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Developing a South-European Eco-Quarter Design and Assessment Tool Based on the Concept of Territorial Capital

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Additional information is available at the end of the chapter

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1. Introduction

Many studies have been undertaken with regard to eco-neighbourhoods in Europe. However, most of the projects that have been completed and are being analysed in relevant studies are located in Northern Europe, i.e. the BedZed in England, Hammarby (Stockholm) and BO01 (Malmö) in Sweden, Kronsberg (Hannover) in Germany, Vesterbro (Copenhagen) and Kolding in Denmark, Vauban in Freiburg and others. Findings from these projects permit nowadays to speak about a Northern European eco-neighborhood model (Souami, 2009). However, it would be interesting to investigate eco-neighborhood projects in Southern Europe that are either already realised or still in the design phase. The questions that rise are on one hand the sustainability approach that was followed for these projects and on the other hand the specific criteria involved in each case. To this end, an investigation is undertaken regarding the tools that are being used in terms of the environmental principles-criteria which are taken into account by each of them and how easy these tools are to use. Finally, a comparative analysis follows regarding the different Southern European projects and the environmental criteria involved in their implementation.

The present chapter can be summarised in three fundamental objectives: a) the investigation of contemporary tools and methods of planning and assessment of eco-neighborhoods aiming at identifying similarities and differences but also issues that can lead to an efficient Mediterranean methodology, b) the study of examples of Mediterranean eco-neighborhoods in order to create a good and bad practice guide and g) the proposal of a new assessment tool for the Mediterranean eco-neighborhood, based on the concept of territorial capital (OECD, 2001).

The methodology that was followed regarding the first objective focuses in the parametric analysis of basic criteria of existing tools seeking common ground and differences. As for

the second objective the environmental criteria of examples under consideration are investigated with the use of the One Planet Living framework, while the new “SDMed eco-neighborhood tool” was based on:

1. the research and parametric analysis among the tools that concern the development of eco neighborhoods;
2. the SDMed building performance assessment tool (Sinou & Kyvelou, 2006);
3. the concept of territorial capital (OECD, 2001) and its exploitation at local level and the approach of territorial cohesion (both internal and external) that should govern an agglomeration or urban development, even at the scale of a neighborhood.

2. Definition of eco-neighbourhoods

Different approaches and perspectives can be identified regarding the definition of the term “neighborhood” and therefore “eco-neighborhood”. One of the most common is to do with density and population. The link between the levels of density and land take in a typical neighborhood of 7500 people. The message is clear: the lower the density, the larger the amount of area that is occupied by buildings, roads and open space. Density per se is not an indicator of urban quality. An interesting definition of eco-neighborhood is given by Barton where he categorises according to different spatial scales. The smallest scale is the building scale; the next one is the home place scale, then the neighborhood scale, the small town scale and finally the city scale. The key sustainability and health issues identified by Barton are: plan for local facilities with attractive walking routes, local hubs to support healthy lifestyles and development of local food, waste, water and energy capture systems (Barton, 2010).

Neighborhood is defined as a residential or mixed use area around which people can conveniently walk. Its scale is geared to pedestrian access and it is essentially a spatial construct, a place. It may or not have clear edges. It is not necessarily centred on local facilities, but it does have an identity, which local people recognize and value (Barton, 2000). Moreover, it is interesting to note the three different facets of neighborhood that Barton distinguishes. Firstly, the neighborhood perceived as the base for home life, education, leisure and employment activities. Secondly, seen as a place, as an aesthetic experience and thirdly as the locus for community (Barton, 2000). All these three facets can be identified in the tools that will be presented in section three; however each tool seems to have a slightly different orientation according to whether it will be used from town planners, or urban designers, or even at an earlier stage from stakeholders during decision making. Moreover, it is significant to note at this point that the most coherent and complete approach is the one that takes into consideration in planning not only issues of energy, transport and resources but also social and economic parameters.

About the model of eco-neighborhood or eco-district, we should mention that a meaningful typology has been drafted by Souami (Souami,2009). He distinguishes three phases of eco neighborhoods’ creation, in less than two decades. According to Souami, each phase is corresponding to one of the three different types of eco-neighborhood and it is the second type that permits more performances compared with the other two types, thus representing in a certain way ‘the very model of the so-called ‘eco-neighbourhood’.

2.1. The initial eco-neighbourhood type of the '80s

According to Souami, the initial eco-neighborhood type was most often a small pool of buildings located in the periphery of cities or in rural areas. The initiators of such projects were usually professionals and experts, politically active, enrolled in so-called alternative movements. Convinced about the importance of 'green' development and construction, the founders of eco-neighborhoods adapted both the idea and the process before choosing the site to accommodate and implement their ideas which was chosen later on. During the 1980s, we meet neighborhoods of this type in Austria, in the Netherlands and in Germany. They are, in fact, eco-villages transformed into neighborhoods and the organisation in a community or associative form of development is often used to group the inhabitants, in order to organise the public areas and implement the project.

2.2. The 'prototype' of eco-neighbourhood of the '90s

In this case, some communities have taken advantage of exceptional urban events to initiate sustainable districts on their territory: World's Fair in Hanover, B01 exhibition in Malmö, London Olympics, Olympic Games bid in Paris, Zaragoza's candidature for EXPO 2008 that initiated the 'Ecociudad Valdespartera' etc. These events have been all opportunities to initiate positive processes that go beyond conventional practices, showing ambitious environmental goals.

The projects are accompanied by an important work of communication, especially internationally. They are developed as exemplary neighborhoods, particularly successful demonstration projects addressing both to technicians and local politicians. Nevertheless, some of them constitute events by themselves. As far as governance and investment schemes are concerned, we should note that:

- partnerships involve communities, private and public developers, social housing agencies, several operators of urban services and facilities (energy, water, etc.), groups of experts and many contractors
- funds are cumulative and come from various sources: local (municipalities, public and private developers), national (sectoral programmes, exceptional ministerial grants or subsidies) and international (various European programmes).

Leaders of local projects show innovative and mainly broadly applied technical solutions (systematic recycling of rainwater, deployment of extended solar panels, photovoltaic panels, etc.) and technicians and policy-makers have the opportunity to test, validate and correct certain choices. These projects are also considered as places that promote a learning procedure for stakeholders and citizens (Kyvelou, 2010).

2.3. From the mid-90s a new type of eco-neighbourhood appears based on environmental quality criteria

In the third category, eco-neighborhood projects are initiated in a conventional manner since they mobilise ordinary tools of development and construction but they integrate

environmental quality objectives. In other words, these districts adopt common and unexceptional production methods in order to integrate sustainable development perspectives. Some of them clearly refer to the achievements of the 'prototype' sustainable neighborhoods (the so-called European 'vedettes'). These projects, often modest in size, are being planned in a long-term period and they are sometimes considered as resulting from the dissemination procedure of the proto-neighborhoods and the 'prototype' ones. Nevertheless, Souami argues that, according to his investigations and research, there is no systematic genealogy and explicit influences between these neighborhoods (Souami, 2009).

Furthermore, history shows that eco-neighborhood projects concern issues arising from territorial, urban, social and economic aspirations that go beyond environmental considerations. These socioeconomic and urban contexts are different in each case: economic prosperity for some of them, acute socioeconomic crisis for others, reshaping of political and institutional context, poverty, etc. This diversity proves that there is no common profile to serve as a basis for the creation of an eco-neighborhood. In all cases, eco-neighborhoods are implemented in order to enhance image of the city and local identity. The objective is to protect the sites concerned and therefore the cities where they belong, from their prior image. This image is part of the elaboration of public policies across the whole city. The classification of a district based on its environmental performance depends on a long-term work on the construction of place identity and the deepening of the feeling of belonging to this neighborhood. The place would no longer be identified by its history, its people, its animation or attendance. It would initially live through the image of environmental performance that circulates outside. The existence of prior approaches and actions on environmental issues is not always an asset for the development of operational projects aimed at sustainable development. In some cases, certain environmental policies have applications in connection with sustainable urban projects. In other cases, affected communities have not been able to mobilise their achievements of past policies to initiate and carry out operational projects of environmental quality. Sometimes, sustainable neighbourhoods are not preceded by pre-existing environmental policies. Summing up, we should note that:

- there is not a prerequisite for environmental policy or a prerequisite for sustainable development to achieve eco-neighbourhoods;
- eco-neighborhoods are often conducted in parallel with the establishment of local policies for sustainable development and these projects may contribute to developing local sustainable development policies;
- eco-neighborhoods are not the operational implementation of existing policies for sustainable development which prove and demonstrate their effectiveness.

3. Eco-neighborhood tools

There are numerous tools developed so far, to assess performance of eco-neighborhoods and provide guidance for their planning and design. The following are the most popular ones.

3.1. To BioRegional one planet living framework

This framework consists of ten principles which should govern sustainable communities, namely, zero carbon, zero waste, sustainable transport, sustainable materials, local and sustainable food, sustainable water, land use and wildlife, culture and heritage, equity and local economy and lastly health and happiness. This approach is a very simple one and can be easily used to help individuals and local stakeholders to examine the sustainability challenges and develop appropriate solutions (Table 1).

Zero carbon		Making buildings more energy efficient and delivering all energy with renewable technologies.
Zero waste		Reducing waste, reusing where possible, and ultimately sending zero waste to landfill.
Sustainable transport		Encouraging low carbon modes of transport to reduce emissions, reducing the need to travel.
Sustainable materials		Using sustainable healthy products, with low embodied energy, sourced locally, made from renewable or waste resources.
Local and sustainable food		Choosing low impact, local, seasonal and organic diets and reducing food waste.
Sustainable water		Using water more efficiently in buildings and in the products we buy; tackling local flooding and water course pollution.
Land use and wildlife		Protecting and restoring biodiversity and natural habitats through appropriate land use and integration into the built environment.
Culture and heritage		Reviving local identity and wisdom; supporting and participating in the arts.
Equity and local economy		Creating bioregional economies that support fair employment, inclusive communities and international fair trade.
Health and happiness		Encouraging active, sociable, meaningful lives to promote good health and well being.

Table 1. Principles of BioRegional One Planet Living framework

The One Planet Communities programme uses a set of Common International Targets against each of the 10 One Planet principles to ensure that international partners' projects are guided towards a shared end-point by 2020 and to determine what level of performance is required for a development to be endorsed. Behind the One Planet initiative there are three overarching environmental drivers:

- sustainable ecological footprint;
- sustainable carbon footprint; and
- clean (non-polluting) activities.

3.2. The Eco Town framework by the Cambridge quality charter of growth

The Eco-Town framework focuses on state of the art green building, energy and transport technologies and materials to be used in an urban development context. The task is to ensure zero-carbon housing and that energy efficiencies are achieved through waste reduction, energy conservation technologies and use of more sustainable sources of energy.

The Eco Town approach refers to new settlements with a minimum of 5000 homes where the developments should reach zero carbon standards, should provide good range of facilities and affordable housing. The framework consists of four fields, the four Cs, namely, climate, connectivity, community and character. Each one of the four is subdivided in several criteria (Table 2).

UK Eco-Towns	
Climate	Energy
	Water
	Environment
	Planning for low carbon
	Low-environmental
Character	Place-making
	New design and High Design Standards
	Attractiveness and desirability
	Investment
	Locally-based facilities
Connectivity	Employment opportunities
	Transport
	Services
Community	Social mix
	Sustainable community principles
	Governance
	Delivery organisation

Table 2. Principles of Eco-Town framework

3.3. The DPL approach

DPL is an approach for sustainable urban planning that attempts to quantify and measure sustainability of urban areas (districts) based on 25 environmental, social and economic indicators (Planet, People, Profit) (Table 3). Planet indicators are subdivided into two categories, namely, stocks and local environment. People indicators are subdivided into four categories namely, safety, services, green space water and quality. Profit indicators are subdivided into three categories namely, economic vitality, sustainable businesses and capacity change. DPL was developed by IVAM in cooperation with TNO Environment and Geosciences and with financial support from the Dutch Ministry of Housing Spatial Planning and the Environment (VROM).

DPL – sustainability profile of a district		
PLANET	PEOPLE	PROFIT
stocks	safety	economic vitality
1. Material use	10. Social safety	20. Local employment
2. Energy use	11. Traffic safety	21. Local economic activity
3. Land use	12. External safety	sustainable businesses
local environment	services	22. sustainable businesses
4. Water management	13. Quality of services	capacity to change
5. Soil contamination	14. Access to services capacity to change	23. Flexibility
6. Waste management	green space and water	24. Mixed use
7. Air pollution green space and water	15. Local green space	25. ICT infrastructure
8. Noise	16. Local water	
9. Smells	quality	
	17. Quality of the district	
	18. Quality of the dwellings	
	19. Social cohesion	

Table 3. The indicators of sustainability assessment according to DPL

3.4. The Med Eco-Quartier approach

The objective of the Med Eco-Quartiers Project was to define precisely the criteria and tools for creating eco-neighborhoods in the Mediterranean region, by studying different cultures, procedural approaches and environments. As part of the project four working tools were developed. They range from the phase of project design to the final realisation phase. The

four tools are *Med Eco-urbanisme*, *Med Eco-constructibilité*, *Med Eco-gouvernance* and *Med Eco-sensibilisation* (Tables 4 & 5)

Criteria of MED ECO-urbanism
1. Government and organisation
2. Economic and social growth
3. Natural and cultural/archaeological heritage
4. Restriction of urban sprawl
5. Local services
6. Mediterranean natural and climatic characteristics

Table 4. The six criteria for the development of Mediterranean eco-neighborhoods by the MED Eco-urbanism

Preoccupations for the Mediterranean eco-neighborhoods
Preserving resources
Reducing pollution
Reducing waste
Managing natural and technological risks
Improving comfort
Preserving health
Culture and heritage
Integration of the public into the project
Maintenance evolutions
mastering cost excess
Local networks
Low nuisances building sites

Table 5. Preoccupations for the Mediterranean eco-neighborhoods, source : “MED-Ecoquartiers”

The Med Eco-planning tool consists of a grid of decision support and audience piloting development project. The overall approach, crossing the various themes of sustainable urban design leads to the fundamental objectives of the project. The study of the Med Eco-planning tool recommendations allows the specification of the characteristics of the new district. Even if the Med Eco-planning tool provides a framework for reflection and action, it remains a deliverable that has not proved its replication value since it has not been linked with implementation of eco-neighborhoods in the Mediterranean (Kyvelou & Papadopoulos, 2011).

3.5. The LEED for Neighborhood development project scorecard

The tool is subdivided into five categories. Each of them has several analysis criteria, which are either prerequisite or are being given a score (Table 6). The main categories are Smart Location and Linkage, Neighbourhood pattern and Design, Green Infrastructure and

Buildings, Innovation and Design Process and Regional Priority Credit. The tool similarly to LEED for buildings calculates a certification estimate and gives five total scores, namely certified, silver, gold and platinum.

LEED for Neighborhood Development	
Smart Location and Linkage	27 points
Neighborhood Pattern and Design	44 points
Green Infrastructure and Buildings	29 points
Innovation and Design Process	6 points
Regional Priority Credit	4 points

Table 6. The basic categories of LEED for Neighborhood tool

3.6. The HQE aménagement

Formalised in March 2010, the “HQE aménagement” has been subject of a Guide issued under the auspices of the HQE Association. It is, primarily, a pragmatic and ambitious methodology, mostly based on the feedback from concrete operational projects of development. It is based on business and professional logic, which is the one of the developers. The “HQE aménagement” also aims at equipping every stakeholder involved in the development with a reference framework and a common vocabulary for conducting eco-districts and improving professional practices.

HQE Aménagement	
Objectives	Themes
Ensure integration and cohesion in relation to the urban tissue and other territorial scales	<ol style="list-style-type: none"> 1. Wider territorial unity and local frame 2. Density 3. Mobility and accessibility 4. Cultural heritage, landscape and identity 5. Adaptability and evolutivity
Preserve natural resources and promote environmental and health quality	<ol style="list-style-type: none"> 6. Water 7. Energy and Climate 8. Materials and equipment 9. Waste 10. Ecosystem and biodiversity 11. Natural and technological risks 12. Health
Promote social life and support dynamics of local economy	<ol style="list-style-type: none"> 13. Economy of the project 14. Mixture of uses and land uses 15. Atmosphere and public spaces 16. Integration and training 17. Local economy dynamics

Table 7. The basic topics of HQE Aménagement

It is a thematic approach that describes the objectives that are sought within the sustainable operation of development. Organised in 17 themes, it allows the direct choice of sustainable actions for the implementation of the following characteristics and subjects of interest (Table 7). The 17 themes are divided into three major sets: territorial analysis - technical and environmental analysis - socio-economic analysis.

- Territorial Analysis: Ensure integration and consistency of the eco-district with the urban area and other territorial levels.
- Technical and Environmental Analysis: Preserve natural resources and promote environmental quality and health.
- Socio-Economic analysis: Promote social life and strengthen the dynamics of local economy.

4. Is there a South-European model of eco-neighbourhood?

The north-european eco-neighborhood model is mainly described by its technical and environmental performance in terms of energy, saving water or recycling materials. They seem to be the main mechanism to move from principles to the effective implementation of sustainable urban development. The urban planning and design and the implementation of networks are resulting from this approach. This model governed by the environmental approach and its performance is mainly used by communities as a powerful tool of communication, promoting the region and even as leverage to reverse social and economic depreciation. However, these social and economic aspects are not sufficiently highlighted and are not explicitly included within the agreed content of the model. On the contrary, Southern European countries and especially the Mediterranean seem to prefix social, economic and governance issues and less attention is paid to environmental performances at least from the point of view of their initial definition and specification.

4.1. The case of France: Relative delay, centrally directed movement, focus on societal issues

In France, despite a relative delay, many cities have been engaged recently in the process of sustainable neighborhoods. Most of the projects are being actually studied and implemented, so their status does not allow to fully evaluate the results and present a meaningful analysis. In addition, the famous "Grenelle de l' Environnement" has proposed to initiate a plan of voluntary eco-neighborhoods driven by local governments: at least one eco-neighborhood in every municipality that intends to realise programmes of housing development until 2012 (in continuity with the existing urban texture and integrated in the city master plans) as well as fifteen large-scale projects of energy, architectural and social innovation, while the release of growth is planned to occur by 2012 through the creation of ten "Ecopolises", that is cities of at least 50,000 inhabitants integrating environmental quality and new information and communication technologies ("Attali" commission).

What is important in France is the strong political will and the consequent centrally directed generalisation: the "Sustainable City Plan" (Plan Ville Durable), presented to the Council of

Ministers on 22 October 2008, aimed at fostering the emergence of a new way to design, build, develop and manage the city. As defined by the Ministry of Ecology, Sustainable Development, Transport and Housing (MEDDTL), the eco-neighborhood is a sustainable operation of high demonstrative and exemplary value. Considered as key measure of the Sustainable City Plan of MEDDTL, it contributes to improving quality of life, while adapting to tomorrow's challenges: "preserving resources and landscapes, while preparing the conditions for the creation of a suitable housing supply". A first call for projects for the competition entitled "EcoQuartier" was launched in October 2008 with local communities to bring together stakeholders of quality operations within an operational Club, enhance their actions and allow the dissemination of good practices. 160 projects have been submitted by communities, coming from all French regions. In 2009, the following cross-cutting issues have enabled to distinguish the winning communities through a ranking of 28 projects:

- Relevance of the urban project, governance, management and structuring of the project, mixt uses and environmental aspects of the development.
- Water, waste, biodiversity, mobility, energy efficiency and renewable energy, density and urban forms, sustainable construction.

The National Award was delivered to the ZAC of Bonne in Grenoble (38). The second call for eco-neighborhood projects was launched in January 2011. A new eco-neighborhood grid was set up in order to serve the project analysis by experts but also to provide a "framework for thought" by any community seeking to implement an eco-neighborhood. In 2011, 393 applications were submitted. A double Grand National Award was delivered to:

- Nancy, and Laxou Maxéville (54 - Urban Community of Greater Nancy) - The Hague Plateau
- Roubaix, Tourcoing and Wattrelos (59 - Urban Community of Lille) - The Union.

The success of the two calls for proposals (2009 and 2011) demonstrated the enthusiasm of local communities to develop sustainable operations, whether in cities, towns or rural communities. A committee charged to form a proposal for an "écoquartier label" was formed. This committee issued, late 2011, recommendations addressing to the Minister of Housing and Urban Development for the establishment of a national eco-district label.

These centrally directed processes in cooperation with local authorities highlight already major projects and underline the fact that the phenomenon of eco-neighborhoods is widespread in France and building resilience is ongoing for these innovative projects of urban development.

Moreover, the HQE Association, a public character platform of stakeholders dealing with sustainable building and sustainable urban development, in collaboration with SNAL (Syndicat National des Aménageurs Lotisseurs) which is a federation of over 300 private developers who contribute to the production of more than 25,000 houses annually, have produced a guide on how to integrate the HQE process for buildings in urban projects. This was the concept that led to the creation of a new HQE process entitled "HQE Aménagement" which has been subject of experimentation since 2006 in 10 pilot community

projects. This approach aims at ensuring that all environmental, social and economic concerns are handled by developers and should allow private or public developers to monitor the project so that it incorporates a variety of concerns and all stakeholders likely to be involved: professionals, residents, technical services of the community. The “HQE Aménagement” is fully compatible with the future label “écoquartier” planned by the Ministry of Ecology, Sustainable Development, Transport and Housing (MEDDTL) as far as both piloting, management system and process of the development project are concerned.

To note that the design of eco-neighborhoods in France gives emphasis on the social dimension of the outputs (Lefèvre & Sabard, 2009) even by means of the rebirth of the cooperative movement, which is evident since the beginning of 2000 in France.

4.2. A mediterranean eco-neighborhood model elaborated in the framework of an interregional cooperation programme

The overall objective of the MED-Ecoquartiers project, carried out in the frame of the Medocc-INTERREG IIB and based on a European regional partnership, was to produce a common methodology in order to serve as a set of principles for the creation of new neighborhoods that are consistent with the principles of sustainability (planning, building, energy, mobility, quality of life, activities, natural resources, historic buildings and landscape) in the countries of the Western Mediterranean. It grouped the cities of Pezenas (eco-neighborhood of Saint-Christol, 29 ha for 1700 inhabitants), Dos Hermanas (Spain, eco-neighborhood Montequinto for 12,000 inhabitants), Faenza (Italy, eco-district of San Rocco, 350 dwellings for 1,000 inhabitants), Elefsis (Greece, eco-neighborhood of 88 apartments on 3 hectares).

4.3. Strategic spatial planning prevailing in an Italian eco-district project

Under the hypothesis that “there is no a unique Mediterranean city, but only many different Mediterranean cities” and looking for describing as much as possible the Mediterranean diversity, the Italian partners of the Med-Ecoquartiers Project have elaborated one of the most significant examples in St Rocco neighborhood in the City of Faenza. The San Rocco neighborhood project in Faenza addressed the two fundamental issues for the construction of new neighborhoods; the first one related to land use and consequently town planning, while the second one related to experimental aspects, implementation techniques, the use of materials and innovative technology that can improve the overall quality of the ecosystem. The San Rocco neighborhood seems to be totally oriented towards the “relationship style of planning”, even though a great deal of attention has been paid to the physical product, if only to ensure environmental sustainability. The experimental planning and building of the San Rocco neighborhood bridges the gap between product focused and relationship focused planning and is strongly Mediterranean in culture. Residents’ involvement was also enhanced. Another useful conclusion deriving from the Italian Project is that a Mediterranean eco-neighborhood

results from strategic planning (Nonni, Laghi, 2008). The project is a strategic planning one with people and their relationships at the centre.

4.4. Greek eco-neighborhood projects linked with workers' housing projects

Eco district ideas are still in their infancy in Greece, despite a boost in green development initiated recently by the government. There is no real "eco-neighborhood" implemented in Greece and many questions need to be answered on the way to implement eco-neighborhood projects in the country. Nevertheless, Greece has participated in the Med-Ecoquartiers through a project to construct 88 housing units in the city of Elefsis. The project was carried out by the Workers' Housing Organization, a public institution that since its inception in 1954, is responsible for the construction of social or workers housing dwellings, but the Elefsis project was already in construction phase which is a fact that has hampered the implementation of the Med-Ecoquartiers tools. They only contributed to a partial modification of the original design and improved the environmental performance of the project in some areas. However, the involvement of the Organization in the Project has contributed to a broader learning process to the extent that achieved awareness and knowledge around the question of eco-neighborhoods has had a replication effect through the adoption of the criteria introduced by the programme to other projects managed by the same organisation : a new settlement in Iasmos (Rodopi) has been designed as a pilot village for implementing as much as possible the methodological tools produced by Med-Ecoquartiers and major part of the sustainable planning was the consultation between the various stakeholders, the local government and the residents in order to build the necessary resilience (Kyvelou & Papadopoulos,2011). Moreover, the Organisation has announced a European architectural competition in collaboration to the Greek Institute of Architecture (EIA) regarding the environmental design of a new social housing settlement and is currently expanding its ecological action, by participating in the ELIH-MED Project dealing with energy refurbishment of low-income housing in the Mediterranean.

4.4.1. "Green neighborhood" projects in depreciated areas of western Athens

The most recent attempts to develop eco-neighborhood projects in Athens is the one led by the Ministry of Environment, Energy and Climate change and the Centre for Renewable Energy Sources (CRES) in the depreciated and low-income area of western Athens, namely the municipalities of Aigaleon and Aghia Varvara. Nevertheless the scale of the projects is too small and no real sustainable approach can be implemented. In fact, a block of 4 social housing buildings has been chosen to serve for the pilot implementation of both zero energy buildings and an interior urban oasis as well, to improve microclimate conditions. The ministry is also attempting to implement a particular public-private partnership scheme, through voluntary agreements with small construction enterprises which can provide construction materials and building products to affordable prices. The success of this scheme is crucial for accomplishing a major objective of the project, that is to stimulate local economy dynamics. Another remark that has to be made concerns the failure of a firstly

launched project in Aigaleo due to the non capacity of the local authority to fully understand the project and find the necessary institutional tools to cope with the land and buildings ownership related constraints.

As far as the Aghia Varvara project is concerned, both on-site visits, use of interactive questionnaires and data collection from the Public Power Corporation confirmed the need for interventions in buildings in three key areas: The first one concerns exterior insulation of the building shell, replacement of old simple glazed window frames with double glazing, replacement of old blinds and use of cold paintings. The second axis is to replace the various heating and cooling systems with an energy efficient central heating and cooling system. Finally, ensuring hot water through a central solar system is the third axis of the operation.

The programme is aiming at maximising energy efficiency of the neighborhood, achieving thermal comfort for residents and improving significantly their quality of life and at the same time minimise environmental impacts.



Figure 1. Social housing apartment buildings and the urban tissue of the Aghia Varvara (Western Athens) green neighborhood project.

4.4.2. Private eco-developments in high-income suburbs, focusing on marketing

Private projects can be often met in the Mediterranean area as they concern the creation of eco-villages either of secondary residences and touristic complexes or high income level housing in prestigious suburbs. In these projects, innovation and marketing for commercial reasons are usually prevailing. An example of such a development is the "Designer Village" developed by a private construction company in Dionysos, on the foothill of the Pendeli mountain. The project concerns the development of 85 plots in which 240 dwellings are being erected. Each plot has approx. an area of 1500m². In an attempt to use green marketing tools, nine Greek architectural cabinets of different architectural perceptions and tendencies have been invited by the construction company, to put down their inspirations. "Designer Village" is already referred to as a kind of park of exemplary Mediterranean architecture, characterized as an "excellent project" by an EC programme competition. It focuses on energy efficient techniques and improvement of thermal and visual comfort and indoor air quality. Although the environmental objectives and targets associated with the rational use of resources (energy, water etc) are ambitious, the complex is far from being characterised as eco-neighborhood

since it doesn't promote neither social mixing, nor economic efficiency, accessibility and affordability or cooperation among inhabitants. In conclusion we would say that an eco-neighborhood may be regarded as such only if it is the result of social dynamics and not a simple consumer product (Kyvelou & Papadopoulos, 2011).

5. Findings of the comparative study of the existing assessment tools

The investigation with regard to the existing tools showed that they address different parameters and have different focus. It is not easy to select the most appropriate tool, since there is none of them addressing all the issues and remaining, at the same time, easy to use. It was shown that most of the environmental, social and economic parameters are being implemented in different ways for each project.

However, in many of the cases, there are parameters that were neglected. Two of them is good design and place-making. It is strongly believed by the authors that the latter should be included to an eco-neighborhood approach and addressed at an earlier stage. The aspect of good design is not only related to environmental design and its many criteria but also to issues such as attractiveness and high design standards which are addressed by the Cambridge Quality Charter of Growth. Place-making, that is making of a real coherent neighborhood with social and territorial cohesion is also often neglected.

On the other hand, since current economic and financial crisis lead to fragmentation of society, special attention has to be paid, in these projects, on social equity issues as one of the aims of sustainable territorial development. The principle of social equity focuses on the right to work and housing but also on the access to services and public goods and on the fight against poverty and social exclusion. Each citizen must have access to a job and decent housing, but also to the essential public goods. The access to housing, medical care, education and information should lead to a more stable society capable of solidarity, tolerance and generating participation. It can develop its traditions while promoting a sustainable lifestyle. Finally, 'social equity' can be defined as the addition of the merit principle of equality. This aim can be divided into four targets: ensuring everyone an adequate housing, ensuring access to efficient public services, promoting access to employment, fighting against occupational and social exclusion. To achieve the first target, the issues in a territorial project are:

- promote the social mix
- promote diversity of housing supply
- promote affordable housing policy
- integrate urban projects in a social housing policy consistent with the entire city.

Apart from social equity principles, an eco-neighbourhood initiative should be based on adaptive and flexible governance schemes (Chouvet, 2007), that is bring together community stakeholders, property developers, utilities, and the city to solidify a shared sense of purpose and partnership through the following actions:

- establish municipal policy and organisational structures to support the eco-district development;
- create an engagement and governance strategy to build community support, set priorities and actions;
- develop an assessment and management to guide project development and track ongoing performance;
- identify commercialisation opportunities for the private sector to test promising products and practices;
- implement sustainability projects through technical and economic feasibility analysis, assembly of project financing, and establishment of public-private partnerships (Kyvelou & Karaiskou, 2007).

6. Comparing Mediterranean eco-neighbourhoods

This part of the research has identified examples of eco-neighborhoods in Southern Europe, either completed or in the design phase. These neighborhoods have various scales and cover regions approximately from 10 to 250 hectares (Table 8). This is an ongoing investigation aiming to identify and classify examples, which can be used as models in future eco-neighborhood design.

Amongst the 16 presented cases, one of them is located in Portugal, three in Spain, three in France and nine in Italy. In Table 8 some general characteristics are presented for each example while in Table 9 an analysis of the different environmental, economic and social parameters that were implemented in each project is undertaken. For methodological reasons, a single tool was selected for the purposes of this classification, the “One Planet Living framework” initiated by Bioregional. The 10 principles of the tool form the corpus of the analysis which will follow.

We should note here that the North-European model is mainly described by its technical and environmental components. The performance in terms of energy, saving water or recycling materials are particularly highlighted. They seem to be the main mechanism to move from principles to the effective implementation of sustainable urban development. The urban planning and design and the implementation of networks are resulting from this approach. This ‘model governed by the environmental approach and its performance’ is mainly used by communities as a powerful tool of communication, promoting the region and even as leverage to reverse social and economic depreciation. However, these social and economic aspects are not sufficiently highlighted and are not explicitly included within the agreed content of the model of sustainable urban development.

On the contrary, Southern European countries and especially as far as the examples examined in the Mediterranean, are concerned, seem to prefix social, economic and governance issues and less attention is paid to environmental performances at least from the point of view of their initial definition and specification. In Table 8, it is also clear that sustainable transport is also a field of Mediterranean interest together with health and happiness issues.

6.1. What would be the model of a Southern European eco-neighborhood?

The study of a series of eco-neighborhoods in Southern European countries led us to the conclusion that a Southern European eco-neighborhood model is certainly emerging. Specifically, the experience of Southern Europe shows that eco-neighborhoods are neither merely expressions of integration of sustainable development in city planning nor only products integrating new technologies and alternative energies.

The eco-neighborhoods, as developed in Europe are, in our view, important local aspects of strategic spatial planning, as this is reborn and reshaped today in Europe, thus being products of a dynamic political and social process. Eco-neighborhoods are manifestations of the change of regulatory planning (based on physical planning) to a territorial management process where "territorial marketing" has a predominant role (Kyvelou, 2010). They reaffirm, moreover, that sustainable development is an exceptional unifying element and point of recasting spatial policies. Sustainable neighborhoods are also emphasizing the issue of scale which is nowadays one of the most important theoretical discussions in spatial and urban planning. Another important conclusion is that an eco-neighborhood mainly depends on the extent to which there is a tradition of strategic spatial planning, on the cultural tradition and level of collective and community involvement (Chiotinis, 2006) and on the presence of catalytic investments and the possibility of implementing public - private partnerships towards a process of stimulating local economy dynamics (Kyvelou & Karaiskou, 2006).

The Mediterranean countries usually lagging behind as far as the above conditions are concerned, present a spontaneity and a delay of implementation. Constraints of implementation show that an eco-neighborhood initiative should be based on adaptive and flexible governance schemes, and on engagement strategies that would bring together community stakeholders, property developers, utilities, and the city to solidify a shared sense of purpose and partnership through the following actions :

- a. Establish municipal policy and organisational structures to support the eco-neighborhood development;
- b. Create an engagement and governance strategy to build community support, set priorities and actions;
- c. Develop an assessment and management toolkit to guide project development and track ongoing performance;
- d. Identify commercialization opportunities for the private sector to test promising products and practices; and
- e. Implement sustainability projects through technical and economic feasibility analysis, assembly of project financing, and establishment of public-private partnerships (Kyvelou, Marava & Kokkoni, 2011).

Both lessons from the North-European examples of eco-neighborhoods and observation from different types of eco-districts in Southern Europe, either public or private projects, can provide helpful criticism and a good framework to discuss issues of efficient implementation in the near future. This framework could help to modeling work that is both to the construction of a model that can predict future trends and to the affirmation of the model, meaning that it can be used in the reproduction and replication of certain practices and related projects.







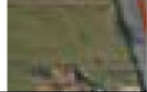





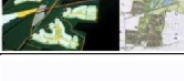



Project name	plan	area	dwellings	inhabitants	total cost
Portugal					
Mata de Sesimbra, Lisbon		5300 he+4800he natural	8000 units tourist	25.000 inhabitants	800 mil Euros
Spain					
Entrenucleus, Dos Hermanas, Seville		39,5 hectares, 7, 2 hectares settlement 160,50 km2	13500 units homes and offices	126.000 inhabitants	244 mil Euros
Ecociudad Valdespartera, Zaragoza		243,3 hectares	9.678 social housing units	31.000 inhabitants	N/A
Logroño Montecorvo, Rioja Province		56 hectares	3.000 carbon neutral housing units	130.000 inhabitants	388 mil Euros
France					
Andromède in Blagnac		210 hectares	3.700 housing	1 million	N/A
Ville de Pézenas, Quartier Saint Christol		29 hectares	90.000 sq met.	250 families	31 mil Euros
Saint Lys-Haute Garonne		7 hectares	N/A	7500	N/A
Italy					
St.Rocco, Faenza		8,3 hectares	390 housing units	950	9,4 mil Euros
Malizia Ecologic quarter, Siena		5 hectares	150 housing units +commercial etc	N/A	N/A
Cogmento project, Modena		11,7 hectares	220 housing units	770	5,5 mil Euros
BIOPEP		14,7 hectares	340 housing units	N/A	N/A
Sanpolino quarter, Brescia		N/A	2.000 apartments	N/A	N/A
Parco Ottavi project, Reggio Emilia		53 hectares	131.000 sq m surface,1.500 housing units	4.500	N/A
Pietrasana, Vigevano, - Pavia		N/A	220 lodgings	N/A	5,7 mil Euros
Villa Fastiggi, Pesaro		15 hectares	333 dwellings	N/A	N/A
Bologne, quartier de la Bolognina ouest		30 hectares	N/A	64.000	N/A

Table 8. Examples of Mediterranean eco-neighbourhoods

CATEGORIES IDENTIFIED FROM THE PROJECTS	ONE PLANET LIVING PRINCIPLES	
	Zero Carbon	Zero Waste
Portugal		
Mata de Sesimbra, Lisbon		
Spain		
Entrenucleus, Seville		
Valdespartera, Zaragoza		
Logroño Montecorvo, Rioja		
France		
Andromède quarter, Blagnac		
Ville de Pezenas, Saint Christol		
Italy		
St.Rocco, Faenza		
Malizia ,SienaCognento		
BIOPER, Modena		
Sampolino quarter, Brescia		
Parco Ottavi , Reggio Emilia		
Public Buildingsr, Pietrasana		
Villa Fastiggi, Pesaro		
Quartier de la Bolognina		
Greece		
Elefsis		
Iasmos		
Aghia Varvara		
	Solar - panels, wind control	
	orientation	
	Renewable energy	
	biomass	
	Photovoltaic systems	
	Thermal stations	
	Waste management	
	Pedestrian routes	
	Bicycle network	
	Green belts	
	Urban bus lines	
	Covered parking	
	Sustainable materials	
	Local and sustainable foods	
	Rainwater storing	
	Water reutilisation	
	Water nets	
	Water devices	
	Land and wildlife	
	Connection with historical centres	
	New cultural centres	
	Social services	
	Generation mix	
	Integrating urban environment	
	Sports facilities	
	Public buildings	
	Kindergartens	
	Urban parks	

Table 9. Parametric analysis of the sustainability criteria according to the One Planet Living framework.

6.2. What would be an efficient sustainability assessment tool for Southern European eco-neighborhoods?

The short analysis of the eco-neighbourhood design tools has shown that they have different orientations in terms of their focus on environmental, social or economic strategy. Some of the tools seem to be more design oriented while others have a social resilience focus. The Eco-Neighborhood is more than a mere buzzword or local marketing tagline. The neighborhoods have ambitious targets that go well beyond load reduction. They draw upon new and often complex practices, from urban project design to construction, use and assessment and it is often complicated for the local authorities to implement these practices as new methodologies need to be addressed and many of them recoil at doing so, from the very start of the project.

The above described experiences in Southern Europe show that an assessment tool for eco-neighborhoods cannot be efficient if nor directly linked with the valorisation of the territorial potential and the territorial capital (OECD, 2001), at local level. We have therefore proceeded to the formation of a new tool, largely inspired by the territorial capital and the territorial cohesion concepts, which gives emphasis to the holistic approach of the city, its neighborhoods and its relationship and interdependence with its region. The so-called “SDMed eco-neighborhood” tool is structured around the main determinants of the territorial capital (geographical, cultural, political, material, social and intellectual capitals) and is analysed in a series of criteria capable to manage the complexity and diversity of the Mediterranean urban phenomenon (Sinou & Kyvelou, 2006)

The concept of territorial capital was first proposed in a regional policy context by the OECD in its Territorial Outlook (OECD, 2001), and it has been later on reiterated by DG Regio of the European Commission: “Each Region has a specific ‘territorial capital’ that is distinct from that of other areas and generates a higher return for specific kinds of investments than for others, since these are better suited to the area and use its assets and potential more effectively. Territorial development policies (policies with a territorial approach to development) should first and foremost help areas to develop their territorial capital” (European Commission, 2005). Territorial capital is referring to the following elements: a/ a system of localised externalities, both pecuniary and technological; b/ a system of localised production activities, traditions, skills and know-how; c/ a system of localised proximity relationships which constitute a ‘capital’ – of a social psychological and political nature – in that they enhance the static and dynamic productivity of local factors, d/ a system of cultural elements and values which attribute sense and meaning to local practices and structures and define local identities; they acquire an economic value whenever they can be transformed into marketable products – goods, services and assets – or they boost the internal capacity to exploit local potentials; e/ a system of rules and practices defining a local governance model. Accordingly, the OECD has rightly drawn up a long list of factors acting as the determinants of territorial capital, and which range from traditional material assets to more recent immaterial ones. All the above have been used to draft the SDMed Eco-neighborhood tool.

Territorial capital	Territorial cohesion components
Geographic	Emmissions
	Landscape resources
Cultural	Cultural heritage
Political	Governance
Material	Economic growth-wealth
	Resources
	Sustainable transports-mobility
Social	Health and safety
	External accessibility
	Internal connectivity
Intellectual	Creativity

Table 10. The conceptual elements behind the SDMed Eco-neighborhood tool.

7. The SDMed Eco-Neighborhood tool

As it was mentioned in the introduction the SDMed Eco-Neighbourhood tool was based on:

1. the research and parametric analysis between the existing eco neighborhood tools;
2. the SDMed building performance assessment tool (Sinou & Kyvelou, 2006);
3. the concept of territorial capital (OECD, 2001);
4. The current economic and financial crisis and the consequent limitation of public funds.

By its definition, the concept of territorial capital can be divided in geographic, cultural, political, material, social and intellectual capital, while approaching territorial cohesion we can categorise actions in emissions, local resources, cultural heritage, governance economic growth, resources, sustainable transport-mobility, health and safety, external accessibility, internal connectivity and creativity (Kyvelou, 2010).

Thus, the structure of the new tool is constituted by the main subdivisions of territorial capital, eleven objectives-targets linked to territorial cohesion and in 39 accordingly sub-targets (Table 11). These sub-targets are further divided in more criteria in order to include all the parameters that can influence sustainable neighborhood. The final depiction of the tool is under study; however a first attempt is presented in the diagram of Table 10.

SDMed ECO NEIGHBORHOOD tool

Territorial capital	11 Targets territorial cohesion	39 Sub-Targets		
Geographic	Emissions	1.1	Emissions (CO2)	Reduction of CO2 emissions
		1.2	Water waste	Management of water waste
		1.3	Production of solid waste	Management of domestic waste Management of construction waste Management of solid waste infrastructure
		1.4	Management of litter and waste	Network of sewage
		1.5	Urban heat island effect	Measures to reduce heat island effect
		1.6	Night-time light pollution	Reduction of light pollution
		Landscape resources	2.1	Natural and technological risks
	2.2		Influence to the urban form	Optimisation of land use Compact growth – Density Intelligent planning Integration of environmental issues in urban planning
	2.3		Adaptive opportunity	
	2.4		Quality of public spaces	Tree-lined and shaded streets Cohesion and linkage among urban spaces Design with bioclimatic criteria
	2.5		Comfort (thermal, visual, acoustic)	Nuisance linked to the neighborhood Noise pollution in the neighborhood from vehicles or activities Minimisation of construction nuisance

SDMed ECO NEIGHBORHOOD tool

Territorial capital	11 Targets territorial cohesion	39 Sub-Targets		
				Visual quality of natural environment - view Visual quality of built environment Preferred locations Water efficient landscape Steep slope protection
		2.6	Air quality	Interior air quality Exterior air quality
		2.7	Spatial comfort and comfort of activity	Quality of building Quality of housing Variety in housing Satisfaction of users and residents Support of architectural quality Innovation and exemplary performance
Cultural	Cultural heritage	3.1	Maintenance of natural heritage - biodiversity	Maintenance of wetlands and natural beauty landscapes Protection of rural land Extinction species and ecological communities
		3.2	Maintenance of cultural heritage	Conservation and re-use of cultural heritage
		3.3	Maintenance of built environment	Use of existing buildings Preservation of historical resources and adaptive reuse Brownfield redevelopment
Political	Governance	4.1	Functionality and possibility of services control	
		4.2	Adaptability and flexibility of services	
		4.3	Robustness and maintenance of	

SDMed ECO NEIGHBORHOOD tool

Territorial capital	11 Targets territorial cohesion	39 Sub-Targets		
			services	
		4.4	Community involvement	
		4.5	Ownership of land and buildings	
		4.6	Public Private Partnerships	
Material	Economic growth-wealth	5.1	Cost of land and construction cost	Local economic dynamic Creation of social economy
		5.2	Cost of of life cycle (€/year) (maintenance, exploitation et deconstruction)	
		5.3	Cost of waste management and cost of emissions (€/year)	
		5.4	Support of local economy	Presence economic activities Presence of retail trade Local food production Mixed use neighborhood centers
	Resources	6.1	Effect in the energy resources	Improvement of energy efficiency for heating, cooling and electricity (buildings and infrastructures) Use of renewable energy (locally) Orientation Heating and cooling of district Certified green buildings
		6.2	Exhaustion of raw material	Integration of recycled and reused materials, constructions and process of demolition in buildings and the public spaces

SDMed ECO NEIGHBORHOOD tool				
Territorial capital	11 Targets territorial cohesion	39 Sub-Targets		
		6.3	Use and management of water	Consumption of potable water Use and management of rain water of Stormwater management
		Sustainable transport-mobility	7.1	Transportation cost
	7.2		Improvement of transportation and mobility	Improvement of transport Safe and convenient paths for pedestrians and bicycles Areas with decreased dependence automotive Transit centre Network bicycle path and storage Reduction of parking footprint Street network
Social	Health and safety	8.1	Health and productivity	Improvement of cleanliness in the neighborhood and communal spaces Right and access to care and health
		8.2	Safety of users	Improvement of safety of people and goods Improvement of road safety
	External accessibility	9.1	Accessibility for people with special needs	Accessibility
		9.2	Accessibility in open spaces	Access in public spaces Access in recreation facilities
	Internal connectivity	10.1	Involvement of users	Involvement of residents and users in the process of sustainable urban development Participation of residents in decision making and projects related to the community Strengthening of community

SDMed ECO NEIGHBORHOOD tool				
Territorial capital	11 Targets territorial cohesion	39 Sub-Targets		
				Promotion and participation of community
		10.2	Creation of work places	
		10.3	Social diversity	
Intellectual	Creativity	11.1	Support of education - Levels of education and professional skills	Diversity in age distribution Mixed income communities Connected and open community Collaborations Promotion of academic success Reinforcement of the role of school in the community International cultural contacts - connectivity

Table 11. The new SDMed ECO-NEIGHBOURHOOD tool

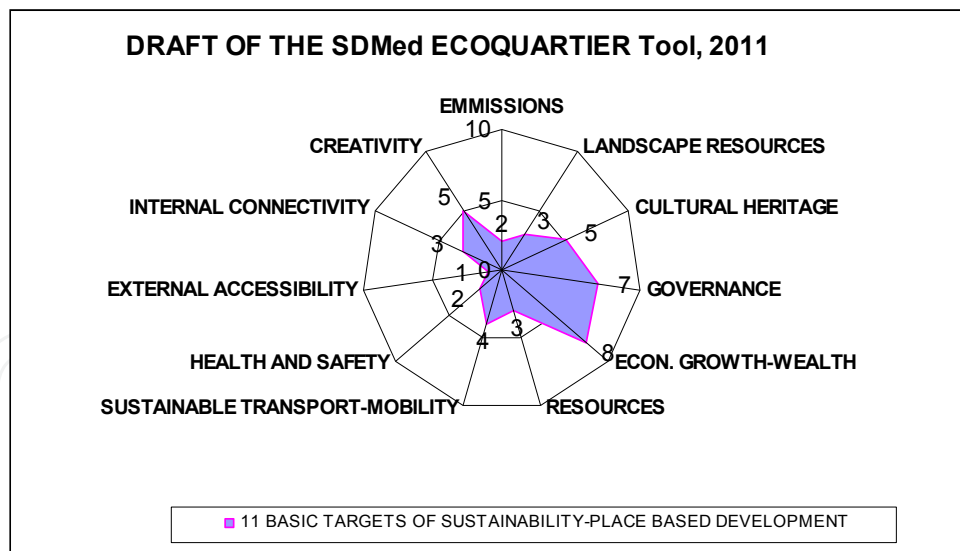


Figure 2. Draft illustration of the SDMed Eco-neighbourhood tool.

8. Conclusions

The climatic, social, cultural, governance and spatial planning related specificities of the Mediterranean region and the delay of eco-neighborhood development in the Mediterranean countries combined with current need of economic and social regeneration

lead to the necessity to develop a tool adapted in these specific needs and particularities. The comparative research showed that the assessment tools for eco-neighborhoods have been structured around different principles and ideas. There is an abundance of tools and their evaluation constituted an aid for the creation of a new proposal. The parametric analysis of tools that were selected created a base for the creation of the new tool that has to be enriched in order to face the particular needs of the Mediterranean region, with sensitivity and taking into account current economic and financial crisis.

Furthermore, the investigation of existing Mediterranean examples gives important information with regard to the sustainability criteria that are used in most of the cases.

Finally, the concept of place-based development and contemporary planning criteria like the one of territorial capital have been explored in order to form a proposal for a new methodological tool based on the need of place-making and urban regeneration under economic crisis and lack of public funds. Sustainability in the scale of a neighborhood cannot be a static process, has to do with innovation and has to ensure the creation of wealth at local level and the stimulation of local economy dynamics. Planning a contemporary eco-neighborhood is a complex procedure and addresses both economic, social, environmental and governance related challenges. Achieving an eco-neighborhood assumes the development and implementation of a process of project management and an action plan involving local actors at the different phases of a project. Furthermore, it involves setting objectives and implementing actions to achieve environmental, economic and social performances.

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