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Journal of
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This special issue collects a selection of peer-review papers presented at the 8th International Conference INPUT 2014 titled "Smart City: planning for energy, transportation and sustainability of urban systems", held on 4-6 June in Naples, Italy. The issue includes recent developments on the theme of relationship between innovation and city management and planning.

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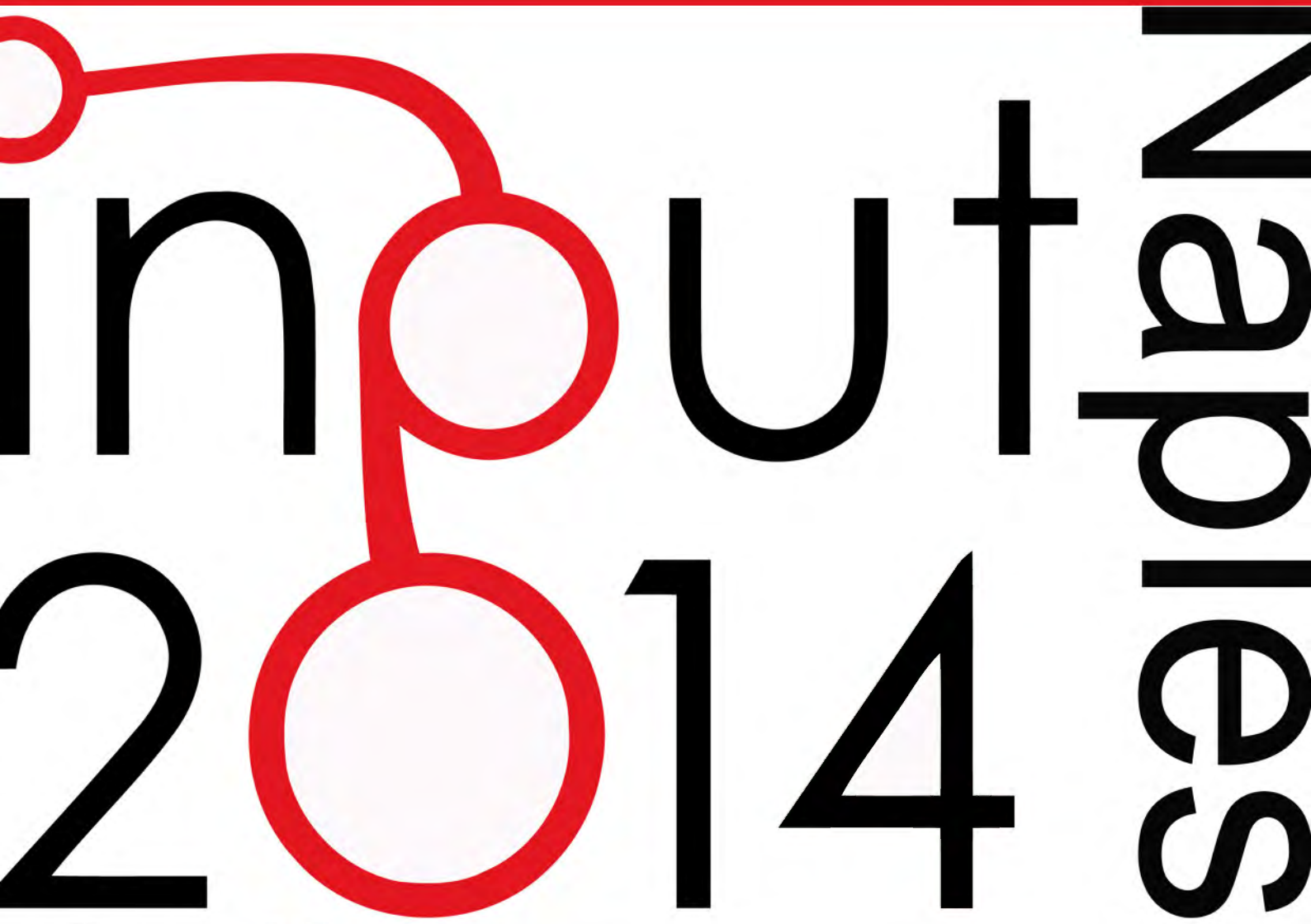

Smart City

planning for energy, transportation and sustainability of the urban system

Special issue, June 2014

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SMART CITY

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Special Issue, June 2014

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Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it
e-mail: redazione.tema@unina.it

TeMA Journal of Land Use, Mobility and Environment

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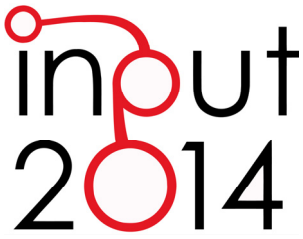
TeMA Journal of Land Use, Mobility and Environment

This special issue of TeMA collects the papers presented at the 8th International Conference INPUT 2014 which will take place in Naples from 4th to 6th June. The Conference focuses on one of the central topics within the urban studies debate and combines, in a new perspective, researches concerning the relationship between innovation and management of city changing.



TeMA Journal of Land Use, Mobility and Environment

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EIGHTH INTERNATIONAL CONFERENCE INPUT 2014

SMART CITY. PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

This special issue of TeMA collects the papers presented at the Eighth International Conference INPUT, 2014, titled "Smart City. Planning for energy, transportation and sustainability of the urban system" that takes place in Naples from 4 to 6 of June 2014.

INPUT (Innovation in Urban Planning and Territorial) consists of an informal group/network of academic researchers Italians and foreigners working in several areas related to urban and territorial planning. Starting from the first conference, held in Venice in 1999, INPUT has represented an opportunity to reflect on the use of Information and Communication Technologies (ICTs) as key planning support tools. The theme of the eighth conference focuses on one of the most topical debate of urban studies that combines , in a new perspective, researches concerning the relationship between innovation (technological, methodological, of process etc..) and the management of the changes of the city. The Smart City is also currently the most investigated subject by TeMA that with this number is intended to provide a broad overview of the research activities currently in place in Italy and a number of European countries. Naples, with its tradition of studies in this particular research field, represents the best place to review progress on what is being done and try to identify some structural elements of a planning approach.

Furthermore the conference has represented the ideal space of mind comparison and ideas exchanging about a number of topics like: planning support systems, models to geo-design, qualitative cognitive models and formal ontologies, smart mobility and urban transport, Visualization and spatial perception in urban planning innovative processes for urban regeneration, smart city and smart citizen, the Smart Energy Master project, urban entropy and evaluation in urban planning, etc..

The conference INPUT Naples 2014 were sent 84 papers, through a computerized procedure using the website www.input2014.it . The papers were subjected to a series of monitoring and control operations. The first fundamental phase saw the submission of the papers to reviewers. To enable a blind procedure the papers have been checked in advance, in order to eliminate any reference to the authors. The review was carried out on a form set up by the local scientific committee. The review forms received were sent to the authors who have adapted the papers, in a more or less extensive way, on the base of the received comments. At this point (third stage), the new version of the paper was subjected to control for to standardize the content to the layout required for the publication within TeMA. In parallel, the Local Scientific Committee, along with the Editorial Board of the magazine, has provided to the technical operation on the site TeMA (insertion of data for the indexing and insertion of pdf version of the papers). In the light of the time's shortness and of the high number of contributions the Local Scientific Committee decided to publish the papers by applying some simplifies compared with the normal procedures used by TeMA. Specifically:

- Each paper was equipped with cover, TeMA Editorial Advisory Board, INPUT Scientific Committee, introductory page of INPUT 2014 and summary;
- Summary and sorting of the papers are in alphabetical order, based on the surname of the first author;
- Each paper is indexed with own DOI codex which can be found in the electronic version on TeMA website (www.tema.unina.it). The codex is not present on the pdf version of the papers.

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SPECIAL ISSUE

Eighth International Conference INPUT
Smart City - Planning for Energy, Transportation and Sustainability of the Urban System

Naples, 4-6 June 2014

MARGINALITY PHENOMENA AND NEW USES ON THE AGRICULTURAL LAND

DIACHRONIC AND SPATIAL ANALYSES OF THE MOLISE COASTAL AREA

Donatella Cialdea[a], Luigi Mastronardi[b]

[a, b] University of Molise L.a.co.s.t.a. Laboratoy
e-mail: [a] cialdea@unimol.it;
[b] nardi@unimol.it

ABSTRACT

This paper analyzes the evolution of land use in the Molise Region. The attention is focused on the changes that occurred primarily on the rural area of the coastal area in this Region.

The presence of urban centers of limited dimension, both for the demographic performance and for the dimensional order, is the main characteristic of this area. The historic part of rural tradition, at the same time, no longer emerges as a primary component of the regional landscape. This trend is particularly evident in the coastal zone, which is analyzed in this work not only in the range of areas that directly bordering the Adriatic Sea, but also in its pre-coastal zone, which remains imprinted on a matrix rural, but suffering from marginalization phenomena

KEYWORDS

Rural Land, Marginality, Landscape, Agriculture

1 INTRODUCTION

The geographical area's marginality comes from a large number of demographic, social and economic causes, but it takes many configurations depending on the methodological approach.

From the demographic point of view, the Molise Region is characterized by the presence of small size municipalities with fewer than 5,000 inhabitants (125 out of 136 municipalities), which cover 82 % of the total area with the middle of the regional population (Figure 1): 105 towns have less than 2,000 inhabitants and extends over approximately 65% of the region, with almost 30% of the total population, while 88 municipalities that have less than 5,000 inhabitants and population density of less than 50 inhabitants/km² appear in strong condition of depopulation.

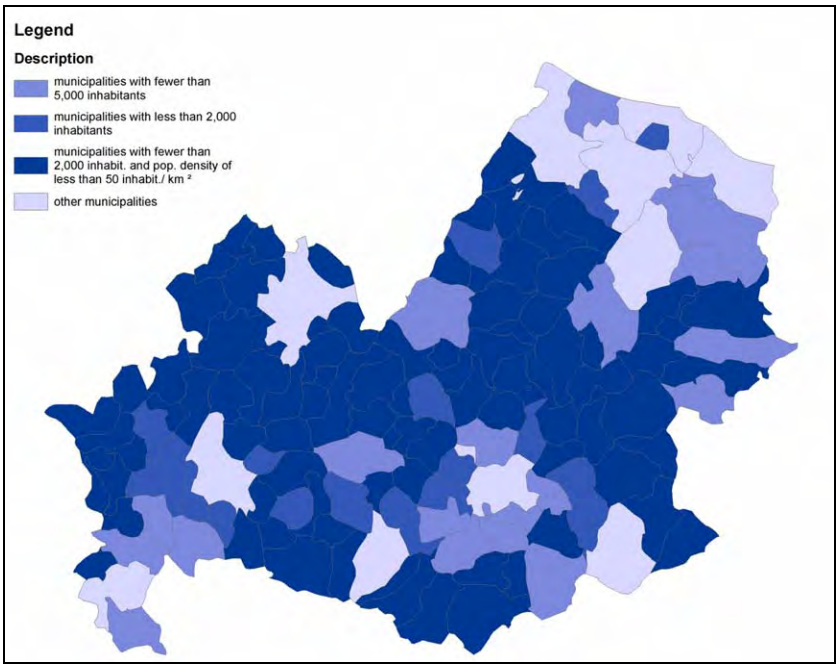

Fig. 1 Demographic Map of the Molise Region

2 THE MARGINALITY IN THE MOLISE REGION

In accordance with the OECD methodology (1994), which defines rural municipalities with population density below 150 inhabitants per square kilometer, almost all municipalities of the Molise Region (129 of 136) are classified as rural, while the provincial areas are "Predominantly rural".

The OECD methodology is mainly based on demographic criteria: however it is not able to grasp in a right way the regional marginality, which contains its own internal social and economic realities that are much more complex.

In fact the marginality condition in Molise is more articulate as well as highlighted in the past researches carried on Agricultural Land Italian Systems (Cannata 1989; Argiolas and Cannata 1980; Cannata and Forleo 1998) and on Rural Land Zoning (Molise Region 2007; Pistacchio 2008). These works take into account not only the demographic aspect, but also the physical aspect of the area, the productive structure of the agricultural sector, the relationship with other economic sectors, the condition of economic and social development .

In chronological terms, in the '80s Cannata and Argiolas identify in Molise eight Rural Systems with different levels of development. "Non-Agricultural and Attractive Systems" show a good condition and well-being: in these systems agriculture activity appears to be specialized in crops with high added value. "Integrated Farming and Attractive Systems", medium growth rate, have a good supply of urban services: their farming activity is specialized and integrated with the total economy. "Medium Autonomous Development Systems" have a condition of unbalanced development in relation to the services provision, to the quality of life and levels of consumption, despite the significant consistency of small industries, trade activities and production autonomy.

"Dependent Agricultural Development Systems" are devoid of autonomy in production and therefore depend on the most dynamic production activities: in this case municipalities are located in mountainous areas where there is a strong presence of forests and agriculture is the most significant activity. "Strong Exodus Marginal Systems" are also devoid of autonomous productive activities and agriculture does not appear to be competitive. "Ancient Depopulation Marginal Systems" show a clear situation of social and economic marginality: they are mountain areas with high incidence of wooded areas, with the agricultural use of the land in very big farms predominantly voted to livestock activities. "Medium Marginality Agricultural Systems" have a degraded economic and productive structure. "High Marginality Agricultural Systems" show situations very negative because of the presence of lower income levels, of high unemployment, of high incidence in the elderly population and of low levels of education.

At the end of the 90s, Fanelli (1998), using a broader set of indicators, identifies a new situation, different from that described above and characterized by six municipalities homogeneous groups. "Centers" have the characteristics of the medium-rich and urban areas, where agriculture is not the most important activity in terms of value added and employment. "The Lower Molise Area" is the zone characterized by a good economic development, where agriculture is competitive and highly productive, with high capital-intensive and specialized crop irrigation.

"The Inside Area Agriculture" is based on animal husbandry, that allows this system to reach higher levels of income and consumption enough, but in a social and productive context which doesn't get to production standards and demographic structures of the most dynamic areas. "The Mountain Agriculture" presents the strong delay in economic development, because of its non-competitive agriculture, connected to its state of territorial isolation with insufficient administrative services, as well as a significant rate of depopulation.

"Municipalities within Protected Areas", which are included in the National Park of Abruzzo, Lazio and Molise have a high tourist vocation, but at the same time they suffer a strong social and economic marginality due to remoteness from major centers in the region and the low productivity of natural resources.

"Municipalities based on Industrial Activities", characterized by non-agricultural development, are in good geographic location and have a good consistency of infrastructures.

In the "Molise Regional Rural Development Plan" (2007), two different typologies are identified: they are "Urban Centers" and "Rural Areas with Development Problems", which are divided into: a) Hilly Irrigated Areas; b) Hilly Rural Areas; c) Mountain Areas (Figure 2).

"Urban Centers" correspond to the most dynamic areas of the region with a good amount of services and good level of well-being; they are attributable to the two capitals of Campobasso and Isernia. "Hilly Irrigated Areas" include the coastal strip and the inland plain: despite their characterization by elements of fragility, they have some characters that are fundamentally different compared to other rural areas with development problems, particularly with regard to their competitiveness of the agricultural activities.

"Hilly Rural Areas" differ from the first one in relation to the reduced incidence of irrigated areas; this situation, also with their geo-morphological conditions, affects their agricultural production and, more

generally, on their economic balance. Moreover, they are characterized by strong elements of rurality, associated with lack of infrastructures and services that distinguish them significantly from other hilly areas.
"Mountain Areas" correspond to the most marginal and peripheral areas of the region, in which geographic morphological and climatic features, influence in a negative way business decisions and consequently the levels of development of the territory.

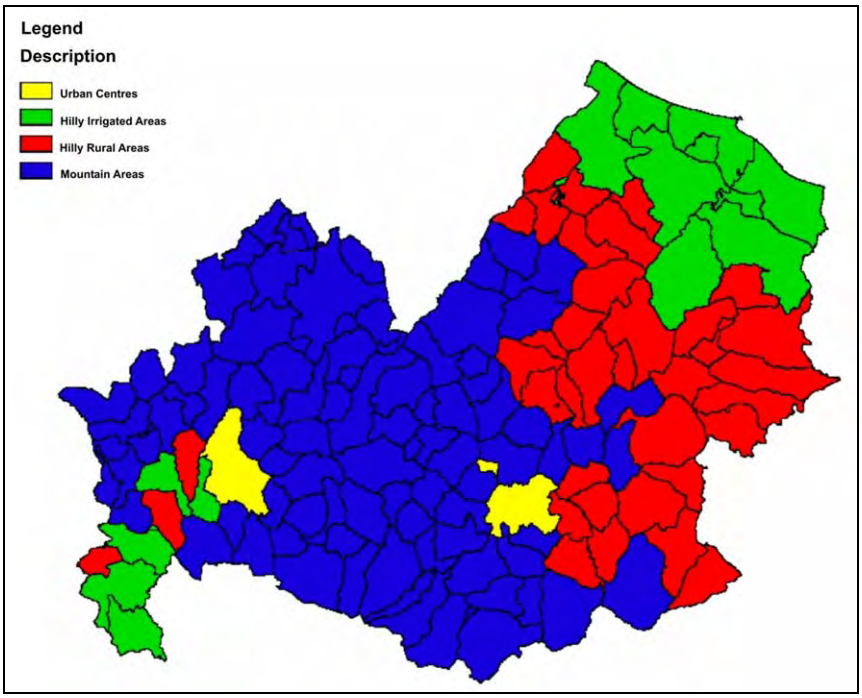

Fig. 2 Land Classification Map of the Molise Region

The result of a different zoning, performed recently by Pistacchio (2008), shows, finally, four clusters. They are: 1) "Marginal Area"; 2) "Urban Area"; 3) "Productive Area"; 4) "Medium Area". The "Marginal Area" has a low population density, a high index of old age and economic dependence, a low incidence of utilized agricultural area compared to the total utilization. The "Urban Area" is characterized by high population density and good services sector development. The "Productive Area" shows a significant use of agricultural area and a clear presence of competitive and specialized farms in irrigated crops, as well as a good percentage of employers in agriculture activities. The "Medium Area" is interposed between the Urban Area and Productive Area. It is precisely in these areas - identified as predominantly rural from regional investigations - that in recent years were made the most renewable energy installations (Cialdea, 2010 b). Our attention turns particularly to installations which have a more significant impact on the landscape - and inevitably affect the agricultural activities that take place on it - or wind power and ground-mounted photovoltaic plants (Figure 3).

3 THE TERRITORIAL SYSTEM OF THE COASTAL AREA

The coastal zone of the Molise Region is our sample area. It is a short coastline of about 35 km which presents, however, some different situations. First of all, it is characterized by the mouths of three rivers, the Trigno River, the Biferno River and the Saccione River, but there are many other strong elements.
However there are three ports, some already realized for a long time and others more recently existing.

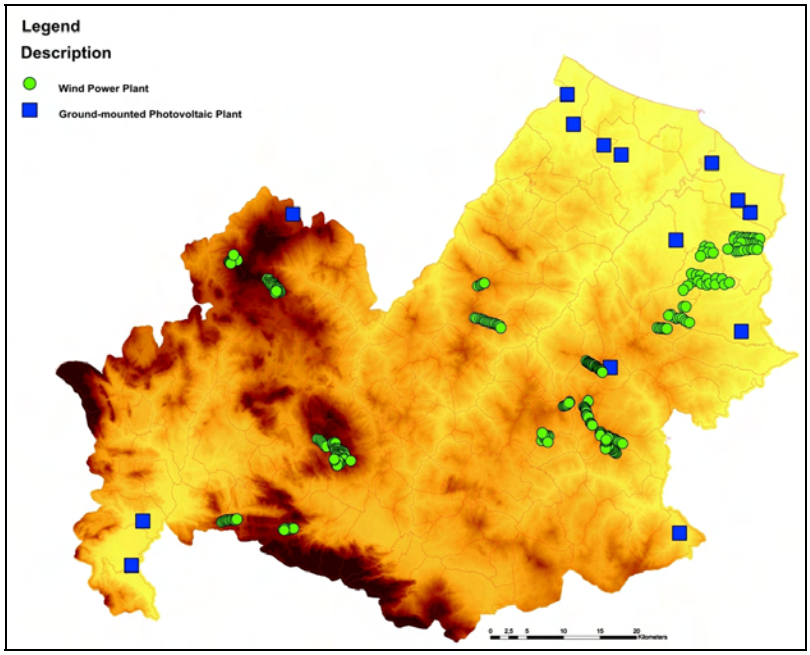

Fig. 3 Wind power and Ground-mounted Photovoltaic Plants in the Molise Region

For the Termoli harbor, built in 1905 (it was designed in 1890 but it was not then authorized), successive new extensions undergone; in Campomarino the port, though not completely, was recently realized, even in Montenero di Bisaccia there is a new port, on which there were in many debates.

There is, then, the strong presence of the industrial area, the largest and most started in the region , which is stationed near the town of Termoli.

In this area, finally, significant remediation of wetlands were made from the late 50s, which have changed the aspect and the land use of most of the coastal and pre- coastal zone (Cialdea 2009). The coastal area is covered by the *Landscape Plan No. 1 Coastal Area*, for a total of 48 434 hectares[1], and it is, of course, never returned to any Mountain Community.

Moreover, in the last fifty years there were considerable changes in land use (Cialdea et al. 2006, 2007a, b).

First of all, there was a net decrease in areas with shrubs and bushes that it turns into an agricultural area.

Only in few circumstances, where agriculture activities appeared uncomfortable because of the area's topography, agricultural zones were abandoned: consequently these areas have slowly naturalized (this is the case of the wooded areas along the Tecchio River, near Petacciato, which before were devoted to agricultural uses).

A Campomarino , however, we see the opposite phenomenon: in Ramitelli locality, forest areas disappeared to take place for agricultural use.

Another growing problem is the disappearance of the dune system: on the coast of Molise today do not have that few residual areas, often remained only by chance. This ecosystem degradation began with the early works of reclamation of the Adriatic coast, but in more recent times it had a large increase. In fact, the coastal building development, which was spontaneous, chaotic and deregulated, pushed the anthropic presence more and more close to the shoreline, destroying the sparse vegetation typical of the dunes and

[1] In this area the geological constraint is extended to almost 50% of its surface. The archeological sites are significant in the municipalities of Campomarino Guglionesi, San Giacomo degli Schiavoni and San Martino in Pensilis and the tracks involving the municipalities of San Giacomo and San Martino.

leveling the dunes themselves for their own purposes. All along the coast, therefore , there is an increase in number and size of urban areas. This phenomenon is particularly concentrated around the town of Termoli (already in the 90s, there was a consistency of urban areas equal to 10 times that of forty years earlier). The analysis carried out for the definition of the land use (Figure 4) bring out the clear vocation to agricultural production: in particular, land valley and irrigated areas along the hillside are considered as exceptional value, both for their geo-pedological asset and for their cultural attitudes (Cialdea *et al.* 2010a).

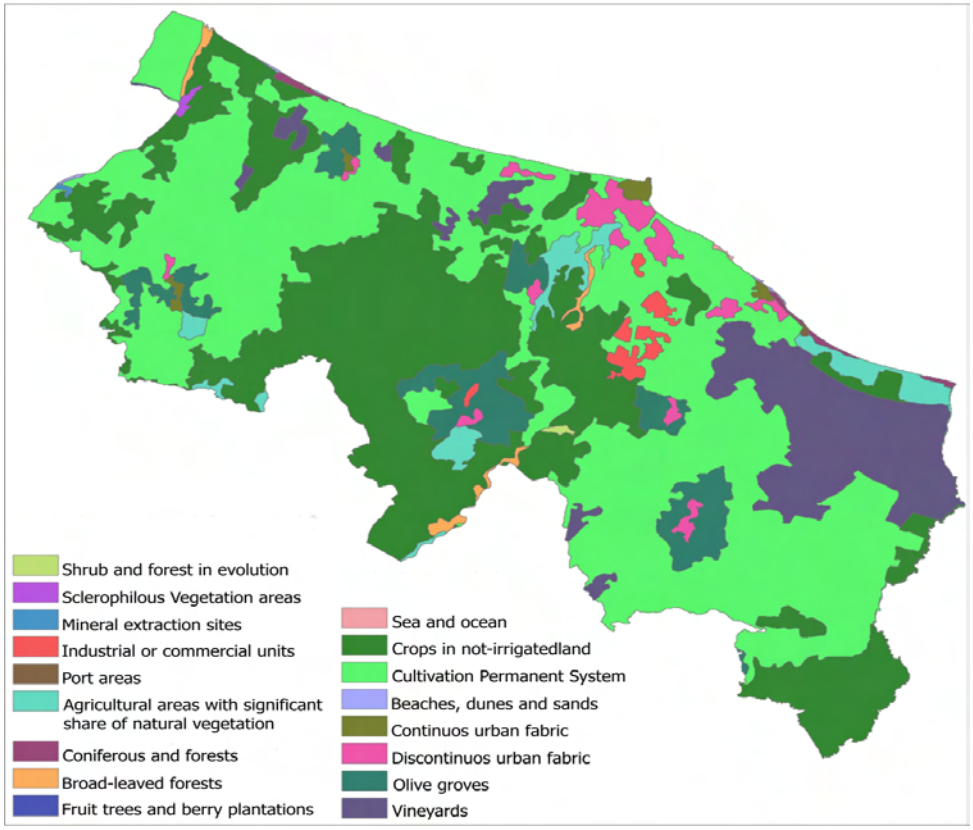

Fig. 4 Land use analysis in the coastal area

Areas along the Biferno and Trigno Rivers, and in general all coastal areas, are considered by the plan of exceptional natural interest: there are, in fact, areas that were then proposed as Sites of Community Importance, reflecting the presence of flora and fauna as important to highlight the need to protect their biodiversity. These are: the dune habitat in Campomarino, rare flora in the coastal area near the Saccione River; the wetland biotope in the district of Salcete in Guglionesi on the left side of the Biferno River; the habitat suitable for aquatic species along the Tamburro River (it is currently the only wetland remaining in the stretch from the Liscione dam to the Biferno's mouth) which is characterized by the presence of holm-oak Mediterranean forests. Worth less, but similarly important elements in this area, are the coastal wetland typical of the Mediterranean basin located near the mouth of the Biferno River- and therefore in an area subject to intense human activity - and the forest named Fantine in Campomarino, currently extremely devastated by the presence of activities, including a dump, but potentially recoverable thanks to the remains of holm oak survivors. Moreover, in the actual Landscape Plan, there are different areas characterized by the visual interest such as peak lines and hilly performances. It is necessary to underline the exceptional importance of the so-called headland of Campomarino, that put Campomarino in a panoramic location.

Elements of geological hazard have been identified in Petacciato landslides, in Montenero di Bisaccia and Guglionesi landfall and also in Montenero di Bisaccia along the right side of the Trigno River. In essence, the coastal zone is certainly the part of the region with the major transformations, in the area which is also highly exposed to anthropogenic pressures, especially those linked to the increase in tourism. Of course, also the creation of reservoirs and the abundant mining activity contributed to the actual condition of the landscape feature, particularly in the coastal area, where the already mentioned urbanization occurred rapidly and without effective checks both for the settlement of industrial settlement and for urban increase.

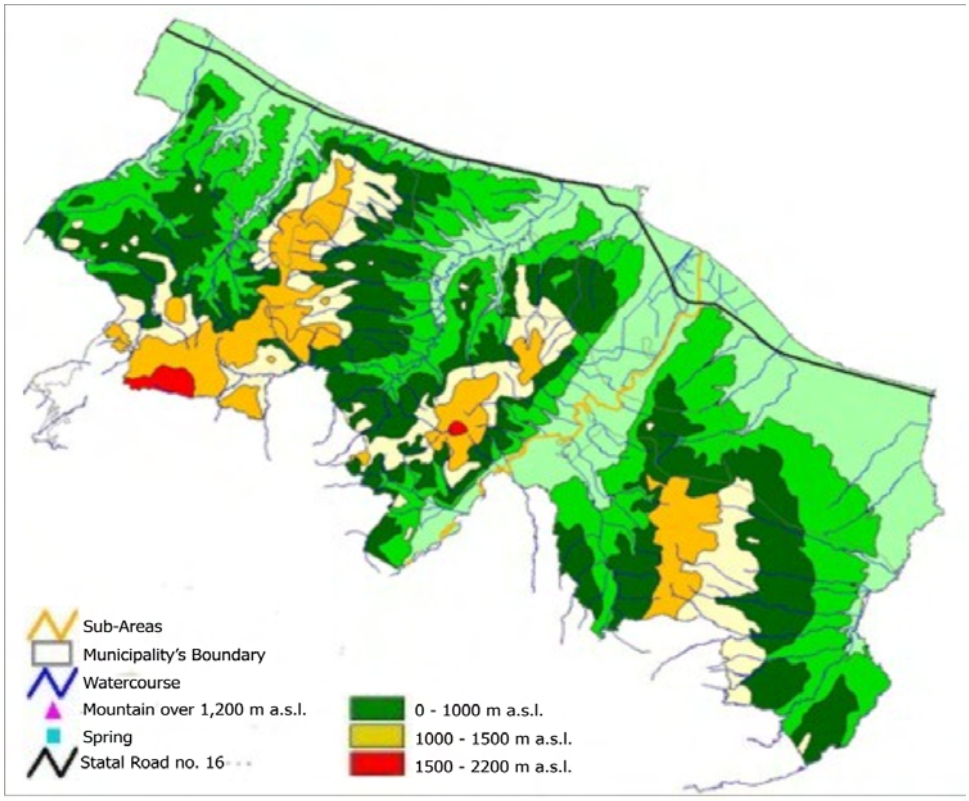

Fig. 5 Landscape visual analysis in the coastal area

However figure 5 describe our interpretation of the landscape in this zone: the coastal area could be divided into two sub-areas. The demarcation is essentially signed by the Biferno River. In its right side there is the area with the higher soil fertility and where farming activity is more developed, also as a result of the past land reclamation. In the left side of the Biferno River there are the greater phenomena related to the human activity, to the expansion of the urban area of Termoli and especially to the presence of the industrial area.

4 THE PRODUCTION SYSTEM OF THE COASTAL AREA

This study area has a clear condition for development and economic diversification with respect to the regional framework .

Industrial activities and services play an important role in the town of Termoli. This condition is significant also in the industrial Map of Italian Localism (CENSIS 1982). In the industrial area of Termoli, that reaches the top of specialization with the participation of the mechanical industry, diversification of production grew up in the direction of agro-food and chemical industries. Starting in '60's, there was a significant increase in

local units of industry and services. In 1961 there were just 1,681 local units, while in 2010, local units amount to about 50 000. Really there are significant differences between different National Census. In fact, over the past few decades the increase of local units had a lower intensity compared to the period 1971-1991. The result is, therefore, a framework that emphasizes a clear outsourcing of the production system.

At the local level, the positive trend has mainly affected Termoli and more lightly Montenero di Bisaccia and Campomarino. In 2011, tourism has a consistency of 180 structures, with a high prevalence of complementary ones (150 units) compared to the hotels. The accommodation capacity is 4,791 guests: the hotel facilities offer 1,881 beds. Complementary exercises, however, are more receptive availability (2,910 beds). In relation to the hotels, data referring to 1998-2011 reveal a clear increase in the number of beds (+530 units). The extra-hotel capacity, however, showed a steady decrease in the number of beds in the villages and camps, while the consistency of the tourist and hotel residences increase and facilities so-called environmentally friendly (cottages, B & B) consolidate. In 2000, farms amounts to little more than 6,000 units, while the SAT and the UAA amounted respectively to 37 708 hectares and 35,909 hectares. The average farm size is relatively small (a little over 7 hectares). The impact resulted from the agricultural area close to 95% of the Total farms land.

In 2000, farms amounts to little more than 6,000 units, while the Total farms Land and the Agricultural Land amounted respectively to 37,708 hectares and 35,909 hectares. The average farm size is relatively small (a little over 7 hectares). The impact resulted from the agricultural area close to 95% of the Total farms land.

Agriculture suffers a drastic restructuring and tends to specialization and intensification. Between 1950 and 2010, the farms number increased slightly, except in Montecilfone, Petacciato and San Giacomo. In contrast, the Total farms Land and the Agricultural Land is greatly reduced in each Municipality, except in Campomarino Montenero di Bisaccia and San Martino in Pensilis. Consequently, the average size corporate decreased significantly. This condition is to be read in relation to the actions of land reclamation.

The land structure does not detect phenomena of sputtering but since the 90s in almost all areas there were a decline in the share of the Agricultural Land of farms with over 50 hectares.

Irrigation played a very important role for the development of this area, where rainfall is scarce and poorly distributed over the course of the agricultural year. Irrigation developed in the 80s, thanks to the use of water resources of the Guardialfiera Lake, which has a usable capacity of about 137 million cubic meters of water. In 2010, irrigated areas totals more than 5,000 hectares and affect significantly all the municipalities in the area: it is a phenomenon that must be carefully assessed in terms of farming but also the environmental impact (Forleo *et al.* 2011). Data relating to farms indicate a widespread presence and extensive use of irrigation. More than half of farms use irrigation for a coverage of more than 70% of their irrigable area. The percentage of irrigated area in the total Agricultural Land takes significant values in Campomarino, Guglionesi, Petacciato, Portocannone and Termoli. Irrigation affects mainly horticultural crops, industrial plants (sugar beet) and fruit trees. Great importance have dynamics of the production structure of the area: in 2010, the production scenario appears to be more varied than in the 50s. Data reveal, however, a clear decrease of arable land and permanent grassland. In contrast, permanent crops showed a significant increase. Moreover the forest increase appears smaller. The weight of the arable land unchanged, the incidence of meadows and pastures reduced, while there is a significant increase in permanent crops. The so-called "other land" almost disappeared. With particular reference to wine production, it is appropriate to emphasize the special vocation of agriculture in the area and the importance of the production of DOC and DOCG area.

The livestock farming is marginal in the context of this area, although in recent years there were a slight increase in the number of farms in Campomarino, San Martino in Pensilis and Petacciato.

The spread of organic farming in the study area is relatively low: farms that adopted organic production amounted to just 108 units (Molise Region, Department of Agriculture 2008). The Total farms Biological Land is 512.35 hectares, while the Agricultural Biological Land covers an area of 291.68 hectares.
At the municipal level, the analysis shows that Petacciato is the Municipality with the majority of biological land, which represents the 44.2% in terms of Agricultural Land and 49.8% in terms of Total farms Land.
In Guglionesi the biological surface amounts to 91.49 hectares and 74.38 hectares of Agricultural Land (25.5% of Agricultural Land and 17.9% of Total farms Land). In Campomarino the Total farms Land and the Agricultural biological Land amounted to, respectively, 29.89 and 18.6 hectares. In Termoli, the Total farms Land and the Agricultural Land correspond, respectively, to 6.01 and 3.94 hectares (1.4% of the Total Agricultural Land and 1.2% of the total farms land). The result is a framework that emphasizes a clear process of specialization and intensification of agriculture, which created environmental problems and simplification of the landscape.
The study area has a clear interconnection between production specialization and Municipalities in which there is a greater concentration of employment levels. Employment grew significantly only in the last thirty years. The occupational structure undergoes a profound change. Since the 60s there is, in fact, a progressive reduction of the employed in agriculture and consequently employment growth in industry and services. In percentage terms, the weight of the labor force in agriculture, which in the past was the most consistent activity, down from 59% in 1961 to just over 8% in 2010, compared to an increase in industry (from 23% to 37%) and services (from 17% to 54%). The agricultural sector was, therefore, a sort of reservoir for industrial activities and more recently also for the tertiary sector. The last period is characterized by a much lower decline of assets in agriculture, by a gradual increase in the industrial sector and a persistent increase in the services sector. In any case, about 90% of the workforce that supports industrial activities comes from the agricultural sector.
The disaggregated analysis within Municipalities, highlights how the evolution of the employed in the reporting period was substantially different. With the exception of Termoli , which has seen a sharp increase in employment (+60%) , the remaining municipalities have suffered a consistent decrease.
Profound changes occurred: if in 1971 it was still possible to identify Municipalities with workers in agriculture that exceeded the 50% (Campomarino, Guglionesi, Montecilfone, Montenero di Bisaccia, Petacciato, San Giacomo degli Schiavoni), already in 1991, no one Municipality exceed this threshold.
Termoli absorbed 90 % of the increase in industrial employment, while, as regards tertiary activities, all Municipalities registered, an increase in the number of workers. In 2010, agriculture employers are eloquently in Montecilfone (18%), while in Termoli are less than 5% of the labor force. The working units in the industrial sector have an important place in Montenero di Bisaccia (47% of the total), while those employed in the services sector showed a significant consistency in Termoli and San Giacomo degli Schiavoni (respectively 60% and 57%).
The scenario described, on the one hand, defines this district as the so-called "strong areas"; on the other hand it highlights how significant changes undergone in the economic structure, that is in a phase of consolidation.

5 CONCLUSION

The analysis of renewable energy installations highlights how the area most affected, especially from wind farms is the right Biferno hills. This area, as previously described, is higher fertile and characterized by greater agricultural activity. Moreover the Landscape Plan no.1 highlights that these areas are characterized

by a high production value[2]: they are the low hills of Molise between the territory of San Martino in Pensilis, Ururi and Rotello.

On the other hand, these areas possess significant or even higher visual interest, always in accordance with the plan, which described these hill areas such natural formations soil of visual elevated value[3]. Moreover photovoltaic systems have been installed, for the most part, on agricultural land which is of elevated agricultural production value.

Within the general framework of the Region, the study area is the most devoted to the tourism industry and its coastal location, at the same time, it is also one in which the major intensive agriculture activity is concentrated, thanks to favorable climatic conditions and good availability irrigation in addition to the presence of some valuable productions, including the biological ones.

This area is an example of Italian Localism, but the economic dynamics have not been able to consolidate relations between Municipalities, nor to interact with the regional productive fabric.

Moreover, the production of energy from renewable sources is a national priority as it increases the security of energy supply, promotes employment and helps to reduce the environmental impact associated with the energy cycle, but of course the plants planning must necessary take into account the characteristics of the territory, specifically in relation to he impact on productive activities that are predominant in it.

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IMAGES SOURCES

Fig. 1: ISTAT Data with reference to 2011 year, our elaboration.

Fig. 2: Molise Region, Regional Rural Development Plan 2007.

Fig. 3: DTM Molise Region, investigation on present plants ARPA Molise Region, our elaboration.

Fig. 4: Corine Land Cover 2006, our elaboration.

Fig. 5: Molise Region Vegetation Map, our elaboration.

AUTHORS' PROFILE

Donatella Cialdea

Full Professor (Urban Planning) at the University of Molise since 1988. Actually she is a President of the Civil Engineering Course, already Dean of the Faculty of Engineering from 2009 to 2012. She is the Director of the Laboratory L.A.Co.S.T.A. (Laboratory for activities relating to the Territorial Development and Environment) at the University of Molise in order to prepare students and operators in the Geographical Information Systems field). She is the Coordinator of the PhD Course in "Landscape Analysis and Valorisation" at the University of Molise, based consortium with the University of Sassari, from the cycle XX. She was the Scientific Coordinator of the International Master Level I Pro.D.U.C.T.I.V.E. Coast (Proposal for the Development of Urban and Coastal Territory in relation to the Value of the Environment), aimed at the technical-scientific training of a specific professional figure - the Selective Interpreter of Territorial Data).

Luigi Mastronardi

Professor of "Environmental Economics" in the Department of Biosciences and Territory, University of Molise (Italy). He is graduated in Economic and Social Sciences in with specialization in Agro-Business Economics. He has achieved the PhD in Agricultural Economics and Policy. Main areas of scientific interest include sustainable tourism regarding agri-tourism and rural tourism, agricultural economics (rural policy, organic farming, agricultural landscapes, short food supply chain) and environmental economics (protected areas, sustainable rural development, environmental policy, rural development analysis regarding public expenditure).