs involved in the project, represent two fundamental factors in the process used to structure the organisational model for the local agro-energy supply chain inserted into the *Appulo-Lucano* district. Thus, the concept of a network of small installation plants, homogeneously distributed throughout the area in question and based on a model of balanced rotation of energy and grain crops on an experimental agricultural surface of approximately 200 hectares, has led to the

construction of the short supply chain supported by the *Coop. Agricola Silvium*.

Reflecting on the several advantages presented by this experimentation (including reduction of energy dependence, recovery of otherwise abandoned lands, fostering the local economy and employment, ecological disposal of waste by enhancing crop residues, etc.) has led local administrators to increase the geographic boundaries of the project, thereby establishing the regional renewable energy district *La Nuova Energia*, along with a notable development plan for agro-energy production. By developing an appreciation of the agro-energy perspective for rural lands, the *Alta Murgia* area has worked as an important driver for the economic and socio-ecological transition of the entire Apulia area. Most importantly, it has done so through the direct and transversal involvement of local public and private stakeholders.

4. CONCLUSIONS

From the analysis of this significant Italian case study, a series of conclusions can be formulated, specifically in regards to the relationship between this new form of sustainable energy production and the consequent material and immaterial transformational processes which are thereby ingenerated within the landscapes involved.

By serving as the foundation for the application of sustainable public policies at the local level and for the management programmes established for productive activities by private enterprises in the agricultural and livestock sectors, the interactions between the different local and regional entities in our study are currently leading to new forms of public-private cooperation aimed at promoting specific ways to integrate economic, social, and environmental drivers into the strategic plans of small and medium agricultural firms (Pellerano, Pantaleo, Tenerelli, Carone, 2007).

If evaluated in terms of the physical socio-economic consequences of these interactive processes leading to the establishment of such forms of public/private cooperation, we may deem the agro-energetic evolution of the *Alta Murgia* rural environment to be important driver of a new model of *sustainable* management of local energy sources, in accordance with the way in which said *sustainability* is understood by political powers or viewed as "the dominant metanarrative of the twenty-first century" (Selman, 2010). In fact, as emphasized by Phills, Deiglmeier, and Miller (2008), the erosion of boundaries between the political and business sectors, which can be pursued in the context of this type of multi-level transformational process, is the first step toward a "cross-sector fertilization of ideas, values, roles, relationships, and capital". At these intersections

“social innovation are blossoming”, new and better approaches to creating social value are generated, providing, as in the case of *Alta Murgia* National Park, an opportunity to integrate the fundamental principles of sustainable development into the economic and socio-ecological transitions which affect these rural areas at the regional and local scale.

If, on the other hand, we evaluate it in terms of the social perception of the agro-energy landscapes, then we may affirm, as already pointed out by van de Horst and Evans (2010) in a case study in the United Kingdom, that the “argument of landscape” is not yet a prominent component of the public/private debate about green energies or in public opposition to biomass energy power plants. Despite their notable visibility and extension within rural landscapes, bio-energy crops seem to not constitute an important reason for controversy at present, as is instead the case with large-scale wind power plants. Nonetheless, it appears to simply be a matter of “time and scale of the development”. Evaluation of the different ways in which this kind of production impacts the transformation of “familiar” agricultural lands, and consequently the way they are perceived by inhabitants, would probably represent a relevant issue for future debates about the social acceptance of green energy within the “everyday landscapes” described by the *European Landscape Convention*.

A relevant suggestion about a hypothetical method to establish a new field of research on these emerging topics was produced in the discussion which developed during the session *Climate change and the new energy paradigm* of the “8th Council of Europe Meeting of the Workshops on the Implementation of the European Landscape Convention - *Landscape and driving forces*” (Malmö, 8-9 October 2009). A better understanding of the way in which the 20th century carbon energy landscapes were formed, in accordance with the different patterns and methods which were developed in the past to manage both energy production and consumption, may represent a first step towards a *landscape-sensitive approach* to energy issues. The conceptual reciprocity of landscape and energy provides, for example, a fundamental perspective for reflection: “as many of the ideas around energy are abstract and difficult to grasp, the idea of landscape may be able to solidify the debate, to ground it, to help make the energy debate more concrete” (Fairclough, Sarlöv Herlin, 2010).

In conclusion, if we follow the perspective of considering this *landscape approach* as a key factor of energy sustainability, a new set of scientific tools to be used in evaluating the social impact of agro-energies may be constructed, and may eventually lead to the establishment of a new development line

for the multidisciplinary research developed by *territorial intelligence*.

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