

# **RECOVERY, INNOVATION AND SUSTAINABLE DEVELOPMENT OF THE BUILT ENVIRONMENT**

The case of a Greek traditional town

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## **A B S T R A C T**

The rapid growth of transport and communications networks has posed excessive development pressures on remote locations. The impact of economic activities – tourism in case - on the environment –built heritage and natural - has been of increasing concern to policy makers by the late 80s. By then it was realized that economic development could be sustained indefinitely only if it could be based on grounds which would take into account its dependence on the natural environment and cultural heritage.

In traditional societies the visual harmony between “development” and “context” used to be self-sustained. Internal cohesion at such a level is no longer an easy task to achieve in modern societies. The pace of change of today makes the cohesive development of life patterns through generations rather implausible. This may imply a conscious selection of elements from former cultures to be incorporated on the basis of criteria related to the likely potential of these elements when used as components in modeling contemporary life.

This presentation aims to the implementation of processes of recovery and urban rehabilitation in cities by using, as strategic tool, technologic innovation. We propose recovering, re-functioning and telematic networking of important buildings in order to transform these buildings in nodes of a network for recovery and rehabilitation of city centres and neighbourhoods.

The built environment is an economic, environmental and social resource with a high value, which couldn't be lost. Recovery and re-functioning oriented to re-using could offer important perspectives in construction and in other fields linked up with expected results of economic, productive and employment growth, according to principles of sustainability.

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## 1. INTRODUCTION: Trends in urban rehabilitation in Greece - Arachova

In Greece, the protection of historic urban centres or even of traditional housing areas within the urban structure has not been carried out with social considerations in mind, but rather results from a mimicry of the general trends which prevailed in large European towns during the 1970s - which is why the statutory side of conservation as well as the actual objectives of conservation have not brought about a significant enhancement of Arachova's cultural heritage, but rather the tendency to destroy its traditional buildings(1). The conservation of heritage cannot be achieved by merely creating a set of rules. Protection of the past is one of the human needs joining the present with the eternal. Given this approach, conservation is not limited to buildings or constructions in general, but must include its social and physical environment(2).

Toward the end of the 1980s we have the structural elements of the town come to be considered integral to the social environment. Since that time, the protection of buildings, as well as of those who use them, has played a decisive part in the restoration and development of heritage. Schemes to develop heritage in this way in Greece had been implemented on a much smaller scale than in other European countries. The schemes for restoring and developing the Athens' historic quarter, Placa were aimed at both retrieving the social nature of the urban centre of Athens and developing its economy (financial support for traditional housing, repair and preservation of traditional buildings, creation of pedestrian zones, setting out public areas, moving away activities which spoil the environment, etc).

The development of Arachova, as with Greek towns in general, has been a process of urbanization in which town planning has been partial or non-existent. Despite this, Arachova has mainly good points - friendly atmosphere, relaxed way of life, sense of community, security even at night, etc. Arachova tends to define its policies for reconciling identity and local history on the one hand, with necessary progress and openness towards modern urban life on the other. From now on it is essential that all actions and projects aiming to promote development and sustainability, particularly in the urban context, shall not be reduced to technical solutions or economic calculations. The spatial structures of our town derive from the social structures, economic system, modes of production and ideologies of our society. Conservation becomes the establishment of a link with the past. It is the representation of the past in the present and for the future(3).

Sustainability is perceived as a local process both creative and dynamic. The model under consideration conforms perfectly to the purpose which is to increase the likelihood of contact, exchange and communication between different people, activities, associations and institutions without compromising the quality of life within the town or that of the ecosystems around it and in its region.

An integrated stance will make it possible to minimise the effects of the lack of coordination which may create many environmental problems. To achieve integration it is crucial to establish well structured organisation measures both at the stage of policy formulation and project implementation.

## 2. SCIENTIFIC SUPPORT: The Basic Principles

The built environment represents a resource which should be used in a sustainable manner in order the utilisation of it from the rising generations is not compromised. The change is not only procedural or programmatic, but also cultural and political. The research intends to promoting a “culture of recovery” instead of a “culture of expansion” which has so far characterised negatively the modern town-planning politics. The instrument of this cultural revolution is the technologic innovation in her largest potentialities, so as to face the government of the complexity of the phenomena of urban decay.

The project idea is based on a key conception: the sustainable development of the cities may be pursued only by joining the technologic innovation and the recovery of the built environment. The sustainable development is observed according to the three dimensions: environmental, social and economical(4). The city is examined according to her nature of territorial system which is highly complex. The technologic innovation is here considered as a complex system of tools and techniques with a particular attention to telematics services. The buildings recovery is here considered as re-functioning and re-using oriented. Building systems are considered essential components of urban systems.

The recovery has been faced so far in a sectorial manner. On a disciplinary level, all the different social, economic, town planning and architectural environments have been kept separate. Often, specific results have been obtained for single building components or single buildings. But in the absence of a global vision, the negative external factors and the dynamics of inter-relationships on an urban scale have been ignored. It is claimed that greater building efficiency (energy savings, increased life cycles, etc.) cannot be solely attained by acting on the "building system". On the one hand, operations to improve the efficiency of large groups of buildings must be looked at on an urban level; on the other hand, there must be an improvement in the efficiency of functions allocated to the same buildings.

On the urban level we have found out the trend to operate on the sections of cities only by means of partial projects without general integrated plans. Furthermore and often the physical components have been considered by neglecting the functional components, then. The sustainability and her three main dimensions (environmental, social, economical) and two transversal dimensions (space and time) have got a position of poor importance. The research would give her contribution within the integrated, multidisciplinary, multi-purposed strategies and methodologies. It is realised as necessary to adopt a holistic approach for a sustainable urban development(5).

The processes of recovery will focus on the construction (or re-construction) of the effectiveness of the building and urban systems by working both on the large buildings (or group) and on the functions which are lodged there. Only starting from the urban level we can operate on building level. In effect, we need to define an innovative methodological approach which begins on an urban scale to resolve problems of building stock, intervening not only on the physical elements of buildings and cities but also on functional components. The objectives of building efficiency can be more easily attained by acting on the efficiency of the functions allocated to the buildings themselves(6).

The project implementation will be pursued by means of the dialogue between the local level and the global one: recovery and rehabilitation of group of buildings and urban areas within a global framework of re-arrangement of the whole territory. In particular, these interventions should be included in the cognitive framework of the complexity of the Mediterranean territory and the new forms of urban-territorial developments (widespread city, development directories, trans-frontiersman regions, etc.).

The technologic innovation plays an important role because it allows the re-functioning of functions allocated in the buildings by creating a telematic network of “poles of urban rehabilitation”. At territorial level, the re-functioning of the networking may contribute to create a sustainable mobility, by reducing the transport demand.

Particular attention has been done to the contribution of operators (designers and buildings enterprises), of telecommunication firms (network and re-function project), of decision-makers (local authorities), of financial supporters (public and private). Their support to the project (or their involving in progress) may assure results and significant economic and social impacts, employment and quality of life in cities.

### **3. OBJECTIVES**

The recovery, the rehabilitation and the networking will allow to obtain definition, specification and realisation of a sustainable built environment and the upgrading of the quality of large groups of urban buildings.

In particular, our objectives are related to: improving quality of life, productivity and user accessibility, social inclusion, accessibility in relation to the built environment, land use planning to minimise the overall demand on the transport system, assessing and mitigating risks associated with natural and man-made disasters, governing indoor health and comfort. We would realise many best practices to demonstrate how the methodological approach can help: reduction of primary energy consumption in existing buildings, reduction in the use of primary raw material, recycling construction related waste, reducing the best practice life cycle cost of the construction process.

Starting from these articulate but precise positions, the scientific objective is:

- Definition, specification and experimentation of an operating methodology. That should be able to create some integrated processes of urban recovery and rehabilitation in the centres and neighbourhoods of cities by operating on large groups of buildings and by applying innovative instruments and techniques.

This main objective is divided into sub-objectives those are verifiable and measurable:

- improving quality of life, productivity and user accessibility,
- social inclusion,
- accessibility in relation to the built environment,
- land use planning to minimise the overall demand on the transport system,
- assessing and mitigating risks associated with natural and man-made disasters,
- governing indoor health and comfort,
- best practices to demonstrate how the methodological approach can help:
  - a) reduction of primary energy consumption in existing buildings,
  - b) reduction in the use of primary raw material,
  - c) recycling construction related waste,
  - d) reducing the best practice life cycle cost of the construction process.

### **4. THE WORK SCHEDULE**

The work is arranged taking into consideration the goals, the available resources (human, technical and financial potential) and the timeframe ( the project period).

First of all, we analyse the state of the art as regards recovery and urban rehabilitation, with a deep investigation of the recovery oriented policies. This synthetic reading is targeted to the project goals. We investigate the emblematic accomplishments of space and functional rehabilitation of large groups of buildings and urban ambits. In particular, those emblematic cases are investigated whose rehabilitation has been carried out through innovating

technologies (telematics and not). The most important cases are strictly chosen according to the general features and the local peculiarities, in relation to the project.

Then, we pass to the definition of the methodological hypothesis. We work out a procedure for implementing integrated projects of rehabilitation by networking large groups of buildings for innovated urban functions allocation (re-function).

We work out this procedure through investigating the local, European, global dynamics (evolution trends of the European region, development axes, diffuse city, the governance of complexity, the United Europe policies for the European region layout) and through testing the effectiveness using expectation models and indicators.

Once defined the methodology, we go on with the survey, by defining – in details - the programmatic census papers, which are proposal-project key oriented.

By the above census papers, we determine of the possible buildings to be networked and transformed into rehabilitation poles. The sample areas are pointed out (areas affected by building groups) and chosen according to the criterion of potential emblematicity peculiar to the “best practices”. A database and a territorial information system as well as the transfer and spreading of the obtained outcome, will be worked out.

In order to pass from the survey phase to the operating one, the first step entail the individuation of the public and private bodies being interested: public administrations, governmental bodies, local authorities, banks and finance companies, trustee, telecommunication companies, building enterprises, etc.

We investigate the opportunities and potentials of involvement, planning the approach strategy in a different way according to the specific categories: public, private, firm, body, etc. The contacts with the representatives of each potential supporter they are first general and then personal, choosing the key persons among those appearing more related to the project goals. Also in this phase, we envisage the organisation of conferences and workshops for awakening both the insiders and the public opinion to the theme, through mass media (newspapers, television, internet, etc.).

So, we enter the project phase of recovery, re-functioning and networking of buildings and/or building groups pointed out in the sample areas chosen in the survey phase. After fixing the hierarchy of intervention priorities, we plan (and accomplish in some emblematic cases) the (space and functional) re-using oriented re-functioning and the networking of the “rehabilitation poles”.

Finally, it is expected a checking phase, where the obtained outcomes will be checked according to the fixed goals and, eventually, adjustments through processes of feedback will be carried out.

## **5. CASE STUDY: Urban Rehabilitation of the Historic Centre of Arachova in GREECE**

It is a project for the recovery of the historic building of elementary school and the buildings block around it in Arachova and the urban rehabilitation of the historic centre of Arachova.

### *Objectives:*

- ✓ Balancing of activities in all sectors, reinforcing local traditional character and creating opportunities for recreation, informing and public awareness to local population and tourists.

- ✓ Traditional activities diffusion on to the main central historical axes (East – West / North – South)
- ✓ Telematics introduction and networking in Local, National and Global level.

*Actions:*

1. Renovation and re-functioning of the historic building of ELEMENTARY SCHOOL. Transformation to the pole of the TOWN historical, folklore and environmental MUSEUM (a).
2. Recovery, new function and incorporation in the pole of the BUILDING CAVE, as library and coffee room (b).
3. New uses, new functions in ARCHES as laboratories and specific museums, part of the buildings pole (c).
4. Reformation of open spaces around the main rehabilitation pole and in the broader area of the historic centre (central road, North-South axe, Aphanos place, Xenia place) (d).
5. Re-functioning and networking of the Town Hall's ground floor as information and exhibition centre (e).
6. Restoration and new uses in a traditional building on to the central place as municipal café and meetings room (f).
7. Renovation, re-functioning and networking of the Red Cross old building as Pastoral Museum (g).
8. Renovation, re-functioning and networking of the two old Olive Press buildings as Olive Museum with exposition and sale of local – biological products (h).
9. Opening of the new Elementary School building to the local society as training centre as well as as focal contact point between urban space and natural environment (unique view to the exceptional Delphi landscape) (i).

(see Figure 1)

*Outputs:*

- ✓ Multiobjective Town Museum through re-functioning and networking of existing traditional buildings.
- ✓ Information and exhibition centre – network.
- ✓ Laboratories promoting traditional productive and artistic activities.

**5.1. Total cost:**

TOTAL URBAN AREA under rehabilitation

Buildings: 4200000 Euro

Open spaces: 4500000 Euro

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TOTAL 8700000 Euro

BUILDINGS POLE under rehabilitation

Buildings: 1800000 Euro

Open spaces: 500000 Euro

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TOTAL 2300000 Euro

**5.2. Total duration:**

Three (3) years for the planning and five (5) years to the complete carrying out.

### 5.3. Interested areas and volumes:

Total urban area: 58184m<sup>2</sup>

Volume of all buildings in the urban area: 63700m<sup>3</sup>

Volume of buildings under rehabilitation: 20900m<sup>3</sup>

## 6. SOCIAL AND ECONOMIC IMPACTS

### General:

- ✓ Safeguard of local society structure through reinforcing and promoting of local identity and preservation of traditional activities (first dimension of the sustainability goal: society).
- ✓ Balance of the activities in all sectors of local economy (second dimension of the sustainable development: economy).
- ✓ Reinforce man – natural environment harmonious development process (third dimension of sustainability: environment).

### Specific:

- Enlargement and diffusion in all central urban tissue of social space.
- Job creation and public awareness promotion.
- Reproduction on handicraft and artistic base of authentic local activities.
- Opening in European and International scale of the local cultural and environmental heritage, built and movable (telematics and internet web sites).
- Public's access facilitation on local cultural and environmental traditional values (audio visual equipment).
- Training of young and unemployed people as well as immigrants to the traditional techniques as well as innovative perspectives in traditional activities.

### 6.1. Employment impact:

1) in the planning stage : 70 employees

2) in the building recovery : *total urban area*  
buildings: 700 employees  
*rehabilitation pole*  
buildings: 300 employees

3) in the urban rehabilitation: *total urban area*  
open spaces: 500 employees  
*rehabilitation pole*  
open spaces: 80 employees

## 7. SPECIFIC ELEMENTS OF THE CASE STUDY

The rehabilitation pole is in the east part of the city centre and on the East – West main axe and includes:

- The existing Elementary School which is a historical building (1830) with significant architectural value (main building).
- The Building Cave space which is a cave under the main focal point of the city (Clock Tower, 1837) built traditionally on its front side located in close neighbourhood with the main building.

- The Arches whose elevations were recently adapted to the traditional architectural identity.

Area of the appurtenant lot: 9000m<sup>2</sup>

Volume: 9700m<sup>3</sup>

Square footage of the building: 2000m<sup>2</sup>

The main building is an one (ground) floor construction whose courtyard is one level below the main access road, giving entrance to secondary functional spaces. The Building Cave is a two floors construction into a natural cave of corresponding height. The Arches(22 in number) are one elevation and two floors constructions.

### **7.1. Construction**

The main building and the Building Cave are stone constructed and need preservation and restauration adding new facilities as well as infrastructure and communication networks in order to re-function as Town Museum (main), Library and Coffee room.

The Arches are mainly (inside) structured with beton arme, their front elevation is recently reconstructed with stones completed (filled) with bricks. They need communication networks, heating system and all the relevant equipment in order to function as Laboratories and Museums with specific character (Photo archives, ancient books, traditional weaving designs, tools and techniques, local musical hearings, etc.)(7).

All open spaces in the rehabilitation pole are to be reformed in order to ameliorate their aesthetic and function as well as the accessibility to the focal point of the Clock Tower (recently restaurated) which provides an exceptional view to the uniqueness of the Delphi landscape(8).

### **7.2. Condition**

The main building is in relatively good situation but an innovation procedure in almost all parts of its construction is urgently needed.

The Building Cave is abandoned for decades and its condition is quite bad. Renovation and revitalisation is of urgent priority.

The Arches are in good structural condition but as now they function as store houses they need innovation to accept the new uses.

### **7.3. Function and innovation:**

Actual functions of the buildings (pole) : ELEMENTARY SCHOOL, STORE HOUSES, EMPTY BUILDING

New functions: HISTORIC, FOLKLORE, ENVIRONMENTAL MUSEUM, LIBRARY, COFFEE ROOM, LABORATORIES, SPECIFIC MUSEUMS.

## **8. RE-FUNCTIONING AND TECHNOLOGICAL INNOVATION**

The project is conceived as a dynamic process for the involvement of cultural and environmental resources as a set of objectives for the sustainable development preserving former structures as functional sources of information and inspiration. The innovative way in organising the city's activities, the reorganisation of the local people and tourist movement, the use of new communication and information technology and the creation of new places of work keep, in the pace of today's change, the cohesive development of life patterns through generations(9).

### **8.1. Building innovative technologies:**

- Introduction of new productive systems for heating and electricity and systematic use of the solar energy and natural gas.
- The use of new technologies, new materials and low energy design principles so that saving energy in buildings.
- Creating, through new communication technologies incentives for less transportation volumes.

### **8.2. Economic and financial elements:**

Actual value of the building: 1180000 Euro

Building value after the recovery: 4000000 Euro

Cost of the recovery: 1800000 Euro

### **8.3. Proposal about fund raising :**

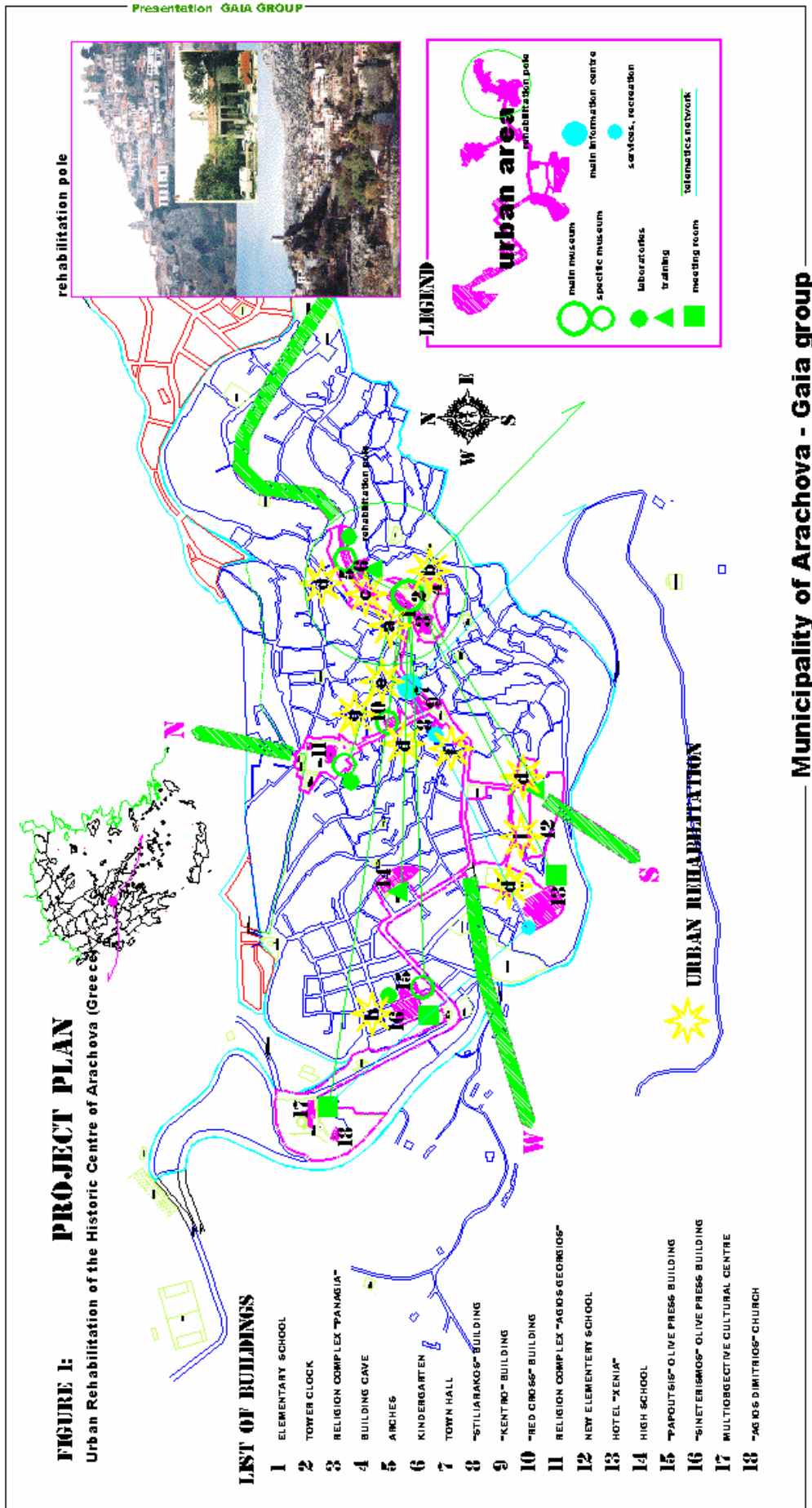
Municipality of Arachova, Local Investors, Ministry of Environment and Public Works, Ministry of Culture, Ministry of National Economy (National Tourism Organisation), Public and Private Network and Telematics equipment Agencies, UE funds (DG XVI, XI, etc.).

## **9. EXPECTED OUTCOMES**

The expected outcomes are both methodological and operating (best practices). We stress the importance of procedures which could be defined, worked out and tested with the possibility to apply them in the different contexts and, in particular, in the disadvantaged regions mostly affected by problems related to employment and economic growth as well as social and urban decay. Outcomes are on building level but they are also on urban level. We believe that the buildings changes are not possible without an urban approach(10). The methodological outcomes are transferred and, above all, transformed into real and integrated actions, which represent the most important outcome expected by this project. Indeed, the firm component (construction and telecommunications), co-ordinated by the scientific component will be able to carry out the recovery of groups of buildings changed them in a rehabilitation network system.

The pole of urban rehabilitation will be the centre of urban functions innovated by the researchers by means of re-functioning processes, and will represent best practices at a Global level. They will represent the reference point of other local authorities, firms and insiders. As regards the proposers, the expected outcomes are the attainment of methodological and operating capacities which will contribute to take part in the rehabilitation processes started by the research, even after its conclusion, and to promote new similar initiatives.

In particular, the research contribution should help determinate a new market sector where, thanks to the gained anticipation and know-how, the firms joining the project could acquire a privileged position. Besides, the multisectorial nature of the project between construction and telecommunication trade could further increase competitiveness and foster the acquirement of a prevailing position on the market. The research global effectiveness will be valued through the dimension of the re-functioning interventions and telematics network, as well as the quantity and quality of the rehabilitation processes which will be started, which represent as many best practices.



**Municipality of Arachova - Gaia group**

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